

**Natural Calamities, Economy and Ecology: A Study on Northern Bengal  
during the Second half of the Nineteenth Century and First half of the  
Twentieth Century**

**A Thesis submitted to the University of North Bengal  
For the Award of**

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in  
History**

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January 2018**

## DECLARATION

I declare that the thesis entitled '**Natural Calamities, Economy and Ecology: A Study on Northern Bengal during the Second half of the Nineteenth Century and First half of the Twentieth Century**' has been prepared by me under the guidance of Dr. Dahlia Bhattacharya, Assistant Professor, Department of History, University of North Bengal. No part of this thesis has formed the basis for the award of any degree or fellowship previously.

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## **Abstract**

The present study intends to explain, from historical perspective, the occurrence of natural calamities such as – earthquakes, cyclones, floods, droughts and famines which took place in the northern part of the colonial Bengal between second half of the nineteenth century and first half of the twentieth century. The northern part of Bengal during the nineteenth and twentieth centuries was comprised of the princely State of Cooch Behar; and the districts of Jalpaiguri, Darjeeling, Rajshahi, Rangpur, Dinajpur, Malda, Pabna, and Bogra which collectively formed the Rajshahi Division. The study tends to focus on the causes and impact of the natural calamities that had occurred in this part of Bengal and their subsequent influences on ecology, population and economy. The environmental condition and social relations of production prevailed in northern Bengal had been manifested critically during the time of natural hazards. Moreover, the distinctiveness of northern Bengal in terms of climatic disorder, river-influence and rainfall, endemic inequalities in food-consumption, the proportion of mortality along with the over-all demographic pattern influenced and shaped by these natural calamities - invokes the priority of analyzing these crucial issues, yet to attain any serious historical interventions on the part of the professional historians.

The present work has been divided into five main chapters excluding the Introduction and Conclusion. The first chapter entitled ‘Historical Geography and Demography of Northern Bengal’ seeks to historicize the geographical transformations and ecological vulnerabilities during the colonial periods in northern Bengal. The chapter also intends to explain the demographic transformations of northern Bengal shaped by the environmental factors and natural disasters occurred during the period of the study. Apart from the geographical and demographical changes the chapter will also focus on the political construction of the northern Bengal districts which had gone through several territorial and administrative adjustments and transfers of lands among each other even in the first half of the twentieth century. In order to analyse the geographical characteristics, the river system, change of river course and formation of new lands seemed to be the most decisive factor for the geographical construction of the region. Northern Bengal had a great variety of topographical structures which extended from the Darjeeling Himalayan ranges to the riverine inundated agricultural

tracts. The second chapter entitled ‘Cyclone, Society and Economy: Disaster and Damage in Northern Bengal (1864-1899),’ focuses on the occurrences, spread and effects of the cyclones from 1864 to 1899, on society and economy of northern Bengal and side by side examines the genesis and dissemination of meteorological knowledge during the second half of the nineteenth century. The cyclones under the period of study had originated in the Bay of Bengal and travelled to the northern districts of Bengal, and few were caused by local depressions. The third chapter entitled ‘Earthquake, Vulnerability and State: Northern Bengal in 1897 and 1934’ describes the impact of the Earthquake of 1897 and 1934 in the society and economy of northern Bengal. The chapter also examines the growth of geological knowledge as part of disaster mitigation process in colonial India.

The fourth chapter ‘Rivers, Floods and Contagion: A Historical Survey on Rainfall, Embankments and Disease in Nineteenth and Twentieth Century North Bengal’ is broadly divided into four parts. The first part deals with the famine of 1787 caused by the devastating flood which was instrumental to the change of course of the river Tista. The second part has described the causes and occurrences of floods took place in north Bengal from 1850s to the 1920s and the state of society, economy and market amidst the destructions of life and property. The third part of the chapter highlights the constructions and role of embankments, drainage and irrigation in connection with the occurrences of floods and examines the colonial ideology of construction and maintenance of these means to eradicate the severity of floods. Finally, the last part is related with the diseases and epidemics caused by water-logging, embankments and contagion which had aggravated the sufferings and impoverishment for the people. Thus the chapter provides a detail analysis of floods and other collateral damages it brought about in form of destruction of lives, production and property in colonial north Bengal.

The fifth or the last chapter titled ‘Drought, Scarcities and Famines: Ecology, Subsistence and Economy in Northern Bengal (1866-1909)’ intends to draw the impact of drought or shortage of rainfall in the economy, ecology and society of northern Bengal. The present chapter has been divided into three major parts viz. the first part explores the hitherto uncharted history of 1873-74 Bengal-Bihar famine in northern Bengal; the second part seeks to unearth the specific and distinctive aspects of the famine of 1896-97 along with a comparison of other parts of Bengal; and the third part deals with the scarcity of 1908-09 which was limited to some particular areas of northern Bengal. However, the main objective

of the chapter is to critically examine the ecological and environmental changes which took place in northern Bengal in terms of variations in rainfall, short and long lasting drought and their impact on the human-nature relations in form of agricultural production and subsistence, which in turn had influenced the complex social-ecology of survival and livelihood, depended on State's and private charity and relief. Famines had brought into all these elements together in a single fold which was characterized by a consistent tension existed between market, politics and society. The study concludes with the remarks on the assessment of the extent of impact of the natural disasters on the society and economy of colonial northern Bengal.

## *Preface*

The present study offers a critical understanding towards the historicity of the occurrences of natural disasters, viz. cyclone, earthquake, floods, droughts, famine, and their subsequent impact on the society and economy of northern Bengal during the periods from second half of the nineteenth century to the first half of the twentieth century. Disasters during the colonial period deserve to get special attention by the historians as the disasters played crucial role in the transformation of human-nature relationship in the changing atmosphere of natural disorders. Natural calamities which have so far been dealt by the natural scientists, geographers, meteorologists and geologists, should have been deciphered in terms of the historical changes of topography, demography and social-ecology of a particular region where politics and control of water, land and market appears distinctively in comparison with the other regions. Thus regional study in environmental history has fashioned the recent researches on historical interpretations of natural disasters, and in doing so, water appears to be the deciding factor which had formed the central consideration of colonial policies on agriculture, irrigation, embankment, and public health. The historical dimension of rainfall fluctuations, riverine changes, crop production and subsistence vulnerability have been entwined with the complex relationships between the State, market and society. The ecological vulnerability which was aggravated by the calamities were instrumental in bringing out new histories of displacement, rehabilitation, fractured livelihood, and overall socio-economic degradation in the colonial northern Bengal where politics of colonial relief had fraught with the ideologies of further control of revenue and other natural resources. The trauma and sufferings of the indigenous people were further intensified by the loss of human lives, cattle, and lands, hostile market, and by the contradictory relief measures propounded by the colonial State and other agencies. Thus the natural calamities which occurred in colonial northern Bengal during the period of the study had transformed the existed pattern of livelihood and production, and introduced new scope for the reconstruction of the history of ecological vulnerability, environmental transformations and economic changes took place in the society of this region.

**Tirthankar Ghosh**

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## Glossary

|                         |                                                    |
|-------------------------|----------------------------------------------------|
| <i>adivasi</i>          | indigenous people, tribal people                   |
| <i>aman</i>             | winter rice                                        |
| <i>anna</i>             | fraction of rupee                                  |
| <i>aus</i>              | autumn rice                                        |
| <i>bania</i>            | trader                                             |
| <i>barind</i>           | upland tract of Malda and Rajshahi district        |
| <i>bheels</i>           | deep water                                         |
| <i>bil</i>              | water-body, marsh                                  |
| <i>boro</i>             | summer rice                                        |
| <i>char</i>             | alluvial land                                      |
| <i>chhit</i>            | piece of land                                      |
| <i>chaukidar</i>        | village police                                     |
| <i>cutcha</i>           | mud-house                                          |
| <i>dhan</i>             | paddy                                              |
| <i>diara</i>            | fluvial deposited land found in Malda district     |
| <i>gola</i>             | granary                                            |
| <i>hat</i>              | village market                                     |
| <i>jalkar</i>           | water tax                                          |
| <i>jote</i>             | Cultivable land                                    |
| <i>jotedar</i>          | landholder or holder of cultivable land            |
| <i>kachari/kutcheri</i> | Office of landlord or sometime government officers |
| <i>khal</i>             | water channel drawn from river to land, canal      |

|                     |                                                       |
|---------------------|-------------------------------------------------------|
| <i>khas mahal</i>   | government estate                                     |
| <i>khiyar/khiar</i> | Sapless or hard tract of land found in Bogra district |
| <i>mahajan</i>      | creditor/noble man                                    |
| <i>mofussil</i>     | countryside                                           |
| <i>mauza</i>        | village revenue unit                                  |
| <i>naib</i>         | officer of landlord                                   |
| <i>nulla</i>        | small streams                                         |
| <i>pali</i>         | silt-covered                                          |
| <i>patni</i>        | a type land tenure or contract                        |
| <i>patni</i>        | holder of <i>patni</i>                                |
| <i>pucca</i>        | brick-house                                           |
| <i>ryot/raiyat</i>  | peasants                                              |
| <i>tal/taal</i>     | Low / swampy tract of land found in Malda district    |
| <i>taluk</i>        | rent collecting unit of district                      |
| <i>thana</i>        | police station                                        |
| <i>zamindar</i>     | Landlord/landed magnet                                |

## Abbreviations

|        |                                           |
|--------|-------------------------------------------|
| BL     | British Library                           |
| EBR    | Eastern Bengal Railway                    |
| EPW    | Economic and Political Weekly             |
| IESHR  | Indian Economic and Social History Review |
| IOR    | Indian Office Records                     |
| MSSR   | Private Papers                            |
| MAS    | Modern Asian Studies                      |
| Offg.  | Officiating                               |
| Progs. | Proceedings                               |
| Secy.  | Secretary                                 |
| WBSA   | West Bengal State Archives                |

## **Introduction**

The present study intends to explain, from historical perspective, the occurrence of natural calamities such as – earthquakes, cyclones, floods, droughts and famines which took place in the northern part of the colonial Bengal between second half of the nineteenth century and first half of the twentieth century. The northern part of Bengal during the nineteenth and twentieth centuries was comprised of the princely State of Cooch Behar; and the districts of Jalpaiguri, Darjeeling, Rajshahi, Rangpur, Dinajpur, Malda, Pabna, and Bogra which collectively formed the Rajshahi Division. The study tends to focus on the causes and impact of the natural calamities that had occurred in this part of Bengal and their subsequent influences on ecology, population and economy. Northern Bengal produces an exclusive variety of topographical configurations which were constructed by the Himalayan hills in the extreme north of the districts of Darjeeling, the Terai (foot-hill) region of Darjeeling and Jalpaiguri with rich forest tracts and tea gardens, and widespread agricultural lands in the plains of the northern Bengal. The environmental condition and social relations of production prevailed in northern Bengal had been manifested critically during the time of natural hazards. On the other hand, the distinctiveness of northern Bengal in terms of climatic disorder, river-influence and rainfall, endemic inequalities in food-consumption, the proportion of mortality along with the over-all demographic pattern influenced and shaped by these natural calamities - invokes the priority of analyzing these crucial issues, yet to attain any serious historical interventions on the part of the professional historians. The areas which had been ravaged by the calamities had shown certain distinctiveness in terms of loss and recovery that varied from region to region, and the proposed study intends to explore this varied nature of the after-effects that were markedly different for the districts of northern Bengal in comparison with the other parts of Bengal and India as well. Moreover, the present research intends to critically examine the Governmental measures and policies adopted in order to rescue the people from the disasters and salvage the plight of the victims.

The geo-morphological evolutions through the centuries had not only shaped the sub-Himalayan tract of which districts of northern Bengal form a major part but made significant contributions towards the formation of natural topographical atlas of Bengal as a whole. Being contiguous to the sub-Himalayan region which is very prone to the zone of seismic activity, districts of northern Bengal, more or less, in general had to witness a series of earthquakes that ravaged its different parts during the colonial rule. Though Geology as a scientific discipline was a product of colonial initiative to acquire knowledge about mineral resources of India but it had little contribution in mitigating the earthquake occurrences and its effects. The earthquake of 1897 is officially known as Assam Earthquake and the earthquake of 1934 has been termed as Bihar-Nepal earthquake. Several historical and scientific researches on 1897 and 1934 earthquakes have been carried out by the historians and social scientists that delve into the aftermath of the disaster in the northern and north-eastern parts of India but little importance has been given to the affected areas of north Bengal. Available documents and information on these two earthquakes for northern districts of Bengal are not only scarce but could only be obtained in a more scattered manner. Perhaps for this reason hardly any attempt has been made by the social scientists to find out the extent of destruction and suffering or recuperating of the society of north Bengal during and after the earthquakes. The study will focus on two major earthquakes, occurred in 1897 and 1934 which produced considerable changes in the existed state of land, water-bodies and drainage pattern, public and private masonry buildings, the railways and also in the overall communication system of northern Bengal. Earthquakes in northern Bengal had frequently been accompanied with destructive landslides in the hilly region of northern Bengal which aggravated the sufferings of the people in terms of increased number of deaths and damage of natural resources and human properties.

Storms and cyclones made time to time visit to the different districts of this region accompanied by heavy rainfall and wind of great force. From the month of November to May upper winds over the Himalayan region are predominantly westerly. Nonetheless, Cyclones did not restrict to these months but appeared in a more violent form in many times of the year. The districts of northern Bengal frequently fell under violent gale between 1864 and 1899 (with other parts of Bengal or sometime exclusively). The cyclones under the period of study whether came from the Bay of Bengal or having regional origin did not confine themselves to their origin, in fact, northern part of the Bengal as well as other parts of Bengal

were also hit by these cyclones. Cyclones had very often accompanied with heavy rains which had contributed to rising water level in the rivers that endanger the possibilities of floods. Official reports of several government departments regarding cyclones of this period had not only contradicted with each other but produced ambiguous information from which any uniform deduction could hardly be drawn. Despite of their origin in the Bay of Bengal the cyclones had several times produced death and destruction in the northern part of Bengal, which was located far from the sea or coastal area. Any historical attempt on the part of the historians to decipher cyclonic impact upon human lives, settlement and society in this part of Bengal is still awaited. The sufferings caused by the cyclonic disasters, and destructions it brought about need to be spell out separately and distinctively for the northern districts so far the varied nature of meteorological information about the cyclones for different areas and subsequent government reliefs are concerned.

Floods produced serious destruction of lives and agricultural crops in northern Bengal. Bengal, as a whole, became wealthy in agricultural production and trade by the outstanding contributions of its rivers which nature has given to her. But the valuable offerings of rivers sometime got disturbed with the considerable increase in water level in the river-bed. The rivers of northern Bengal had their origin in the Himalayan hills which provided an undaunted supply of water throughout the year. But floods in this region caused both by the heavy or unseasonable rainfall in the plains and hills and unprecedented increase of water-level swept away the lands and people rested on its bank. Moreover, the intensity, duration and geographical distribution of rainfall throughout the region produced floods of varied in nature and severity. Duration of floods and their severity were determined by the quantity of inflow of waters caused by the cyclonic and general excess of local rainfall and outflow of waters depended on the subsequent evaporation, sloppy nature of the land or the drainage pattern (natural and constructed). Riverine morphology had a considerable impact towards the formation of topographical and agricultural settlement in the northern districts of Bengal. Tista, the largest river of northern Bengal had many times brought about large quantity of water due to the melting of glacier or heavy rainfall in the hills which inundated a large tract of land spread across northern Bengal. Other rivers of northern Bengal like – Karatoya, Lish, Ghish, Torsa, Jaldhaka, Kaljani, Mahananda, Atrai etc. also flooded the region frequently. Ganges, rolling down to the southern part of northern Bengal mainly through the district of Murshidabad caused severe floods. Loosening of lands or rocks due to the heavy and sudden

rains sometimes caused devastating landslides in the hilly part of northern Bengal which called for additional damage of human property and lives. Embankments which supposed to be a major concern for reducing the danger of flood occurrence sometimes even heightened the tensions among the flood victims because the colonial hydrology had yet to tap new tools or solutions for diminishing the hazardous effects of inundation in the northern part of Bengal. The large scale destruction of crops and commodities had resulted to widespread increase of prices and aggravated enduring poverty of the people. Thus the natural events had contributed to the spawning of complex relationship between environment, social ecology and subsistence.

On the other hand, unprecedented or continuous shortage of rainfall lasted for couple of seasons had created the condition for drought. Persistence of drought for long time of a year caused serious scarcities of food grain which were intensified into a famine by its further extension. The reason of famines was twofold – first was the natural factor i.e. severe drought which caused to the large scale destruction of crops and the second was human-factor that acted as the main catalyst to transform a famine-warning region into a famine-point region. Northern districts of Bengal sometime exclusively had to witness a series of scarcities and famines as a result of both the natural and human factors and on certain occasions became a part of a widespread famine which had affected Bengal as a whole. There had been ten wide-spread famines in India during the forty years, from 1860 to 1900; and in spite of relief operations carried out by the British Government there was a great number of life which were lost during these years. In the second half of the nineteenth century Bengal had witnessed serious famines in 1866 (as a part of Bengal-Orissa famine), in 1873-74 (Bihar-Bengal famine) and in 1892 and 1896-97 (along with other provinces of India). Until the Great Bengal famine of 1943, though there was no occurrence of famine in Bengal but there were some issues of serious scarcities in the early part of the twentieth century. The agricultural production and market of Bengal could not remain far from the adverse impact of the Great Depression during the 1920s and 30s. All these precedents were outnumbered by the famine of 1943 in comparison to the death and destruction, it called for. The whole of Bengal was ravaged to such an extent during the famine of 1943 which caused massive rupture in the economy and society of Bengal that recovery from this amounted to a considerable time.

In a land like Bengal where agriculture, the backbone of Bengal's economy, heavily depends on the regularities and quantity of rainfall, then how can one completely ignore or eschew a

comprehensive survey of rainfall pattern in Bengal. Even the Government did not have much felt to alter the rainfall dependency of the people through sufficient irrigation or canal networks or even the scarce introduction of irrigation or canal system did not provide any assistance or relief to the poor during the time of shortage of rainfall. Famine literature regarding Bengal or India has already made rich by the valuable writings and researches by the academicians from different fields. The present study does not intend to indulge into any present-day dominant theoretical presuppositions or their exertions, rather to interrogate the dynamics of social ecology influenced by the shortage of rainfall and the successive crop-failure, through the examination of meteorological or rainfall data and its co-relation with the crop production and trading of commodities, whether intensified and aggravated to the famine condition by the activities of human agency. Persisting research works on several Bengal famines, so far, mostly have confined to the narratives of the economic and political factors and their impact on society, thereby ignore the climatological aspect; but an ecological and meteorological investigation could possibly add a new dimension to the existing famine-literature, yet to incorporate the issues of politics and control of water. Moreover, the existing writings on Bengal famine though have focused on Bengal as a single 'region', hardly involve any detail survey of specific district/s or region separately despite of the fact that famine condition and its development and successive relief measures had widely varied from district to district and region to region. The present study will thus try to explore the distinctive situation of the famine affected districts of northern Bengal even along with their minor sub-divisions and *thanas* in a comparative manner so that additional or new information and interpretations could emerge. Since there is no attempt to make any district-wise study of famines so far, the proposed study, therefore, is also intended to situate the condition of life, property, production and society of northern Bengal during the famines occurred under the period of study.

The advent of colonialism, as a global phenomenon, had acted as a watershed in transforming the existed biosphere in India that evolved through the changing trajectories in the sphere of political ecology. The imperial ideology of controlling the forests and increasing pressure of land revenue transmuted the Indian society more vulnerable to the climatic disasters. Politics of water and food intensified during the floods, droughts and famines have not only unfolded the complexities of ecological variability but have revealed the unexplored historicity of the natural disasters. The temporary or permanent dislocation of ecological dependency within

the society in terms of livelihood, entitlement, recovery, rights and control had confronted between the ideologies and initiatives of relief, charity and hegemony on the part of the Governmental and non-governmental agencies. The complex demographic behaviour of northern Bengal comprised of several types of tribes, castes, indigenous and European population had responded differently during different natural calamities. The frontiers of northern Bengal developed social relations of production and distribution so markedly different from both western and eastern Bengal that the broad outlines of demographic mobility need to be sketched separately for this region, especially during the calamitous days.

Expansion of railways in different parts of northern Bengal from the second half of the nineteenth century enabled the colonial government to get access to the rich natural resources of this region and to impose its domination over the natural world that had to accommodate considerably with growing colonial demands. The mutual contradiction between the prompt expansion of commodity production for a capitalist world market and the continuity of non-capitalist agrarian social structures can probably be best viewed in terms of the situation when the normal rate of production, trade and consumption or appropriation was shattered by the occurrence of calamities. Commodity frontiers appeared to have been transformed during and after the calamities that contributed to the shifting of culture of food-consumption from paddy, rice etc. to other makeshifts or more coarse quality of food grain and the cattle were also suffered from want of fodders during these times. The successive changes introduced in land-revenue, agriculture and trading pattern during the calamitous days had become more critical for the subsistence and survival of the people of this region. Vulnerability of disasters was further aggravated due to the appearance of diseases (malaria, cholera, influenza, and small-pox etc.) or epidemics which were more intensified during the period of climatic disorders and inflicted additional sufferings for the victims of the disasters. Thus the governmental policy of relief had to co-exist with the concerns for public health and its restoration.

Over the past few decades researches on environmental history of India have unearthed many uncharted terrain of historical ecology and eco-political aspects of environment and climate but little importance has been given to the natural disasters. Disaster which as a subject or discipline belongs to the safe hands of the geographers, geo-scientists or meteorologists could equally be interesting and important for a historian since a historical study of disasters may produce additional information and knowledge thereby exploring an alternative dimension of

socio-economic and political history. Thus the present study intends to explore the social history of climatic disorders and natural disasters that affected the northern Bengal and brought out changes in ecology, economy and society of northern Bengal.

Natural history or environmental history has long been viewed as ‘non-historical’ subject which has neither human connections nor any social implications. Reconstructions of human history have not been substantiated by the influences of natural events in the professional arena of historical writings although Fernand Braudel in *The Mediterranean and the Mediterranean World in the Age of Philip II* (1949) vehemently protested against the historians who treated the environment simply as a silent and passive backdrop to their historical narratives and provided a major ‘break’-through in the prevailing distinction between the natural and human history. Environmental history, as one of the latest scholarly endeavours which emerged in the late twentieth century, has made an attempt to explore the human-nature relationship from the historical standpoint. The major practical issues of environmental history, J. Donald Hughes<sup>1</sup> remarks; are: the impact of environmental actions in human societies, the fluctuations in the natural environment resulted from the human actions and the influences of those changes in turn on history, and the history of human perception about the world of nature and its mechanisms. In today’s context of global warming and climate change Dipesh Chakrabarty’s ‘The Climate of History’ (2009) attempts to explain the causes of these problems in the advent of the Age of Anthropocene as a new geological epoch when “humans exist as geological force” that “severely qualifies humanist histories of modernity/globalization.”<sup>2</sup> Natural disasters such as floods and droughts had serious human influences upon themselves because the environment was more critically transformed by the human power, control, and direction for the sake of human interests which was deliberately detrimental for the maintenance of natural or environmental balance. In fact, the shortage or excessiveness of rainfall had been politically categorized and diverted to a abnormally transforming character of human response and solidarity which was more market driven, socially hierarchical and politically controlled by the State or agencies.

The brutal and dramatic encounter between human existence and natural disasters exhibited the saga of continuity of human civilization since the dawn of the appearance of human being in this earth; contrary to this, at the same time, progress of civilizations had also been accelerated by utilizing the natural resources and forces in a more favourable way. Side by side, there were substantial indigenous strategies for environmental management on a small

scale, according to Richard H. Grove (1995), which often involved <sup>3</sup> a considerable understanding of environmental processes, had existed in many parts of the world since time immemorial. This fundamental relation between the nature and human being had hardly changed over the centuries and still today, despite of use of latest scientific developments, man could scarcely have the fortune in taming nature. Environmental or natural factors determine the economic, social livelihood of geographical inhabitants which are subject to transformation with the pace of changing nature of natural or climatological occurrence, be it temporary or enduring. The historical dimensions of the natural disasters or calamities (such as – flood, earthquake, cyclone, drought, landslide, etc.) form one of the important segments of historical reconstruction of human past and these issues are also increasingly coming to be recognized, with their regional and local variations. Regional environmental history seems to be a vital inclusion in interpreting the natural or ecological issues of a particular region with an in-depth and thorough research since, as has been argued by Hughes (2006), ‘a region, more aptly than a nation, can be defined in ecological terms’. Similarly, though the impact of the natural hazards or disasters may be shown most instructively, as argued by Hughes (2012) in more limited case studies, ‘but no case study, however small, may be considered in isolation.’<sup>4</sup> In the days of increasing fashioning of academic researches by interdisciplinary approach the history of technology, agricultural history or economic history as a whole, forest history and ecological history etc. might be regarded as integral parts of the environmental investigations since they explore human interactions with the natural environment. Thus in recent years when environmental or natural history has come out as a subject of ‘mainstream’ history, these environmental actions have been enabled the historians to interpret the ‘potentialities’ of these natural activities in order to highlight the changing features of ecological, economic and social environment with an interdisciplinary method.

Colonialism marked a watershed in environmental history of the globe. After the fifteenth century the evolving global structure of trade and travel provided the backgrounds for a process by which indigenous European ideas about nature were gradually transformed and developed through the exhaustive inclusion of ‘information, impressions and inspiration from the wider world’. In this way the commercial and utilitarian purposes of European expansion generated a situation, as argued by Grove (1995), in which the tropical environment was increasingly utilized as the symbolic location for the idealized landscapes and aspirations of the western imagination.<sup>5</sup> Similarly, for India, as the world ecology has been profoundly

changed during the eighteenth and nineteenth centuries by the growth of western capitalism, according to Madhav Gadgil, and Ramchandra Guha (1992), first through trade and later by colonialism, in view of this alteration the ecological transformations in India during the colonial period deserve special interest in regard to the intimate connection that recent research has made between British imperialism and environmental degradation in the colonized countries.<sup>6</sup>

There occurs a remarkable shift in the perspective and interpretation of the impact of natural disasters viz. earthquake upon the human society. According to Stallings (1997) the shift has been marked from 'the oldest and most prevalent typification' of the effect as 'life-loss' to the 1970s invention of the impact as 'psychological harm'.<sup>7</sup> But on the other hand, it is said to believe that, 'memory of natural disasters is, in contrast to the memory of war, markedly short-lived' which induced to, according to Christof Mauch (2009), 'eclipse destructive natural phenomena that occurred in the past.'<sup>8</sup> Psychological trauma produced by the disaster and subsequent recovery from that trauma needs a careful and cautious analysis of emotional underpinnings which appears as an important element in the disaster-discourse because, as Simmons (2008) believes, 'most humans and their institutions live in a world of feelings and moods' where 'feelings are also constructed cognitively.'<sup>9</sup> Thus "the ecology of emotion"<sup>10</sup> has also guided the behavioural aspect of the assessment of loss, time and material need for recuperation and finally the restoration of the pre-disaster order. The cultural ecology of land use, water management etc. have become the dominant elements in the process of recovery which further deepens the question about the concern for transforming character of those aspects. The transforming character of land, agriculture and consumption during the colonial period had a serious bearing on the question of 'ecology of culture' which was constructed and shaped by the State and its administration on the one hand, and long-established tradition of belief, and mutual cooperation of poverty and livelihood on the other hand. Although in general cases the 'cultural factors operate at various levels through the policies of sovereign states (and the world bodies to which they belong), the public and private agencies that serve those policies, and the public officials who are directly responsible for how the policies are carried out'<sup>11</sup> but the colonial administration in India faced great difficulties in acquiring necessary information about the disaster and conducting subsequent relief operations. Information and resource collection for the recovery had also appeared as important elements for the victims of the disaster who were placed in a critical condition and brought down to a

status of wretched. However, the process of recovery and restoration of pre-calamity order includes in it, as Ben Wisner and others (2003) have argued, ‘the manner in which assets, income and access to other resources, such as knowledge and information, are distributed between different social groups, and various forms of discrimination that occur in the allocation of welfare and social protection (including relief and resources for recovery).’<sup>12</sup>

Academic researches on disasters have tended to focus on the process of disaster mitigation and the impact of the disaster because, as argued by Greg Bankoff (2003), these aspects ‘are inseparably linked to questions of environmental conservation, resource depletion and migration patterns in an increasingly globalised world.’<sup>13</sup> In the 1990s there was increasing emphasis on natural disaster information and mitigation and the decade was celebrated as the International Decade for Natural Disasters Reduction (IDNDR). The information was technical and initiated the basis for major enterprises in building structures designed for seismic safety, slope stability, severe storm warning systems, and global monitoring and reporting.<sup>14</sup> On the other hand, the historical dimension of natural disasters is no less important in exploring the history and legacies of vulnerability and coping of the societies lived under the colonial domination and in doing so, Tirthankar Roy (2014) argues, ‘a deeper understanding of the impact of natural disasters upon society needs a graded sense of time’.<sup>15</sup> Roy’s book provides useful insights to the analysis and understanding of the historicity of natural disasters, and has enriched the existing historiography by raising new arguments and questions on the method of historical reconstruction of natural disasters in colonial India. Although the book has ‘introduced’ disasters as historical subject, but lacks any detail analysis of the occurrences and impact of the disasters which widely varied from one place to another. K. Hewitt argues (1983) that the western inference on disasters like, abnormal natural events or vulnerable population, rests on the postulation of ‘a socio-cultural construct reflecting a distinct, institution-centred and ethnocentric view of man and nature’<sup>16</sup> and these characteristics has been frequently demonstrated by the commonly assigned designation of ‘topicality’.<sup>17</sup> Along with the geographical heterogeneity there were differences in demographic structures affected by the unequal terms of international trade which made the populations of less developed countries ‘more likely to die from hazard’ in comparison with the more developed countries.<sup>18</sup> Asian Disaster Reduction Centre has compiled the statistics on disaster mortality in the recent past which revealed, as argued by Tirthankar Roy, the

probability that death caused by natural disasters in South Asia was double than the rest of the world (excluding China).<sup>19</sup>

Until the advent of the knowledge of ‘vulnerability’ to illustrate disasters, there was a collection of predominant interpretations which rarely delved into the problem of a particular society that produces the experiences through which people encounter dangers. One approach was blatantly naturalist (often termed as physicalist), where the entire circumstances has been attributed to ‘the fierce forces of nature’ or ‘nature on the rampage’, on the other hand, further observations of ‘man and nature’ confrontation intricate a more delicate environmental determinism, in which the perimeters of human rationality and resultant confusion of nature stretched to catastrophic errors in our interfaces with it.<sup>20</sup> But the notion of a society’s vulnerability to natural hazard can be attributed more than to a region’s geographic or climatic tendency to hazard though very often the major historical and social dimensions of natural hazards or disasters were overlooked in emphasizing disaster prevention through the improving scientific applications, engineering remedies and the administrative management of hazard. At the same time a group of populations as well as the governments were categorized as liable of lacking of adequate knowledge and awareness, which could initiate measures towards reducing of risk but failed to do so.<sup>21</sup> Vulnerability can be devoted to the errors in planning, location, strategy, and construction of a community’s erections and organization. R. Chambers (1989) has argued that vulnerability can be denoted by historical developments which dispossess people from the resources of surviving from hazard without suffering losses that make them physically weak, economically penurious, socially dependent and degraded and psychologically impaired.<sup>22</sup> Recent researches on disasters especially which are of ‘geographical study’ have argued on the “disasterscape” of a region which ‘epitomizes the collective condition of disasters.’<sup>23</sup> Anu Kapur (2010), who has coined the term, has described ‘disasterscape’ in the following words:

“...it denotes an area that manifests the hallmark of a disaster. Characterized by features of destruction, devastation, and state of upheaval,... A disasterscape is a place where human life is lost or damaged, relationships ripped and livelihoods disrupted... The disasterscape is also a commodity, which can not only be sold but also politicized and corrupted. For it can sharpen our ecological and political sensitivities and human sensibilities....”<sup>24</sup>

Northern Bengal, both as a geographical region and political-administrative unit had witnessed a series of natural disasters which were further intensified by the human

interferences, and hence it can be said that the natural disasters which occurred in northern Bengal had truly formed the “disasterscape”.

Greg Bankoff (2001) has further argued that the western assumption ‘to depict large parts of the world as dangerous places for *us* and *ours*’<sup>25</sup> provided a major justification for their ‘civilizing mission’ and the process of adaptation for themselves in the ‘temperate climate’ was coupled with ‘cultural constraints’ and criticism of the oriental society and environment. Moreover, colonial rule became the major stricture in measuring the extent and complexities of the reasons of vulnerabilities and efficiency in conducting relief operations. Recovery from the natural disasters could not only be a matter of accumulation of resource or execution of relief but it was more based on the society’s knowledge and understanding of cultural distinctiveness for themselves and the space provided by the colonial state to recover the colonized from the given ‘marginality’ of their material and spiritual conditions. Tirthankar Roy elsewhere (2008) argues that ‘the process of economic recovery depends largely on the success of managed retrieval and reconstruction of assets’ which usually involves a greater degree of ‘money, information, infrastructure and coordination.’<sup>26</sup> As the rich and poor both suffer loss during the natural disasters, so Roy has designated the natural disasters as ‘class neutral’ in contrast to the ‘man-made war or civil strife’,<sup>27</sup> but the fact is that neither the degree of loss did match with each other nor the process and duration of recovery was identical for the both, rather disasters has intensified the vulnerability and dependency of the later upon the former.

The existed literature mentioned above has no doubt contributed to the understanding of the problems of natural disasters and its impact on society and economy in a broader scale. Although during the recent decades problems relating to ecology, especially under the influence of the debate on climate change, has attained considerable attention by the historians and sociologists, but any historical work on a particular or smaller region where the elements of calamity, ecology, and vulnerability could be intersected more categorically, is yet to attain any proper historical interpretation by the historians. Northern Bengal, in this respect, deserves special attention by the historians who were earlier more inclined to focus on the overall environmental transformation in terms of colonial policies on forest, land pattern, and agricultural changes of any region, but to explore the complexities and dynamism of disaster occurrences, sufferings and displacement, and rehabilitation and relief operations of any particular region. It is in this recent wider background that the present

historical study seeks to draw the changing relationships between the natural calamities such as – earthquakes, landslides, cyclones, floods, and droughts occurred during the second half of the nineteenth century and the first half of the twentieth century and their impact on the society, economy and ecology of the northern districts of colonial Bengal. The study also intends to underscore the far-reaching impact of environmental and ecological transformations occurred in this region caused by the natural calamities.

An interdisciplinary method has been followed in writing this dissertation. The study connects itself with the wider academic networks of geography, economics, ecological and environmental history along with their basic element i.e. human society. The collection of sources for the whole research work is divided into two parts. The first part is the collection of data. For this purpose both the primary sources and secondary sources have been utilized. For the primary sources several unpublished documents like – archival sources viz. annual reports, Government proceedings and official correspondences stored in several archives; and among the published documents – published travelogues and memoirs of the British officials, newspaper reports, survey and settlement reports of several districts, Census reports of the relevant volumes, famine commission report, district gazetteers of several northern districts of Bengal have been consulted. For the collection of secondary sources, contemporary and recent books, monographs, journals, periodicals, unpublished Ph. D dissertations, digital sources have been taken into account. The second part of the method comprises of the analysis and interpretation of the collected data and information in order to offer some logical suggestions for the understanding of the problem.

The present work has been divided into five main chapters excluding the Introduction and Conclusion. The first chapter entitled ‘Historical Geography and Demography of Northern Bengal’ seeks to historicize the geographical transformations and ecological vulnerabilities during the colonial periods in northern Bengal. The chapter also intends to explain the demographic transformations of northern Bengal shaped by the environmental factors and natural disasters occurred during the period of the study. Apart from the geographical and demographical changes the chapter will also focus on the political construction of the northern Bengal districts which had gone through several territorial and administrative adjustments and transfers of lands among each other even in the first half of the twentieth century. In order to analyse the geographical characteristics, the river system, change of river course and formation of new lands seemed to be the most decisive factor for the geographical

construction of the region. Northern Bengal had a great variety of topographical structures which extended from the Darjeeling Himalayan ranges to the riverine inundated agricultural tracts. The second chapter entitled ‘Cyclone, Society and Economy: Disaster and Damage in Northern Bengal (1864-1899),’ focuses on the occurrences, spread and effects of the cyclones from 1864 to 1899, on society and economy of northern Bengal and side by side examines the genesis and dissemination of meteorological knowledge during the second half of the nineteenth century. The cyclones under the period of study had originated in the Bay of Bengal and travelled to the northern districts of Bengal, and few were caused by local depressions. The third chapter entitled ‘Earthquake, Vulnerability and State: Northern Bengal in 1897 and 1934’ describes the impact of the Earthquake of 1897 and 1934 in the society and economy of northern Bengal. The chapter also examines the growth of geological knowledge as part of disaster mitigation process in colonial India.

The fourth chapter ‘Rivers, Floods and Contagion: A Historical Survey on Rainfall, Embankments and Disease in Nineteenth and Twentieth Century North Bengal’ is broadly divided into four parts. The first part deals with the famine of 1787 caused by the devastating flood which was instrumental to the change of course of the river Tista. The second part has described the causes and occurrences of floods took place in north Bengal from 1850s to the 1920s and the state of society, economy and market amidst the destructions of life and property. The third part of the chapter highlights the constructions and role of embankments, drainage and irrigation in connection with the occurrences of floods and examines the colonial ideology of construction and maintenance of these means to eradicate the severity of floods. Finally, the last part is related with the diseases and epidemics caused by water-logging, embankments and contagion which had aggravated the sufferings and impoverishment for the people. Thus the chapter provides a detail analysis of floods and other collateral damages it brought about in form of destruction of lives, production and property in colonial north Bengal.

The fifth or the last chapter titled ‘Drought, Scarcities and Famines: Ecology, Subsistence and Economy in Northern Bengal (1866-1909)’ intends to draw the impact of drought or shortage of rainfall in the economy, ecology and society of northern Bengal. The present chapter has been divided into three major parts viz. the first part explores the hitherto uncharted history of 1873-74 Bengal-Bihar famine in northern Bengal; the second part seeks to unearth the specific and distinctive aspects of the famine of 1896-97 along with a

comparison of other parts of Bengal; and the third part deals with the scarcity of 1908-09 which was limited to some particular areas of northern Bengal. However, the main objective of the chapter is to critically examine the ecological and environmental changes which took place in northern Bengal in terms of variations in rainfall, short and long lasting drought and their impact on the human-nature relations in form of agricultural production and subsistence, which in turn had influenced the complex social-ecology of survival and livelihood, depended on State's and private charity and relief. Famines had brought into all these elements together in a single fold which was characterized by a consistent tension existed between market, State and society.

## Notes and references:

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- <sup>5</sup> Richard Grove, *op. cit.*, p. 3.
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- <sup>7</sup> Robert A. Stallings, *Sociological Theories and Disaster Studies*, Preliminary Paper (249), Disaster Research Centre, University of Delaware, 1997, p. 9.
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- <sup>10</sup> For details see *Ibid.*, pp. 223-226.
- <sup>11</sup> Joan Iverson Nassauer (ed.), *Placing Nature: Culture and Landscape Ecology*, Island Press, Washington, D.C, 1997, p. 26.
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<sup>16</sup> K. Hewitt, 'The Idea of Calamity in a Technocratic Age' in K. Hewitt (ed.) *Interpretations of Calamity from the Viewpoint of Human Ecology*, MA: Allen and Unwin, Boston, 1983, p. 8.

<sup>17</sup> For details see David Arnold, 'Tropical Medicine before Manson' in David Arnold (ed.), *Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500- 1930*, GA: Rodopi, Amsterdam and Atlanta, 1996, pp. 1- 19.

<sup>18</sup> Greg Bankoff, *op. cit.*, pp. 10- 11.

<sup>19</sup> Tirthankar Roy, *op. cit.*, p. 6.

<sup>20</sup> Ben Wisner et al, *op. cit.*, p. 10.

<sup>21</sup> For details see A. Varley, 'The Exceptional and Everyday: Vulnerability in the International Decade for Disaster Reduction' in A. Varley (ed.), *Disaster, Development, and Environment*, Wiley, Chichester, 1994, pp. 1 -11.

<sup>22</sup> R. Chambers, *Vulnerability, Coping and Policy*, *IDS Bulletin*, 20 (2), 1989, p. 1.

<sup>23</sup> Anu Kapur, *Vulnerable India: A Geographical Study of Disasters*, Sage Publications, New Delhi, 2010, p. 5.

<sup>24</sup> *Ibid.*

<sup>25</sup> Greg Bankoff, 'Rendering the World Unsafe: 'Vulnerability' as Western Discourse,' *Disasters*, 2001, 25(1), p. 20.

<sup>26</sup> Tirthankar Roy, 'State, Society and Market in the Aftermath of Natural Disasters: A Preliminary Exploration,' *Indian Economic Social History Review*, Vol. 45, No. 2 (June 2008), p. 262.

<sup>27</sup> *Ibid.*

## **Chapter I**

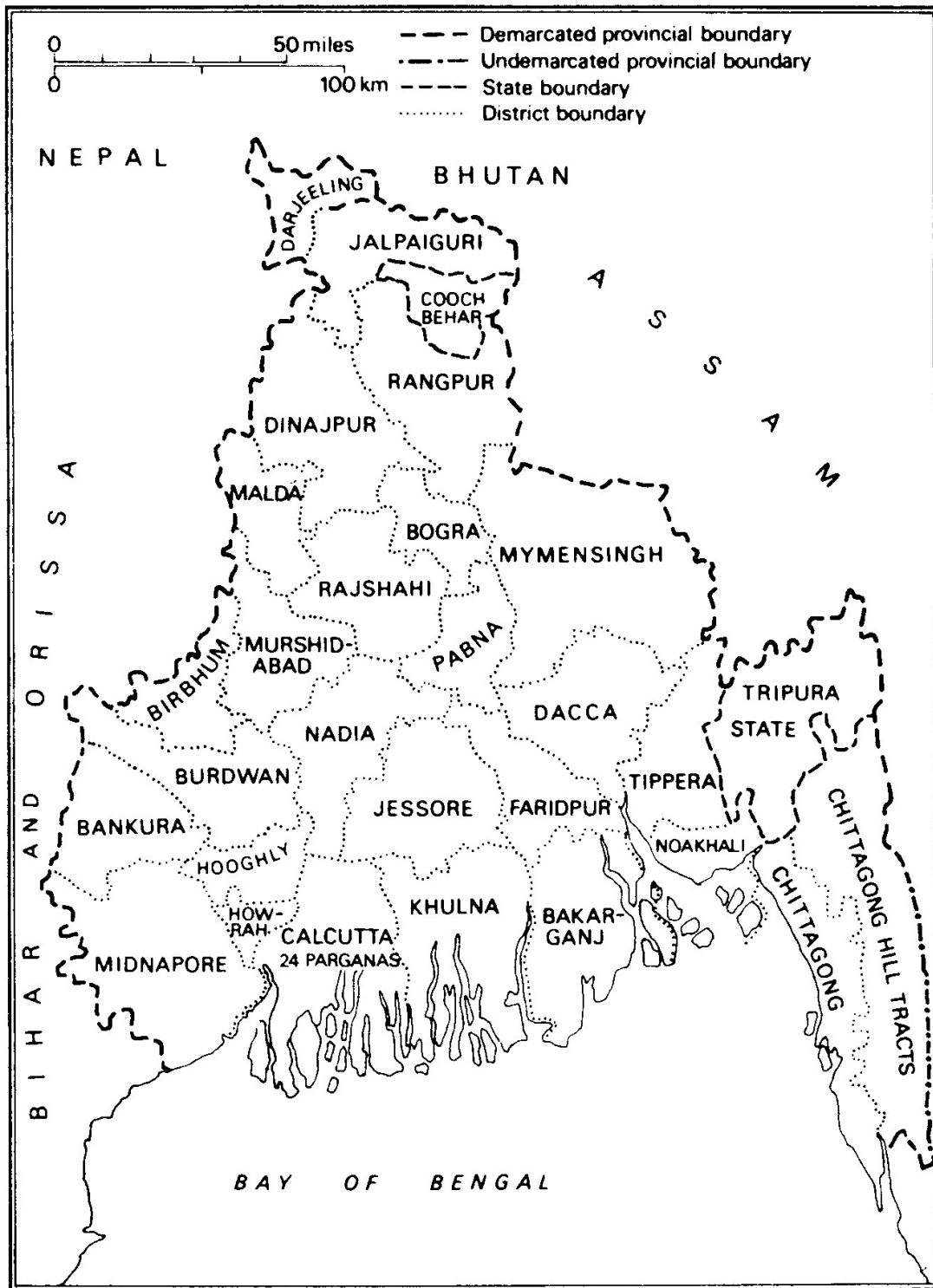
### **Historical Geography and Demography of Colonial Northern Bengal**

The present chapter seeks to historicize the geographical transformations and ecological vulnerabilities during the colonial periods in northern Bengal. The chapter also intends to explain the demographic transformations of northern Bengal shaped by the environmental factors and natural disasters occurred during the period of the study. Apart from the geographical and demographical changes the chapter will also focus on the political construction of the northern Bengal districts which had gone through several territorial and administrative adjustments and transfers of lands among each other even in the first half of the twentieth century. In order to analyse the geographical characteristics, the river system, change of river course and formation of new lands seemed to be the most decisive factor for the geographical construction of the region. Northern Bengal had a great variety of topographical structures which extended from the Darjeeling Himalayan ranges to the riverine inundated agricultural tracts. Niharranjan Ray, while describing the northern boundary of Bengal, has argued that the north of Bengal is bounded up by the Sikkim and the snowy Himalayan peak of Kanchenjunga below which there are Jalpaiguri and Darjeeling districts.<sup>1</sup> The districts of Jalpaiguri, Darjeeling and the State of Cooch Behar were overwhelmingly populated by the hilly tribes viz. Lepcha, Limbu, Koch, Rajbanshi, and Bhutia; and the north-eastern boundary in the ancient time was extended up to the Brahmaputra river which demarcated the eastern and western boundary of Pundrabardhan and Kamrup State respectively.<sup>2</sup> H. Blochmann has mentioned about the five 'districts' of Bengal during pre-medieval period viz. the Radha, the country west of the Hugli and south of the Ganges; Bagdi, the delta of the Ganges; Banga, the country to the east of and beyond the delta; Barendra, the country to the north of the Padma and between the Karatoya and the Mahananda rivers; and Mithila, the country west of the Mahananda.<sup>3</sup> But what emerged in the colonial period was altogether different and unprecedented, because the colonial initiative to

organize and systematise the administrative and political boundaries of Bengal as well as India had given birth to a new ideology and practice of map-making. These cartographic endeavours were, however, aimed at the collection of accurate knowledge about the district, *parganas*, and *thanas* and thereby to control the revenue and criminal administration more efficiently. Therefore, throughout the colonial period the districts of northern Bengal had witnessed innumerable cases of transfers and readjustments of their boundaries which were no less important than the riverine or topographical changes of the region. In fact, disaster mitigation process, relief operations etc. were largely controlled and maintained by the district officials of the colonial administration which was headed by the Lieutenant Governor of Bengal. The united topography of Bengal had been largely constructed by numerous rivers among which the Ganges and the Brahmaputra, according to Major James Rennell, deserved special attention. Rennell had remarked that -

“The Ganges and Burrampooter [Brahmaputr] rivers, together with their numerous branches and adjuncts, intersect the country of Bengal (which, independent of Bahar and Orissa, is somewhat larger than Great Britain) in such a variety of directions, as to form the most complete and easy inland navigation that can be conceived.”<sup>4</sup>

The Ganges which had change its course for several times in Bengal, especially from the one side of the delta to the other, that Rennell found it difficult to identify any ‘*virgin*’ land, between the Tippera hills on the east, and the province of Burdwan on the west; nor on the north up to Dacca and Boalia (Rajshahi).<sup>5</sup> The riverine and overall geographical and topographical transformations had influenced the demographic or population trends which were further shaped and altered by several natural disasters, diseases and epidemics and their subsequent influences.



Map. 1.1: Bengal districts in the early twentieth century

Source: Sugata Bose, *Peasant Labour and Colonial Capital: Rural Bengal since 1770*, (1993), p. 85.

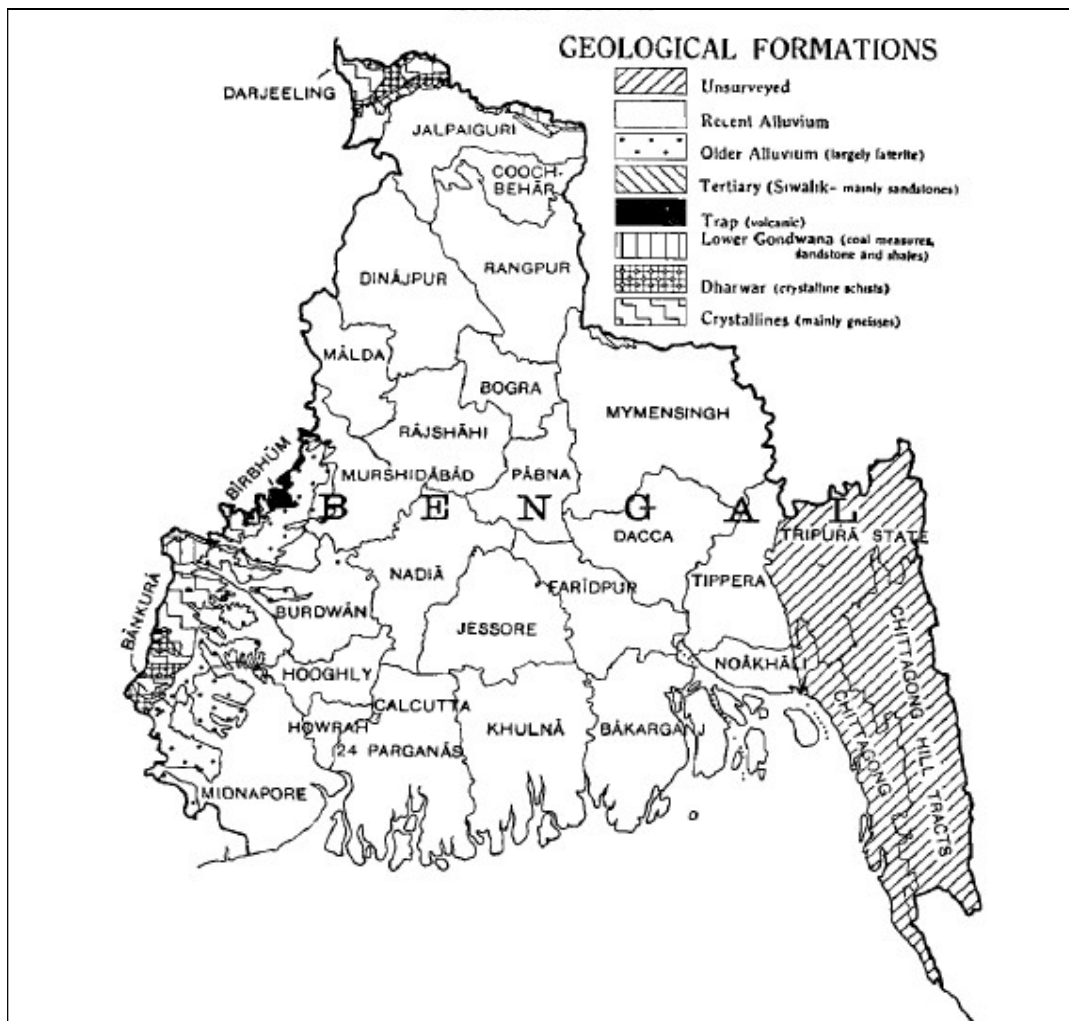
## Historical Geography, Ecology and River Systems of Northern Bengal

The political divisions of Bengal had not always been complemented with those indicated by the physical features of the country or the ethnic distribution of the people, and this characteristic had prevailed especially in respect of Commissioners divisions. The census of 1901 described that there was no natural dividing line between the Patna and Bhagalpur Commissionerships, while the latter incorporated Malda, the greater part of which was in all respects similar to the adjacent districts of the Rajshahi Division to which it formerly belonged.<sup>6</sup> On the other hand, although the Mahananda had been regarded as ‘the true ethnic and linguistic’ boundary between Bengal and Bihar, but nearly a quarter of the Purnia district located to the east of that river, and in the same way the Himalayan district of Darjeeling embraced a considerable tract in the plains. Thus it was suggested that since district was the ‘unit of administration’, therefore, it was ‘desirable that the results of the census should be viewed for each such unit as a whole’ instead of breaking up districts.<sup>7</sup>

The term Barendra, according to the census of 1901, persisted in the Barind or elevated tract of old alluvium which extended over a considerable part of the then districts of Rajshahi, Dinajpur, Malda, and Bogra.<sup>8</sup> The census of 1911 had divided the whole Bengal into four natural divisions viz. the West Bengal, the Central Bengal, the North Bengal, and the East Bengal, among which the North Bengal was comprised of the Districts of Rajshahi, Dinajpur, Jalpaiguri, Darjeeling, Rangpur, Bogra, Pabna, and Malda.<sup>9</sup> These districts together had formed the Rajshahi Division. Although the State of Cooch Behar had been placed separately in the census as a sole State which formed the Cooch Bihar Division, but Cooch Behar has been treated as inseparable part of North Bengal in this work due to its close affinity with the districts of the Rajshahi Division in terms of land pattern, production system, composition of population and their socio-cultural behaviour etc. The census has introduced the region i.e. North Bengal in following terms:

“North Bengal lying from east to west between Purnea and the Brahmaputra, and from north to south between the lower spurs of the Himalayas and the Ganges, a remarkably homogeneous area, except for the hills portion of the Darjeeling district which forms part of the Himalayas and is inhabited by Mongolian races, mostly descendants of immigrants from Nepal. In the north there is an unhealthy

submontane tract, the Tarai, from which the country gradually slopes southwards in a wide alluvial plain watered by the rivers flowing southwards from the Himalayas and broken only by the Barind. This is a comparatively high belt of laterite formation lying on the confines of Dinajpur, Malda, Rajshahi and Bogra, which grows only one crop, late rice, and which in consequence is subject to scarcity in years of deficient rainfall. The rest of the area has a rich soil of sandy loam, mainly under rice, which accounts for two-thirds of the cultivated area. Jute is also grown extensively and covers one-tenth of the cropped area; tea is raised in the submontane tract; known as the Duars in Jalpaiguri and the Tarai in Darjeeling as well as on the hills in the latter district. Except in the south-east, communication is mainly by land, and the demand for speedy transport has resulted in large railway extensions.”<sup>10</sup>



Map. 1.2. Geological Formations of Bengal

Source: A. E. Porter, *Census of India, 1931 Vol. V, Bengal & Sikkim: Part I* (Report), 1933, p. 3.

The census of 1931 had considered the geological formations of whole Bengal as 'homogenous', except for the fringe of the province in the extreme north and west and the Tripura State and Chittagong Hill Tracts, where 'change from an alluvial formation generally of recent date' had taken place.<sup>11</sup> Geographically the difference between the different parts of the province, as envisaged by the census, depended upon the degree and nature of their rivers activity. The census of 1931 informed that the North Bengal was comprised of the part of the province north of the Ganges and west of the Brahmaputra and included the Rajshahi Division and the State of Cooch Behar.<sup>12</sup> It is evident from the above map (1.2) that the districts of northern Bengal were part of the recent alluvium tract.

The District of Bogra was situated on the eastern central part of the Rajshahi Division with an area of 1,359 square miles. The Sadar town or district headquarter of the district was Bogra, which was located on the west Bank of the Karatoya river. The district of Bogra was situated on the right bank of the river Brahmaputra, which was locally named as *Daokoha* and was surrounded on the north by the districts of Rangpur and Dinajpur, on the south by Pabna and Rajshahi; and on the west by Rajshahi and Dinajpur.<sup>13</sup> The rivers Karatoya and Phuljhor divided the district into two portions – north and south. The eastern part of the district had contained almost two-fifth of the entire area of the district which can be regarded as the forming part of the valley of the Brahmaputra. This tract was generally low-lying and was intersected by several *khals* and *bils* and was subject to the annual inundations from the overflow of the Brahmaputra, the Bangali, and the Katakali. Although the eastern part had little forests, but the western part of the district was, however, 'well-wooded, dense scrub jungle being found in parts' and was generally above flood level.<sup>14</sup> The soil of eastern part was known as *pali* (silt-covered) and the soil of western parts was known as *khia*r (sapless, hard). The western boundary had also some portion of *pali* tracts which was formed by Jamuna and overflowed by Atrai river. The *khia*r tract which had rounded the Bogra town appeared as a 'raised plots or strips of land 'on which a great amount of mulberry was cultivated.<sup>15</sup>

The district of Bogra (Bagura) was created in 1821 for the purpose of, as argued by C. J. O'Donnell, providing 'additional facilities for the administration of criminal' justice in the outlying eastern police divisions of Dinajpur, Rangpur, and Rajshahi, which had gained a notoriety for dakaiti, or gang-robbery, and other crimes of violence and for the 'supervision' of the Europeans who had settled along the rivers in the east of the district as indigo and silk

planters.<sup>16</sup> The police stations of Lalbazar, Khetlal, and Badalgachhi from Dinajpur; Govinganj and Diwanganj from Rangpur; and Bogra, Adamdighi, and Naukhila from Rajshahi were taken to form the political territory of the district of Bogra. In 1832 Bogra became a revenue receiving centre under the Magisterial supervision, and in September 1839 Bogra had received the police division of Raiganj which was transferred to the district from Rajshahi.<sup>17</sup> The administrative construction of Bogra was chiefly aimed to settle the 'anomalous condition of the revenue jurisdiction'.<sup>18</sup> The solution came in November 1850 when the Deputy-Governor of Bengal had approved the transfer to Bogra of 549 estates from the Collectorates of Rangpur, Dinajpur, Pabna, Mymensing, and Rajshahi after the payment of a total revenue of £8705, 8s. 7d.<sup>19</sup> The rivers Jamuna and Daokoha had attained a great size during this time as a result of change in course of the river Brahmaputra for which it became difficult to exercise 'proper criminal supervision over those parts of Bogra District' which were situated on the eastern bank of these rivers.'<sup>20</sup>

Ecological factors had also become instrumental in the administrative formation of the district or the time to time transfer of the thanas or villages to and from the district - in 1861, some villages of the south of the district were transferred to Rajshahi in response of the suggestion of the Boundary Commissioner 'in order to make the petty river Bhadaya the boundary in that direction; in 16<sup>th</sup> March 1868, the police centre of Lalbazar was taken away to Panchbibi, due to the 'unhealthiness of the former village'; on the 20<sup>th</sup> March of the same year, the police station of Naukhila was transferred for the village of Shariakandi due to the difficulty of procuring water at Naukhila as a result of the silting up of the Manas river, on which it was located; in 1869, further adjustment had been arranged in the southern boundary of the district, particularly towards the south-east, in order to make the river Ichhamati the boundary between the Raiganj police division and Pabna district.<sup>21</sup>

The river system of Bogra had been regarded as the part of the Atrai tributary system of the Brahmaputra. Considering the Karatoya as the central dividing water-channel of the district, the other rivers had been divided into two major river-systems – eastern systems and western systems. The eastern river-system embraced the major rivers viz. Bangali, Halhalia, and Phuljhor along with the minor rivers like – the Valka and the Manash; and on the other hand the western river-system had the rivers namely the Nagar, the Tulsidanga and other minor rivers. The rivers of Bogra which were said to have been the tributaries of the Brahmaputra had fallen into the Atrai, which again also flowed into the Brahmaputra in the district of

Pabna and this meeting point was twelve-miles north of the confluence of the Atrai with the Ganges at Goalando.<sup>22</sup> The river system of the district has been tabulated in the Gazetteer in the following manner:

|                |                              |                |                    |
|----------------|------------------------------|----------------|--------------------|
| Eastern system | Katakhali, Bangali, Halhalia | Phuljhor ..... | Atrai, Brahmaputra |
| Central system | Karatoya                     |                |                    |
| Western system | Jamuna, Tulsidanga, Nagar    |                |                    |

The river Brahmaputra had shifted from its earlier channel after entering into the district of Bogra. The entry of the river Brahmaputra, locally named as Daokoha, into the district had a ‘traditional’ or local version which described that the prevailing bed of the river had been brought by a peasant who had cut a small channel in its bank with a *dao* or hatchet for drifting the inflow of water in order to catch fish and that ‘little cut’ enlarged into a great breach, through which ultimately the whole body of the river found its way.<sup>23</sup> The deserted bed of the river was covered with rich silt every year and produced a good amount of harvest of rice and other crops. In 1888 Mr. O’Donnell had revealed that the course of the river had gradually changed to western direction, and the river again changed its course and the main channel moved steadily eastwards where the river located seven miles from Naukhila.<sup>24</sup> Hunter have produced a somewhat extensive tabulation of the internal rivers which showed that Atrai was the ‘natural recipient’ of all the waters of the District of Bogra.

|       |          |                      |          |
|-------|----------|----------------------|----------|
| Atrai | Jamuna   | Tulsidanga           | Harabati |
|       | Irabati  |                      |          |
|       | Nagar    |                      | Bangali  |
|       | Phuljhor | Halhalia<br>Karatoya | Manas    |

Dr. Buchanan Hamilton had given the following description about Jamua which flowed into the district:

“The Jamuna passes through the division of Lalbazar, and at the town of that name separate into two branches. Before the separation it has two marts, Baksigabj and Belamala, both on the decline. The western branch is the more considerable, and preserves the name. .... On entering the division of Badalgachhi, the Jamuna receives two other small rivers, which also pass through Lalbazar, and are nearly of the same size.... The eastern branch of Jamuna is called Kata Jamuna, and said to be an artificial canal which was made by a very rich merchant...at present the principal landholder in the vicinity. In the rainy season it admits vessels carrying 400 or 500 *mans*, and possesses two small marts.... About nine miles from its separation from the principal branch, the Kata Jamuna joins the Tulsi, a small river which rises in the division of Lalbazar from a marsh called Raktadaha, and afterwards form the boundary between that and Khetlal, between this again and Badalgachhi, and then joins the western branch of Jamuna.”<sup>25</sup>

Karatoya had been one of the largest river in the district, but it had gradually become smaller and shallower than most of the rivers in the district. Niharranjan Ray was of the opinion that from ancient times Karatoya was flowing through the district.<sup>26</sup> There were significant changes in course of the river. Tista was flowing from north to south through the heart of the district where it first went through Sibganj, then through the middle of Bogra, and finally through Sherpur police station, where it ultimately met with Phuljhor at Khanpur.<sup>27</sup> One branch of the river which locally known as *purana* Karatoya (old Karatoya) had passed by Mirzapur and Bhawanipur, and had joined with the Phuljhor lower down in the Pabna district. The river had no such tributaries in the district. The river Nagar which was the branch of the Karatoya was fell in the Karatoya about eleven miles north of Bogra. The Nagar was the boundary between the police divisions of Bogra and Shibganj.<sup>28</sup> The river Halhalia, which entered from the district of Mymensing was broken up by the waters of Brahmaputra which pour down the Jamuna. Branches of Halhalia existed on both sides of the river Jamuna. The western bank of Halhalia flowed through the Shariakandi police division for about twenty miles, and then for ten miles more through the Sherpur police division to its confluence with the Karatoya at Khanpur.<sup>29</sup> Although the lower Halhalia and Phuljhor were both navigable for large boats, but a part of Halhalia near Shariakandi was very shallow, particularly near the Brahmaputra. One of the major rivers in the district of Bogra, viz. Bangali came from the Rangpur district, and entered Bogra in the Shariakandi thana, about three miles to the south-east of the Sonatola Railway station on the Brahmaputra-Santahar Branch Railway.<sup>30</sup> The Bangali was provided with a large amount of water from the Karatoya down the Katakhalia due to the floods of 1820.<sup>31</sup> From Sonatola the Bangali flowed towards south-east and it

continued to travel in that direction till it reached Chhahata, and this point at Joregachha the river bifurcated into two streams, one of which took a straight southerly course and came to be known as Halhalia, while the other branch had continued to be called as Bangali took a south-easterly course which travelled past the Dhunot thana; and both the branches again reunited in Dhunot thana to form the Phuljhor river.<sup>32</sup> The Bangali, the Halhalia, and the Phuljhor were navigable throughout the year for boats of three or four tons of cargo, and in the rainy season became the important medium of boat traffic for all over the east of the district. The river Manas which came into the district from Rangpur, was formerly a river of about the same size as the river Bangali. But the Brahmaputra had annihilated all the traces of the river throughout the district. The river Manas had gradually turned into a 'short channel four miles long, choked with sand, running between the Bangali and the Brahmaputra, and joining the [Brahmaputra] river four miles north of its Halhalia branch.'<sup>33</sup>

The river Brahmaputra and Karatoya had undergone a considerable change in their river course in the district. Brahmaputra had changed its direction and bed since the beginning of the nineteenth century and as a result an entirely new branch of river system had emerged in Eastern Bengal. Hunter had noticed the flow of Brahmaputra between the Shariakandi police division of Bogra and the Diwanganj police division of Mymensing, whereas Major Rennell had described in 1781 that the river had bent away eastward from Diwanganj and about eighteen miles from Shariakandi.<sup>34</sup> About the river Jamuna, Dr Buchanan Hamilton remarked: "the river threatens to carry away all the vicinity of Diwanganj, and perhaps to force its way through the Konai into the heart of Nattor."<sup>35</sup> As a result of these changes the whole river system in the tract between the Karatoya and the high country in Mymensing, known as the Madhupur jungle, had been so massively broken up that it appeared impossible to identify the rivers separately 'except by name'.<sup>36</sup> Karatoya had also undergone a severe change and deviation in its course at Mahasthan. In the midway between Bogra and Sherpur there were instances of a large diversion where after every two or three miles there appeared considerable islands of red soil surrounded by alluvium which demonstrated the varied direction of the river.<sup>37</sup> Karatoya had witnessed a great change in terms of its volume of water. Although Karatoya had been mentioned as 'a very considerable' and 'large' river in the descriptions of Buchanan Hamilton and Major Rennell, but by the last quarter of the nineteenth century it turned into 'a narrow, extremely shallow, and almost stagnant stream.'<sup>38</sup>

The District of Rajshahi, after which the Division was named as the Rajshahi Division, was situated in the south-west of the Division with its headquarter at Rampur Boalia, located at the northern bank of the Ganges, which was known as the Padma in this tracts.<sup>39</sup> The Ganges which formed the natural boundary to the south and south-west, separated the districts of Nadia and Murshidabad from Rajshahi. The district was bounded west by Malda, north by Dinajpur, and east by Bogra and Pabna. The district had been divided into three major portion – the *Barind* tract, the Riparian tract, and the *bil* area. Although the overall *Barind* region of northern Bengal included the highland areas of Malda, Rajshahi, Dinajpur, Rangpur and Bogra districts of Rajshahi division, but the *Barind* tract of the Rajshahi district commenced from near Godagari and extended to northwards along the western boundary and then bent to the east by stretching along the whole of the north of the district.<sup>40</sup> Although the Barind was a elevated tract but there was no considerable difference of level between the *Barind* and the rest of the district. The second division was the riparian portion of the district which went through along the Ganges and was consisted of Rampur Boalia, Charghat and Lalpur with a relatively high level of the field that was slopping down northward from the Ganges.<sup>41</sup> The third division viz. the *bil* areas which were comprised of the *thanas* of Naogaon, Bagmara, Puthia, Panchupur, Nator, Baraigram, and the southern part of Singra had been identified as swampy, waterlogged and intersected by the numerous rivers that produced malaria in every year with the advent of rain.<sup>42</sup> The *bil* portion can be again subdivided in two areas viz. the growing and the not growing *ganja* of which the growing areas fell into the Naogaon *thana* and had a higher surface which appeared less vulnerable to the blockage of drainage.

The Ganges and the Mahananda were the two major rivers in the district – Ganges formed the boundary on the south-west and the south, while Mahananda merely passed on the extreme western boundary for about three or four miles to the point of its confluence with the Ganges. Contiguous to the place where the Ganges had touched the western boundary of the District, a delta had been constructed by its waters in concurrence with the river Mahananda.<sup>43</sup> Hunter was informed by the Collector that during the last quarter of the eighteenth century, two rivers viz. Ganges and Mahananda ran almost parallel with each other for about twenty-five miles lower than their current-point of junction which was broken up by a small tracts of land rested with the villages.<sup>44</sup> From about five miles lower the Rampur Boalia, the Ganges created a small stream viz. Narad which travelled in a north-easterly direction through the *thanas* of Boalia, Putia, Nator, and Baraigaon. The river Baral which was an important

offshoot of the Ganges in the Rajshahi district had flowed ‘in a winding easterly course’ through the southern *thanas* of Charghat and Baraigaon.<sup>45</sup> The Ganges, while flowing through the district of Rajshahi had given birth to numerous alluvial tracts and *chars* which were densely cultivable. The Mahananda, after flowing through the districts of Purnia and Malda travelled through the western boundary of Rajshahi, but the river neither received any tributary nor produced any offshoots during its stay in the district of Rajshahi. The river Atrai which travelled through the district of Dinajpur and entered into the Rajshahi district from the north of the Manda *thana* passed through the Manda, Bindaikara, and Singra *thanas*. The district of Rajshahi was especially known for the large number of *bils* or swamps which spread across throughout the district. These *bils* were varied in sizes – some were small and some were too big, like the Chalan Bil. The Chalan Bil which had stretched over an area of 140 square miles on the borders of the Rajshahi and Pabna districts, was located between Singra (a *thana* in the Nator subdivision), and the north bank of the Gumani.<sup>46</sup> The Chalan Bil was said to have extended previously over an area of 421 square miles, but the whole area gradually turned into dry and became small.<sup>47</sup> The largest breadth of *bil* was almost nine miles from Taras on the north-east to Narayanpur which was one mile from Biyaghat, a village on the north bank of the Gumani; while the largest length was about fifteen miles from Singra to Kachikats on the Gumani.<sup>48</sup> The Gumani river flowed along Singra and met with Gur or Atrai, the chief feeder of the Chalan Bil, to the south-east of Bahadurpur and formed a large space for open waters which was 4 to 6 miles in width and known locally as the Failam. Since the old Atrai was gradually dying and a part of its bed had been captured by the river Gadai, there had been an encroachment of the silt-laden Padma river into the *bil* which was resulted in the fast silting up in the portions nearer to the channel of Atrai.<sup>49</sup>

The district of Pabna was surrounded on the north by the districts of Rajshahi, Bogra, and Mymensing; on the south by the River Padma or Ganges which separated it from the districts of Nadia and Faridpur; on the west by river Jamuna which distinguished it from the districts of Mymensing and Dacca; and on the east by the districts of Rajshahi and Nadia.<sup>50</sup> The district of Pabna, which was constituted in 1832, was charged under a Joint-Magistrate and Deputy Collector; and in 1859 the district had received a full Magistrate and Collector.<sup>51</sup> The district was situated at the head of the Bengal delta within the angle formed by the confluence of the Ganges and the Brahmaputra. The district was not uniform in character in terms of the level of the ground – the south-western portion which had the Sadar subdivision was

relatively high and acted as the obstruction to drainage; whereas the Sirajganj subdivision was low-lying and the drainage was open here.<sup>52</sup>

The river system of the district of Pabna was comprised of the rivers of the Ganges or Padma and the Brahmaputra. The whole district was traversed by the networks of minor river channels and streams and the interior of the district was constructed by the deserted beds of old rivers.<sup>53</sup> The Ganges or the Padma formed a part of the western and the whole of the southern boundary of Pabna. The river Ichhamati which emerged from Pabna at the village of Dogachhi, seven miles from the south-east of Pabna town, crossed the civil station and flowed through the district with a convoluted route and joined with Harasagar.<sup>54</sup> Harasagar was the principal branch of the river Jamuna which separated Pabna from the districts of Mymensing and Dacca; and the Baral and the Karatoya or Phuljhor were the two branches of the Harasagar. The district had witnessed continuous process of alluvion and diluvion in the course of the principal rivers of the district. While mentioning about the Collector's report, M. H. Kisch, who compiled the *Account* of the district of Pabna had stated about the following changes that had taken place in the river-course or the beds of the rivers: an important incident of diluvion had taken place in 1863 when about 3465 acres of land had been deviated from the estate of Balrampur and annexed to the estates of Bharara and Dogachhi; an important fluvial change had taken place in the course of the Padma which previously flowed closely to the town of the Pabna had later shifted for about four miles in 1876.<sup>55</sup> A large portion of the district had been occupied by the Chalan Bil which covered an extensive area in the Raiganj and Chatmohar *thanas*.<sup>56</sup> The river Atrai which was the principal feeder of the Chalan Bil, had brought down its water through a passage between the districts of Rajshahi and Dinajpur.

The District of Dinajpur had been appeared to Hunter as a triangular tract of country, with the acute angle towards the north and the district was laid between the Districts of Jalpaiguri and Rangpur on the east and Purnia on the west, and in the south bordering on parts of Malda, Rajshahi, and Bogra Districts.<sup>57</sup> The jurisdiction of Dinajpur had undergone remarkable changes. In order to enable the administration to cope successfully with the *dakait*s or gang robbers the limits of the District were gradually constrained. There were great differences between the revenue, magisterial, and civil administration of the district. The criminal administration was regulated by the natural boundaries of the district, and while the revenue administration was controlled by the old division of the land into *parganas*. Between 1787

and 1870, the district had witnessed several changes in terms of fiscal, administrative and judicial regulations.<sup>58</sup> There were some undulations in the northern and southern part of the district of Dinajpur. The district was intersected by numerous rivers, marshes and *bils*. The whole District formed part of the rich arable tract lying between the Ganges and the southern slopes of the Himalayas and the country had a gradual slope from north to south. The Nagar river formed the natural boundary on the Purnia side, and the river Karatoya had separated the district from Rangpur for about 50 miles on the south-east.

The obvious direction of the rivers in the district was from north to south, and they ultimately fell to the Ganges. The rivers had, however, hardly been noticed with any frequent inundations. During the rainy season, the main rivers in the district viz. Nagar, Punarbhaba, and Atrai were navigable by standard-sized country boats to about as far as Dinajpur town, but in the dry season which persisted almost for eight months in a year the river became considerably shallow and difficult for navigation.<sup>59</sup> The river Mahananda, after flowing through Purnia District, had touched Dinajpur near the small village of Mokundpur in the police circle of Hemtabad, and then it turned southwards to form the western boundary of Dinajpur for a distance of from twenty-five to thirty miles, leaving the District at its extreme south-west corner.<sup>60</sup> The major tributaries on the Dinajpur bank were the Nagar and the Hingalbhaba; and the bed of the Mahananda was sandy, and its banks were alternately sloping and abrupt. However, there were no instances of changes in the course of the river. The river Nagar entered into the Dinajpur district from Purnia at its extreme northernmost point, and travelled southwards for about ninety miles in order to form the boundary between Dinajpur and Purnia, and finally it fell into the Mahananda at the point where the Mahananda river first touched on Dinajpur.<sup>61</sup> The Nagar was navigable by large cargo boats during the rainy season, and by small boats and canoes throughout the year. Its principal tributaries on the eastern or Dinajpur bank were the Patki, Singia, Tilai, Nuna, Gandar, Kaya, and Kulik rivers, among which the last being by far the most important river. The Kulik which was the principal tributary of the Nagar had its rise in a marsh in the north-west of the police circle of Thakurgaon, and after running a course of thirty-six miles through the *thanas* of Ranisankail, Pirganj, and Hemtabad, had fell into the Nagar near the village of Gorahar, where the Nagar river joined with the Mahananda.<sup>62</sup> The river Tangan entered into the district from its northern boundary from Jalpaiguri, and after crossing the *thanas* of Thakurgaon, Pirganj, Kaliyaganj, and Bansihari it passed into the Malda district where it met with the

Mahananda.<sup>63</sup> The total length of course of the river in the Dinajpur district was about 80 miles. The principal tributaries of the Tangan were the Ghoramara, a small flow of water rose near Ruhiya, and Tulai, which emerged in the jurisdiction of Pirganj and joined the Tangan in Bansihari *thana*. The river Punarbhaba emerged from a marsh called Brahmanpukur, in the Thakurgaon thana, and after passing through the Birganj thana it was joined by the river Dhepa at the Kotwali of the district. The name Punarbhaba had been assigned to the combined river course which was comprised by the Dhepa and Punarbhaba.<sup>64</sup> After the Kotwali the river entered into Gangarampur where it created its new branch called Brahmani; and a few miles below the Gangarampur these two channels were united by a canal.<sup>65</sup> The Atrai river was the channel by which the waters of the Tista found their way into the Ganges before the change of course of the Tista river in 1787-88. Despite of its deprivation of water from the main source of supply the Atrai had remained the most important stream in the District. The river entered into Dinajpur from the Rangpur District on the north-east, near the village of Jiaganj, and took a southward course through the thanas of Birganj, Patiram, Patnitala, and Porsha, where it had left the District on its extreme southern border, after a course of eighty-four miles in a straight line, and passed into Rajshahi District and finally poured its waters into the Ganges in Pabna District under the name of the Baral.<sup>66</sup> To the east of Kantanagar, the Atrai created a branch called the Gabhura or Garbheswari from its western bank, which after a course of fifteen miles, rejoined the parent stream near Sahebganj. The chief tributaries of the Atrai within Dinajpur District were the Kastua-khari, Satkharia, Khari, and the Dharna *khal* on its west or right bank; and the old Tista or Karto, Bholi, old Atrai, Jamuna (not the river mentioned above, but another of the same name), and Ichhamati on its east or left bank.<sup>67</sup> The Atrai was navigable throughout its course in Dinajpur District during the rains, and by small boats and canoes in the dry season. According to the Revenue Survey of the District conducted in 1863, although it was found that, the river had constantly changed its course, but in 1870, however, the Collector reported that ‘no instances of alluvion or diluvion, or of changes of course in the channel of the river, had of late taken place.’<sup>68</sup> Although by the orders of the Governor General in Council attempt had been proposed in June 1889 to restore Tista to its original channel but it was finally abandoned as it was appeared ‘impracticable’; but the river bed of the Atrai had been constantly silting up during these days and this process was ‘hastened by the raising of the level of the river-bed in the earthquake of 1897.’<sup>69</sup> The river Jamuna has deserved to be mentioned here. The Jamuna, which was one of the original channels of the Tista, entered into the Dinajpur district from

the north-east of Parbatipur of Rangpur and travelling to the south passed into Bogra near Hilli and finally poured its waters in the Atrai in the Rajshahi district.<sup>70</sup> Among the 65 miles, consisted of deep and narrow channel, of its total course in the district a considerable portion of the river was navigable for moderate sized boats during the rainy season. A small river channel viz. the Chhiramati which had no tributaries emerged from a marsh in Hemtabad *thana*, and after running a course of about thirty miles through Hemtabad and Bansihari thanas it left Dinajpur near its south-western corner, and passed into Malda District, where, after a further course of a few miles it fell into the Mahananda river.<sup>71</sup>

The district of Malda had to move through several administrative transformations during the colonial period. Malda with some of its other *parganas* and *thanas* came into existence as a district (though its many parts or *thanas* formerly belonged to the districts of Purnia, Rajshahi and Dinajpur) when it was placed under a Joint Magistracy in March 1813 and Mr. Braddon was first deputed as the Joint Magistrate and Deputy Collector of the Zilla in 13th March 1813.<sup>72</sup> This administrative reconstruction which provided a fertile ground of enticements had a profound effect on the cultural landscapes of the district that incorporated the mosaic of ethno religious and linguistic elements into the cultural traditions of Malda.<sup>73</sup> In 1832 a separate treasury was opened and in 1859 the district was placed under the administration of a full-fledged Magistrate and Collector.<sup>74</sup> The district of Malda formed a part of the Rajshahi division till 1876 when it was transferred to the Bhagalpur division but in 1905 the district was transferred again from the Bhagalpur division to the Rajshahi Division on the formation of the province of Eastern Bengal and Assam<sup>75</sup> and till August, 1947 the district remained within the Rajshahi division. It can be noticed from the different sources that in course of time the boundary of the district of Malda was gradually expanding. During Hunter's time the total area of the district, excluding the river areas, was 1806.64 square miles, whereas Lambourn mentioned the total area as 1,899 square mile, but in the Survey Settlement Report the total boundary of the district was noted as 1,987 square miles.<sup>76</sup> The whole country was alluvial in origin, but the tract which existed to the west of the Mahananda and in the direction of the Ganges was low-lying, and to a great extent still subject to the effects of fluvial action.<sup>77</sup> In this part of the District, there were situated the *chars* and various other alluvial accretions, which the Ganges has created during that important change in its channel which had taken place since 'it washed the walls of the ancient city of Gaur.'<sup>78</sup>

The district was broadly divided into three natural or physiographical units viz. *barind*, *diara* and *tal*. The part of the district east of the Mahananda river was called as *barind*, made up of the ancient alluvial humps with red clay soils which were remnants of old riverine floodplains that remained unaffected subsequently by inundation and renewed silting. The name 'barind' was emerged from the word 'Barendra' where 'Mahananda was the boundary in the olden days between the territory of the Barendra and the Rarhi Brahmins.'<sup>79</sup> To the west of the Mahananda the land was again divided into two portions by Kalindi river flowing west and east from the Ganges.<sup>80</sup> The remaining part of the district fell on an adjacent tract of flat lowland which formed the local catchments of the Mahananda and Ganges and this lowland tract which dropped gradually from the north to south was classified into two additional physiographic regions known as the *tal* and the *diara*. The *diara* was a relatively well-drained flatland shaped by the fluvial deposition of newer alluvium in the intermediate region between the *barind* upland and the swampy *tal* tract.<sup>81</sup> Large parts of the *diara* had begun to attract a new population since the early 20th century, after the exposition of alluvial chars by the westward migration of Ganges which opened this area for revenue settlement. Bhutni *diara* to the northwest of Manikchak *thana* was settled after 1921 by agriculturists who migrated to cultivate the river chars from Murshidabad district, where fresh erosion was taking place along the opposite river bank at the time.<sup>82</sup> The *barind* was thinly settled and extensively roofed by forests and the relative scarcity of water made it unsuitable for intensive agriculture. Tribal migration into this region was carried out by the British during the late 19th century as a conscious policy for disbanding the tribal who had violently protested during the Santal Revolt of 1855 against the British penetration into the tribal land. The *tal* area, which covered the areas of approximately Harishchandrapur and Ratua police stations between the Mahananda in the north and the Kalindri river in the south, was a low-lying area subject to the inundation with the rise of rivers.<sup>83</sup>

Among the several rivers the four rivers viz. the Ganges, the Mahananda, the Kalindri, and the Punarbhaba were navigable throughout the year for boats of upwards of 100 maunds, or four tons burden whereas the other four others, namely, the Tangan, the Pagla the Sonakhali, and the Suarmasa were navigable only during the rainy season, and for boats of under 50 maunds or two tons burden.<sup>84</sup> The river system of Malda was mainly comprised by the Ganges, with its several ancient beds and branch channels, and the Mahananda, with its three large tributaries. The main stream of the Ganges which travelled through the entire west and

south-west border of the District first touched on the District at the north-west corner where it had received the tributary waters of the Kosi. At this point it took a wide curve, and moved for some 15 miles in a southerly direction. The river finally left the District at its extreme southern corner, at the point where it was joined by the Mahananda, just above the police station of Godagari in the adjoining District of Rajshahi.<sup>85</sup> The streams of the river Ganges remained as 'the most admirable means of water communication for this portion of the District.'<sup>86</sup> The map compiled by Mr, Pemberton, the Revenue Surveyor, in 1848, placed the town of Rajmahal as actually on the main stream of the river. But later the stream had set in the opposite direction and as a result Rajmahal had been abandoned by the Ganges, which tried to clear its way through the middle of the District of Malda. The Collector of Malda argued in 1870 that the Ganges at that time was nearer to Haiatpur, which two or three years earlier was some miles remote from it.<sup>87</sup> Flowing from Purnia, the Mahananda first entered into the district through the extreme north and formed the north-eastern boundary of the district and was joined by the Tangan as its only tributary.<sup>88</sup> In its total length of 80 miles in the district the river flowed from north to south by dividing the district with two equal portions. Although before the introduction of railways the Mahananda acted as a most important channel of direct communication between the Lower Bengal and the sub-Himalayan districts, but the expansion of railways in northern Bengal, especially in this part, had undermined its importance. Till the reaching point at Malda, the Mahananda remained 50 yards width, though it widened to an average of 200 to 600 yards after receiving the water of Kalindri with the high silting up but it had 'diminished the volume of water' the former river had carried.<sup>89</sup> Melting of snows and the excessive rains had largely contributed to the raising of river beds which frequently resulted in severe floods in the district. In Rennell's map Kalindri had been shown as an offshoot of the eastern branch of the Ganges.<sup>90</sup> Kalindri which was brought to the plain from the Nepal hills by the Ponar river, entered into the district from Purnia near Hatichapa and joined with Ganges on its right bank.<sup>91</sup> Tangan, the tributary of Mahananda entered into Malda from Dinajpur into the north-east corner of the District and after getting a southerly course of nearly thirty miles, poured its water into the Mahananda at Muchia.<sup>92</sup> The Tangan brought down with it a larger quantity of silt, and as a result it had to suffer a lot during the later years which triggered considerable changes of course. There was small *nala* that connected Muchia with the Tangan into which the main body of the stream had turned after the total desertion of its old bed, which was still traceable in a southern direction by Kendua.<sup>93</sup> It was reported that the Tangan had also apparently altered its course

in the neighbourhood of the village of Raniganj. Although the banks of the river were distinct and well marked, but the river channel of the Tangan in many places got contracted by the sand and mud which had been brought down from the hills to such an extent that it acted as an impediment against the navigation during the hot weather.<sup>94</sup> This silting up of the bed was especially observable near Bamangola. The river which Punarbhaba had formed the eastern boundary of the district of Malda, ran through the Bamangola and Habibpur police station and after entering Gomastapur it turned into south-west and poured its water into the Mahananda at Makdampur Ghat.<sup>95</sup>

As it is mentioned in the Gazetteer, the name Rangpur originated from the words *Ranga* i.e., pleasure and *pur* i.e., place, which together form the meaning as ‘a place of pleasure or the abode of bliss.’<sup>96</sup> The District of Rangpur was surrounded on the north by the District of Jalpaiguri and the Princely State of Cooch Behar, on the east by the Brahmaputra river and the Districts of Goalpara of Assam and Mymensingh, on the south by Bogra District, and on the east by the Districts of Dinajpur and Jalpaiguri. Although the *thanas* of Rangpur had been established by the regulation of XXII of 1793, but they had to witness considerable changes in their position in course of time.<sup>97</sup> The Survey and Settlement operations which had been conducted in the district of Rangpur between 1931 and 1938 had pointed out two disputes regarding its boundary problem – the survey and demarcation of the main boundary; and the demarcation of the *chhits* or enclaves of Cooch Behar within Rangpur and of Rangpur within Cooch Behar.<sup>98</sup> On the other hand, there were also certain exchanges of Rangpur *chhits* with Dinajpur and Jalpaiguri. The Rangpur *chhits* in Dinajpur were handed over to the later and left for the settlement authorities of Dinajpur; and the Rangpur *chhits* in Jalpaiguri were surveyed and the maps and records had transferred over to the Deputy Commissioner of Jalpaiguri in order to transfer the Dinajpur and Jalpaiguri *chhits* to Rangpur.<sup>99</sup>

The Brahmaputra and Tista river had great influence in shaping the topographical peculiarities for the district of Rangpur and they had to go through certain some changes in their course. In 1809 Buchanan Hamilton had described the changes in the rivers course of the district in the following manner:

“Since the survey was made by Major Rennell (about thirty years ago) the rivers of this district have undergone such changes .... The soil is so light, and the rivers in descending from the mountains have acquired such force, that frequent and great changes are unavoidable. Old channels have been swept away, and new

ones are constantly forming... After tracing the name of a river for some distance, you lose it for all of a sudden, and perhaps recover the same name at a distance of twenty miles, where many large rivers intervene, and no channel remains to assist in the discovery of the former connection. The old channels have not only lost their current of water, but have been entirely obliterated by cultivation, or by beds of sand thrown into them by newly-formed rivers.”<sup>100</sup>

Adding more ‘confusion to this, Hamilton had further informed about the rivers which had different names in different parts of their course which had motivated Major Rennell ‘to have altogether avoided giving names to many of the rivers.’<sup>101</sup> However, despite of these difficulties there were some major rivers in the district of Rangpur – viz. Brahmaputra, Tista, Karatoya, Dharla. The river Brahmaputra had ran along the eastern boundary of the district by separating it from Goalpara and Mymensing. But as a result of changes in its course, a tract of alluvial land called Raomari which previously belonged to the Rangpur district had been shifted to its right bank. The river first entered into the district from its north-east corner at Majhiali about eight miles south-east of Dhubri which was the headquarter of the Goalpara district.<sup>102</sup> Although Brahmaputra was navigable throughout the year by the large boats but during the last quarter of the nineteenth century it had been observed that there emerged a good number of islands and sandbanks created by its channels which were steadily shifting from one point to another. These changes had been resulted in the gradual drifting of the Chlmari police station further inland; and in the complete obliteration of Kaliganj and Bhawaniganj. The Tista (Trisrota) was the second river in importance. It entered Rangpur from Jalpdiguri about six miles north of the village of Baruni, and travelled through the District from north-west to south-east, till it fell into the Brahmaputra a few miles to the south-west of Chilmari police station in Bhawaniganj Subdivision; its length is estimated at about a hundred and ten miles within Rangpur District. Several islands and sandbanks were formed by the current, but these were fewer in number and of much smaller size than those in the Brahmaputra. The lower part of the Tista, from Kapasia to Nalganj-hat, was known as the Pagla river. The Tista had been noted for frequent and violent changes in its course; and many old channels were found, such as the Chhota Tista, Bura Tista, and Mara Tista, each of which at one time might have formed the main channel of the river, but which were gradually deserted, and only navigable in the rainy season.<sup>103</sup> During Major Rennells Survey, the main stream of the Tista had flowed towards south instead of south-east and had met the Atrai river in Dinajpur, and finally poured its water into the Padma or Ganges. But as a result of the destructive floods of 1787 in Rangpur, the river had suddenly abandoned its old channel and

shifted its waters into a small branch which was an ancient bed of the same river.<sup>104</sup> The Dharla, the another tributary of the Brahmaputra, was a branch of the Torsha river, from which it bifurcated in Cooch Behar and first touched on Rangpur at the village of Durgapur, where it obtained the waters of the Jaldhaka river from Cooch Behar, and this united stream was called as the Dharla.<sup>105</sup> In its course for a few miles this river acted as the boundary between Rangpur and Cooch Behar and then it turned south and entered into the District. Again after a course of a few miles, it received the waters of the Torsha, its parent stream, from where it travelled in a south-easterly course till it fell into the Brahmaputra at Bagwa.<sup>106</sup> In its total course of 55 miles in the district of Rangpur the river flowed with its sandy bed and low-lying banks. River Karatoya was another important river in the district of Rangpur. The Karatoya formed for some distance the boundary between Rangpur and Dinajpur, and then it crossed Govindganj *thana* and passed into Bogra District. In its course through Rangpur it was enriched by two tributaries from the east, each of greater volume than itself, the Sarbamangala and Jubaneswari.<sup>107</sup> The river Ghaghat which travelled through the centre of the district and from Gaibandha it was joined with the river Manas. The Ghaghat had operated previously as the tributary of the Tista, but during the 19<sup>th</sup> century the mouth of the river had been gradually silted up, and the river became stagnant.<sup>108</sup> Another small river, called Manas, which was a branch of Tista in the Sadar subdivision, flowed parallel to it for about twenty-five miles before it met with the Tista.<sup>109</sup> The river had gradually become shallow by the silts deposited every year and portions of it were cultivable during the winter season when it had become totally stagnant. River Sankosh was one of the major river in the district of Rangpur. It entered into the district from Cooch Behar at *mauza* Uttar Dhaldanga in police station Bhurungamari and after travelling in a south-easterly direction it fell into Brahmaputra in police station Nageswari.<sup>110</sup> Sankosh in its different stages of flow had been identifies with different names – in the Survey Settlement Report, the major channel was regarded as Raidak, whereas its upper riches was called as Heldanga, and its lower reaches the Dudhkumar.<sup>111</sup>

The District of Jalpaiguri was bounded on the north by the district of Darjeeling and Bhutan; on the south by the district of Rangpur and the Princely State of Cooch Behar; on the west by the districts of Darjeeling, Purnia and Dinajpur; and on the east by the Eastern Duars. The district of Jalpaiguri was comprised of the Western Duars, which was annexed in 1865 after the war with Bhutan; and the *thanas* of Jalpaiguri (previously known as Fakirganj), Boda,

Rajganj, and Patgram (separated from the Rangpur district in 1869 and 1870).<sup>112</sup> The district was divided into two broad well-defined tracts – the tract which was west of Tista, and the region east of Tista. The western part of the Tista which was the older portion of the district was permanently settled; on the other hand, the eastern part of the Tista which was located between the boundary-lines of Bhutan on the north and Cooch Behar State on the south, existed as a piece of submontane tract of about 22 miles in width was known as the Western Duars, which was annexed from Bhutan in 1865.<sup>113</sup> The Western Duars had been divided into three subdivisions: the Sadar or principal subdivision, comprised of the tract of land between the Tista and the Torsha rivers with the headquarter at Mainaguri; the second was the Buxa subdivision, stretched from the Torsha to the Sankosh river which bordered the Eastern Duars with its headquarter at Alipur; and the third was the Dalingkot (Danlinkote) subdivision which was ‘co-extensive with the mountainous tract of the annexed territory.’<sup>114</sup> The tract which was situated in the Western Duars to the east of Jaldhahka river was known as the Falakata subdivision with its headquarter at Falakata. However, the District of Jalpaiguri had come into being as District in 1<sup>st</sup> January 1869 by the incorporation of the Western Duars with the Jalpaiguri subdivision of Rangpur.

Apart from the Tista, the district of Jalpaiguri had numerous rivers which were full of boulders on their hilly parts and their frequent change of course had done great damage to the life and property of the inhabitants. Tista which was the largest river of the district entered from the north-west corner. The Tista had no tributaries in its right or west bank, whereas on the left bank its principal tributaries were Lish, Ghish and Dharla. The Dharla was formed by the confluence of the Chel, Mal, and Neora rivers and brought down a considerable volume of water.<sup>115</sup> The flood of 1787 had altered the topography of the district which had witnessed a great change in the river-course of the river Tista. The Tista had left its earlier channel and began to flow through a new channel after the flood of 1787.<sup>116</sup> Major Rennel had provided the following description about the old course of the Tista in his *Memoir of a Map of Hindustan*:

“The Tista is a large river which runs almost parallel to the Ganges nearly a hundred and fifty miles. During the dry season, the waters of the Tista run into those of the Ganges by two distinct channels, situated about 20 miles from each other, and a third channel at the same time discharges itself into the Megna; but during the season of the floods, the Ganges runs into the Tista whose outlet is then confined to the channel that communicates with the Megna.”<sup>117</sup>

The river Mahananda, another river of great importance in the district, had entered into the district from the Darjeeling district (near Mahaldiram) just above the Siliguri. Hunter had mentioned about the description of Buchanan Hamilton regarding the river Mahananda in the following manner:

“The Mahananda, for about five miles after entering upon the plains, forms the boundary between the Kingdom of Nepal and the Company’s territory. For about six miles it separates this jurisdiction from that of Purnia, and then flows a long way through that district until it reaches the frontier of Dinajpur. So far as it continues on the frontier of Rangpur [now Jalpaiguri] the Mahananda is inconsiderable. It has, indeed, a channel of no small size, being perhaps three hundred yards wide;...”<sup>118</sup>

From Jalpaiguri, the Mahananda received three small branches, which emerged from the springs - the northern most branch was called as Trinayi, which joined the Mahananda at the south of Sanyasikata (Siliguri); another branch viz. Ranchandi emerged in Sanyasikata and by its course separated that division from Boda; and the third one was comparatively large and was divided into two heads – the eastern part was called as Chakar and the western was Dayuk, which had later joined with each other and flowed together as Dayuk, and after passing Boda the combined stream had fell on the Mahananda in Purnia district.<sup>119</sup> The Karatoya emerged in the Baikunthapur forest in the north-west portion of the district and after travelling into the district the river entered into the Rangpur district. Buchanan Hamilton had argued that the Karatoya flowed for about forty-five miles through the centre of the north-western divisions of the district of Jalpaiguri and then the river was engulfed by the old channels of the Tista.<sup>120</sup> The major tributaries of the Karatoya were the Talma and Chani on its right bank, and the Sahu on its left bank. Hunter had mentioned about the south-eastern course of the river when it joined with the Old Tista and flowed together by lost its name.<sup>121</sup> The Jaldhaka river which acted as the boundary between the Mainaguri and Falakata *tehsils*, emerged in the Bhutan Hills and drained the eastern slopes of the Rishi-la mountain in the Darjeeling District. After coming into the district, the river travelled in a southerly direction in order to reach to the boundary of the district, where it took a turn to the east and entered Cooch Behar State.<sup>122</sup> In the north of the Bengal-Duars railway-line the Jaldhaka river was divided into two branches – the western branch came to be known as Hatinala. Jhaldhaka had two tributaries in the Jalpaiguri District – viz. Murti and Daina. Murti had come from the Dalinkot hills in Darjeeling, and Daina which used to change its course frequently, emerged from the Butan Hills and fell into the east bank in the Moraghat

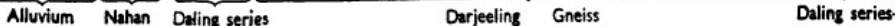
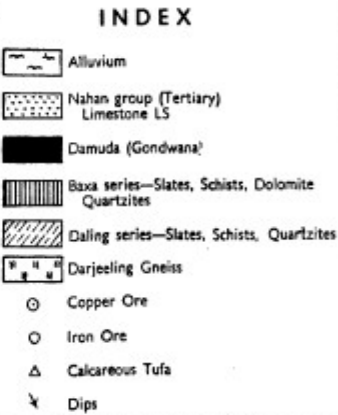
*pargana*.<sup>123</sup> There were other important small rivers in the district – Duduya, Mujnai, Torsa, Kaljani, Raidak, Sankosh. The river Duduya was formed by the united waters of Gairkata, Nanai, Angrabhasa and other small river channels which emerged in the north-west part of the Duars. Duduya flowed in a south-easterly direction and after that it entered into the Cooch Behar State at Dakalikoba Hat.<sup>124</sup> The chief tributaries of the Duduya were the Gulandi, the Kalua or Rethi, Barabank, Dim-Dima, and Tasati.<sup>125</sup> The river Mujnai emerged in the southern slopes of the Bhutan hills near Hantapara and after a winding southerly course it entered into Cooch Behar State below Falakata.<sup>126</sup> The Torsha emerged from the Chumbi Valley of Tibet, where it was called as Machu and travelled through Bhutan. Torsha had come into the British territory by the Bala Duar and ran south through the Western Duars by separating the Falakata and Alipur tehsils, and it entered into the Cooch Behar State at the village of Nekobarpara.<sup>127</sup> The river Kaljani was formed by the combined waters of the Alaikuri and Dima rivers, which first took the name of Kaljani after their junction at Alipur.<sup>128</sup> Kaljani in its short course in the Western Duars demarcated the boundary between Jalpaiguri and the Cooch Behar State. Kaljani had no tributary on its west or right bank in the Western Duars, but on the left bank it received the waters of the Nunai, Chek, and Gadadhar streams.<sup>129</sup> The river Raidak, which emerged from close to the mount Chumatarhi in Tibet flowed southwards through the Western Duars and entered Cooch Behar below the *taluk* Burujkuti. The old course of the Raidak formed the boundary between the Alipur and Bhalka *tahsils*, but in 1905 the river had rose with a high flood and abandoned its former bed and swept across the tracts beside it and poured its waters into several small streams to the west of its earlier course.<sup>130</sup>

The flood of 1787-88 had a profound impact not only on several rivers but on the topographic transformations of northern Bengal where river had taken new channels and landscapes had been changed subsequently. The Karatoya had witnessed a great change in terms of its volume of water. Although Karatoya had been mentioned as ‘a very considerable’ and ‘large’ river in the descriptions of Buchanan Hamilton and Major Rennell, but by the last quarter of the nineteenth century it was turned into ‘a narrow, extremely shallow, and almost stagnant stream.’ This change could be dated from the beginning of the mid-nineteenth century. Buchanan Hamilton had regarded the upper stream of Karatoya as Tista, but during the later period much of its waters were carried off by the largest river in Rangpur passed down the Karatoya. The flood of 1787 had covered the river beds with sand which in course of time

had brought down the Karatoya into a 'river below very shallow'. Although before the flood of 1787 the combined current of the river Dhepa and Atrai used to carry huge volume of water but after 1787 it was 'silted up' and was 'never navigable for large boats even in the rains.' The Atrai was the channel by which the waters of the Tista found their way into the Ganges before the change of course of the Tista river in 1787-88.

District of Darjeeling which was a part of sub-Himalayan tract had added a new dimension to the topographic and geo-morphological setting of northern Bengal. According to L. S. S. O'Malley, the name Darjeeling had originated from the term '*dorje*, the precious stone or the ecclesiastical sceptre which was emblematic of the thunderbolt of Sakhra (Indra) and of *ling*, a place' and this indicated the place of the *dorje*, the numinous thunderbolt of the Lamaist religion after which the Buddhist monastery of Observatory Hill was named.<sup>131</sup> During the colonial times the frontier district of Darjeeling was bounded up by Nepal on the west by the mighty Singalila chain of mountains, and Bhutan on the north-east and its south-eastern and southern boundary pushed to the plains of Jalpaiguri and Purnia. William Hunter had demarcated the natural boundary of Darjeeling, made by the contributions of several Hilly rivers (Ramnian, Great Rangit and Tista) along with mountain streams namely – Phupchu, Rishi, and Rangpu at its northern side and certain other rivers (Mahananda, Galma) which made the boundary at its southern side i. e. Terai region or forest-plains part of Darjeeling.<sup>132</sup> Naturally Darjeeling falls into two distinct tracts – the Terai region- immediately lower the hills, and the ranges of hills and deep valleys of the lower Himalayas. To the north of the Terai, the Himalayas stood out in a succession of bold spurs, which could be 'compared with that of the weather-beaten front of a mountainous coast.'<sup>133</sup>

(AFTER MALLET)



Horizontal & Vertical Scale,  $\frac{1}{4}$  inch = 1 Mile = 5280 ft.

Map. 1.3

Source: A. J. Dash, *Bengal District Gazetteers: Darjeeling* (1947)

O'Malley had given the following descriptions about the Himalayan Hills of the district:

“The Himalayan range has been commonly divided into three zones: the great range of snowy peaks, ...the Lower or Outer Himalayas, and thirdly, the comparatively low hills forming the sub-Himalayan zone... In Darjeeling the mountains belong to the Lower Himalaya zone and consist of long tortuous ranges, running generally from north to south throughout its length...the snowy range lies far beyond the limits of the district to the north... This range forms the great backbone of the Darjeeling Himalayas... From Kinchinjunga the Singalila range, an immense ridge 60 miles long, stretches south to the plains, forming the boundary between Nepal and Darjeeling”<sup>134</sup>

The highest ground of the district was in the north-west where Singalila ridge entered the district at Phalut; the ridge was almost 12,000 feet high at Phalut and further south at Sandakphu from where it descended to Manibhanjan (6,000 feet) as the boundary between the District and Nepal. The ridge continued southward to the level of the plains first as the boundary and then as the top of slopes on the left bank of the Mechi river.<sup>135</sup>

While describing river system of the district of Darjeeling A.J. Dash had argued that the ‘rivers of the district drain ultimately to the south, though the west to east ridge across it causes a series of Tista tributaries rising on its northern face to flow northwards and others flow east or west before joining the main river.’<sup>136</sup> O'Malley was of the opinion that Tista formed the boundary between the State of Sikkim and British territory of Darjeeling up to the Great Rangit from where it turned to the south passing through the mountains and debouched on the plains through a canyon called as the Sevok Gola Pass.<sup>137</sup> Tista had several tributaries in the district of Darjeeling – Rangpo and Rilli on its left bank; and the Great Rangit, the Rangpo, the Rayeng, and the Sevok on its right bank. The river Tista was connected by a suspension bridge near Melli; and in the gorge, there were total three bridges across the district, among which two were reinforced concrete bridge which hold heavy road traffic and one suspension bridge that carried only animals, pedestrians and connected Darjeeling with the great trade route across the Jalep-la pass into Tibet.<sup>138</sup> Although the Tista was created by the snowmelt water, but rains, especially during the monsoon, made it absolutely indomitable and caused serious floods both in the hills and the plains. The Mahananda was another great river of the district which emerged from Mahaldiram hills, and leaving the hills the river formed the boundary between the Terai and Jalpaiguri to Phansidewa. Although the river had no tributaries in its hilly part, but as Hunter remarked, the New Balasan, the Mechi, and the

Chegna rivers, which all flowed through the district had poured their water on the right bank of the Mahananda.<sup>139</sup> The river Great Rangit flowing from the west to east entered into the District and formed a part of the northern boundary where it received the Ramman on its right bank and below that junction flowing eastwards the Great Rangit received the Little Rangit and Rangnu as tributaries from the Darjeeling side.<sup>140</sup> There were great differences in colours and temperature between these two great rivers viz. the Tista and the Great Rangit – the colour of the Tista was ‘cloudy’ and the water is relatively cold which was ‘due to the the number of glaciers drained by it’ whereas the Great Rangit was ‘dark green’ and ‘very clear’ and the water of Great Rangit was ‘appreciably warmer’ than that of the Tista.<sup>141</sup> The Little Rangit emerged from the Tanglu Mountain in the Singalila range on the borders of Nepal and flowed in a north-easterly direction till it poured its water into the Great Rangit on its southern bank.<sup>142</sup> The Balasan river took its rise at Lepcha Jagat a few miles to the south-west of the station of Darjeeling and travelled a southerly direction towards the Tarai where it was divided into two streams viz., the New Balasan which joined the Mahananda on its right bank just below Siliguri, and the Old Balasan which flowed southward till passing out of the Terai and joined the Mahananda in Purnia.<sup>143</sup> The new channels, as remarked by O’Malley and Dash, was said to have been constructed during the 40s of the nineteenth century by the Meches who dammed the old stream for fishing purpose.<sup>144</sup> The river Mechi which formed the western boundary of the district emerged from the Rangbang spur in the Singalila range on the Nepal border and flowed towards the south till it passed into Purnia district.<sup>145</sup>

Apart from the districts of the Rajshahi Division, the princely state of Cooch Behar can also be considered as integral part while studying the northern Bengal, because during the colonial period Cooch Behar was comprised of a larger area of country and its inhabitants were spread to the neighbouring British Districts as well than the mere small present State of Cooch Behar. The name Cooch Behar was a compound of two words, Cooch and Behar. The term Cooch was a corrupted form of *Coch*, or *Koch*, which was the name of a race of people inhabiting a large tract of country in the north-east of Bengal ; and *Behar*, or, *Vihara*, signifies abode, or sport. Thus the meaning of the term Cooch Behar is the land of the Koches.<sup>146</sup> Cooch Behar was bordered on the north by the Western Duars; on the east by the Guma Duars, and *pargana* Ghurla of Goalpara of Assam, and the *parganas* of Gaibari and Bhitambar of Rangpur, and by the rivers Gadadhar, Sankosh, Baguni, and Mara Dudhkumar; on the south by Chakla Purvabhadra, and *parganas* Kakina and Kazirhat in the District of

Rangpur, and *pargana* Patgram in the District of Jalpaiguri ; and on the west by *pargana* Kazirhat in Rangpur, and Chakla Boda in Jalpaiguri.<sup>147</sup> Cooch Behar was considered as a feudatory State under the charge of the Lieutenant-Governor of Bengal in the political and foreign department, and was administered 'directly by its own hereditary Raja' who was subject to the payment of a fixed tribute to the colonial government.<sup>148</sup> The boundary disputes which prevailed between the Cooch Behar State and Rangpur district in terms of their enclaves had been finally solved in the year 1934.<sup>149</sup> The dispute was, however, centering on the question of Cooch Behar enclaves in Rangpur and Rangpur enclaves in the Cooch Behar State. Hunter had mentioned about six principal rivers in the State viz. the Tista, the Singimari, the Torsha, the Kaljani, the Raidak, and the Godadhar, all of which flowed from north to south.<sup>150</sup> The Tista had entered into the State at Bakshiganj and flowing towards south-easterly it cut-off the western portion of the State. The Tista in its course in the district had separated Haldibari from Mekhliganj thana and passed out to the State by *taluk* Kuchlibari to flow into the Rangpur district.<sup>151</sup> Hunter had considered the river Singimari as the 'longest' and the 'most perfect river in the State', on which bank the former headquarter of the Government was situated near Gosanimari (at Kamatapur).<sup>152</sup> The Singimari, Hunter described, entered into the State under the name of Jaldhaka from the extreme north-west corner of the district, near Moranger Hat in Khiti and travelled in a south-easterly direction through the villages of Giladanga, Panigram, Dhaibanga, Khaterbari, and Mathabhanga'.<sup>153</sup> The middle portion of the river was called as Manshai and the river finally joined with the Torsha on the southern border of the State near Gitaldaha.<sup>154</sup> The principal tributaries of the river were Mujnai, Satanga, Duduya, Dolang, and Dalkhoa. Among these, the Mujnai carried a part of the waters of the Torsha via Buri Torsha from Bala Duars. Dharla which was a very significant river of the State had flowed through the southern portion of the district while its lower course had been appropriated by Manshai-Singimari stream of Jaldhaka and its headwaters of the upper course were consumed by the Tista.<sup>155</sup>



Map. 1.4. Map of the Cooch Bihar State (1900)

Source: Harendra Narayan Chaudhuri (compl.), *The Cooch Behar State and its Land Revenue Settlements* (1903).

The Dharla entered into Cooch Behar in *taluk* Panisala, and after travelling for five miles through Mekhliganj *thana* it left the Changrabandha border on its right bank from where it passed out from the district and entered into Patgram *thana* of the district of Rangpur.<sup>156</sup> The river Kaljani cut across the eastern angle of the State and joined with the river Sankoh. The police station of Tufanganj was situated on its banks, and its tributaries were Chika and Alaikumari on the left, and the Ghargharia and Buri, or Old Torsha on the right bank.<sup>157</sup> The river Raidak flowed through the eastern border of the State in parallel with the Kaljani and moved further to the east to form the river Sankosh which was again joined by the Gadadhar and the ultimately these united stream fell into Brahmaputra.<sup>158</sup> Durgadas Majumdar was of the opinion that the Torsha (means ‘angry water’) which had been the ‘Sorrow of Koch Bihar’ for over two centuries had frequently changed its course and that the entire northern portion of the Mathabhanga *thana* had been laid waste by its whims, and as a result prosperous villages and marts that had developed on its bank were devastated and the whole country was left by several deserted channels.<sup>159</sup>

Kosi which was one of the important rivers of ancient Bengal flowed through the district of Punia and moved southwards till it fell into the Ganges. But formerly the direction of the river was westward and it joined with the Brahmaputra. Niharranjan Ray argued that the Kosi had gradually shifted from east to west due to the frequent changes of its courses through the centuries and as a result a vast area between Gour, Laxmanabati and Pandua had turned into a land of marshes and low-lands which had been deserted and destroyed by severe inundations.<sup>160</sup> The *bils* and *jhils* which were abundantly found in the north-eastern portion of the district of Malda were probably the offshoots of the river channels of Kosi and Mahananda.

## II

### **Demographic Transformations in Colonial Northern Bengal (1872-1941)**

Northern Bengal was comprised of several aboriginal and emigrant tribes. There was variety of tribal population in colonial times in the districts of northern Bengal. From Darjeeling to Pabna the mosaic of several castes, tribes had provided a unique demographic character for the northern Bengal. A. Campbell had depicted the emergence and formation of Darjeeling district as a hill-district or a sanatorium in the following manner:

“Darjeeling, in lat. 27<sup>0</sup> north and long. 88<sup>0</sup> 22' east, was ceded to the British Government by the Raja of Sekim in 1835, to enable it to establish a sanatorium there for Europeans from Calcutta and Bengal.... The country attached was without inhabitants. This state of things soon altered. People flocked from all sides, and we rapidly acquired a thriving population. When I took charge there were not more than fifty families in the whole tract. In twelve years we had 10,000 inhabitants in it; and by an accession of territory, we had an increase of 36,000 in the Terai, or lowlands, at the base of the hills. In 1861, when I left Darjeeling, the total population was estimated at 60,000. The rapid progress of the new station was the result of free labour and free trade, regularly paid wages, a light land assessment, strict and prompt administration of justice, and close attention to the peculiar habits and customs of all classes. ....The scenery is unsurpassed anywhere in beauty and grandeur; a tract of finely wooded and variously shaped mountains extending northwards, till they terminate in a stupendous range of perpetual snow, of which Kunchinjunga, the highest peak, is

28,136 feet above the level of the sea. The climate and soil favour the growth of tea and chinchona, which are now grown there.”<sup>161</sup>

Thus it is evident from the above description that the population of Darjeeling was largely comprised by the emigrants who were brought out by the European colonizers for facilitating trade in tea and other commercial purposes. The transformation of Darjeeling from a land of ‘without inhabitants’ to a ‘thriving population’ can be attributed to the colonizers initiative of building a sanatorium there and to exploit the vast natural resources for their petty commercial interests. The hill stations of British India were regarded by the western observers as ‘an island of Victorian values and symbols without a clientele.’<sup>162</sup> Imperial design behind the construction of sanatoriums or health-places in colonial India thus invites the scope for historical scrutiny of the colonial objective on the discourses of imperial practices which reinforced the distinction of this British enclave not only as a suitable place for colonial administrators, but also on the basis of a racial and spatial categorization that represented the sense of British superiority and difference spawned up from the fear of being degenerated.<sup>163</sup> Apart from this, alike many other hill stations or sanatorium around the Indian subcontinent, the construction of Darjeeling displayed the legacy of British perception ‘as sites of colonial leisure and recreation; temperate places that represented socially, culturally and architecturally, derivations of metropolitan and imperial symbols of leisure’ and in addition with an aim of its incorporation into the colonial economy.<sup>164</sup> O’Malley in his Gazetteer had remarked that ‘The growth of the Darjeeling district affords the most remarkable instance of the expansion of population of which there [was] any record in Bengal.’<sup>165</sup>

Table. 1.1

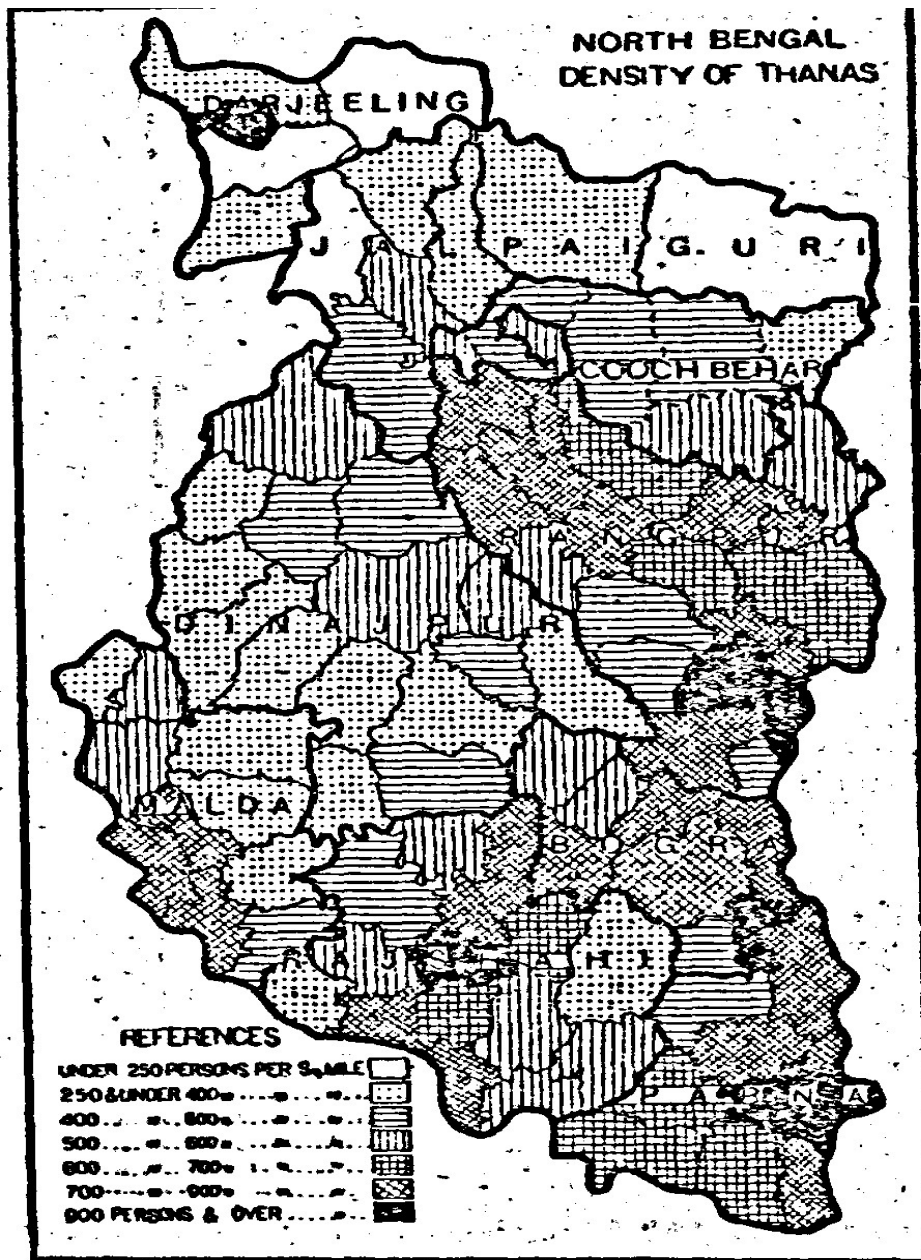
Growth of population in Darjeeling district, 1872-1941

| Census  | No. of population | No. of increase | % of increase |
|---------|-------------------|-----------------|---------------|
| 1871-72 | 94,717            |                 | ----          |
| 1881    | 155,179           | 60,467          | 63%           |
| 1891    | 223,314           | 68,135          | 43.4%         |
| 1901    | 249,117           | 25,803          | 11.5%         |
| 1911    | 2,65,550          | 16,433          | 7%            |

|      |          |        |     |
|------|----------|--------|-----|
| 1921 | 2,82,748 | 17,198 | 6%  |
| 1931 | 3,19,635 | 36,887 | 13% |
| 1941 | 3,76,369 | 56,734 | 18% |

Source: Arthur Jules Dash, *Bengal District Gazetteers: Darjeeling*, p. 49.

At close of the nineteenth century the population was returned as 249,117 in 1901 in comparison with the 94,717 in 1871-72. The population in 1901 was increased 2½ times greater than that of 1871-72.<sup>166</sup> The increase of population was due to the emigration of a large number of migrant people for the tea industry which made the district populous. In 1872 the number of tea estates in Darjeeling was only 74 with an area of 14,000 acres which was increased to 30,000 acres by the 153 tea estates in 1881; and in 1901 the tea estates were increased to 177 with an area of 45,000 acres.<sup>167</sup> The growth of agricultural tracts in the Terai region was also responsible for the increase of population in the district.<sup>168</sup> The total density of population in the district as a whole was 214 persons per square mile, whereas only in the Terai region there were 279 persons per square mile.<sup>169</sup> The development of communication through railways and roads were instrumental to encourage the people to migrate into the place. A large portion of population had migrated to the district from Nepal, Bihar and Sikkim, among the largest number of people came to the district from Nepal.<sup>170</sup> In the district of Darjeeling, Dash had mentioned that, there were 87 females to every 100 males according to the earlier gazetteer, whereas the 1941 census had recorded the male population as 1,99,891 against a female population of 1,76,478 i. e. just over 88 females for every 100 males.<sup>171</sup> The Nepalese, Lepchas, Limbus, Bhutias, and Rajbanshis were the principal inhabitants of the district with a considerable number of European population.



Map 1.5. Population Density in 1911

Source: . L. S. S. O'Malley, *Census of India 1911*, p. 11.

John F. Grunning had divided the district of Jalpaiguri into two 'well-defined' parts viz., – the permanently settled *parganas* which had formed the part of Rangpur, and the Western Duars which were annexed in 1865 at the time of Bhutan War.<sup>172</sup> The population had increased nearly two times greater between 1872 and 1901.

Table. 1.2

## Growth of Population in Jalpaiguri District, 1872-1901

| Census | No. of population |
|--------|-------------------|
| 1872   | 417,855           |
| 1881   | 580,570           |
| 1891   | 680,736           |
| 1901   | 787,380           |

Source: John F. Grunning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, p. 30.

The increase of population had taken place in both of the parts. During the last quarter of the nineteenth century the district had witnessed several jurisdictional changes which influenced the estimate of the population. According to a rough estimate made by a survey in 1865-67, the population of Western Duars was returned as 49,620. The subsequent census had recorded a considerable increase of population in Western Duars – in 1881 the population was 182,687 which increased to 296,348 in 1891, and in 1901 it had increased to 410,606.<sup>173</sup> This growth of population in Western Duars was largely due to a great influx of tribal people from Chotanagpur plateau and the immigration from the Cooch Behar State. The growth of population was fostered by the remarkable development of tea industry in this area where the Santal, Oraon, Munda tribes who migrated from the Chotanagpur region had cleared the forest tracts and settled there. Despite of this increase of population, the census of 1901 had designated the climate of the Western Duars as ‘not notoriously bad and malarious fever of a severe type’ was prevalent which obstructed ‘a natural increase of population.’<sup>174</sup> Apart from the migrated population, the district was largely inhabited by the Rajbanshis, Nasyas, and Sekhs as the aboriginal of that tract. Due to the peculiar nature of the soil, population was unevenly distributed in the district and in some areas the number of population was meagre.<sup>175</sup> Due to the precarious condition caused by the severe malarial fever, cholera and other diseases the death rate remained so high that the ‘the Western Duars was accepted with resignation by the inhabitants, European and Indian alike...’<sup>176</sup>

The princely State of Cooch Behar had witnessed several transformations in terms of fluctuations in the number of population between 1872 and 1941.

Table 1.3

## Demographic fluctuations in the Cooch Behar State, 1872-1941

| Census | No. of total population | % of increase(+) decrease (-) |
|--------|-------------------------|-------------------------------|
| 1872   | 532,565                 | -----                         |
| 1881   | 602,624                 | 13.15 (+)                     |
| 1891   | 578,868                 | 3.9 (-)                       |
| 1901   | 556,116                 | 4.1 (-)                       |
| 1911   | 591,012                 | 4.58 (+)                      |
| 1921   | 590,599                 | 0.07 (-)                      |
| 1931   | 589,053                 | 0.26 (-)                      |
| 1941   | 638,703                 | 8.43 (+)                      |

Source: Extracted from Durgadas Mazumdar, *West Bengal District Gazetteer: Koch Behar*, 1977, p. 45.

The above table has shown decrease in population in 1891 and 1901 census. The deduction in 1891 was caused partly by the two epidemics of cholera and partly to the migration of people to the tea garden of Western Duars. The population had further reduced, as recorded by the 1901 census, by the prevalence of ‘unhealthy climate’ and the scarcity of food in 1897 when there was a widespread famine throughout the province.<sup>177</sup> There was again a decrease in population between 1911 and 1921 which was 0.07% and this was caused by the influenza epidemic. In 1931 there was also a further decrease of 0.26% which was resulted from the cholera and small-pox epidemics that occurred in 1928 and 1929.<sup>178</sup> The census of 1911 had designated the princely state as ‘thinly populated’ where the maximum density was 552, and only Dinhata and Haldibari came with a moderate density.<sup>179</sup> Between 1891 and 1911 the number of females for every one thousand male had gradually decrease, whereas there was minor increase from 1911 to 1931.<sup>180</sup>

There were difficulties in obtaining accurate number for the Malda district prior to the census of 1872. Hunter had observed that the only immigrants into this District were a few hill-men from Chotanagpur who were mostly *Dhangars*, but there were also some Kols and

Santhals.<sup>181</sup> Although there was general increase of population (5%) between 1872 and 1881 but there was a slight fall in the southern portion of the district of west of Mahananda, and this was caused by the malarial attack during the second half of the decade.<sup>182</sup> But there was an increase of 14.5% between 1881 and 1891, as a result of opening of the *barind* tract by the Santhals who contributed to the increase of population in the southern portion of the district.<sup>183</sup> The immigration of Santhals into the district had continued for the next decade (1901) when the population was increased by 8.5% and this was further increased by 1911 to 13.5% due to the constant inflow of the Santhals.<sup>184</sup>

District of Dinajpur had witnessed the immigration of seasonal labourers from the neighbouring tracts from where a large number of tribal population had migrated into the district. Hunter was of the opinion that at the time of harvesting labourers had migrated to Dinajpur from neighbouring Districts as reapers who used to get 4 *annas* a day for their work.<sup>185</sup> Day-labourers had also come from Rajmahal to the large river side marts, from January to March, to husk rice for the grain merchants and *Dhangar* coolies also used to come regularly every year to Dinajpur to work on the roads, or to clear jungle for the zamindars.<sup>186</sup> Apart from the migrated people there were large numbers of aboriginal and semi-aboriginal people who lived in this district. Koches or Rajbanshis who were principally agriculturists had also inhabited this land. Hunter had mentioned the description of the Assistant Magistrate of Dinajpur regarding this group of people in the following manner:

“The Koch and Palis or Paliyas, as they are indifferently called, are a people peculiar to this part of the country, and are distinguished from all other Bengalis by their broad faces, flat noses, and projecting cheekbones, as also by their appearance and different style of dress. They profess to be Hindus; but while they follow the Hindu religion in the main, they also practise some ceremonies borrowed from Musalmans and others, which are apparently remnants of an older superstition.... The Palis are subdivided into three classes - the Sadhu, Babu, and Desi Palis.”<sup>187</sup>

Prior to the census of 1872 the slow rate of population growth had been observed and this was due to the prevalence of malarial fever, ‘for which this district has as evil a reputation as its neighbour Rangpur.’<sup>188</sup> In 1872 it was reported that deaths occurred in Dinajpur was excessively high than that of the other districts in the Division and in 1876 the fever mortality had reached to the 22.05 per mile of the total population of the district.<sup>189</sup> There was slight increase in population in 1891 (2.7%) than the earlier decade and this increased had

continued for the next couple of decades.<sup>190</sup> The census of 1911 had noticed unfavourable conditions for the increase of density in the district and this was due to the unhealthy climate and 'the south [was] covered by the high undulating ridges of the Barind, in which cultivation [was] either impossible or unprofitable.'<sup>191</sup>

For Hunter, Rangpur which was the most populous district in the Rajshahi Division contained nearly one person for every acre and the most thickly settled parts of the district were the tracts on both side of the Tista, which divided the District from north-west to south-east.<sup>192</sup> The first census (1872) had reported 2,149,972 number of population which in 1881 census had been diminished to 2,097,964, and it again decreased to 2,065,464 by 1891.<sup>193</sup> Due to the prolonged prevalence of malarial fever the district had lost 4 percent of its population between the years 1872 and 1891. Although before 1881 the malarial fever was limited in the *thanas* of Mithapukur and Pirganj which located at the centre of the district, but a general deterioration of the condition had been noticed from 1891 in the *thanas* east to district and north of them; and this time the malarial fever was accompanied with frequent cases of cholera that collectively increased death-rate in the district.<sup>194</sup> The contagion for cholera was caused, as apprehended by the colonial administration, by the coolies who were migrating to Assam tea gardens via the district of Rangpur and on the other hand, the malarial prevalence and severity was caused by the obstruction of the old drainage channels in the south and west of the Tista, and the overall prevalence of water-logged conditions of the district.<sup>195</sup> Despite of long-continued unhealthiness, the 'very fertile soil' of Rangpur was praised in the census of 1901 for producing 'a far greater population than Dinajpur to the west, Kuch Bihar and Jalpaiguri to the north or Goalpara in Assam to the east.'<sup>196</sup> The only places where there were less than 500 persons to the square mile were two unhealthy and ill-drained police circles in the south-central part of the district on the bank of the old Karatoya and a tract along the eastern boundary which included in its nominal area the bed and sandy *chars* of the Brahmaputra.<sup>197</sup> In the Report of the Survey and Settlements, Arthur Coulton Hartley had remarked that 'before 1910' the data and information regarding the prevalence of diseases and their impact was not reliable and mentioning the improvement in the public health since the 1920s onwards he stated that 'on account of the prevalence of malaria, it still cannot be reckoned as one of the healthy district of Bengal, it is no longer notorious.'<sup>198</sup>

Table. 1.4

Yearly death-rate per mile of population in Rangpur district

| Year    | Death-rate (per mile) |
|---------|-----------------------|
| 1911-20 | 31.59                 |
| 1921-30 | 27.00                 |
| 1931    | 25.23                 |
| 1932    | 20.72                 |
| 1933    | 28.05                 |
| 1934    | 27.11                 |
| 1935    | 27.55                 |

Source: Arthur Coulton Hartley, *Final Report of the Rangpur Survey and Settlement Operations, 1931-38*, (1940), p. 7.

Although the table has shown a decline in the death-rates but at the same time these were static and the years were going on without any check in death-rates which were principally caused by the malarial fever that was ‘more pronounced in the south-west than in any other area.’<sup>199</sup>

The growth-rate of population in the district of Rajshahi had been recorded unevenly in different parts. From 1872 to 1891 the *thanas* to the north and west of the district had shown increased number of population, whereas the central and southern portion of the district had witnessed decrease in population.<sup>200</sup> In fact, it was remarked that ‘no district in Bengal [had] such a bad record’ than the district of Rajshahi, since it had made ‘no advance’ in population growth.<sup>201</sup>

Table. 1.5

Growth of population in Rajshahi, 1872-1911

| Census | Total number of population | % of increase (+)<br>& decrease (-) |
|--------|----------------------------|-------------------------------------|
| 1872   | 1,421,865                  | .-----                              |
| 1881   | 1,449,033                  | + 1.9                               |

|      |           |       |
|------|-----------|-------|
| 1891 | 1,437,859 | -0.8  |
| 1901 | 1,460,584 | + 1.6 |
| 1911 | 1,480,587 | + 1.4 |

Source: L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 49.

It can be noticed that population had decreased in 1891 by 0.8 percent and till 1901 the central and southern thanas had suffered a loss of 12.8 percent of population due to malarial attack in the district, whereas in contrary to this population increased by 25.6 percent in Barind and by 59.3 percent in the fertile tracts of Naogaon and Panchupur in the Naogaon subdivision.<sup>202</sup> The relatively low density in Rajshahi, as identified by the census of 1901, was due partly to its containing a large portion of the Barind and partly to the presence of numerous marshes and lakes, including the Chalan bil, the largest sheet of inland water in Bengal.<sup>203</sup> Despite of continuous prevalence of fever, population rate had was increased in 1911 census by 1.4 per cent, which included the increased number of Muslim population in comparison with the Hindus who had lost 3 per cent of their population.<sup>204</sup> The census of 1921 had returned with a total population of 1,489,675 (573 per square mile) and increase of population since 1872 was one thousand per annum.<sup>205</sup> The fluctuation of population in some *thanas* of the district between 1872 and 1921 was as follows:

Table. 1.6

Variation in Population in *thanas* of Rajshahi, 1872-1921

| Thana               | Population in |         | Variation<br>per cent |
|---------------------|---------------|---------|-----------------------|
|                     | 1872          | 1921    |                       |
| Godagari            | 34,683        | 59,771  | + 72                  |
| Puthia              | 143,087       | 79,932  | -44                   |
| Charghat and Lalpur | 206,766       | 102,927 | -50                   |
| Manda               | 92,328        | 144,392 | +56                   |
| Nator               | 139,652       | 107,458 | -23                   |
| Baraigram           | 127,941       | 89,673  | -29                   |

|         |         |         |    |
|---------|---------|---------|----|
| Boalia  | 110,307 | 99,926  | -9 |
| Tanor   | 91,032  | 92,948  | +2 |
| Bagmara | 128,687 | 125,397 | -2 |

Source: W. H. Nelson, *Final Report on the Survey and Settlement Operations in the District of Rajshahi, 1912-1922*, (1923), p. 20.

The above table has shown a steady decline in population in Nator subdivision, and Charghat and Puthia *thanas*, which was due to the decrease in the means of subsistence of people caused by the decline in silk industry or by the deterioration of fertility power of land; and these problem were equally instrumental in the *thanas* of Boalia, Tanor and Bagmara.<sup>206</sup> The reason for the decrease of population in Nator subdivision, and Charghat and Puthia *thanas* was the ‘bad climate’ which had been in ‘a serious change for the worse in the climate operating’ during the 80s of the nineteenth century.<sup>207</sup> This change for the worse could also be seen in the drainage system which subsequently affected public health. Although the Atrai from the north, and the Narad and the Baral from the Ganges were formerly active streams in this region but Narad had dried up entirely, and the Atrai and the Baral were in a decadent position.<sup>208</sup> The slow but constant depopulation of some parts of the country had contributed to the increase of jungle and fallow land which coupled with the malarial mosquitoes caused ‘further disease and depopulation.’<sup>209</sup> However, the Barind tract was the developed part of the district where immigration of considerable number of Santhals had taken place along with the addition of other aboriginals, both of whom had migrated into the district for agricultural employment.<sup>210</sup>

The decades between 1872 and 1901 had observed a constant increase of population in the district of Bogra.

Table. 1. 7

## Growth of Population in Bogra, 1872-1901

| Census | Total no. of population | Density per square mile | Percentage of increase |
|--------|-------------------------|-------------------------|------------------------|
| 1872   | 689,467                 | 459                     | ----                   |
| 1881   | 734,358                 | 490                     | 6.6                    |
| 1891   | 817,494                 | 563                     | 14.8                   |
| 1901   | 854,533                 | 629                     | 11.7                   |

Source: Extracted from J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, (1910), pp. 27-28.

There was continuous increase of percentage and density population between 1872 and 1901. Although it was believed that the increase between 1881 and 1891 was due to the expansion of Eastern Bengal State Railway from Sara to Siliguri in 1878, but Mr. Lyon, the Collector of Bogra was of the opinion that since there was ‘scarcely any migration either inwards or outwards’, therefore, the number of population in the district ‘increased by births alone.’<sup>211</sup> The tract between the Karatoya and Daokoha where jute had been grown most abundantly was the most densely populated part of the district.<sup>212</sup> Bogra had received a considerable immigration of people from its neighbouring district Pabna, Nadia, Saran, Chotanagpur plateau, and the United Province.<sup>213</sup>

The population of the district of Pabna had increased between 1872 and 1881 by 8.3 percent, which increased in 1891 by 3.85 percent and this was further increased by 4.3 per cent in 1901 census.<sup>214</sup> The population would have been much greater if there had not been emigration of a large number of people from the district to the districts of Rangpur and Goalpara where the people could find ‘cheap and fertile’ lands for settlement and agriculture.<sup>215</sup> In the census of 1901, Pabna stood first in respect of density of population and this was mainly due to the rich jute fields of the Sirajganj Subdivision. It was also probable that the actual area was greater than would appear from the figures based on the survey, and that in some parts the district had gained by alluvion which could be seen in the Shahzadpur thana where the minimum area held a density of 1,235 to the square mile.<sup>216</sup> The years between 1911 and 1921 had witnessed ‘unfavourable’ conditions as a result of prevalence of

malaria and influenza which carried away more than one percent of total population during 1918 and 1919.<sup>217</sup> Pabna had the highest density of population in northern Bengal which was 828 persons per square mile and Sirajganj subdivision was the most thickly populated part of the district.<sup>218</sup>

Apart from the birth or death-factors the population of northern Bengal had been largely influenced by the process of inter-district migration. For northern Bengal chief impetus had come from the two factors- viz. immigration of Santhals from the Santhal pargana or the Chotanagpur region, and the seasonal migration of people from the neighbouring districts to a particular district especially during the time of jute cultivation which involved a great number of labourers. In fact this was an important reason to argue that the number of people shown in the district census might not be the permanent number of population, especially for the case of the group of people who frequently migrated from one district to another in search of occupation and subsistence; thus while collecting the number of people for the census data the time of a year emerged as most crucial factor. The Nandigram *thana* of Nator subdivision of Rajshahi district had received population from the district of Bogra and the population of Badalgachhi had been enlarged by the Oraon tribal people. Haraprasad Chattopadhyay has shown that the Atrai police station had received jute traders and labourers till 1929 due to the rise in price of jute; and the police station of Biral and Raiganj of Dinajpur had become populated by the labourers from other districts when the jute industry was greatly prospered, but the immigrant labourers moved away from the police stations before the census was taken.<sup>219</sup> It has been already noticed that the district of Jalpaiguri and Darjeeling had witnessed a great number of tribal people in accordance with the development of tea industry in those districts. Inter-district and intra-district migration among the districts of northern Bengal was very much common in this region which caused a constant fluctuation of population. Bhatiyas from the district of Mymensingh, Pabna, and Bogra had immigrated into the *char* lands of Nageswari, Bhurangamari, and Rahumari in the district of Rangpur and settled there; on the other hand, a number of villages in Shariakandi of Bogra had been abandoned by their people among whom some had migrated into Mymensingh, and others fixed with the *thanas* of Panchbibi, Khetlal, and Jaipurhat of the Bogra district.<sup>220</sup> The *char* lands of Pabna and Malda had attracted a large number of people from their neighbouring district for the fertile agricultural fields. There was also migration between the princely state of Cooch Behar and the districts of Bengal.<sup>221</sup>

Table. 1.8  
Variation in Population in the Rajshahi Division, 1872-1921

| District       | 1921      | 1911      | 1901      | 1891      | 1881      | 1872      |
|----------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Rajshahi       | 1,489,675 | 1,480,587 | 1,460,584 | 1,437,859 | 1,449,033 | 1,421,865 |
| Dinajpur       | 1,705,353 | 1,687,863 | 1,566,845 | 1,482,355 | 1,442,320 | 1,429,900 |
| Jalpaiguri     | 936,261   | 902,660   | 786,326   | 679,623   | 579,373   | 416,781   |
| Darjeeling     | 282,748   | 265,550   | 240,117   | 223,314   | 153,646   | 91,996    |
| Rangpur        | 2,507,854 | 2,385,330 | 3,164,115 | 2,065,249 | 2,097,553 | 2,153,061 |
| Bogra          | 1,048,606 | 983,667   | 853,504   | 763,574   | 686,185   | 641,281   |
| Pabna          | 1,389,494 | 1,428,686 | 1,421,305 | 1,362,225 | 1,311,649 | 1,211,570 |
| Malda          | 985,665   | 1,004,159 | 881,734   | 612,761   | 709,834   | 675,978   |
| Cooch<br>Behar | 592,489   | 592,932   | 560,974   | 578,868   | 602,624   | 532,565   |

Source: W. H. Thompson, *Census of India, 1921 Vol. V Bengal, Part II – Tables*, Bengal Secretariat Book Depot, Calcutta, 1923.

The principal cultivating classes of northern Bengal were Muslim and other lower classes, whereas most of the revenue collecting zamindars and taluqdars and their agents were Hindus of Brahman and Kayastha castes and the proportion of these higher caste Hindus in the total population ‘was much lower than anywhere else in Bengal.’<sup>222</sup> This ‘numerical weakness’ of the high caste Hindu landlords or taluqdars and the non-residential character of a large number of zamindars had provided the opportunity for the jotedar class to emerge as ‘controlling’ authority of the villages of Dinajpur and Rangpur districts where they had hardly any rivals against them.<sup>223</sup> Sugata Bose has also reiterated this view by saying that in Dinajpur and Rangpur the zamindars had been pushed away from any real control over the land and became absenteees which facilitated the scope for the big jotedars for establishing their command over the land, labour and credit, and by doing so they were successful to capture even the half of the produce as rent from bargadars.<sup>224</sup> A great portion of jungle tracts of Dinajpur and Rangpur had been turned into cultivable lands during the period between 1770 and 1860 when population and production had also simultaneously increased and the rich peasants who reclaimed the forest tracts had now come to be known as, according to Sugata Bose, jotedars.<sup>225</sup> Although it was axiomatic that the increased population in the district of Rajshahi division would provide the opportunity for increase production, but on the contrary, the growth of population in the first half of the twentieth century did not contribute

to bring out any technological innovations for the development of agricultural productivity, which increased only at an annual rate of 0.05 percent in the Rajshahi division.<sup>226</sup>

During the decade 1921-1931 Bengal 'happily suffered from no major natural calamity.'<sup>227</sup> But the distribution of rain was either uneven or defective in Burdwan, Presidency and Dacca Divisions in 1921-1922 and in the districts of Burdwan, Birbhum, Bankura, Murshidabad, Nadia, Malda and Dinajpur in 1927-1928.<sup>228</sup> Again in 1923-1924 there was shortage of rains before sowing the main rice crop which produced a small outturn in Burdwan and Rajshahi Divisions. During 1927-1928 there was a decline in the outturn especially of winter paddy in districts of Western and Northern Bengal where the cultivating classes had to experience considerable distress, and the results of this distress were felt also in the following year, 1928-1929, when however the crops were excellent but substantial adversity was caused to the inhabitants of the southern parts of the Dacca district by the rapid erosion of the river Padma.<sup>229</sup>

The constant increase of population had affected the ecological balance which was further aggravated by the transformations that had taken place in the nature itself. Rivers of northern Bengal were continuously shifting their courses which also resulted in the change of their river beds that subsequently created new *char* lands. The abandoned river beds had turned into jungle tracts which facilitated the reasons for extensive malarial attacks. The ever increasing pressure of population on land fostered the necessity of bringing large tracts of land under cultivation which ultimately led to large scale deforestation and subsequent deterioration of ecological balance. S. C. Majumdar had commented that this ecological deterioration which was caused by the growing population and indiscriminate use of land and forest tracts had heightened the tensions when 'as a consequence more and more of the precipitation [was] flowing as surface run-off into [the] rivers thus increasing the intensity of floods and reducing the subsoil storage, which in its turn [was] reducing the dry weather flow so necessary to serve the needs of man – for irrigation, navigation, domestic supply etc.'<sup>230</sup> The subsequent chapters on rainfall, droughts, floods and famine will delve into this 'question of water' which intensified ecological vulnerabilities during the time of its shortage or excessiveness.

## Notes and References:

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<sup>1</sup> Niharranjan Ray, *Bangalir Itihas (Adi parva)*, Book Emporium, First Published 1356 B. S., Calcutta, p. 83.

<sup>2</sup> *Ibid.*, pp. 83-84.

<sup>3</sup> H. Blochmann, *Contributions to the Geography and History of Bengal (Muhammedan Period)*, Asiatic Society, Calcutta, 1968, p. 3.

<sup>4</sup> James Rennell, *Memoir of a Map of Hindustan or the Mughal Empire*, W. Bulmer & Co., London, 1792, p. 335.

<sup>5</sup> *Ibid.*, p. 348.

<sup>6</sup> E. A. Gait, *Census of India, 1901 Vol. VI Part I: The Report*, Bengal Secretariat Press, Calcutta, 1902, p. 14.

<sup>7</sup> *Ibid.*

<sup>8</sup> E. A. Gait, *op. cit.*, p. 5.

<sup>9</sup> By the census of 1911, Sikkim was separated from the Government of Bengal and it was no longer included in North Bengal. L. S. S. O'Malley, *Census of India 1911, Vol. V: Bengal, Bihar and Orissa and Sikkim, Part I – Report*, Bengal Secretariat Book Depot, Calcutta, 1913, p. 5.

<sup>10</sup> *Ibid.*, p. 11.

<sup>11</sup> A. E. Porter, *Census of India, 1931 Vol. V, Bengal & Sikkim: Part I (Report)*, Central Publication Branch, Calcutta, 1933, p. 3.

<sup>12</sup> *Ibid.*

<sup>13</sup> J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, Pioneer Press, Allahabad, 1910, p. 1.

<sup>14</sup> *Ibid.*, p. 2

<sup>15</sup> *Ibid.*

<sup>16</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, Trubner & Co., 1876, p. 130.

<sup>17</sup> *Ibid.*

<sup>18</sup> Before the formation of the district of Bogra, the estates which were lying east of the Bogra, on the bank of the Brahmaputra, had to pay their revenue into Rampur Boalia, the

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Civil Station of Rajshahi, while the other estates, situated only twelve miles south from the Bogra head-quarters, were required to pay their revenue into Mymensing Treasury, which was located as many miles to the east on the other side of the river Brahmaputra. After the formation of the district of Bogra, the Deputy Collector was charged with the responsibilities to collect only the revenue of such estates which was laid only within his former Magisterial jurisdiction, whereas all other owners of the other estates had been allowed with the option of paying their revenue to their old Collectorates. *Ibid.*, pp. 130-131.

<sup>19</sup> *Ibid.*

<sup>20</sup> *Ibid.*, p. 132.

<sup>21</sup> *Ibid.*

<sup>22</sup> J. N. Gupta, *op. cit.*, p. 3.

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.*, p. 4.

<sup>25</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, p. 137.

<sup>26</sup> For details about the ancient channels of the Karatoya in the Bogra district see Niharranjan Ray, *op. cit.*, p. 109.

<sup>27</sup> J. N. Gupta, *op. cit.*, p. 5.

<sup>28</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, p. 138.

<sup>29</sup> *Ibid.*, p. 140.

<sup>30</sup> J. N. Gupta, *op. cit.*, p. 4.

<sup>31</sup> The Katakhalī was a cross channel which had diverted its path from Karatoya near Govindganj into the Bangali at Ramnagar. Later on Katakhalī was included in the district limit of Rangpur.

<sup>32</sup> *Ibid.*

<sup>33</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, p. 140.

<sup>34</sup> *Ibid.*, p. 141.

<sup>35</sup> In Rennell's map, the Konai and Jamuna were separate rivers which running nearly parallel to one another, from eight to ten miles apart. The Konai had received the waters of Bangali

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which did not have any connection with Karatoya and the Jamuna river fell into the river Konai about twenty miles south of its confluence with the Bangali. *Ibid.*

<sup>36</sup> *Ibid.*

<sup>37</sup> *Ibid.*, p. 142.

<sup>38</sup> This change could be dated from the beginning of the mid-nineteenth century. Buchanan Hamilton had regarded the upper stream of Karatoya as Tista, but during the later period much of the waters were carried off by the largest river in Rangpur passed down the Karatoya. The flood of 1787 had covered the river beds with sand which in course of time had brought down the Karatoya into a 'river below very shallow'. *Ibid.*, pp. 142-143.

<sup>39</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, Bengal Secretariat Book Depot, Calcutta, 1916, p. 1.

<sup>40</sup> Thus the *Barind* tract acted as the border of three districts – Malda, Dinajpur, and Bogra; and comprised parts of three subdivisions of the Rajshahi district viz. – the whole of Godagari thana and the greater part of Tanor in the Sadar subdivision, the major portion of Manda and Mahadebpur in the Naogaon subdivision, and the north of Singra including Nandigram in the Nator Subdivision. *Ibid.*, pp. 2-3.

<sup>41</sup> *Ibid.*, p. 3.

<sup>42</sup> *Ibid.*, p. 4.

<sup>43</sup> This delta between the two rivers had been gradually diminished by the force of the Ganges, and the place of the confluence of the rivers had been relocated to the further northward direction. W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, p. 22.

<sup>44</sup> *Ibid.*

<sup>45</sup> *Ibid.*, p. 23.

<sup>46</sup> The south-eastern limit of the *bil* was at Astamanisha in Pabna; the northern limit of the *bil* in the Rajshahi district was located from Singra to the Bhadai river which separated Rajshahi from the districts of Pabna and Bogra; and the eastern boundary was stretched from north to south Pabna which incorporated the village of Taras on the east of the Bhadai river. L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 5.

<sup>47</sup> In 1909 a temporary subdivision (i.e. Chalan Bil subdivision) of the Public Works Departments was instituted for examining the drainage problem of the *bil*, and another enquiry had found that the total area of the *bil* had been reduced to 142 square miles. *Ibid.*, p. 8.

<sup>48</sup> *Ibid.*, pp. 5-6.

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<sup>49</sup> *Ibid.*, p. 7.

<sup>50</sup> Till the end of 1870s the land revenue administration of the whole of Pabna was the under the jurisdiction of the Rajshahi treasury. W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Districts of Murshidabad and Pabna*, Trubner & Co., London, 1876, p. 270.

<sup>51</sup> From 1859, the district had undergone numerous important administrative changes. In 1862-63, the subdivision of Kushtia was transferred from Pabna to Nadia. In the 1<sup>st</sup> May 1871, the *thana* of Pangsa was shifted from Pabna to Goalando subdivision of Faridpur district, and the *thana* Kumarkhali to Kushtia subdivision of Nadia district. *Ibid.*

<sup>52</sup> The lower portion of the district was benefited by the annual deposit of the silt from the Jamuna and after the subside of the floods water readily flowed to the drainage channels and kept the this portion of the district more healthy than the other parts. L. S. O'Malley, *Bengal District Gazetteers: Pabna*, The Bengal Secretariat Book Depot, Calcutta, 1923, p. 2.

<sup>53</sup> *Ibid.*, p. 6.

<sup>54</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Districts of Murshidabad and Pabna*, p. 271.

<sup>55</sup> *Ibid.*, p. 272.

<sup>56</sup> L. S. O'Malley, *Bengal District Gazetteers: Pabna*, p. 4.

<sup>57</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, Trubner & Co., 1876, p. 356.

<sup>58</sup> For details about the fiscal and administrative changes between the period mentioned see *Ibid.*, p. 357 – 358.

<sup>59</sup> F. W. Strong, *Eastern Bengal District Gazetteers: Dinajpur*, Pioneer Press, Allahabad, 1912, p. 3.

<sup>60</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 359.

<sup>61</sup> *Ibid.*

<sup>62</sup> *Ibid.*, p. 360.

<sup>63</sup> F. W. Strong, *op. cit.*, p. 4.

<sup>64</sup> Dhepa emerged from a marsh called Saselapiyala in the Thakurgaon thana, a few miles north of the source of the Punarbhaba. After it entered into Birganj it was connected with the Atrai river by a channel called Malijol. Although before the flood of 1787 the river used to carry huge volume of water but after 1787 it was 'silted up' and was 'never navigable for

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large boats even in the rains.' The bed of the river was broad, sandy and shallow. *Ibid.*, pp. 4-5.

<sup>65</sup> While approaching towards Malda, the river turned to the south and travelled parallel to this direction for about 20 miles through a stretch of low-lying country called the Duba, and it ultimately met with Mahananda. After Duba, the river channel became narrow and deep.

<sup>66</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 362.

<sup>67</sup> *Ibid.*

<sup>68</sup> The Atrai being the more direct course of the old Tista, whose waters were diverted into the Brahmaputra in 1787-88, has suffered considerably as a navigable channel in consequence and Major Sherwill, in his Revenue Survey Report, dated January 1863, stated that the large grain-marts in the north of Dinajpur had declined in proportion. *Ibid.*

<sup>69</sup> F. W. Stong, *op. cit.*, pp. 5-6.

<sup>70</sup> *Ibid.*, p. 6.

<sup>71</sup> The bed of the river was sandy and the sloppy banks for the most part were covered with jungle and remained uncultivable. *Ibid.*, pp. 360-361.

<sup>72</sup> J. J. Pemberton, *Geographical and Statistical Report of the District of Malda*, Calcutta, 1854, p. 1.

<sup>73</sup> *District Human Development Report- Malda* (henceforth *DHDR*), Development and Planning Department, Government of West Bengal, Kolkata, April, 2007, p. 3.

<sup>74</sup> G. E. Lambourn, *Bengal Districts Gazetteers: Malda*, The Bengal Secretariat Book Depot, Calcutta, 1918, p. 26.

<sup>75</sup> *Ibid.*

<sup>76</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 17; G. E. Lambourn, *op. cit.*, p. 1; M. O. Carter, *Final Report on the Survey and Settlement Operations in the District of Malda, 1928-1935*, Bengal Government Press, Alipore, 1938, p. 1.

<sup>77</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 20.

<sup>78</sup> Although the soil was sandy, but it became enriched each year by the deposits of mud that were left by the inundations of the Ganges. *Ibid.*

<sup>79</sup> M. O. Carter, *op. cit.*, p. 2.

<sup>80</sup> G. E. Lambourn, *op. cit.*, p. 2.

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<sup>81</sup> Lambourn categorized the *diara* as the low bank of a river and *karara* the high bank in order to differentiate between the land below and above flood level, respectively, during the process of later alluvium deposits. *Ibid.*

<sup>82</sup> *DHDR.*, p. 91.

<sup>83</sup> The water entered from the Ganges by the Kalindri in the south and from the Mahananda in the north; and the continuous silting up of the banks flooded the areas and crops besides the banks. M. O. Carter, *op. cit.*, pp. 2-3.

<sup>84</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 22.

<sup>85</sup> *Ibid.*, p. 23.

<sup>86</sup> It was, however, in the District of Malda that more important changes of channel had taken place than in any other portion of the course of the Ganges in this part, and in this section the river was still most active in cutting down portions of its banks and forming new *chars*. *Ibid.*

<sup>87</sup> It can be noticed that in this surrounding areas there had always been a navigable junction between the Ganges and the Kalindri. Buchanan Hamilton described the lower part of the Kalindri, as a mere branch of the Ganges. Although there was not any considerable volume of Ganges water passed down this way, but merely that at Gargariba there was an important navigable connection between the Kalindri and an old branch of the Ganges called the Buriganga. *Ibid.*

<sup>88</sup> G. E. Lambourn, *op. cit.*, p. 4.

<sup>89</sup> *Ibid.*, p. 5

<sup>90</sup> M. O. Carter, *op. cit.*, p. 8

<sup>91</sup> Kalindri travelled through a south-easterly direction with a very winding curve till it joined with the Mahananda at Malda. G. E. Lambourn, *op. cit.*, p. 5.

<sup>92</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 26.

<sup>93</sup> *Ibid.*

<sup>94</sup> *Ibid.*

<sup>95</sup> M. O. Carter, *op. cit.*, p. 10.

<sup>96</sup> J. A. Vas, *Eastern Bengal and Assam District Gazetteer: Rangpur*, Pioneer Press, Allahabad, 1911, p. 1.

<sup>97</sup> Although Rangamatii and Dhubri were formerly under the North Rangpur, but later they were transferred to the new District of Goalpara of Assam. Govindganj Fiscal Division which

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was formerly included in Rangpur had been shifted to Bogra and the other thirteen Fiscal Divisions viz. Kabilpur, Bahaman-Kunda, Khamar Mahal, Babanpur, Mukhtipur, Sultanpur, Khas Taluk, Bajitpur, Palasbari, Siksahar, Barisakpala, Kunj Goraghat, and Maimunthpur transferred from Bogra to Rangpur. The three *thanas* of Fakirganj, Boda, and Sanyasikata were transferred to the newly-formed district of Jalpaiguri in 1869. The *thana* of Patgram was detached from Rangpur and added to Jalpaiguri from the 1st April 1870. There was wide difference between the criminal revenue, and civil jurisdictions of Rangpur. This difference had been emerged from a portion of *pargana* Patiladaha being borne on the rent-roll of Rangpur, while it situated within the criminal jurisdiction of *thana* Diwanganj in Mymensing District. The civil jurisdiction of Rangpur was stretched over the whole of the neighbouring District of Bogra. W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 161.

<sup>98</sup> Arthur Coulton Hartley, *Final Report of the Rangpur Survey and Settlement Operations, 1931-38*, Bengal Government Press, Alipore, 1940, p. 2.

<sup>99</sup> *Ibid.*, pp. 3-4.

<sup>100</sup> J. A. Vas, *op. cit.*, p. 3.

<sup>101</sup> *Ibid.*, p. 4.

<sup>102</sup> *Ibid.*

<sup>103</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 165.

<sup>104</sup> For a detail analysis of the flood of 1787 see chapter IV.

<sup>105</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 166.

<sup>106</sup> *Ibid.*

<sup>107</sup> In many parts of its course in the district of Rangpur, the Karatoya was known as the Bura or Old Tista; and the broad sandy channel in many places demonstrated the route followed by the Tista before the great transformation brought about by the inundation in 1787. *Ibid.*, p. 168.

<sup>108</sup> Arthur Coulton Hartley, *op. cit.*, p. 6.

<sup>109</sup> J. A. Vas, *op. cit.*, p. 9.

<sup>110</sup> Arthur Coulton Hartley, *op. cit.*, p. 7.

<sup>111</sup> *Ibid.*

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<sup>112</sup> Tha Patgram *thana* was an isolated area, bifurcated fully from the district of Jalpaiguri and surrounded by the Cooch Behar State on all sides. John F. Grunning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, Pioneer Press, Allahabad, 1911, p. 1.

<sup>113</sup> *Ibid.*

<sup>114</sup> From the 1<sup>st</sup> January 1867, the Danglikot subdivision was transferred to the Darjeeling district; and at the same time the criminal jurisdiction of the three police stations viz. Boda, Sanyasikata (present Siliguri) and Fakirganj which formed the Titalya subdivision of the district of Rangpur, was transferred to the Deputy Commissioner of the Western Duars, but the civil and revenue jurisdiction were retained in Rangpur. On 1<sup>st</sup> January 1869 the Titalya subdivision was finally separated from Rangpur and incorporated with the Western Duars. W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, Trubner & Co., London, 1876, pp. 216-217.

<sup>115</sup> John F. Grunning, *op. cit.*, p. 7.

<sup>116</sup> For the detail analysis of the flood of 1787 and its impact on the river Tista see Chapter IV.

<sup>117</sup> James Rennell, *op. cit.*, p. 352.

<sup>118</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 229.

<sup>119</sup> *Ibid.*

<sup>120</sup> John F. Grunning, *op. cit.*, pp. 7-8.

<sup>121</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 231.

<sup>122</sup> The Jaldhaka river joined with Torsha in the Rangpur district and both the river together flowed under the name of Dharla into the river Tista. John F. Grunning, *op. cit.*, p. 8.

<sup>123</sup> *Ibid.*, p. 9.

<sup>124</sup> *Ibid.*

<sup>125</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 233.

<sup>126</sup> John F. Grunning, *op. cit.*, p. 9.

<sup>127</sup> Torsa had numerous small streams at its right or west bank, and at its left bank it had a large tributary named as Hansimara. *Ibid.*

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<sup>128</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 233.

<sup>129</sup> *Ibid.*, p. 234.

<sup>130</sup> John F. Grunning, *op. cit.*, p. 11.

<sup>131</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, Bengal Secretariat Book Depot, Calcutta, 1907, p. 1.

<sup>132</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 18.

<sup>133</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 4.

<sup>134</sup> *Ibid.*, p. 5.

<sup>135</sup> From the Manibhanjan towards the east, there was a ridge that undulated up to the pass at Ghum and then went steeply upward to the heights of the Senchal and Tiger Hill (8,6000 feet). It then turned southward and gradually descended to the Mahaldiram and Dow Hill above Kurseong and then moved further towards the south in the plains. Arthur Jules Dash, *Bengal District Gazetteer: Darjeeling*, Bengal Government Press, Alipore, 1947, p. 2.

<sup>136</sup> *Ibid.*, p. 3.

<sup>137</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 7.

<sup>138</sup> *Ibid.*, p. 8 and Arthur Jules Dash, *op. cit.*, p. 3.

<sup>139</sup> The banks of the Mahananda were sloppy. In the hilly parts, its banks were covered with trees and jungle, but in the lower parts its banks were cultivable. W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 25.

<sup>140</sup> The Ramman emerged from the Phalut Mountain, and the Little Rangit from Tanglu and the Rangnu flowed down from Senchal in a valley several thousand feet deep. Arthur Jules Dash, *op. cit.*, p. 5.

<sup>141</sup> *Ibid.*

<sup>142</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 9.

<sup>143</sup> *Ibid.*, p. 10.

<sup>144</sup> *Ibid.*

<sup>145</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 27.

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<sup>146</sup> Thus the meaning of the term Cooch Behar appears as the abode or land of the Koches. However, for another instance the term indicates the land of sporting or dalliance with the Koches and has a legendary reference to the *vihār* of god Mahadeva with the Koch damsels. In fact the same god has been regarded in mythology to be the progenitor of the present line of rulers of Cooch Behar. The second elucidation of the term, however, eventually guides to the first, and the appropriate meaning of the name Cooch Behar is the land of the Koches. Harendra Narayan Chaudhuri (compl.), *The Cooch Behar State and its Land Revenue Settlements*, Cooch Behar State Press, Cooch Behar, 1903, p. 1.

<sup>147</sup> *Ibid.*, p. 2.

<sup>148</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 332.

<sup>149</sup> *The Annual Report on the General Administration of the Cooch Behar State for the year 1934-35*, Cooch Behar State Press, Cooch Behar, 1935, p. 3.

<sup>150</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 334.

<sup>151</sup> Durgadas Mazumdar, *West Bengal District Gazetteer: Koch Behar*, Calcutta, 1977, p. 8

<sup>152</sup> Singimari was called as Jaldhaka by Hunter, whereas Durgadas Majumdar mentioned the river Jaldhaka as separate river in the district. *Ibid.*, p. 8 and W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 335.

<sup>153</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 335.

<sup>154</sup> *Ibid.*

<sup>155</sup> Durgadas Mazumdar, *op. cit.*, p. 10.

<sup>156</sup> *Ibid.*

<sup>157</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling and Jalpaiguri, and State of Kuch Behar*, p. 336.

<sup>158</sup> *Ibid.*

<sup>159</sup> Durgadas Mazumdar, *op. cit.*, p. 11.

<sup>160</sup> Niharranjan Ray, *op. cit.*, p. 111.

<sup>161</sup> A. Campbell, 'On the Tribes around Darjeeling,' *Transactions of the Ethnological Society of London*, Vol. 7, No. (1869), pp. 145-46.

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<sup>162</sup> Judith T. Kenny, *Climate, Race, and Imperial Authority: The Symbolic Landscape of the British Hill Station in India*, *Annals of the Association of American Geographers*, Vol. 85, No. 4, Dec., 1995, p. 694.

<sup>163</sup> *Ibid.*, p. 699 and 700.

<sup>164</sup> Nandini Bhattacharya, *Leisure, Economy and Colonial Urbanism: Darjeeling, 1835–1930*, *Urban History*, August 1, 2013, 40(3), pp. 442 - 43.

<sup>165</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 43.

<sup>166</sup> *Ibid.*, p. 44.

<sup>167</sup> *Ibid.*

<sup>168</sup> For a detail discussion of demographic transformation in the Terai region during the colonial period see Sudip Khasnobish, *Socio-economic and Political Transition of Darjeeling Terai (1864-1994)*, Unpublished Ph. D dissertation, University of North Bengal, February 2016, ch. II.

<sup>169</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 47.

<sup>170</sup> In the census of 1891, it was found that 88,000 people were born in Nepal against the total population of 223,314. The 1931 census had recorded that 59,016 people were born in Nepal against the total population of 319,635. Arthur Jules Dash, *op. cit.*, p. 50.

<sup>171</sup> *Ibid.*, p. 51.

<sup>172</sup> The first attempt to record the number of population was conducted in the year 1858-59 at the time of the Revenue Survey of Rangpur when it was appeared from a rough estimate that the population of the permanently settled areas of Jalpaiguri was 189,067 which was considered as 'too low' in 1870 by the Deputy Commissioner of the District. John F. Grunning, *op. cit.*, p. 30.

<sup>173</sup> *Ibid.*, p. 31.

<sup>174</sup> *Ibid.*, p. 32.

<sup>175</sup> *Final Report on the Survey and Settlement Operations in the Jalpaiguri District, 1906-1916*, The Bengal Secretariat Book Depot, Calcutta, 1919, pp. 10-11.

<sup>176</sup> *Ibid.*, p. 15.

<sup>177</sup> Durgadas Mazumdar, *op. cit.*, p. 45.

<sup>178</sup> *Ibid.*

<sup>179</sup> L. S. S. O'Malley, *Census of India 1911, Vol. V*, p. 12.

<sup>180</sup> Durgadas Mazumdar, *op. cit.*, p. 45.

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<sup>181</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 41.

<sup>182</sup> The total number of population in 1872 was 677,328. G. E. Lambourn, *op. cit.*, p. 27.

<sup>183</sup> *Ibid.*

<sup>184</sup> *Ibid.*, pp. 27-28.

<sup>185</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 376.

<sup>186</sup> *Ibid.*

<sup>187</sup> *Ibid.*, p. 380.

<sup>188</sup> F. W. Strong, *op. cit.*, p. 31.

<sup>189</sup> *Ibid.*

<sup>190</sup> The census of 1901 had reported an increase of 5.3 percent with a total number of population of 1,567,080 which was increased in 1911 by 7.72 percent with a total population of 1,687,863. This increase was due to the immigration of Santhals in the southern thanas who were brought to clear the jungle tracts of the district and thereby contributed to the expansion of agricultural frontier. *Ibid.*

<sup>191</sup> The Balurghat subdivision had only 380 persons per square mile. L. S. S. O'Malley, *Census of India 1911, Vol. V*, pp. 12-13.

<sup>192</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 207.

<sup>193</sup> J. A. Vas, *op. cit.*, p. 34.

<sup>194</sup> *Ibid.*

<sup>195</sup> *Ibid.*

<sup>196</sup> The density of population was little less than that of Bogra and was almost the same as that of Mymensingh which was located on the south-east. E. A. Gait, *op. cit.*, p. 20.

<sup>197</sup> *Ibid.*

<sup>198</sup> Arthur Coulton Hartley, *op. cit.*, p. 7.

<sup>199</sup> *Ibid.*, p. 8.

<sup>200</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 49.

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<sup>201</sup> *Ibid.*

<sup>202</sup> *Ibid.*

<sup>203</sup> E. A. Gait, *op. cit.*, p. 20.

<sup>204</sup> *Ibid.*

<sup>205</sup> W. H. Nelson, *Final Report on the Survey and Settlement Operations in the District of Rajshahi, 1912-1922*, Bengal Secretariat Book Depot, Calcutta, 1923, p. 20.

<sup>206</sup> *Ibid.*, p. 21.

<sup>207</sup> *Ibid.*

<sup>208</sup> *Ibid.*

<sup>209</sup> The expansion of Eastern Bengal Railway embankments along the lines of the rivers had obstructed the natural drainage and created a favourable condition for the malarial mosquitoes. *Ibid.*

<sup>210</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 51.

<sup>211</sup> J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, p. 28.

<sup>212</sup> *Ibid.*, p. 29.

<sup>213</sup> *Ibid.*, p. 30.

<sup>214</sup> L. S. O'Malley, *Bengal District Gazetteers: Pabna*, p. 29.

<sup>215</sup> *Ibid.*, p. 29 and 31.

<sup>216</sup> E. A. Gait, *op. cit.*, p. 19.

<sup>217</sup> The census of 1921 had shown a decrease of 39,092 persons which represented 27 percent of the population. There was overall deduction of population throughout the Pabna district except for the *thanas* of Raiganj and Taras. L. S. O'Malley, *Bengal District Gazetteers: Pabna*, pp. 29-30.

<sup>218</sup> *Ibid.*, p. 30.

<sup>219</sup> Haraprasad Chattopadhyay, *Internal Migration in India: A Case Study of Bengal*, K. P. Bagchi & Co., Calcutta, 1987, pp. 80-81.

<sup>220</sup> *Ibid.*, p. 81.

<sup>221</sup> It was recorded in the census of 1931 (Vol. V, Part I) that 61,000 persons born in British Bengal immigrated into the State of Cooch Behar, while 29,000 persons born in the States of

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Cooch Behar and Tripura had migrated to the British Bengal. Cited in Ibid. For more details see, A. E. Porter, *Census of India, 1931, Vol. V. Bengal & Sikkim, Part I – Report*, Calcutta Publication Branch, Calcutta, 1933, p. 104.

<sup>222</sup> Ratnalekha Ray, *Change in Bengal Agrarian Society, c.1760-1850*, Manohar, New Delhi, 1979, p. 174.

<sup>223</sup> *Ibid.*, p. 190.

<sup>224</sup> Sugata Bose, *Peasant Labour and Colonial Capital: Rural Bengal since 1770*, Cambridge University Press, Cambridge, 1993, p. 121. For a detail analysis on the ‘jotedars’ also see Sugata Bose, *Agrarian Bengal: Economy, Social Structure and Politics, 1919-1947*, Cambridge University Press, Cambridge, digital version, 2008, pp. 3-33.

<sup>225</sup> The cultivated area in Rangpur had increased by 15 percent in the early 1870s in comparison with that in 1809. Sugata Bose, *Peasant Labour and Colonial Capital: Rural Bengal since 1770*, p. 23.

<sup>226</sup> Cited in *Ibid.*, p. 32

<sup>227</sup> A. E. Porter, *Census of India, 1931*, p. 10.

<sup>228</sup> In the year 1930-1931 a cyclone had visited Gaibandha subdivision in Rangpur district and an earthquake had caused great damage to property in Cooch Behar and Rangpur district. *Ibid.*

<sup>229</sup> *Ibid.*, p. 11.

<sup>230</sup> S. C. Majumdar, *Rivers of the Bengal Delta*, University of Calcutta, Calcutta, 1942, p. 5.

## Chapter II

### **Cyclone, Society and Economy: Disaster and Damage in Northern Bengal (1864-1899)**

Cyclones had brought great damage and destructions to the society and economy of northern Bengal during the nineteenth century. A tropical country like India is acutely susceptible to the occurrence of storms. Wind circulation and solar radiation above the Bay of Bengal had acted as the main catalyst for the creation of cyclonic storms. The recent definition or characteristic of cyclone is pertinent to note here. According to the *International Perspectives of Natural Disasters*: ‘Tropical storms have wind speeds in the range of 18 to 32 meters per second. When the wind speeds exceed 32 meters per second, the system is called a severe tropical storm, and the names cyclone, typhoon, or hurricane are used.’<sup>1</sup> However, the first ‘recorded’ storm in the Indian Ocean which was accompanied by an earthquake and *tsunami* took place on October 11, 1737.<sup>2</sup> A historical study of Cyclone of a specific region (Bengal or especially northern Bengal) would unfold the so far unearthed terrain of meteorological development towards a better understanding of cyclonic occurrences and to the mitigation of hazard. But Government or State system seems to be the deciding factor in terms of production of knowledge and lessening of suffering.<sup>3</sup> This chapter, however, focuses on the occurrences, spread and effects of the cyclones from 1864 to 1899, many of which had originated in the Bay of Bengal and travelled to the northern districts of Bengal and few were caused by local depressions, on society and economy of northern Bengal and side by side examines the genesis and dissemination of meteorological knowledge during the second half of the nineteenth century.

Storms and cyclones made time to time visit to the different districts of this region accompanied by heavy rainfall and wind of great force. From the month of November to May upper winds over the Himalayan region are predominantly westerly. Nonetheless, Cyclones did not restrict to

these months but appeared in a more violent form in many times of the year. The districts of northern Bengal frequently fell under violent gale between 1864 and 1899 (with other parts of Bengal or sometime exclusively). The cyclones under the period of study whether came from the Bay of Bengal or having regional origin did not confine themselves to their origin, in fact, northern part of Bengal as well as other parts of Bengal were also hit by these cyclones. Cyclones had very often accompanied with heavy rains which had contributed to rising water level in the rivers that endanger the possibilities of floods. Official reports of several government departments had not only contradicted with each other but produced ambiguous information from which any uniform deduction could hardly be drawn. Any historical attempt on the part of the historians to decipher cyclonic impact upon human lives, settlement and society in this part of Bengal is still awaited. The sufferings caused by the cyclonic disasters, and destructions it brought about need to be spell out separately and distinctively for the northern districts so far the varied nature of meteorological information about the cyclones for different areas and subsequent government reliefs are concerned.

### **The Cyclone of October 1864**

During the second half of the nineteenth century cyclonic appearances in Bengal became more frequent than the earlier times. The cyclone of October, 1864 deserves to have the foremost mentioning among the cyclone narratives. The cyclone had commenced to the north-west of the Andamans on October 2<sup>nd</sup> and ultimately it reached to the Lower Assam on the afternoon of the 7<sup>th</sup> October. The records for the cyclone had largely been obtained from the copies of a ship's logs which started to record the accounts of wind movements along with barometer readings three to four days preceding to the cyclone from the observatories of Ceylon, Madras, Port Blair, and Calcutta and of very few other stations of Bengal.<sup>4</sup> The '*Report on the Calcutta Cyclone of the 5<sup>th</sup> October 1864*', written by Lieut. Col. J. E. Gastrell and Henry F. Blanford remained one of the major sources of information on the 1864 cyclone. In the Bay of Bengal and the outlying

northern parts of the sea southerly winds were started blow from the 1<sup>st</sup> October which gradually proceeded to the northern side, but data on wind pressure was only recorded at the stations of Kandy, Madras, Calcutta and Agra.<sup>5</sup> Apart from the ship's logs, among the several land stations like Kandy, Madras, Calcutta, and Agra and so on, for the northern districts of Bengal the information was collected from the observatories of Rampur-Boalia (in the district of Rajshahi) by Dr. P. F. Bellew and of Darjeeling by Dr. B. Simpson.

The first appearance of the cyclone was experienced by a ship, namely *Moneka*, on 1<sup>st</sup> October, which recorded: “dark, rainy, squally weather, and west to west-south winds – with a low Barometer and with a heavy swell from the south south-west” and for 2<sup>nd</sup> October, in the afternoon, it reported that the sky “looked very black and lowering and a high rolling sea came down from that quarter, rising very quickly.”<sup>6</sup>

Table. 2.1:

Barometer and Thermometer Reading and Wind Direction on the 2<sup>nd</sup> October

| Land Stations                | Barometer       | Thermometer | Wind    | Remarks                                            |
|------------------------------|-----------------|-------------|---------|----------------------------------------------------|
| Kandy (altitude 1,560 feet)  | 28.332b         | 71.4        | SW      | Mean of day                                        |
| Singapore (altitude 50 feet) | 29.99c          | 83          | .....   | Bar. 9 a.m.<br>Therm. mean of maximum and minimum. |
| Port Blair (sea level)       | 29.823b         | 87          | SW      | Noon observation                                   |
| Madras                       | 29.847b         | 82.8        | N by E. | Mean of day                                        |
| Calcutta (altitude 18 feet)  | No observations |             | .....   | ” ”                                                |
| Rampore-Beauleah             | 29.822c         | 85          | E.      | ” ”                                                |
| Darjeeling (7, 169 feet)     | .....           | 61          | SW      | ” ”                                                |

Source: Extracted from the ‘*Report on the Calcutta Cyclone of the 5<sup>th</sup> October 1864*’, p. 10.

From the above table it thus can be noticed that the cyclone coming down rapidly from northward direction had formulated by the noon of the 2<sup>nd</sup> October and this was confirmed from the observation of *Moneka* and Port Blair. The *Conflict* and *Golden Horn* were another two ships situated at the Bay of Bengal which also recorded the emerging cyclone. The logs of the *Golden Horn* narrated the appearance of the cyclone in the following manner:

“Sunday, October 2<sup>nd</sup>, 1864, - A. M. Winds light from north-west to west, with heavy appearance; vivid lightning and squalls with deluge of rain, each squall getting heavier.... Forenoon; double reefed the topsails. P. M. Winds north-easterly..... Later part of the day and night, strong breeze and deluge of rain.”<sup>7</sup>

However, for the 2<sup>nd</sup> October no data had been obtained for any station between Port Blair and Chittagong. On the 3<sup>rd</sup> October a significant change had taken place in the Meteorology of Bengal and the northern part of the Bay. The northerly force which was situating only in Eastern Bengal gradually dispersed itself nearly whole of the meteorological stations and extended far down the western part of the Bay.<sup>8</sup> The change in the temperature though was very minimal but could be noticeable. At Cuttack, the Sand Heads, and Darjeeling there is a fall of 1° from the mean of the previous day, and at Calcutta of 1° since the 1<sup>st</sup>; and at Rampur-Boalia (District *Sadar* of the Rajshahi District) the mean fall since the 2<sup>nd</sup> October was 2°, and 3° since the 1<sup>st</sup>.<sup>9</sup> On the 4<sup>th</sup> October, a ship named *Proserpine* when crossing the head of the Bay with a distance of 180 miles from the centre of the cyclone “experienced very heavy weather from the recurrent southerly wind current, which was, ....., the chief cause and feeder of the Cyclone”.<sup>10</sup> The general conclusion regarding the appearance of the cyclone which was noted at the report had suggested that the cyclone was mainly derived from a stormy current “originally from the west south-west and south-west, which was felt in Ceylon and Port Blair on the last two or three days of September, and began to curve in to the Cyclone on the 2<sup>nd</sup> October” and on the 3<sup>rd</sup> October it was blowing with a second storm of about 280 miles to the north-west of the Andamans and ‘advanced at an average speed of 10 miles an hour .....at midnight on the 4<sup>th</sup>, whence the storm continued its destructive course over Lower Bengal’.<sup>11</sup>

C. E. Buckland mentioned that “According to the observations at the Meteorological Observatory, the wind which had been blowing from N. E. suddenly veered at 9 a.m. to E. raging

very strongly and in great gusts, varying in pressure from 5 to 32 lbs. per square foot, till about 2 p.m., when the wind shifted to S. E. The gale was accompanied by heavy driving rain. At 11 a.m. the barometer stood at 29.46 inches, gradually and continuously descended to 28.80 inches at 2 p.m. and rose at 6 p.m. to 29.66 inches.”<sup>12</sup> In Rampur-Boalia the cyclone reached with its full force on 5<sup>th</sup> October. Mr. Blechynden recorded the detail changes observed in the Barometer and Thermometer and jotted down the hourly description of the cyclone in terms of wind-force and direction, changes in temperature and rain etc.:

“October 5th. ---- 7 a.m. cloudy, with wind from north-east; - 10 a.m. cloudy and drizzling; wind from north-east; - 1 a.m. clouds flying low, showers off and on; wind north-east and blowing stronger; 2 p.m. blowing stronger; .....and indications of bad weather, Thermometer 84°; Barometer 29.40; - 4 p.m. wind on the increase,.....6 p.m. blowing strong and in gusts; more rain.....8 p.m. wind very much increased and the gusts stronger....direction of wind north-east by north; 9 p.m. blowing a strongish gale; gusts at time very severe; Thermometer 78°; Barometer 29.27;.....10 p.m. blowing a perfect gale; wind in severe gusts accompanied by a sound like distant thunder;....trees beginning to fall; Thermometer 75°; Barometer 29.20; - 11 p.m. a very severe gale, blowing steadily,....very severe gusts;...Thermometer 72°, Barometer 29.15.

October 6<sup>th</sup>. ---- 12 midnight, gale at its highest, no walking against the wind, ...Trees falling and branches being knocked off; raining hard, Thermometer 72°, Barometer 29.00; ..... 2 a.m. wind due north-west,....steady blow very strong.....3 a.m. still blowing hard, but not so severe; rain freer; Thermometer 72°, Barometer 29.3; from which time the gale abated, and at 10 a.m. there was sunshine, and wind south-west.”<sup>13</sup>

The above account had provided vivid description of the cyclonic occurrence in Rampur Boalia and as it is apparent the wind was gradually turning from the north-east direction to the north (5th. Oct.) then north-west and finally to the south-west (6<sup>th</sup>. Oct.) and the Thermometer showed a continuous decline from 84° to 72°. The continuous flow of hard wind for more than one and a half day had resulted into the destruction of trees.

But other accounts did vary from the above description. The Executive Engineer of Rajshahi had reported the following narrative:

“..... On the morning of the 5<sup>th</sup> the atmosphere was misty, and by 10 o'clock rain began to fall, and continued throughout the day, not very heavily, but driven by a strong north wind, the first which had blown from that quarter during the previous nine months. At 7 p.m. the wind veered to the north-east, and increase in violence; by 10h. 30m. p.m. it was from the north, and blowing very strongly. It continued thus till 2 a.m. (on the 6th,) when the wind

shifted to the north-west, and the violence somewhat diminished, and by 6h 30m. a.m. it was coming from due west, and with a few irregular puffs the storm subsided.”<sup>14</sup>

One probable cause of the variation between these two accounts was that the direction of wind and the time of the beginning of rainfall had varied in different stations. On the other hand, the later narratives could not provide any thermometer and barometer data and depicted the cyclonic occurrence with having a long gap of duration of time between which rainfall, temperature and wind direction were not only varied but also contradicted. As a result of the cyclone a number of trees and native huts were blown down, and in the town of Rampur one *pucca* house and 200 *cutcha* houses were demolished and one man was killed. Despite of being in the equal distance from the central tract of the cyclone Rampur Boalia was more affected than Berhampur.<sup>15</sup>

Nator of Rajshahi District was also severely hit by the cyclone. Data collected and reported from Singra, Boraigaon, and other places of Nator had varied in regards to the wind direction, the times in the changes of the storm. But it was deducted from the available information, although remained contradictory, that the centre of the cyclone had passed over Nator. The Police report asserted that “The cyclone commenced about 7 o’clock on the evening of the 5th October, and lasted till 3o’clock in the morning. The wind blew from the north-east [till] about midnight, [when] there was a lull, and then the wind shifted to the north-west, blowing as hard as ever..... During the storm a brilliant meteor was seen.”<sup>16</sup> On the other hand, the report of the Executive Engineer, though not being of an eye witness’s report, mentioned that from 7 p.m. the wind was blowing from the south whereas the lull in the storm was lasted from 10 to 11 p.m. and occurred after an unexpected turn of the wind to south-west.<sup>17</sup> However, at Boraigaon the cyclone was started at 8 o’clock while in Singra the ‘height of the storm’ was lasted between 3 o’clock and 12 at the midnight. Moreover, Mr. F. Grant while travelling in a boat on the river from 15 miles north-east of Nator experienced that “..... The wind gradually increased, and from about 9 to 11 p.m. it blew a perfect hurricane. The direction of the wind.....was north-east. About 11 o’clock there was a perfect lull, after which it again commenced to blow with greater violence than ever. This time the direction of the wind was north-west.”<sup>18</sup> Thus the available narratives had shown that different parts of the Rajshahi district were affected by the cyclone which was changing its direction gradually and appeared these areas in varied times having

varied degree of force of wind and rain. The information provided by the officials or other persons had sometime differed from each other but were equally useful, although subject to the proper enquiry and corroboration from other sources and scientific explanation, for the construction of the account of cyclone.

The account for the district of Bogra was interesting enough to note here. C. E. Buckland mentioned that the storm cutting across the Ganges between Rampur Boalia and Pabna, flounced the whole of the Bogra district, and rounded to the eastward when it had reached 25° N., after which it expended in the Garo hills.<sup>19</sup> According to a correspondent of the Englishman newspaper the morning of the 5th October was accompanied with a mild rain and strong eastward breeze and the wind was gradually taking southward turn with a form of a violent squall which was increasingly expanded to a violent cyclone in the midnight along with heavy rain and finally went to the westward direction.<sup>20</sup> Dr. Tylers account told us that:

“On the 5th, rain; wind still from north-east, increasing from noon until it became a gale at 9 p.m., and continued to blow with increasing violence up to midnight, when there was a sudden lull about a quarter of past 12 for about 20 minutes, and the wind veered round by south to south-west, and from this point blew as fiercely nearly as before for about two hours; gradually changing to the west and subsiding about 4 a.m. of the 6th.”<sup>21</sup>

Describing the condition in Bogra, Assistant Superintendent of Bogra had wrote to the Deputy Inspector –General of Police that:

“the storm when was its climax, viz., about 2 a.m. was decidedly from East to North-East; as I can testify by the effect on my house, also by the directions in which all the trees have fallen. Yesterday afternoon heavy squalls of wind accompanied by rain swept across the country and continued to increase in intensity during the whole afternoon. The wind was first from the East and gradually chopped round to the West by sun-set when began the full fury of the storm.”<sup>22</sup>

Apart from the minor scribbles in the above mentioned accounts for the cyclone, on the whole, they narrated the appearance and spread of the cyclone in the district of Bogra which devastated the region on 5<sup>th</sup> October, 1864. But it was difficult to find out the exact course of the cyclone in this district due to its sudden change in direction. Although it was somehow identified that the centre of the cyclone was over Nator and Singra of the Rajshahi District but at the same time

there was prevailing anticipation of having more than one vortex of the wind. The passing of the wind from one district to another was so diversely directed that it became problematic to allow any concrete identification about not only the wind-direction but also the visiting-time of the storm in a particular area. The, rain that the cyclone brought out, due to its excessive quantity had resulted in high floods in the eastern *thanas* of Bogra.<sup>23</sup>

Looking at the district of Pabna the situation appears quite different. Different parts of the district of Pabna were also hit by the ‘hurricane’ of 5th October.<sup>24</sup> Dadupur, Pabna, Jhenai River, Jamalpur were the worst affected parts of the district. Mr. J. Parker had reported from Pabna that:

“..., the 5th, ...rain accompanied by strong wind from the east, which continued ...till 6 in the evening, when the wind increased. At 7 a.m. it was blowing a perfect gale from the south-east, and continued to increase in violence till between 10 and 11, when it was at the highest...a portion of the pukka work of y house fell, and the whole of the kutchha out-houses and trees were leveled to the ground.., and at midnight the gale was considerably over:...”<sup>25</sup>

Though Mr. Parker was said to inform by his family about an occurrence of earthquake on the day of cyclone but it was not supported by any other sources. At Dadupur, though rain was started from the night of the 4th but the morning of the 5th brought about excessive rain, and gusting storm was increasing throughout the day which was blowing initially from the east and hastily approached towards the south with unprecedented force and finally stopped in the morning of the 6th. In addition with these, the cyclone produced raging fire which was caused by the meteors in a form of lightening in the sky. Captain Graham while travelling on a boat in the Jhenai River had experienced the storm and provided a ‘graphic description of the light’ which accompanied the storm. He thus stated that:

“...I first observed a pale, bright light, on almost a level with the horizon. This light,..., accompanied the wind round to the north-west, where it stopped, and again began to move to the north-east. Thence it went round with the wind to the east and south-east, being sometimes high and sometimes low in the heavens, and finally, at about 1 o’clock on the morning of the 6th, it broke out with great splendour in the south-west, lighting up the whole sky, and appearing like the sun breaking through murky clouds at mid-day. The country was partly lit up, and I thought the day had broken, but after about half an hour the light disappeared, and left everything as dark as ever.”<sup>26</sup>

Though the light was seen from Calcutta and few of its surrounding northern districts, but this sort of electrical occurrence did not appear in the outskirts of the cyclonic zone i.e. Dacca, Chittagong etc. which were left by the light so surprisingly. Jamalpur was also visited by this 'luminous appearance' and this was noticed by a large number of people residing there. In Jamalpur, the light appeared to be more interesting than the earlier. 'During the height of the storm, curious lights were seen of two sorts, viz., balls of fire, two or three or more together, floating about and settling on the trees; and distant glares like villages burning, or day break.'<sup>27</sup> The negative electricity of the atmosphere during rainfall was probably due to the friction of the falling of the rain drops and this was caused by the production of the enormous friction of the wind-borne rain against terrestrial objects which seemed to be a powerful generator of electricity.<sup>28</sup>

After crossing Bogra the storm went westward towards the Garro Hills. Rangpur, Dinajpur and western side of Brahmaputra were also visited by the storm, though in a different way from the other areas. Mr. Wavell had mentioned in his letter that at Bugwah on the Brahmaputra (on the east of Rangpur) the wind had been much strong and at Cooch Behar, as Colonel Haughton reported, some boats were went down into the river. Wavell went on to say:

“[The storm] was stronger at Sadoolpoor ..... [and] at Peergunj ..., and at Bagdwar.....the wind did a great deal of damage to houses and trees: ..... the storm would appear to have been more severe than in any other part of the district....and at Dinajpore, it was only a strong wind. At Julpigoree it was not at all severe.”<sup>29</sup>

At Darjeeling the wind was south-westerly on the 1st and 2nd October. On 3rd and 4th October the wind was gradually from east whereas it turned to the north-east on 5th and the temperature fell two or three degrees with this north-easterly wind.<sup>30</sup>

The cyclone had brought about a large scale destruction of lives and property in many parts of Bengal. Buckland had summarized the impact of the cyclone in the following words:

“The Government buildings sustained severe damage. The distress and suffering to which the survivors in the affected tracts were exposed after the disaster were very great. For several days food was not obtainable, the local stores .had been swept away, and relief could not be sent from Calcutta. In some places, a kind of grass was eaten as food, and at others

which escaped the storm-wave the stores of the rice merchants were broken open and plundered.”<sup>31</sup>

However, there seemed to be varied nature of destruction in the affected areas during the cyclonic days. The estimate and extent of damage was accounted by the Government from the reports of the Commissioners, Magistrates and Assistants, and Police Officers of different divisions and districts. Mr. A. B. Falcon, EsQ., Officiating Magistrate of Bogra wrote to the Commissioner of the Rajshahi Division that “a gale from the North-East occurred last night [5th Oct.], which was done much mischief. The Jail is nearly in ruins. The Police Lines are down; several boats are stranded; many trees have been blown down, and many houses in the Town; and one or two lives have been lost. The river is higher than it has been many years...”<sup>32</sup> The Assistant Superintendent of Bograh had reported to the Deputy Inspector –General of Police that “The strength of the wind, coupled with great fall of rain, have the effect of laying nearly the whole of the Town in a mass of ruins, &c., &c. The Jail of the place which also is (or rather was) a mud collection of buildings, one-half has been rendered quite untenable.”<sup>33</sup> Twelve deaths were reported from the Bogra Town and the total number of deaths, as was reported from different *thanas*, in the Rajshahi District was 147.<sup>34</sup> In Pabna, the cyclone caused severe destruction of houses and trees and many of the Government buildings were entirely damaged.<sup>35</sup>

### **Cyclone of 1st— 2nd November 1867**

A severe storm during the night of the 1st November and morning of the 2nd November 1867 had struck again Bengal. The storm had its origin seemingly at some point in the North East portion of the Bay of Bengal, and the centre of the cyclone, as it was determined, had passed through the East of Saugor Point (24 Parganas), from the opening of the Matla River over Port Canning and Basirhat, and then it took northern North Eastern direction to the east of Kumarkhali and the west of Sirajganj.<sup>36</sup> The northern part of the Ganges was again affected by

the cyclone though it was varied from district to district, since all the northern Bengal districts was not equally hit by the wave of the cyclone equally.

W. Wavell, the Officiating Collector of Bogra had described that: “On the 1<sup>st</sup> the fall was heavier... During the night of the 1<sup>st</sup> and 2<sup>nd</sup> the wind increased.. In the morning it was still ...heavy rain being driven before it, it looked very much .....as after temporary lulls gusts of great force would come and there....This went on till about noon ....the three days was nearly 11 inches, and this combined with the...amount of injury everywhere....”<sup>37</sup> However, the earlier rain before the beginning of the cyclone, as Wavell was of the opinion, ‘did far more good than harm and all was looked well’ until when from the 30th October the day became warmer and on the 1st the cyclone appeared with heavy rains before the sunrise .<sup>38</sup> The outer edge of the cyclone was passed over the district of Dinajpur from the south-eastern part of the district to the south which was blowing from the direction of west to east.<sup>39</sup> Since the cyclone appeared in the district with only ‘an ordinary gale of wind’ there was no destruction of life though a few houses towards the southern boundary were said to have fallen.<sup>40</sup> The rice crop was underwent through the damage ‘very slightly, perhaps 2 annas in the 16, but only towards the south and south-east of the district.’<sup>41</sup> It was opined that ‘there [was] no necessity to set on foot relief measures.’

The impact of the cyclone in the district of Rajshahi was mixed with heavy damage and small scale destruction in different parts of the district. The Deputy Collector of Rajshahi district had initiated enquiries about the extent of damage in the countryside of the district. The *thana* named Singra which was situated to the east of the district had to suffer considerable damage. Mr. Humphery, the Collector of the district of Rajshahi had narrated the visitation of the cyclone in his district.

“With regard to the cyclone itself, during the whole of Friday, the 1<sup>st</sup> of November, there was slight rain and a gusty wind; about 5 p.m. it cleared partially, but at about 7 p.m. it began to rain and a breeze sprang up which steadily increased until 3 p.m., when it reached its height it continued to blow with considerable violence until about 6 a.m. when it gradually moderated; and subsided entirely at 2 p.m. There was a good deal of thunder from 10 p.m. to 8 a.m., but distant, and no lightning visible; there was heavy drifting in the whole time and at the height of the gale the wind was intensely cold.”<sup>42</sup>

Although in the interior there was no considerable amount of destruction but ‘only a few trees have been blown down, and some kutcha houses knocked over these were nearly all uninhabited,..’.<sup>43</sup> However, a large number of cattle were destroyed in the storm in the interior. Though the cyclone had caused less damaged this time in the district than that was in 1864 but Nator was equally hit by this storm even in this time which caused ‘damage to nearly every house in the town...and trees have been blown down, and a few cattle killed thereby.’<sup>44</sup> Despite of these, however, it was suggested that there was no necessity of Government help since in the town no *pucca* house had been injured. But on the basis of more authentic and reliable sources it was continuously assumed to have been identified that from Nator and Singra ‘only bad accounts’ had been furnished. So far the mixed effect of the cyclone in the district was concerned it can thus be noticed that, as narrated by the Deputy Magistrate and Collector of Rajshahi:

“...no serious damage had been done in the neighbourhood of Beaulah, and ....for Nattore and Singra, the most eastern part of the district,...received the only bad accounts....travelling down the Burral, as the roads were too cut up by the inundation, to enable us to ride at any pace,...All along our route ... we noticed the crops were good; and if injured at all, the damage must have been slight, as it was not perceptible. At Nattore very few huts have been fallen, the bamboo posts of which have probably never been attended to since the inundation which invariably rots all the portions buried in the ground; but with this exception no damage appeared to have been sustained and ... was remarkably little sickness, no cholera; and .... very few cases of fever or dysentery. ... the Chullun Bheel at Besaghat, a village on its border, ... the very fragile sheds knocked down. The dhan [paddy], however, had suffered in exposed and high places, the grain having been whipped out and thinned by the force of the wind.”<sup>45</sup>

The district of Rajshahi had again fallen under the cyclonic attack in 9<sup>th</sup> and 10<sup>th</sup> June of 1869. The damage done by the storm had been extensive in several parts of the Rajshahi town, many mat houses had fallen down and numerous fruit trees were injured.<sup>46</sup> But the destruction of houses especially ‘the native houses’ caused by the cyclone had always been regarded by the Government as a ‘usual’ phenomenon.<sup>47</sup>

In 1867, in the district of Pabna the cyclone seemed to have appeared in a different way and its influences had been manifested in a different manner. The Collector of Pabna had narrated the appearance of the storm in the district with a high easterly wind that had been felt for two days

“coming in gusts till the evening of 1<sup>st</sup> November, when it increased in steadiness and strength. The wind continued easterly, occasionally veering to south but more often to north-east, opinions, however, differ very much. From 12 at night to 5 a.m. the storm was at its height, the wind blowing fiercely from the north-east, the storm was accompanied by a deep booming noise.”<sup>48</sup> The Sub-Divisional Officer of Sirajganj had mentioned that from the regular change in the direction of the wind it could be asserted that the storm was of a circular nature and the directions of the wind seemed to indicate that the centre passed in a curve somewhere to the east of Sirajganj and gradually through south to west.<sup>49</sup> It was reported by an officer from Kumarkhali who was of the opinion that

“...it retained almost incessantly during the 1<sup>st</sup> November, and that the storm commenced with a booming noise from north-east by east between 12 p.m. and 1 a.m. of that night the gale was accompanied by very heavy rain towards dawn the north-easterly wind changed to squalls from different directions; between 5 and 6 a.m. the gale appeared to moderate; about 6 ½ a.m. there was a lull for an hour, when it blew for a short time from the north-west and then gradually subsided.”<sup>50</sup>

The cyclone had appeared in the district of Pabna with a news of loss of life of a women due to the falling of her house and at ‘Sirajganj lives were lost, (one from exposure) while at the Sudder one or two cases have been alone heard of’.<sup>51</sup> There was considerable injury that had been done to property, everywhere thatched houses and huts have greatly suffered, scarcely one anywhere escaping from damage, and more than half having been blown down.<sup>52</sup> The greatest loss in property had been sustained by merchants and others, who were forwarding goods by rivers to other parts. Hardly any boat of any kind was able in the larger rivers to ride out so severe gale, and the boatmen had saved their own lives by abandoning their boats.<sup>53</sup> Mr. McWilliam had given ‘the marginally noted’ estimate of the losses in the Kole and near Sirajganj. The Deputy Magistrate of Kumarkhali had estimated the loss of the *mahajans* to be about one lakh of Rupees.

#### ***Lost on the Kole***

Paddy – 1,500 Mds.

Aniseed – 25 Mds.

Rice - 1, 750 Mds.

Cloth – 30 Mds.

|                       |                   |
|-----------------------|-------------------|
| Mustard – 3, 500 Mds. | Goor – 500 Mds.   |
| Jute – 26, 570 Mds.   | Grains – 500 Mds. |
| Tobacco – 300 Mds.    | Sugar – 500 Mds.  |
| Salt – 3, 500 Mds.    | Oil – 200 Mds.    |
| Cotton – 500 Mds.     |                   |

***Lost within two or three days' journey of the place***

|                             |                   |
|-----------------------------|-------------------|
| Rice 1,000 or 1, 500 Mds.   | Jute 20, 000 Mds. |
| Mustard 2,000 or 2,500 Mds. | Salt 15, 000Mds.  |

Source: *Progs. of the Lieut. Governor of Bengal during April, 1868 (General Department). Progs. No. 111, WBSA.*

Nevertheless, the loss of property and commodities in Kole and Sirajganj was in no sense 'marginal' but the amount was underestimated by the observer. On the other hand, the information had varied in the accounts provided by the officials in time to time. W. Le F. Robinson, Officiating Commissioner of the Rajshahi Division had mentioned that "in the greater part of this Division (Rajshahi Division) viz. Moorshedabad, Maldah, Dinagepore, Rungpore, Bograh, and Rajshahye, there was nothing which could be called a cyclone; ...; a few huts and trees were blown down here and there, but there was no real damage done..."<sup>54</sup> It was reported by Robinson that the only places in fact where the storm was felt with degree of severity were Pubna and the sub-divisions of Sirajganj and Kumarkhali and the damages done to the huts, boats or places would not require any special relief. Most interestingly, Robinson had designated the occurrence of the storm 'as a god send' which had provided opportunities to the poorest classes of coolies, 'as they would find ample employment in repairing the houses of their better-off neighbours.'<sup>55</sup> However, the cyclone did not cause, as argued by Robinson, any considerable amount of loss of human life (one woman in Kumarkhali, three persons in Sirajganj, and one or two cases in Pubna!) and the number of loss of cattle was also very few that 'the actual amount was not ascertained.'<sup>56</sup> It was further asserted that the general health throughout the Division was

good and though there was an outbreak of cholera in Rajshahi, but ‘it was not supposed to be connected in any way with the cyclone.’<sup>57</sup>

It can be noticed here that the reports which were sent by the Commissioners or Magistrates had not only varied widely from each other but also contradicted. So far the varied condition in the affected districts of the Rajshahi Division was concerned, the Commissioner of the Division was said to have been convinced from the reports that there was no necessity anywhere in the Division for taking action so far as the cyclone is concerned. The sinking of boats at Sirajganj and Kumarkhali had been identified by the Government as usual ‘that must always happen in a gale of mind’ and even going further it was reported that ‘the gale which appears nowhere to have attained the proportions of a cyclone.’<sup>58</sup> Despite of these, on the basis of the report from the Collector of Bogra it was declared that, for Bogra, ‘the damage done by the laying of the crops would be fully compensated for by the improvement in those parts which were backward’; and for Pabna, since there was ‘no special report’ received so it could be assumed that ‘no special damage ha[d] been done there’.<sup>59</sup> However, the worst affected part of Bengal by the cyclone was the districts of Presidency Division (e.g. 24 Parganas, Jessore and Nuddea) where loss and destruction in terms of life, cattle and houses were amounted to maximum (total number of loss of life, cattle and destroyed houses were 3,934; 60,609; and 8,12,403 respectively in the three districts) and a considerable damage was done to the crops.<sup>60</sup>

### **Cyclone of 20th September 1872**

Several parts of Bengal were affected by the cyclone of 20th September 1872. The wave of the storm went northward upto Tura after traversing the southern part. In fact, many parts were hit simultaneously by the cyclone in the similar time. Among the northern districts of Bengal, the cyclone was severely felt in the districts of Pabna, Bogra, and Rajshahi though the north-eastern adjacent region of Bengal (Assam) and its some parts were also visited by the cyclonic wind.

Commissioner of the Cooch Behar Division informed that Tura was visited by a cyclone on the night of the 20th September 1872 and “all the buildings [were] down blown or greatly damaged; the road to the plains was said to have been quite blocked up by fallen trees”.<sup>61</sup> Government of Bengal once again had embarked on collecting reports and information from the officials posted at the concerned regions.<sup>62</sup> The district of Bogra had witnessed severe destruction of trees, houses and lives. T. F. Bignold, the Officiating Magistrate of Bogra had reported that:

“...the cyclone of the 20th ultimo was felt with considerable severity in the south-eastern and eastern portions of this District, ..... Early in the morning a strong breeze was blowing from the eastward, the cloud aloft being driven with great velocity, the wind increased in force, until after dark gradually veering to the northward, from which quarter it blow with considerable force until about midnight..... throughout Friday the wind is reported to have blown with increasing force from the south, that towards evening it veered to the east, and later on in the night to the north and west, ceasing at about 3 a.m. on Saturday morning the 21st.”<sup>63</sup>

Although the Sudder Station of the district escaped fortunately but the outlying parts were suffered from considerable damage. In Sherpur, 13 miles south of Bogra, buildings were considerably injured and brunches of trees were torn off, and huts were blown down.<sup>64</sup> At Dhunat, an outpost at Sherpur, the cyclone had brought severe destruction: “.....the outpost had been demolished, numbers of native houses in the village had been blown down, trees had been torn up, and of those that were standing many had had their branches torn and twisted in an extraordinary manner. A deserted factory, built of brick, had fallen during the storm, and .....two large native crafts sunk in the river [of Bangali]”.<sup>65</sup> Though crops did not have to suffer much from the cyclone but two cases of loss of life within the jurisdiction of this outpost had been conveyed, one man was died by a falling house, and another was drowned with a sinking boat, while a third, as it was apprehending, had probably been drowned since the person was missing. In addition with this, another two deaths were reported within the jurisdiction of Shariakandi outpost where both persons were killed by falling houses.<sup>66</sup> The principal difficulty that emerged in the post-calamity days was the scarcity of bamboos, thatching grass and labour. The sudden increase of demand had not only contributed to the rising prices of these articles but these had become scarce and continued to remain so especially when ‘with this difficulty of course no official aid could deal.’<sup>67</sup>

At Sirajganj of the district of Pabna, the loss of life was much greater and it was estimated that the number of persons drowned could be amounted to ‘hundreds.’<sup>68</sup> Though there were only ‘17 or 18 cases reported to the police’ but ‘dead bodies continued to float down the river until the 24th, if not later.’<sup>69</sup> The paddy which was sown in the *bheels* or deep water had suffered extremely. The Assistant Superintendent of Sirajganj reported that 80 per cent of the *cutch* houses were blown down, and that 191 large, 500 or 1,000-maund jute boats were submerged under the water and it was estimated that the loss with regard to jute was above a lakh of rupees.<sup>70</sup> However, the account of P. Nolan, the Assistant Magistrate of the district, had forwarded the damage and loss of commodities with more details which showed an increase number of submerged boats carrying jute and other commodities, and the estimate of loss was higher than that of the former estimate.

Table. 2.2:

Damages done to the Sirajganj in the Cyclone of the 20<sup>th</sup> September 1872.

| Nature of Cargo                                                    | Number of boats sunk | Maundage of freight sunk | Maundage of freight recoverd | Value of freight lost in rupees | Amount of damage sustained by freight received in rupees | Total loss               |
|--------------------------------------------------------------------|----------------------|--------------------------|------------------------------|---------------------------------|----------------------------------------------------------|--------------------------|
| Jute                                                               | 83                   | Rs. As. P<br>32,309 0 0  | Rs. As. P.<br>13, 129        | Rs. As. P.<br>57,540 0 0        | Rs. As. P.<br>3,950 0 0                                  | Rs. As. P.<br>61,498 0 0 |
| Salt                                                               | 3                    | 561 0 0                  | .....                        | 1,553 0 0                       | .....                                                    | 1,553 0 0                |
| Cotton                                                             | 2                    | 205 0 0                  | 200 0 0                      | 100 0 0                         | 3000 0 0                                                 | 3100 0 0                 |
| Tobacco                                                            | 1                    | 225 0 0                  | .....                        | 1000 0 0                        | .....                                                    | 1000 0 0                 |
| Straw                                                              | 1                    | .....                    | Received in full.            | .....                           | .....                                                    | .....                    |
| Mustard                                                            | 1                    | 250 0 0                  | .....                        | 800 0 0                         | .....                                                    | 800 0 0                  |
| Looking glasses, combs, tapes, leads, sundries, and an iron chest, | 1                    | .....                    | .....                        | 200 0 0                         | .....                                                    | 200 0 0                  |

|                |     |            |                   |             |           |             |
|----------------|-----|------------|-------------------|-------------|-----------|-------------|
| &c.,           |     |            |                   |             |           |             |
| Rice           | 1   | 257 0 0    | .....             | 474 12 0    | .....     | 474 12 0    |
| Pulse          | 1   | 125 0 0    | .....             | 150 0 0     | .....     | 150 0 0     |
| Paddy          | 1   | 200 0 0    | 100 0 0           | 100 0 0     | 50 0 0    | 150 0 0     |
| Unloaded boats | 15  | .....      | .....             | .....       | .....     | .....       |
| Stone          | 1   | .....      | Received in full. | .....       | .....     | .....       |
| Total          | 111 | 34,132 0 0 | 13,429 0 0        | 61,917 12 0 | 7,008 0 0 | 68,925 12 0 |

Source: *Table showing the damages done to the at Sirajganj in the Cyclone of the 20<sup>th</sup> September 1872*. Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during October 1872 (General Department: Industry and Science Branch), Progs. No. 45, WBSA.

P. Nolan, the Assistant Magistrate, had furnished the above account as an estimate of loss of properties caused by the cyclone in Sirajganj where 111 boats, carrying 34, 132 maunds of goods, were sunk and the total damages were amounted to Rs. 68, 925.

However, a great deal of information was based on the assumption and hypothesis which had influenced and reflected in the preparation of the final report by the Collector of the district of Pabna regarding the effects of the cyclone in the district of Pabna. W.V.G. Taylor, the Collector of Pabna had reported on 21st September that:

“...the station was yesterday (20th) visited with a severe cyclone, which ha[d] caused considerable damage, .....heard but of one death. It had been blowing the greater part of the previous night and early yesterday morning, but from 11 a.m. the wind began to increase, and, veering round from east to north-east 2 p.m., it burst upon us with all its fury and continued till about 4-40 p.m., at which time it was due north. Some 6½ inches of rain fell during the storm,... The jail was much damaged, so much so that, fearing some of the huts might fall in, especially if the storm lasted through the night,.... This morning (21st) ...huts have been blown down in all directions, all plantain trees leveled to the ground, that some large trees had been uprooted, and huge branches of many others were lying, blocking up the roads. On the Issamuttee River some two large laden boats and a few small ones were sunk....on the river Pudda there must have been many lives lost. The crops, too, must...have suffered everywhere.”<sup>71</sup>

Reports from Pabna which had demonstrated not only different accounts of the cyclone which were distinctive from the other districts but also included some additional information, proved to be very useful, though remarkably contradicted from each other, for the reconstruction of the history of the cyclone of September 1872. The varied information and data collected from different parts of the district showed that how the region was fell under the cyclone with varying degree of severity and damage. In the town of Pabna about 20,000 fruit trees were blown down and 5,000 houses and huts were razed to the ground and crops were also suffered severely in several parts of the district.<sup>72</sup> Since ‘the report from the different police stations were more or less meager’ so it had not become possible to gather information for all the police stations of the district by the officials even till the early October. W. D. Pratt, the District Superintendent of Police of Pabna had mentioned in his report that

“... During the cyclone the Challun Bheel altered its appearance entirely. No green was to be seen, but an angry sea, with its waves tearing along, rooting up the rice, and breaking up everything on shore that was exposed to its fury. ....one-eighth of the Challun Bheel rice crop has been damaged.....Within the limits of the municipality ten boats were broken up, about 2,000 mango, jack, and other fruit trees were blown down, and 5000 cutcha houses were leveled to the ground.”<sup>73</sup>

Given the reports of the Collector and the District Superintendent of Police regarding the account of the duration and direction of the cyclonic wind which was blowing ‘....from east to north-east [at] 2 p.m.,’ and ‘it burst upon....with all its fury and continued till about 4-40 p.m’. But it appeared that from 4 to 5 the wind lulled and after 5 it commenced again with the greatest violence from the north-west. Thus it can be observed that the sudden and changing twist of the wind within a short span of time swayed in different parts of the district in a different manner. But there remained some possibilities of exaggeration of the condition which were evident from the different accounts. The district Gazetteer of Pabna had informed ‘about 20,000 fruit trees were blown down’, whereas the District Superintendent of Police’s account noted that ‘about 2,000 mango, jack, and other fruit trees were blown down’; though the number of the damaged houses in both the accounts remained same (5000). In such a situation it appears to be difficult to draw any specific or accurate estimate of the damage done in the Pabna town (municipality area) regarding the destruction of trees. The cyclone was slightly felt towards Aurankhalla outpost, 14

miles from Pubna town, on the high road to Rajshahi. Sugarcane and all high crops have suffered severely and the sub-inspector estimated that the rice had to suffer to the extent of 1/16th of the crop on the ground. Moreover, two deaths and the loss of eighteen more boats including that of with 1,315 maunds coal were said to have been reported.<sup>74</sup> The District Superintendent of Police had been provided with the number of deaths occurred in Dulai (3), Sirajganj (11 more deaths in addition with the previous number), Raiganj (1), and Shazadpur (4) and in addition to this thirty-seven more deaths were reported up to the date i. e. 6th October.<sup>75</sup>

### **Cyclone of October 1874**

The cyclone of October 1874 originated in the Bay of Bengal had passed over the Sand-heads, the Midnapur, Burdwan, and Murshidabad districts en-routed via the districts of Bogra and Rangpur. The cyclone of October 1874 had been regarded as the '*Midnapur and Burdwan Cyclone*' by W. G. Wilson, the Officiating Meteorological Reporter of the Government of Bengal. So far the course and direction of the cyclone was concerned, it was stated by Wilson that:

“The centre of the cyclone, moving in a north-north-westerly direction, passed over the Sandheads about noon of the 15th. It was nearest to Saugor Island about 5 p.m. and struck the coast-line about Long. 87° 37' E. Near Midnapore the course of the cyclone re-curved. The centre passed about 15 miles to the east of that place between midnight and 1 a. m. of the 16th, and the vortex passed over the town of Burdwan between 6 and 7 in the morning. Between 1-15 and 3 of the afternoon of the same day the central calm was passing over the town of Berhampore, the storm having then greatly diminished in violence. The centre after this followed a more easterly path, passing to the westward of Bogra, about 10 p.m., and over the junction of the Teesta and Brahmaputra, about 2 a.m. of the 17th. The storm finally broke up on the western ridge of the Garo Hills, approaching, but not reaching, Goalpara in Assam.”<sup>76</sup>

The movement of the cyclone was noted by the ships namely *Ireshope*, *Patrie*, *Udston*, and *S. S. Scotia* which were travelling and stationed in different parts of northern Bay of Bengal and observed the different courses of the cyclone in different times. Many about the wind pressure,

cloud structure and rainfall in the Bay of Bengal during the cyclonic days had been obtained from the logs of the ships. But at the same time it was difficult to assume any uniformity between the logs of the different ships so as to the information, and thereby to draw any conclusive remarks. However, the cyclone was accompanied with varied amount of rainfall in different parts of Bengal.

Table. 2.3:

Rainfall in Bengal between 15th and 17th October, 1874 during the Cyclone

| Districts    | Areas             | 15th  | 16th  | 17th  |
|--------------|-------------------|-------|-------|-------|
| Burdwan      | Burdwan           | 0.36  | 7.43  | ..... |
|              | Cutwa             | 0.30  | 4.30  | ..... |
|              | Bood-Bood         | 0.26  | 8.40  | ..... |
| Midnapore    | Midnapore         | ..... | 10.27 | ..... |
|              | Tumlook           | 0.87  | 4.50  | ..... |
|              | Contai            | 3.58  | 5.47  | ..... |
| 24 Parganas  | Saugor Island     | 3.90  | 1.44  | ..... |
|              | Calcutta          | 1.27  | 4.56  | ..... |
| Moorshedabad | Berhampore        | 0.49  | 5.93  | 0.03  |
|              | Rampur Hant       | ..... | 5.92  | ..... |
|              | City Moorshedabad | 3.02  | 2.80  | ..... |
|              | Jungipore         | 1.33  | 8.00  | ..... |
|              | Azingunge         | 0.29  | 4.93  | ..... |
| Dinagepore   | Dinagepore        | ..... | 0.28  | 2.80  |
| Malda        | Malda             | 0.12  | 2.29  | 0.05  |
| Rajshahye    | Beauleah          | 0.32  | 3.80  | ..... |
|              | Nattore           | 1.10  | 3.13  | ..... |
| Rungpore     | Rungpore          | ..... | 1.89  | 6.97  |
|              | Bhowanigunge      | 0.51  | 2.85  | 2.15  |
| Bogra        | Bogra             | 1.34  | 3.10  | ..... |
| Pubna        | Pubna             | 0.12  | 1.43  | ..... |
| Cooch Behar  | Cooch Behar       | ..... | 0.56  | 3.96  |

Source: Extracted from W. G. Wilson, *Report on the Midnapore and Burdwan Cyclone of the 15th and 16th of October 1874*, pp. 8-9.

It is evident from the above table that rainfall in different parts of Bengal was not only varied but it had appeared in diverse amount of variety between 15th and 17th. In the 17th i. e. the immediate day of the disappearance of the cyclone, there was virtual absence, rather very meager

except in Dinajpur, Rangpur town and Cooch Bihar, of rainfall in all parts of Bengal. Rainfall, especially in different areas of the districts of Burdwan, Midnapur, and Murshidabad was increased in 16<sup>th</sup> than the 15<sup>th</sup>. On the other hand, in the north of the Ganges i. e. in the northern districts, especially in Rangpur and the Princely State of Cooch Behar, the rainfall was not so much heavy with a nominal fall in Darjeeling and Jalpaiguri districts. Even in the preceding days of the cyclone rainfall in Bengal as a whole was remarkably scarce.<sup>77</sup>

Two of the Government meteorological observatories viz. Burdwan and Berhampur had fallen on the centre of the passage of the cyclone and the latter had provided more valuable barometric information than the former due to the inability to the access of barometer instruments in the late at night when the cyclone commenced in Burdwan.<sup>78</sup> Midnapur and Burdwan had to bear an extensive loss in terms of life and property during the cyclone as the storm had made its visitations more severely in these two districts than the other.<sup>79</sup> Among the northern districts of Bengal ‘there was no cyclone’ in the districts of Pabna and Dinajpur where ‘only a fresh breeze’ and ‘a moderate gale only was experienced’ respectively.<sup>80</sup> But the districts of Rangpur, Bogra, Malda, Rajshahi and Murshidabad were seriously hit by the cyclone. In Rangpur though there was ‘no apparatus to be availed of to note’ the degree of velocity and barometric pressure ‘down at the time’ but despite of that it was reported that ‘the wind commenced blowing from the north-east at about 7. 30 p.m. on the 16th Oct. 1874’ and ‘it gradually increased in velocity and fury, and veering round through the E. and S., at last died out at the S. W. at about 4 p.m.’<sup>81</sup> After the midnight of the 16th the wind became strongest and in the early morning of the 17th it returned further to the north-west and west.<sup>82</sup> As a result many houses and their bamboo attachments had been raged down and around five boats laden with jutes which were proceeding at the mouth of the Tista near Kalmi had been overturned and submerged.<sup>83</sup> However, ‘no loss of life or any such serious accidents’ were reported. But ‘the tobacco crop and cold weather vegetables [had] been irreparably damaged’ since it seemed to be noted that ‘this ton was on the extreme left border of the passage of the cyclone.’<sup>84</sup>

At Bogra the gale initiated at around 7 p.m. of the 16th and reached at its height at 10 p.m. when the wind was swinging from east by north to south-east.<sup>85</sup> On the 15th, the day previous to the

gale, there was uninterrupted heavy rain with variable winds and the total fall of rain up to 6 p.m. of the 15th was 1.34 inches.<sup>86</sup> The centre of the storm was passed from the western part of Bogra which was very near to the junction of the river Tista and Brahmaputra where the storm was appeared with its maximum velocity and power in comparison with the neighbouring areas.<sup>87</sup> Though there was no loss of life in the district of Bogra had been reported but considerable damage was done to the thatched houses and heavy branches of the larger trees were twisted off.<sup>88</sup> In Malda the weather began to change from the night of the 14th when 'clouds collected all around' and on the 15th the rain was started with a serious gale blowing from north-west to east and on 16th it was increased to a considerable amount with an eastward direction.<sup>89</sup> But the Officiating Collector of Malda was of the opinion that there 'was no cyclone in this district, though the 15<sup>th</sup> and 16<sup>th</sup> were very stormy' and 'a good number of trees were blown down in *thana* Gomastapur towards the south of the district, as well as a few huts, and six salt boats were sunk in the Mahananda'.<sup>90</sup> In fact it was opined by him that there was no 'great damage' caused by the cyclone and the rain was proved to be beneficial for the rice crops.<sup>91</sup>

In the town of Rampur Boalia of the District of Rajshahi the cyclone started from 3 a. m. of the 16th October. In the morning, the storm had increased and blowing from a north-eastern direction and as the day was proceeding the wind got stronger and veered to the east and then curved to the south-east accompanying with a heavy rain.<sup>92</sup> The meteorological register at the station of Rampur Boalia had recorded the following barometer and thermometer readings along with rainfall during the 16th of October:

*Meteorological Register kept at civil station of Rajshahi on the 16<sup>th</sup> of October 1874.*

MONTH AND DATE – OCTOBER 16<sup>TH</sup>

At 10 A.M.

Barometer ..... 29.70

Thermometer

|                   |       |       |       |    |
|-------------------|-------|-------|-------|----|
| Of morning        | ..... | ..... | ..... | 0  |
| Of air            | ..... | ..... | ..... | 80 |
| Of wet bulb       | ..... | ..... | ..... | 0  |
| Direction of wind | ..... | ..... | ..... | E  |

At 4 P.M.

Barometer ..... 29.25

Thermometer

|                           |       |       |       |    |
|---------------------------|-------|-------|-------|----|
| Of morning                | ..... | ..... | ..... | 0  |
| Of air                    | ..... | ..... | ..... | 80 |
| Of wetbulb                | ..... | ..... | ..... | 0  |
| Direction of wind         | ..... | ..... | ..... | W  |
| Thermometer in sun's rays | ..... | ..... | ..... | 80 |

CLOUDS

|            |       |       |       |      |
|------------|-------|-------|-------|------|
| At 10 A.M. | ..... | ..... | ..... | 10   |
| At 4 P.M.  | ..... | ..... | ..... | 10   |
| Rain-fall  | ..... | ..... | ..... | 3.80 |

Level of sub-soil of water distance from the surface of the ground ..... 3.6

REMARKS.- Much rain whole night and day, stormy after noon.

Beauleah,  
October 29<sup>th</sup> 1874.

(Sd). R.A.K. Holmes  
Civil Surgeon, Rajshahye.

Source: [Collection No. 4. 31/32] From W. H. Doyly, EsQ., Collector of Rajshahye, to the Assistant Secretary to the Government of Bengal, Statistical Department. – (No. 2904, dated Beauleah, the 29<sup>th</sup> October 1874), WBSA.

The above meteorological record has shown that in the morning (10 a.m.), the wind was blowing from eastern direction but in the evening (4 p.m.) it was veering from the south and the quantity of rainfall was increasingly high throughout the day. The cyclone in the district caused

considerable damage to the properties and lives. A number of fine trees were uprooted in the station, and many *cutch* houses in the town were blown down or damaged.<sup>93</sup> Although rice crop had suffered slight damage but the loss of ratur and sugarcane was considerable enough. It was reported that about 100 boats were sunk at the ghats, but many were subsequently raised and a silk factory to the east of Surda was blown down.<sup>94</sup> From the police reports, it would appear that the violence of the storm was greater in the western *thanas* of the district than elsewhere, viz., Godagari, Tanor, and Manda, where it continued blowing till midnight.<sup>95</sup> The report had ascertained that there were total lives lost by the cyclone: one man was drowned in Singra by the sinking of his boat, one man was killed by a falling branch, and two men were killed by falling walls.<sup>96</sup>

In Murshidabad, however, storms appeared in different parts of the district in different times and continued to blow there for some time.

Table. 2.4:  
Wind direction in Murshidabad during the cyclone of Oct. 1874

| Area              | Direction (blowing from)      | Time of Commencing                                  |
|-------------------|-------------------------------|-----------------------------------------------------|
| Ramnuggur         | North                         | Evening of the 15th                                 |
| Gonateea          | East                          | Ditto                                               |
| Gouripore         | Northerly North Western       | 5 p.m. of the 15th                                  |
| Putkabari         | North East then East by North | Though started on 15th but got stronger in the 16th |
| Beldanga          | East                          | Began in morning of the 16th                        |
| Kandi             | East                          | Night of the 15th                                   |
| Rungamuttee       | South-East                    | Morning of the 15th                                 |
| Berhampore        | East                          | Morning of the 16th                                 |
| Moorshedabad City | Easterly South East           | Morning of the 16th                                 |
| Azimgunge         | East                          | 1 a.m. of the 16th                                  |

Source: Extracted from W. G. Wilson, *Report on the Midnapore and Burdwan Cyclone of the 15th and 16th of October 1874*, pp. 69-70.

The above table has shown that the storm appeared in the district on the 15th of October and stretched to the length and breadth of district from the late-night of the date. The centre of the storm had passed over at Kandi, Beldanga, Berhampur, Murshidabad, Azimganj, and Akriganj and crossed the Ganges passing through the district of Rajshahi.<sup>97</sup>

The cyclone in the district of Murshidabad had resulted in large scale destruction of lives and property. The loss of human life and cattle that was reported was amounted to 27 and 95 respectively, though remained under-marked and subject to the verification of the further reports obtained from the police from different parts of the district.<sup>98</sup> Apart from these, crops this time had to undergo a considerable damage: mulberry, sugarcane, til, and chilli crops, and to the advance portion of the winter rice-crop had suffered severely of which the til crop was the worst sufferer.<sup>99</sup> On the other hand, it was ascertained that the “Kartiki” or early transplanted *dhan*, which was used to be cut in Kartick, had ‘not been damaged, and the crops in the Bhudrehat thana [would] certainly yield a splendid outturn’.<sup>100</sup> Nonetheless, it was said to believe that though the advance portions of the winter rice-crop was suffered maximum from the cyclone but the latter transplantations of the crop was immensely benefitted from the rain and proved to be profitable in the year of scarcity and shortage. But it is to be noted that the considerable amount of loss in the rice-crop during the early years was not entirely compensated by the latter harvest even though the damage caused to the early transplantations was ‘as nothing compared to the benefit caused to the late transplantations’ which ‘formed the bulk of the crop.’ Death of three persons crushed by falling houses was reported from Berhampore and it was informed that some boats had been exhausted near Azimganj.<sup>101</sup>

The multi-dimensional travelling of the wind with varied quantity of rainfall in several parts of the district had, as it was believed, prevented to formulate any concept of uniform direction and force by the observer of the cyclone. Despite of that the passage and duration of the storm was noted down from the information obtained from the Government Meteorological Observatory situated at Berhampur and from Babulbona by Mr. Stocks. From the Berhampur Observatory it was reported that ‘about 7 o’clock in the morning of the 16th the wind, which had backed round to the N. E., was beginning to blow strong in the ghusts’ and the velocity was increased from 7 to 8 a.m. ‘to 21.6 miles an hour’ when the barometer ‘was commencing to fall rapidly.’<sup>102</sup> The barometric information which were recorded by Mr. Stocks had shown the following readings:

Table. 2.5  
Barometric readings taken at Baboolbonah, 16<sup>th</sup> October 1874.

| Hour  | Barometer | Wind                                                              | Rain                                            |
|-------|-----------|-------------------------------------------------------------------|-------------------------------------------------|
| A.M.  |           |                                                                   |                                                 |
| 7     | 29.680    | Blowing strong in gusts, E. ....                                  | Very heavy                                      |
| 7-30  | 29.660    | Gale increasing from N.E. ....                                    | Very dark and heavy rain                        |
| 8     | 29.630    | Strong gusts from N.E. and E. ....                                | Not so heavy, and clear above                   |
| 8-30  | 29.630    | Terrific gusts from N.E. and E. ....                              | Heavy rain, dark clouds, S.                     |
| 9     | 29.620    | Ditto increasing ditto ....                                       | Very heavy                                      |
| 9-30  | 29.570    | Terrible gusts, blowing N.E. ....                                 | Heavier than ever; compound one sheet of water. |
| 10    | 29.570    | Ditto ditto ....                                                  | Less rain                                       |
| 10-30 | 29.540    | Storm as bad as ever, blowing from all sides, principally E. .... | Heavy rain falling.                             |
| 11    | 29.500    | Ditto ditto ....                                                  | Ditto                                           |
| 11-30 | 29.430    | Most terrific gusts N.E.                                          | Ditto                                           |
| P.M.  |           |                                                                   |                                                 |
| 12    | 29.340    | Hurricane, blowing ditto                                          | No rain                                         |
| 12-15 | 29.270    | Ditto S.E. ....                                                   | Ditto                                           |
| 12-30 | 29.210    | .....                                                             | Ditto                                           |
| 12-45 | 29.140    | Ditto E. and S.E. ....                                            | Ditto                                           |
| 1     | 29.100    | .....                                                             | Cleared up                                      |
| 1-15  | 29.090    | Stronger than ever, ditto ....                                    |                                                 |
| 1-30  | 29.080    | .....                                                             | Sunshine                                        |
| 1-45  | 29.100    | Terrible to look at, ditto ....                                   |                                                 |
| 2-15  | 29.110    | .....                                                             | Heavy clouds N.                                 |
| 2-30  | 29.130    | Wind calm, S. ....                                                |                                                 |
| 3-15  | 29.240    | A fine calm day ditto ....                                        |                                                 |
| 4     | 29.440    | Ditto ditto ....                                                  | Rain falling                                    |
| 4-30  | 29.520    | Blowing strong from N.W. ....                                     | Heavy rain                                      |
| 5-30  | 29.620    | Ditto ditto ....                                                  | Slight rain                                     |
| 6-15  | 29.670    | Ditto ditto .... Little wind from N.W.                            | Clouds drifting S.E.                            |

Source: [Collection No. 4. – 40/41] *From W. Wavell, EsQ., Officiating Collector of Moorshedabad, to the Assistant Secretary to the Government of Bengal. – (No. 324Ct., dated Camp Khurgaon, the 21<sup>st</sup> November 1874.)* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.

The above barometric readings had shown that the wind generally commenced from the eastern direction accompanying with heavy rain moved to the north-eastern direction till the 12 noon when rain was stopped. However, rainfall was uniform throughout the day, sometimes it increased to severe but ultimately it was ‘cleared up’ at 1.15 p.m. and sunshine appeared at 1.30 p.m. But the sudden change of weather brought about clouds and it was again started to fall heavily at 4.30 p.m. though finally clouds were drifting towards south-east. It was opined that the escape of the northern part of the district was probably due to the easterly inclination of the storm.<sup>103</sup>

It was between 31st October and 1st November of 1876 when another cyclone hit the lower portions of the Bengal. Originated in the Bay of Bengal the cyclone had travelled a long way and struck Vizagapatnam in South India and brushed up in the districts of Buckharganj, Noakhali and Chittagong of the lower provinces of Bengal.<sup>104</sup> As a result of the cyclone ‘the mouth of the Meghna, known as the groups of Sundeeep,....the islands of Hattea, and Dukhin Shahbazpur ....., and the western coast of the great river within the district of Backergunge’ were severely suffered. In addition to this, the districts of Buckharganj, Noakhali and Chittagong had to undergo through a severe attack by the cholera epidemic during the days of the cyclone.<sup>105</sup> However, the cyclone did not move towards the north of the Ganges and therefore, the northern districts of Bengal had fortunately escaped the visitation of the cyclone.

### **Cyclones of Local Origin in North Bengal**

Apart from the long-distance cyclone which had originated in the Bay of Bengal and travelled through a long way to enter into the land, there were occurrences of local hailstorms which had brought about considerable damage to the life and property of the region. The princely state of Cooch Behar had been visited by a violent hail storm which had passed over a part of the state in March 1887.<sup>106</sup> Due to the appearance of the hurricane that “raged in the town of Cooch Behar at about 9 P. m. on the 29th March....many huts were, levelled down and trees uprooted; even

some strongly built houses with corrugated iron roof or grass thatching were seriously damaged.”<sup>107</sup> The storm coming from the north-west and accompanied with rain and hail-stones though had continued for only 10 minutes but it took away four lives within a short span of time.<sup>108</sup> In April 1<sup>st</sup> 1907 at 11.30 a.m. a severe hailstorm had occurred in the district of Malda. The storm hit the district from the ‘Sonthal hills on a front of two miles southward of Manikchak and extended to Bholahat, lasting for half-an-hour.’<sup>109</sup> Crops like wheat and mulberry and mango trees had to suffer serious loss. It was reported that 19 persons were killed by this violent storm and ‘numbers were wounded by the hailstones,... [while] birds, monkeys and dogs were killed in large numbers.’<sup>110</sup> However, situation became worse when one natural calamity had been followed by another natural calamity, like – landslide or land-fissures followed by earthquakes or flood followed by heavy rainfall and cyclonic storms. Such an example can be seen in Darjeeling in 1899 when four consecutive and uninterrupted natural disorders – cyclone, heavy rainfall, flood and landslides had taken place. The details of these occurrences have been discussed in the chapter on flood and here we can have a brief account about the invasion of the cyclone which had created the ground for the other disasters.

### **The ‘Darjeeling Cyclone’ in 1899**

The year 1899 will long be remembered at Darjeeling as the year of the great disaster. After the violent earthquake of 1897, minor landslides were a frequent occurrence. Darjeeling’s rainy season of 1899 was exceptionally heavy, with an unprecedented downpour on September 23<sup>rd</sup>, 24<sup>th</sup> and 25<sup>th</sup>. The beginning of the disaster was brought forth by a cyclone on 23<sup>rd</sup> which after entering the district moved to the north-west direction and was extended to the north-east ‘as far as the Ramman and the Rangit rivers and to the north-west as far as the boundaries of the district’ and it was more violent ‘from a point 6 miles south of the station of Darjeeling.’<sup>111</sup> The thunder-storm of Saturday (23<sup>rd</sup>) was started at 1.30 p. m. and this was succeeded by excessive rainfall which continued till 8 p. m. of the night. The storm was lasted for whole of that night and

all the next day and night (Sunday, 24<sup>th</sup>) and continued till about 3.30 a. m. (Monday, 25<sup>th</sup>). The cyclone was accompanied with heavy rainfall which continued for three days and the downpour was varied from places to places as shown in below:

Table. 2.6:

Rainfall (in inches) at Different Places of Darjeeling in 23<sup>rd</sup> – 25<sup>th</sup> September, 1899

| Place                   | Rainfall |
|-------------------------|----------|
| Kalimpong               | 13.96    |
| Pedong                  | 7.58     |
| Kurseong                | 19.85    |
| Mangpu                  | 16.85    |
| Tiger Hill Tea Estate   | 29.42    |
| Happy Valley Tea Estate | 27.20    |

Source: O'Malley, L. S. S., *Bengal District Gazetteers: Darjeeling*, Calcutta, 1907, p. 129.

The sudden and excessive rainfall in certain places was succeeded by heavy landslips, for example, the landslip at Rangbi 'extending from an altitude of 7, 000 feet to the bottom of the valley' produced loosening of land almost upto 250 yards.<sup>112</sup> The total rainfall for the year 1899-1900 was 144.4 inches.<sup>113</sup> The cyclone accompanying with excessive rainfall took a heavy toll in the district of Darjeeling. E. C. Dozey had recorded the aftermath of the calamities in the following manner:

"In the town of Darjeeling 10 Europeans and 62 Indians perished (of these 45 died on the precipitous eastern side of the hill) ; in Kurseong there were 9 deaths; while in the district no less than 219 souls perished either from exposure that followed the storm, or by being engulfed in falling debris or slips..."<sup>114</sup>

The number of deaths and estimate of overall destructions had, however, varied in different accounts. *The Fairfield News and Herald* had reported the following impact of the cyclone in the district:

“It is estimated that between Darjeeling and Kurseong alone 300 persons have lost their lives. ... The storm appears to have been extended all over the northern portion of Bengal. Considerable damage has also been done at Silliguri, where a number of wooden huts and the plague camp have been destroyed. The subsidence of the hillside at Darjeeling continues, and is causing alarm, as it threatens to destroy the whole Bazaar. Although the delayed reports from many sections prevent accurate estimates, it is evident that the fatalities far exceed 300. No fewer than 209 persons were killed in the destruction of Phool Bazaar alone; and as many as 100 at Darjeeling. Twenty-one bodies have been at Tamsongbata, where it is believed another 20 persons have been killed. Advices from Rungli show great destruction in the tea gardens around Poomong, Monday night.”<sup>115</sup>

Apart from the above account of the destruction caused by the cyclone, huge amount of loss of lives had been reported as a result of severe flood and devastating landslides which did not even spare the Europeans. Perhaps this was one of the natural disasters from which the Europeans could not escape despite of their ‘efficient’ control of the nature. Their conception of sanatorium had for a while been trembled down by this disaster (discussed in the chapter on flood). Although the cyclone had engulfed the whole of the district but there was no sign of the impact of the cyclone outside the district.

The cyclones originated in the Bay of Bengal and after running a long way to the land of northern districts of Bengal had brought about, at many times, havoc to the society and economy of northern Bengal. However, the cyclones occurred between 1864 and 1874, and in 1899 had diverse impact to this part of Bengal. There is no doubt that the lower provinces of Bengal which fell nearer to the centre of the cyclones had to suffer the maximum damage and destruction in terms of life and property. Despite of being distant to the place of origin of the cyclones northern districts of Bengal had to witness considerable destruction, though varied in amount and severity. The local storms sometime became more dangerous for the region, where it originated, as was in the case of 1899 Darjeeling cyclone. The above portion of the chapter on the various aspects of the cyclones has already demonstrated the condition of life, property, society and economy of northern Bengal during the time of cyclone. But one may assess the post-disaster complexities

prevailed in the realm of social relations and economic production through a comparative and critical study.

It was observed that sometime the centre of the cyclone had passed over some parts of northern Bengal. The centre of the 1864 cyclone was passed over from Nattore of the district of Rajshahi. The cyclonic impact in the northern districts of Bengal had varied due to the variation in velocity and direction of wind. The situation was aggravated when the storms were carrying huge amount of rain which induced the possibility of flood. Cyclones accompanied by flood produced maximum destruction of life and property. Commodities had been drowned in water which amounted to considerable loss of for the producers and traders.<sup>116</sup> The sudden loss of regular commodities adversely affected the prevailing trading system. Government, though sometime, had intervened into this situation but it was not sufficient to deal with. The amount lost in the cyclones to be estimated by the government was frequently contradicted with the private estimation. Boats carrying the commodities were drowned in the water. Sinking of boats had been reported by the police or sub-divisional officers at several times. Crops were severely suffered from the cyclones. Storms and flood had a dual adverse impact on the agriculture of northern Bengal where large scale destruction of crops resulted in the price-rise which added to the sufferings of the people. As one can notice that storms had occurred during the season of autumn when abundant rice were produced, it was struck severely for the peasants and traders who heavily depended on autumn-rice, the chief harvest of the year. There was, however, no zamindari or State relief in this regard though for 1876 cyclone there was a rudimentary system of state relief.

Trees and houses were destroyed. *Pucca* houses faced more damage than the *cutch* houses. The cyclones occurred between 1864 and 1899 had caused loss of life - both human and cattle in the districts of northern Bengal. Deaths which were caused by the falling of trees and drowning in the water were reported by the police. There were several incidents of women dead bodies had found. The police reports on the account of number of death took place in the several cyclones had not only varied but also contradicted. Sometime it was even more difficult to decipher the main cause of death – whether falling of trees, or roof, or thunder, or suffering from long term

illness. When police reached to the area devastated by the cyclonic winds or floods it was much difficult to trace out for them the actual number of deaths occurred because flood had drowned the bodies or carried over the other places. It was rarely heard about any governmental relief to be extended for the families of the dead person. In many cases government had not only overlooked the prevalence of diseases in northern Bengal during the time of cyclone but denied any need of assistance whereas it showed much concern for the cholera epidemic broke out in 1876 cyclone in southern Bengal because the epidemic had ravaged a sizeable area and population of that region. But rescue operation was not a common feature then especially for the cyclone victims. Cyclone induced mortality had hardly generated any tension in the official circles as 'living or dead no rescue could be attempted'. Whatever little measures in the later years had been conducted by the government was just 'to let the poor people see that the authorities are thinking, caring, feeling for them' in their suffering.<sup>117</sup>

### **Meteorology and Colonialism: Evolution of Theories and the 'Laws of Storm' in Nineteenth Century**

The second half of the nineteenth century witnessed a considerable generation of knowledge in the realm of cyclonic appearances, their causes and impact. Meteorological study has attained significant importance in the colonial administration. In fact, it was during the sixteenth century when the Western European powers were set out to establish their commercial hegemony over the world and for that reason they were inclined to collect information about 'atmospheric circulation'. While Chinese, Arab, Malay and Polynesian peoples among others also attained degrees of mastery over this subject, none perhaps did so in such a capacity for the same goal in mind as the mariners of Western Europe had accomplished.<sup>118</sup> The second half of the nineteenth century witnessed a steady and systemic growth of meteorological knowledge in Home through the establishment of British Meteorological Society (1850) by James Glaisher which in 1833

came to be known as Royal Meteorological Society.<sup>119</sup> The navigational necessity of the traders acted as a great motivation for development of science in Great Britain. Astronomy was the first modern science to be brought to India, as a geographical and navigational service though its early use was irregular and generally out of personal interest.<sup>120</sup> There is no doubt that meteorology appeared to be indispensable for a trading nation for establishing the commercial hegemony in the sea routes and this necessity prompted them to discover 'law of storms' so that they could tame seas. It can be noticed from the several reports of the Bay of Bengal cyclones during the second half of the nineteenth century which were prepared for future administrative records that the ships sailing at the Bay of Bengal had provided data regarding the occurrence of the storm in the sea and its passing route to the land. However, there remained a considerable amount of confusion in the log books of ships since the ships were stationed in different locations at the sea and observed the passing of the storms in different times – thus it was very difficult to form any unanimous argument for the origin of the storms. The meteorological observatories or stations which were built in Bengal for collecting vivid account of the cyclones even provided confusing statistics which had placed the origin of the storm 'somewhere' in the Bay of Bengal. It has been mentioned in the Report of the Cyclone of 1874 that there prevailed a great deal of 'uncertainty' in the 'weather indication' observed from the observatories of Calcutta and Saugor Island due to their preceding locations to notice any significant fall of the barometer or increase in the force of wind and this uncertainty led to the confusion in terms of determining the 'probable position and subsequent course' of the storm.<sup>121</sup> This was not only the case for 1874, instances can be drawn from the previous cyclones 'to illustrate the uncertainty which attends the prediction of storms at the close of the south-west monsoon.'<sup>122</sup> However, variability in general indication of weather and changes in barometric readings had distinguished the change of course of the storms from south-west to north-east and vice versa. The characteristics of the storms had varied in terms of their duration, vortex, their rate of motion and the extent of atmospheric turbulence that preceded and accompanied them. Generalization on the magnitude and barometric indications has been made in the official Report of the cyclone of 1874 which was said to be implemented to all the preceding cyclones that had arrived at the shores of Bengal from the middle or southern parts of the Bay.

“...the area of low atmospheric pressure to the northward of a cyclone, when it has advanced up the Bay to some distance from the latitude of its origin, appears to be of no very considerable extent relatively to the magnitude of the storm itself. Thus it is not until a place is near the limit of the gale of wind which surrounds the body of the advancing cyclone that any decided fall of the barometer takes place.”<sup>123</sup>

Notwithstanding the generalization, the flexibilities or steepness of the barometric fall and the extent of atmospheric depression contributed to the remarkable deviation of the vortex and course of the cyclones. In fact the pilot vessels or ships which were stationed at seas to notice the advancement of the cyclones were sometime caught within the vortex of the storm but this difficulties were solved by the ‘long experience [of the commanders] with all the indications of their [storms’] approach’ which helped to ‘manage to keep their vessels at least at a safe distance from the centre of any storm.’

British ships and their log books represented itself as the main instrument and source of information for the meteorological knowledge which were indispensable not only for the commercial purpose but for the safety of the ships themselves. The emergence of colonial meteorological knowledge as a distinctive discipline *per se* science was not a sudden event because even in 1800 meteorology ‘was neither an academic discipline nor an administrative office...’<sup>124</sup> Despite of that endeavours had been directed by the meteorologists towards cataloguing the variabilities, elements and changes taking place in the cyclones throughout the nineteenth century. Even the early part of the nineteenth century had witnessed the initiation, though very small in scale and extent, of the process of collection and analysis of meteorological data and information. Thus the generation of ‘cyclone theories’ was an early-nineteenth century phenomenon. Colonel Capper in 1801 had observed that the storms of the Indian Ocean were ‘whirlwinds or rotatory storms’ and he further went on to say that ‘it would perhaps not be a matter of great difficulty to ascertain the position of a ship in a whirlwind by observing the strength and changes of the wind.’<sup>125</sup> However, the earliest writer of importance on the subject of cyclones was Mr. Redfield who had written a series of papers to American scientific journals from 1822 onwards which contributed to the development of the earlier findings and asserted that the storms originated in the Indian Ocean were vast progressive whirlwinds or rotating storms moving along curved paths. The circular theory was also attested by Lieutenant-Colonel

Reid, of the Royal Engineers, in his writings on the law of storms. He had emphatically laid down the generalization that in the rotary storms of the tropical regions of the northern hemisphere, the direction of rotation of winds was north-west-south-east i.e. anti-clockwise, and on the other hand, for the case of storms in the southern hemisphere the direction of rotation was north-east-south-west i. e. clockwise.<sup>126</sup> Reid's study, published in 1838, was, however, based on 'curious facts' which he collected from the 'accounts of previous storms' that took place in several parts of the globe – in Caribbean region (Barbadoes, Antigua, Apolachicola, St. Marks), in Mauritius (1818, 1819, 1824, 1834, and 1836); and the tornedos occurred in the western coast of Africa. After verifying the existing theories of cyclones 'by making charts on a large scale', he had produced a great deal of knowledge that helped immensely for the guidance of mariners sailing on the tropical ocean where the book could be more necessary for the purpose of 'practical use in navigation'. Providing a stimulus for the mariners he said that: "It would not, perhaps, be a matter of great difficulty to ascertain the situation of a ship in a whirlwind, by observing the strength and changes of wind."<sup>127</sup>

The necessity to record meteorological accounts was once again firmly installed by Henry Piddington, President of the Marine Courts of Enquiry at Calcutta who had the access to the logs of the ships which were damaged by cyclones. Piddington had carefully interpreted and then compiled the experiences of the Captains, which were written in the logs, into twenty-five volumes and these were came out in the *Journal of the Asiatic Society of Bengal (JASB)* under the title of '*The Law of Storms*'. Later H. W. Drove in his *The Law of Storms* had distinguished different forms of winds called by different names. To quote Drove: "... those whose direction is constant being called *gales*; those which have a rotatory motion *hurricanes*, or as Piddington calls them, *cyclones*; and lastly, rotatory storms of smaller dimensions being termed *trombs*."<sup>128</sup> Piddington's observations had been considered as more scientific and trustworthy by the British mariners and officials who heavily relied on them. According to Piddington storms were generated in an area of low atmospheric pressure in an eastward direction in the Bay of Bengal which moved northwest. These oval shaped storms having anticlockwise wind direction were rotatory in characters and went through a fixed design of rotation and expectable speed in the northern hemisphere. He has shown the possible way of measuring the shape, speed and the

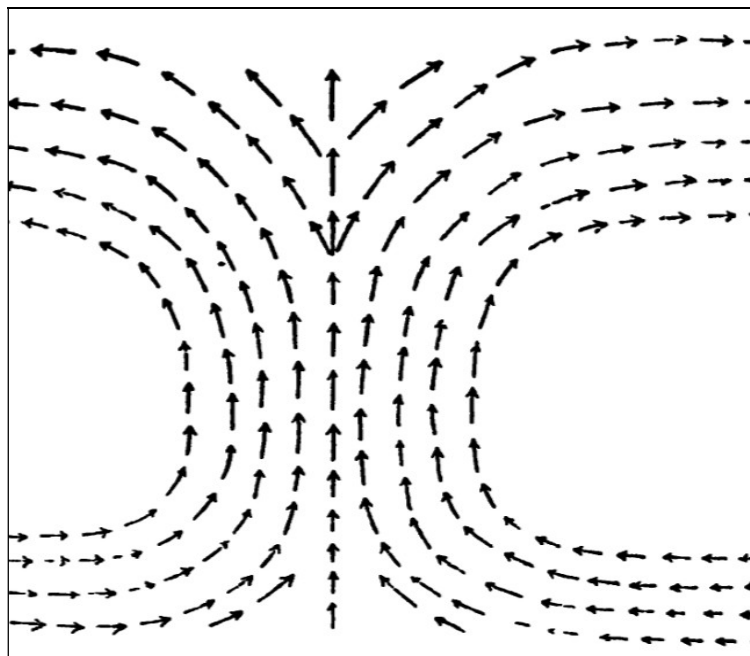
vortex of the cyclones.<sup>129</sup> Thus Piddington had agreed to the theory of rotatory winds in the storms. He significantly contributed to the generation of valuable knowledge regarding the scientific analysis of different aspects of a cyclone. This knowledge, in fact, became the bedrock of the future meteorological researches carried out by the colonial officials and mariners. Piddington has been regarded as the founder of the term ‘cyclone for the peculiar swirling storms of his region’.<sup>130</sup> But unfortunately the laws made by Piddington did not have any decisive impact during his lifetime. Furthermore, it was not possible for the sailors to enter into the vortex of the storm nor to remain at a safe distance from the sea and this cumulatively hindered the process of collection of accurate data. The ships located in the different parts of the ocean were supposed to experience storms differently and moreover, there was no system of communication of the ships among each other.

The proponents of the circular theory had somehow overlooked the other aspects of the cyclones. The contemporary colonial official assessment regarding the works of Reid or Piddington had declared as based on ‘assumption’ and asserted that there is no doubt that defining the wind directions as rotatory was a hypothetical assumption or ‘a rough approximation to the actual character of the atmospheric motion during cyclones’.<sup>131</sup> There were numerous other synchronous storm charts prepared by various meteorologists who had emphasized a centripetal or indraught wind direction and in assimilation with the rotatory winds there originated a spiral or incurving motion of the air towards the centre. This ‘centripetal theory’, later adopted by Mr. Espy, of Philadelphia, had provided the possible explanation of falling of trees during cyclones when winds were blowing or converging towards a particular centre. Since the cyclones originated in the Bay of Bengal visited far inside the country accompanying with heavy rain, Mr. Espy’s proposition is of high importance here which laid down the generalization that the falling of rain during cyclones was caused by the creation of an upward motion of strata in and above which compression is situating and which invited in-draught from all directions in the lower atmospheric strata and an out-draught in the higher.<sup>132</sup> Cyclones originated in the Bay of Bengal during the second half of the nineteenth century had been frequently observed carrying a huge amount of water with them. Sir John Herschel (1861) had revised to some extent Espy’s centripetal theory and Drove’s law of gyration (rotation). After evaluating both the theories he

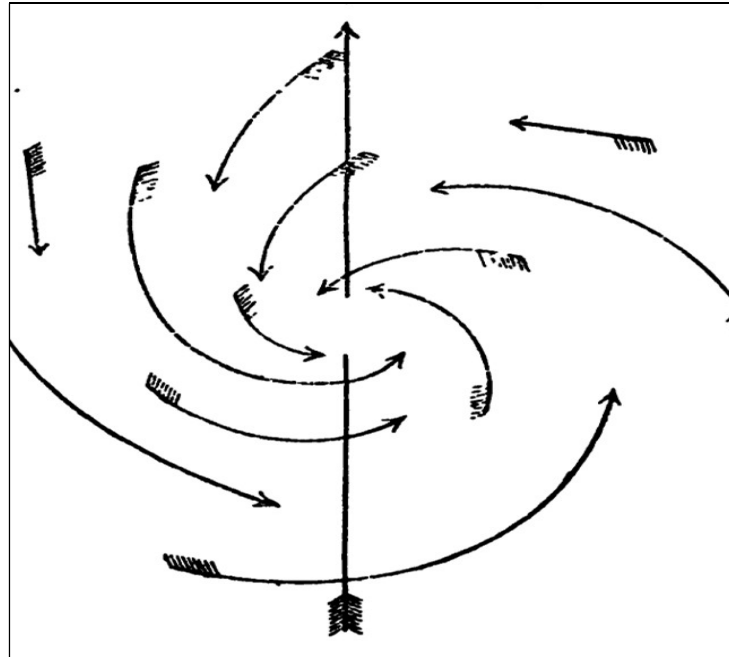
asserted that cyclones were product of the action of local heat producing an upward extension and vertical motion of the air over a specific region which was followed by an in-drught or centripetal direction of wind from the neighbouring areas when rotation induced the deflection of winds in approaching the centre and this ultimately resulted in an inner spiral motion round a centre.<sup>133</sup> Herschel had provided a very useful and important definition of meteorology when he stated that:

“Meteorology, in short, in all that concerns numerical valuation, is pre-eminently a science of detail, and one in which all the subordinate laws which are susceptible of numerical statement have to be made out by laborious and continued observation carried on in every region of the globe. The results of such observation,....freed from the influence of transient and purely local causes of irregularity, and presented in the form of mean or average conclusion, each expressing some general fact or law of progressive change.”<sup>134</sup>

Thus it can be observed that in the second half of the nineteenth century the subject ‘meteorology’ had been regarded by the meteorologists ‘a science’ which was no doubt a remarkable breakthrough in the realm of researches on the evolution of cyclone theories and meteorology as well.



**Figure. 2.1**  
**Wind direction from the centre**



**Figure. 2.2**  
**Wind direction towards the centre**

Source: John Eliot, *Handbook of Cyclonic Storms in the Bay of Bengal for the use of Sailors*, (1890), pp. 13-14.

John Eliot in his *Handbook of Cyclonic Storms* had depicted the above figures containing the centre (origin) and direction (circulation) of winds which were drawn into the centre but not drawn directly to it. The wind direction was followed by a circular or spiral path heading towards the centre.

The theories regarding cyclones had been modified and enriched further by Henry Blanford and J. E. Gastrell (in *Report on October 1864 cyclone*), and W. G. Willson (in *Report on October 1874 cyclone*). Mr. Blanford was credited as one of the author of the *Report on October 1864 cyclone* which was published in 1866. Blanford had put forward the theory of local depression in analyzing the causes of the 1864 cyclone. Though it is now a day a well-known theory but in those days it had a valuable contribution in the area of cyclonic knowledge. Vapour had been ascertained to be the main factor which was created by the combination of light variable wind over the open sea and high temperature, and when vapour got condensed as a result of reduction of its latent heat and lasted for a long time (say for some days) the atmospheric pressure would be locally depressed, thereby to invite inward wind movement to the place of minimum or

depressed pressure. Later Mr. Willson had developed a theory of opposite-parallel winds which was previously put forward by Mr. Meldrum. Mr. Meldrum had found a relationship between solar spot frequency and cyclone prevalence frequency which were created by the action of laterally parallel opposite currents of winds. In this theory it was stated that the rotatory motion and the barometric depression at and near the centre were created due to the action of the opposite and parallel winds. Adding a local dimension in it, Mr. Willson had supported the theory of opposite-parallel winds for analyzing the origin of the October, 1874 cyclone.

Thus one can notice the process of generation and development of knowledge regarding cyclonic occurrences. The natural phenomenon, cyclone, appeared to be an indispensable subject to be dealt with the methods of meticulous analysis and scientific research for its vitality in deciphering the commercial and more broadly, imperial necessities to rule over the ocean. However, researches and endeavour on the part of the mariners and meteorologists' one the one hand and administrative facilities and governmental initiative for proper registration of these events on the other did not go always hand in hand. In fact, Governmental dilemma in terms of the amount of funds to be allotted and spent for the already existed meteorological observatories in India or for the proposed stations in Bengal had unfolded the layers of indecisions and apathy on the part of the colonial government to introduce any sustainable policy even in the later half of the nineteenth century.<sup>135</sup> At the same time the colonial government was not in a mood to allow any experiment for setting up makeshift or temporary meteorological stations. Sometime, even the recommendations of the 'skillful' meteorologists doomed to be a failure as a 'mere fact' that 'would not justify their recommending the establishment of a second class Meteorological Station...; such a recommendation they can conceive be justified only on grounds of a permanent character,...' However, despite of all these reservations 'with a view to a more complete and uniform distribution' the meteorological committee had recommended the establishment of two stations at the north of the Ganges, viz. Muzzaffarpur and Dinajpur, and one to the south-west Bengal viz. Midnapur.<sup>136</sup>

A large amount of cyclonic data had been recorded with the help of barometric and thermometric information captured during the time of storms. However, it was noticed in the case of the cyclones appeared in the Arabian Sea (Western India) that:

“...the errors of the barometers varied from about sixth-tenth of an inch below the truth of about two-tenths above it, and that in half the cases the errors exceeded one-tenth of an inch. The barometric observations were not only corrected for index errors, but also reduced to 32° Fahr. and to sea level...all glaringly inconsistent readings were rejected.... Before entering the barometric observations recorded at land stations on the charts, a correction of diurnal variation, to reduce them from 10 a.m. to noon, was applied to make them comparable with the noon observations recorded on the ships out at sea.”<sup>137</sup>

For Bengal in Eastern India, though it was not copiously authenticated by the meteorologists regarding the accuracy of the barometric and thermometric information on which they had relied upon, but they treated them as workable and dependable. It is interesting to note that the reports on cyclones which appeared in the Western India in Arabian Sea were published from the Superintendent of Government Printing of Calcutta. This shows the impact of the colonial meteorology developed in Bengal which was later followed by the other parts of India. The cyclones in the northern Bengal region were recorded with their barometric variabilities and with the fluctuating rainfall and temperature that included the barometric account of a regular interval of every one or one and half hours of duration of record (especially in the case of 1874 cyclone) which contained detail of varying degree of cyclonic pressure at the different times of day and night. The cyclones occurred between 1864 and 1874 had been noticed with their ever changing wind direction from the meteorological observatories after their entering into the land. For western and south-western districts it was observed in 1888 when four major cyclones had visited in a single year that a prevailing shallow disturbance or barometric depression had existed over a particular area and from this area of depression a number of small storms had developed.<sup>138</sup> Although there was ‘minimum pressure’ in the Southern districts of northern Bengal but at the same time there was ‘a marked tendency to the setting up of a cyclonic circulation of winds’.<sup>139</sup>

In the closing years of nineteenth century and the beginning of twentieth century generation of meteorological knowledge had considerable been systematized and published by the

governmental assistance. The reports of several cyclones originated in the Bay of Bengal had been compiled by the meteorologists under the title of *Handbook of Cyclonic Storms* or *Cyclone Memoirs* in several volumes. John Eliot played a crucial role towards the systematization and publication of these memoirs. The objectives of the compilations and publications of these memoirs were twofold: first to provide seamen a full statement and explanation of “the laws of storms in the Bay of Bengal” for their ‘practical guidance’; and secondly, to inspire the sailors to perceive exactly and vividly the weather conditions of in the Bay of Bengal ‘in the hope that they [would] send in copies of their observations to the Calcutta Meteorological Office, where...every fact likely to be of practical or theoretical use carefully noted and recorded.’<sup>140</sup> Government had taken keen interest in the publication of these Handbooks and Memoirs and these were published from the Superintendent of Government Printing, Calcutta. Thus the documentation on the part of the Government had provided a great impetus towards the generation of meteorological knowledge. It had been cogently mentioned by John Elliot, the Meteorological Reporter to the Government of India and Director General of Indian Observatories, that though there were plenty of theoretical discourses prevailing in the official circle of Indian meteorology but still the *Handbook* was written for the broader knowledge of the sailors ‘without any reference or bias to any particular theory of cyclone generation and motion.’<sup>141</sup> There was another implication of the publication of Handbook other than the meteorological significance. The publication of handbook produced huge demand and it increased during the time of Second World War when the handbook was published by the Government of India from Simla in an abridged form. While forwarding the abridged version of the Handbook, C. W. B. Normand, the Director General of Observatories had categorically stated that: ‘...this abridged edition of the Handbook...will be useful not only to the seaman, but also to the airman and the meteorologist.’<sup>142</sup> Despite of scientific approaches developed for the explanation of clouds during the storms, even in the late nineteenth century it was believed that ‘the examination of synoptic charts can never supersede the necessity of observations on the appearance of the sky.’<sup>143</sup>

## Conclusion

There is no doubt that meteorology both as ‘science’ and a ‘tool’ had a significant impact on the commercial activities as well as on overall economic system. But the expansion of meteorological knowledge did not contribute to the emergence of any practical understanding which could be useful for the mitigation of cyclonic hazard. In fact, the advancement on the field of meteorological knowledge was only directed to the navigational purposes. It hardly had any relevance in forecasting the cyclones for the people who resided on land. It can be said that meteorological survey and research was only confined to the interest of the colonial rulers. When cyclones had took a heavy toll in lieu of losses of human and cattle life, there was hardly any attempt to be made available the meteorological information for the common people. Whatever information about losses or casualties had been collected by the colonial government was confined only into the papers. Only the urban areas and the British settlements received greater attention during the cyclone whereas official reports were collected from all the areas which were affected by the cyclones. Thus Calcutta and Darjeeling occupied the significant position towards mitigation of cyclonic disasters. On the other hand, contradictory official reports displayed ambiguities and uncertainties prevailed in the official circles regarding the loss of life and property in the cyclones. Recovery from the situation was totally relied on the indigenous response to the disasters which demonstrated a wholesome vernacular notion of sensibilities and understanding of natural calamities. It was observed that losses were less in cases of *kutchha* houses than the *pucca* houses. Though it was confidently attributed by the colonial rulers that this could resist further losses, but the assumption was devoid of any tendency or effort on the part of the government to ameliorate poverty of the people so that they could live in a protected or well-constructed house. Materials for repairing destroyed houses could not remain cheap after the disasters, as a result of sudden increase in demand. Side by side, labour became scarce as their individual recovery required a considerable span of time and money. Rural Bengal suffered maximum during this time due to the lack of circulation of money among the villagers who themselves needed charitable support or governmental recovery programme, hardly to find any of those during or after the storm had occurred. Though there was increasing emphasis on the establishment of meteorological observatories in different parts of Bengal but the failure on the

part of the colonial government in introducing better warning systems and preparedness led to the destruction of life and property in every cyclone.

## Notes and References:

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<sup>1</sup> Tonny Gibbs, Windstorms in Joseph P. Stoltman, John Lidstone, Lisa M. Dechano (eds.), *International Perspectives on Natural Disasters: Occurrence, Mitigation and Consequences*, Springer, Netherlands, 2007, p. 65.

<sup>2</sup> Ranjan Chakrabarti, The Kolkata Cyclone/Earthquake of 1737: Random Scribbles, *Vidyasagar University Journal of History*, Vol. 1, 2012-13, p. 1.

<sup>3</sup> The term *hurricane* is originated from the Mayan storm-God Hunraken and the Arawak word *hurican*, which meant the devil wind. The greatest death toll of all recorded hurricanes occurred from October 10-18, 1780. Nearly 20,000 people were perished as the storm hit virtually every island from Tobago in the southeast, through the Windward and Leeward Islands, and across to Hispaniola and Cuba. In the past 60 years in the Caribbean, another 20,000 people have lost their lives because of hurricanes. The pattern in recent times has been a reduction in the number of deaths and injuries due to better warning systems and preparedness. Ibid.

<sup>4</sup> Even in the second half of the nineteenth century the British Government had to depend heavily upon the Ship-masters and others to obtain and keep meteorological records which seemed to have of great importance to them for sailing the ships in the sea and their safe journey. The Newman's Standard Barometer which was stationed at Kandy (Ceylon), Madras, and Calcutta, was used to record barometer readings in the cyclone of October, 1864, had provided information about barometrical and thermometric data from 27<sup>th</sup> September to 1<sup>st</sup> October, 1864. The ship named *Moneka* had supplied the detail records of the cyclone. However, the atmospheric pressures prevailed in these regions and noticed by the different observatories established there were not identical rather varied so widely that it was for sometime become difficult to note this variability. But problem for the time being was overcome by deducting the statistics from maximum barometric data to the minimum.

<sup>5</sup> Lieut. Col. J. E. Gastrell and A. R. S. M. Henry F. Blanford, '*Report on the Calcutta Cyclone of the 5<sup>th</sup> October 1864*', Military Orphan Press, Calcutta, 1866, p. 8. (hereafter *Report on 1864 Cyclone*)

<sup>6</sup> *Ibid.*, p. 9.

<sup>7</sup> *Ibid.*, p. 11.

<sup>8</sup> *Ibid.*, p. 14.

<sup>9</sup> *Ibid.*

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<sup>10</sup> *Ibid.*, p. 26.

<sup>11</sup> *Ibid.*, p. 27.

<sup>12</sup> C. E. Buckland, *Bengal under the Lieutenant Governors: A Narrative of the Principal Events and Public Measures during Their Periods of Office from 1854 to 1898, Vol. I*, S. K. Lahiri & Co., Calcutta, 1901, p. 298.

<sup>13</sup> Mr. Blechynden's account for the *Englishman* Newspaper. *Report on 1864 Cyclone*, pp. 63-64.

<sup>14</sup> *Ibid.*, p. 64.

<sup>15</sup> *Ibid.*

<sup>16</sup> *Ibid.*

<sup>17</sup> *Ibid.*, p. 65.

<sup>18</sup> *Ibid.*

<sup>19</sup> C. E. Buckland, *op. cit.*, vol. I., p. 298.

<sup>20</sup> *Report on 1864 Cyclone*, pp. 65-66.

<sup>21</sup> *Ibid.*, p. 66.

<sup>22</sup> *Extract from a letter from the Assistant Superintendent of Bograh, to the Deputy Inspector – General of Police, No. D., dated 6th Oct. 1864*, Progs. No. 10., Proceedings of the Hon'ble the Lieutenant Governor of Bengal during November, 1864. (General Department). West Bengal State Archives, Kolkata (hereafter WBSA).

<sup>23</sup> J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, Pioneer Press, Allahabad, 1910, p. 74.

<sup>24</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Pabna*, Bengal Secretariat Book Depot., Calcutta, 1923, p. 46.

<sup>25</sup> *Report on 1864 Cyclone*, p. 67.

<sup>26</sup> *Ibid.*, p. 69.

<sup>27</sup> *Ibid.*, p. 70.

<sup>28</sup> *Ibid.*, p. 93.

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<sup>29</sup> *Ibid.*, p. 71.

<sup>30</sup> *Ibid.*, p. 74.

<sup>31</sup> C. E. Buckland, op. cit., vol. I., p. 300.

<sup>32</sup> *From A. B. Falcon, EsQ., Officiating Magistrate of Bograh, to the Commissioner of the Rajshahi Division, - (No. 136, dated the 6th October, 1864),*, Proceedings of the Hon'ble the Lieutenant Governor of Bengal during November, 1864. (General Department). Progs. No. 10, WBSA.

<sup>33</sup> *Extract from a letter from the Assistant Superintendent of Bograh, to the Deputy Inspector – General of Police, No. D., dated 6th Oct. 1864.), Progs. No. 10.,* WBSA.

<sup>34</sup> The police-returns from different *thanas* of the Rajshahi District had reported the following number of deaths caused by the cyclone in the district: Beauleah – 5, Tannore – 3, Bhowanigunj – 7, Bilmariah – 14, Poothea – 24, Charchat – 10, Nattore – 26, Singrah – 37, Boraigaon – 21. The total number of death was 147 and the largest numbers of deaths were occurred at the *thana* of Singrah (37). *Report on 1864 Cyclone*, pp. 138-139.

<sup>35</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Pabna*, p. 46.

<sup>36</sup> “The centre of the storm having traversed the country stretching nearly due east from Calcutta to Basirhat on the Ichamati river. In this line many villages were blown down wholesale, and their destruction was accompanied by much loss of human life. Baruipur, Diamond Harbour, Atharabanka, Basirhat, Gobardanga and Satkhira had suffered severely. The storm-wave beginning from Saugor Island extended a very great distance to the extreme east of the district of 24 Parganas, and in the Kulpotton and Kobadak rivers the water rose to 6 feet above the flood level. The storm was severely felt in Jessore and Nadia and as far as Dacca and Backergunge.” C. E. Buckland, op. cit., pp. 407-8.

<sup>37</sup> *Memorandum from W. Wavell, EsQ., Officiating Collector of Bograh, to the Commisioner of the Rajshahye Division, - (No. 134, dated Bograh, the 4<sup>th</sup> Nov. 1867).* Proceedings of the Hon'ble the Lieutenant Governor of Bengal during April, 1868 (General Department). Progs. No. 102., WBSA.

<sup>38</sup> *Ibid.*

<sup>39</sup> *From H. F. J. Kean, EsQ., Officiating Collector of Dinagepore, to the Secretary to the Board of Revenue, Lower Provinces, - (No. 257, dated Dinagepore, the 11<sup>th</sup> November, 1867).*

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Proceedings of the Hon'ble the Lieutenant Governor of Bengal during April, 1868 (General Department). Progs. No. 103, WBSA.

<sup>40</sup> *Ibid.*

<sup>41</sup> *Ibid.*

<sup>42</sup> *From P. A. Humphery, EsQ., Deputy Collector of Rajshahye, to the Secretary to the Board of Revenue, Lower Provinces, - (No. 6, dated Beaulah, the 13<sup>th</sup> November 1867).* Proceedings of the Hon'ble the Lieutenant Governor of Bengal during April, 1868 (General Department). Progs. No. 106, WBSA.

<sup>43</sup> *Ibid.*

<sup>44</sup> *Ibid.*

<sup>45</sup> *From the Deputy Magistrate and Collector of Rajshahye, to the Commissioner of .....(No. 254, dated Beaulah, the 20<sup>th</sup> November 1867)* Proceedings of the Hon'ble the Lieutenant Governor of Bengal during April, 1868 (General Department). Progs. No. 108, WBSA.

<sup>46</sup> *From W. L. Heeley, EsQ., Magistrate of Rajshahye, to the Commissioner of the Rajshahye Division, - (No. 86, dated Rajshahye, the 11<sup>th</sup> June 1869),* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during September, 1869 (General Department), Progs. No. 157, WBSA.

<sup>47</sup> *From C. E. Lance, EsQ., Officiating Commissioner of the Rajshahye Division, to the Secretary to the Government of Bengal, - (No. 269, dated Berhampore, the 15<sup>th</sup> June 1869.),* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during September, 1869 (General Department), Progs. No. 157, WBSA.

<sup>48</sup> *From W. Le F. Robinson, EsQ., Officiating Commissioner of the Rajshahye Division, to the Junior Secretary to the Government of Bengal, - (No. 134 Ct., dated Camp Rungpore, the 29<sup>th</sup> January 1868)* Proceedings of the Hon'ble the Lieutenant Governor of Bengal during May, 1868 (General Department), Progs No. 66, WBSA

<sup>49</sup> *Ibid.*

<sup>50</sup> *Ibid.*

<sup>51</sup> *From W. V. G. Tayler, EsQ., Collector of Pubna, to the Commissioner of Rajshahye Division, - (No. 505, dated Pubna, the 23<sup>rd</sup> November 1867),* Proceedings of the Hon'ble the Lieutenant Governor of Bengal during April, 1868 (General Department). Progs. No. 111, WBSA.

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<sup>52</sup> *Ibid.*

<sup>53</sup> *Ibid.*

<sup>54</sup> *From W. Le F. Robinson, EsQ., Officiating Commissioner of the Rajshahye Division, to the Junior Secretary to the Government of Bengal, - (No. 134 Ct., dated Camp Rungpore, the 29<sup>th</sup> January 1868)* Proceedings of the Hon'ble the Lieutenant Governor of Bengal during May, 1868 (General Department), Progs No. 66, WBSA.

<sup>55</sup> *Ibid.*

<sup>56</sup> *Ibid.*

<sup>57</sup> *Ibid.*

<sup>58</sup> *From W. LE F. Robinson, EsQ., Officiating Commissioner of the Rajshahye Division, to the Secretary to the Board of Revenue, Lower Provinces, - (No. 20t., dated Camp Maldah, the 11<sup>th</sup> November 1867),* Proceedings of the Hon'ble the Lieutenant Governor of Bengal during April, 1868 (General Department), Progs. No. 101, WBSA.

<sup>59</sup> *Ibid.*

<sup>60</sup> The cyclone had brought havoc to the life and property in the Presidency Division of which the districts of 24 Parganas, Jesore and Nuddea had to face the largest destruction.

| Districts   | Loss of Life | Loss of Cattle | Destruction of Houses |
|-------------|--------------|----------------|-----------------------|
| 24 Parganas | 3,628        | 36,318         | 4,10,054              |
| Jessore     | 126          | 11,735         | 2,74,432              |
| Nuddea      | 180          | 12,556         | 1,27,917              |
| Total       | 3,934        | 60,609         | 8,12,403              |

Amiya Kumar Bagchi and Arun Bandopadhyay (eds.), *Documents on Economic History of British Rule in India, 1858-1947: Eastern India in the Late Nineteenth Century, Part I: 1860s-1870s*, Manohar, New Delhi, 2009, p. 98.

<sup>61</sup> *From Colonel J. C. Haughton, C. S. I., Commissioner of the Cooch Behar Division, to the Officiating Secretary to the Government of Bengal. - (No. 267, dated Julpigoree, the 3rd*

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October 1872), Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during October 1872 (General Department: Industry and Science Branch), Progs. No. 22, WBSA.

<sup>62</sup> The then Junior Secretary of Bengal had instructed the Commissioner of the Rajshahi Division to 'furnish an immediate report as to the damage' caused by the cyclone of September, 1872 in the *thana* of Serajgunj and the district of Bogra of Rajshahi Division. *From J. Ware Edgar, EsQ., the Officiating Junior Secretary to the Government of Bengal, to the Commissioner of the Rajshahye. – (No. 3532, dated Calcutta, the 1st October 1872),* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during October 1872 (General Department: Industry and Science Branch), Progs. No. 38, WBSA.

<sup>63</sup> *From T. F. Bignold, EsQ., Officiating Magistrate of Bograh, to the Commissioner of the Rajshahye Division, Berhampore. – (No. 946, dated Bograh, the 1<sup>st</sup> October 1872,* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during October 1872 (General Department: Industry and Science Branch), Progs. No. 41, WBSA.

<sup>64</sup> *Ibid.*

<sup>65</sup> *Ibid.*

<sup>66</sup> *Ibid.*

<sup>67</sup> *Ibid.*

<sup>68</sup> *From P. Nolan, EsQ., Assistant Magistrate of Serajgunge, to the W. V. G. Tayler, EsQ., Magistrate of Pubna. – (No. 396, dated Serajgunge, the 26th September, 1872),* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during October 1872 (General Department: Industry and Science Branch), Progs. No. 43, WBSA.

<sup>69</sup> *Ibid.*

<sup>70</sup> *From W. D. Pratt, EsQ., District Superintendent of Police, to the Magistrate of Pubna. – (No. 913, dated Pubna, the 6<sup>th</sup> October, 1872),* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during December 1872 (General Department: Industry and Science Branch), Progs. No. 11, WBSA.

<sup>71</sup> *Memorandum by the Officiating Commissioner of the Rajshahye Division. – (No. 249, dated Berhampore, the 28<sup>th</sup> September 1872.),* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during November 1872 (General Department: Industry and Science Branch), Progs. No. 17, WBSA.

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<sup>72</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Pabna*, p. 46.

<sup>73</sup> There were four large *bheels* (water bodies) in the district of Pabna viz. the Challun, Gozna, Borra, and Demra Bheels. These *bheels* were planted with rice, and average depth was 10 feet or 15 feet. Rice crop in these *bheels* had suffered extremely due to excessive wind and rain during the cyclone. *From W. D. Pratt, EsQ., District Superintendent of Police, to the Magistrate of Pubna. – (No. 913, dated Pubna, the 6<sup>th</sup> October, 1872)*, Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during December 1872 (General Department: Industry and Science Branch), Progs. No. 11, WBSA.

<sup>74</sup> *Ibid.*

<sup>75</sup> *Ibid.*

<sup>76</sup> W. G. Wilson, *Report on the Midnapore and Burdwan Cyclone of the 15th and 16th of October 1874*, Bengal Secretariat Press, Calcutta, 1875. (Hereafter - *Report on the Cyclone of 1874*).

<sup>77</sup> In 1874, the rainfall in the Lower Bengal was not only scanty but it was unseasonably distributed in Bengal with an unprecedented increase in occurrence of storms and cyclones in the month of August. Other parts of India (Central Provinces, N. W. Provinces and Bihar) had witnessed good quantity of rainfall. The period from 10th to 14th of October was mostly 'rainless' all over Bengal with occasional showers at some places and the weather became gradually warm. *Report on the Cyclone of 1874*, p. 13.

<sup>78</sup> *Ibid.* p. 43.

<sup>79</sup> The district of Midnapur had to witness the maximum destruction in terms of loss of human lives and cattle, though the other parts of the southern Bengal had also to undergo with severe damage 'but by no means [were] equal to the injury done at Midnapore'. There had been total 3,049 human deaths and 17,500 cattle were perished in the whole district of Midnapur. From station of Midnapur the cyclone had passed over Ghatal and Jahanabad to the station of Burdwan and in the Burdwan district 21,000 houses were destroyed and 29 human deaths were occurred. For more details see C. E. Buckland, *Bengal under the Lieutenant Governors: A Narrative of the Principal Events and Public Measures during Their Periods of Office from 1854 to 1898, Vol. II.*, S. K. Lahiri & Co., Calcutta, 1901, p. 621.

<sup>80</sup> For details see Collection No. 4-34 and Collection No. 4-35 of *Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875* (General Department), WBSA.

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<sup>81</sup> [Collection No. 4. – 38/39] *From Baboo Brojo Kant Rae, Deputy Collector, to the Officiating Collector of Rungpore. – (No. 141, dated Gyebunda, the 30th October 1874), Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.*

<sup>82</sup> *Report on the Cyclone of 1874, p. 78.*

<sup>83</sup> [Collection No. 4. – 38/39] *From Baboo Brojo Kant Rae, Deputy Collector, to the Officiating Collector of Rungpore. – (No. 141, dated Gyebunda, the 30th October 1874).*

<sup>84</sup> [Collection No. 4. – 38/39] *From Baboo Krishto Dhone Ghose, M.D., Civil Surgeon of Rungpore, to the Magistrate of Rungpore. – (No. 402, dated Rungpore, the 31st October 1874), Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.*

<sup>85</sup> *Report on the Cyclone of 1874, p. 77.*

<sup>86</sup> [Collection No. 4. 36/37] *From Dr. A. Lyons, Civil Medical Officer, Bogra, to the Magistrate of Bogra (No. 1222, dated Bogra, the 27th October 1874), Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.*

<sup>87</sup> *Report on the Cyclone of 1874., pp. 77-78.*

<sup>88</sup> [Collection No. 4. 36/37] *From Dr. A. Lyons, Civil Medical Officer, Bogra, to the Magistrate of Bogra (No. 1222, dated Bogra, the 27th October 1874).*

<sup>89</sup> [Collection No. 4- 29/30] *From Baboo Dwarka Nath Chatterjee, Civil Medical Officer, to the Magistrate of Maldah (No. 155, dated Maldah, the 28<sup>th</sup> October 1874), Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.*

<sup>90</sup> [Collection No. 4- 29/30] *From F. Wyer, EsQ., Officiating Collector of Maldah, to the Secretary to the Government of Bengal, in the Statistical Department, (No. 534, dated Maldah, the 29<sup>th</sup> October 1874), Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.*

<sup>91</sup> *Ibid.*

<sup>92</sup> *Report on the Cyclone of 1874., p. 75.*

<sup>93</sup> *Ibid.*

<sup>94</sup> [Collection No. 4. 31/32] *From W. H. Doyly, EsQ., Collector of Rajshahye, to the Assistant Secretary to the Government of Bengal, Statistical Department. – (No. 2904, dated Beaulah, the*

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29<sup>th</sup> October 1874), Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.

<sup>95</sup> *Report on the Cyclone of 1874.*, pp. 75-76.

<sup>96</sup> [Collection No. 4. 31/32] *From W. H. Doyly, EsQ., Collector of Rajshahye, to the Assistant Secretary to the Government of Bengal, Statistical Department. – (No. 2904, dated Beaulah, the 29<sup>th</sup> October 1874).* (WBSA)

<sup>97</sup> *Report on the Cyclone of 1874*, p. 71.

<sup>98</sup> *Ibid.*

<sup>99</sup> *Ibid.*

<sup>100</sup> [Collection No. 4-26] *From W. Wavell, EsQ., Officiating Magistrate and Collector of Moorshedabad, to the Secretary to the Government of Bengal, Scarcity and Relief Department, Darjeeling. – (No. S.R. – H.D., dated Berhampore, the 17th October 1874),* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA

<sup>101</sup> *Ibid.*

<sup>102</sup> *Report on the Cyclone of 1874*, p. 73.

<sup>103</sup> [Collection No. 4. – 40/41] *From W. Wavell, EsQ., Officiating Collector of Moorshedabad, to the Assistant Secretary to the Government of Bengal. – (No. 324Ct., dated Camp Khurgaon, the 21<sup>st</sup> November 1874.)* Proceedings of the Hon'ble the Lieutenant-Governor of Bengal during January 1875 (General Department), WBSA.

<sup>104</sup> For more details see J. Elliott, *Report of the Vizagapatam and Backergunge Cyclones of October 1876*, Bengal Secretariat Press, Calcutta, 1877.

<sup>105</sup> *Papers on the Subject of the Bengal Cyclone and Storm-wave of the 31st October – 1st November 1876 and the Subsequent Cholera Epidemic*, George Edward Eyre and William Spottiswoode, London, 1877, p. 2.

<sup>106</sup> Harendra Narayan Chaudhury, *The Cooch Behar State and its Land Revenue Settlements*, Cooch Behar State Press, Cooch Behar, 1903, p. 79.

<sup>107</sup> The Annual Administration Report of the Cooch Behar for the year 1886-87, cited in *The Cooch Behar State and its Land Revenue Settlements*, p. 80.

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<sup>108</sup> *Ibid.*

<sup>109</sup> G. E. Lambourn, *Bengal District Gazetteers: Malda*, Bengal Secretariat Book Depot, Calcutta, 1918, p. 57.

<sup>110</sup> *Ibid.*

<sup>111</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, Bengal Secretariat Book Depot., Calcutta, 1907, p. 129.

<sup>112</sup> *Ibid.*

<sup>113</sup> *Darjeeling District Gazetteer: Statistics, 1901-02*, Calcutta, 1905, p. 3.

<sup>114</sup> E. C. Dozey, *A Concise History of the Darjeeling District since 1835 with a Complete Itinerary Tours in Sikkim and the District*, Calcutta, 1922, pp. 140 - 41.

<sup>115</sup> *The Fairfield News and Herald*, Winnsboro. S. C., Wednesday, October 4, 1899. Vol. LIV, No. 8.

<sup>116</sup> Kule (in Nov. 1867) and Serajgunge (in Sept. 1872) of the district of Pubna and the whole of Darjeeling district (in 1899) had to suffer a loss of huge amount of commodity like – sugar, paddy, wheat, indigo, jute, salt, tea, timber etc.

<sup>117</sup> Cited in Tirthankar Roy, *Natural Disasters and India History*, Oxford University Press, New Delhi, 2014 (second impression), p. 112.

<sup>118</sup> Greg Bankoff, Winds of Colonization, The Meteorological Contours of Spain's Imperium in the Pacific 1521-1898, *Environment and History*, 12, 2006, p. 66.

<sup>119</sup> The process of collection of meteorological data in Great Britain was started centuries ago when Royal Observatory at Greenwich was constructed in 1675 for the purpose of astronomy and navigation. Later developments were followed by the introduction of new technologies and methods to clarify and analysis of meteorological figures. The Observatory practice of using young boys as computers was introduced by Airy in the 1830s to deal with a backlog of astronomical data. Computers were frequently recruited from the Roan School and also from the Bormann Foundation School attached to the Naval College. The entrance examination for computers involved writing from dictation to test hand-writing, spelling, punctuation, arithmetic, including extraction of square roots and the use of logarithms, and algebra to quadratic equations. Joan M. Kenworthy, *Albert Walter, O. B. E. (1877-1972): Meteorologist in the Colonial Service, Part I: His Early Life and Work in Mauritius*, Occasional Paper, Royal

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Meteorological Society, 2013, p. 6. For more details see Albert Walter, *Echoes of a Vanishing Empire, being the Memoirs of a Meteorologist and Civil Servant in the Colonial Empire 1897-1947*, Volume I, 1963.

<sup>120</sup> R. K. Kochar, *Science in British India. I. Colonial Tool*, *Current Science*, Vol. 63, No. 11, 10 December 1992, p. 691.

<sup>121</sup> *Report on the Cyclone of 1874*, p. 81.

<sup>122</sup> *Ibid.*

<sup>123</sup> *Ibid.*, pp. 82-83.

<sup>124</sup> Tirthankar Roy, 'The Law Of Storms': European and Indigenous Responses to Natural Disasters in Colonial India, C. 1800–1850, *Australian Economic History Review*, Vol. 50, No. 1, March 2010, p. 8.

<sup>125</sup> Cited in J. Elliott, *Report of the Vizagapatam and Backergunge Cyclones of October 1876*, p. 3.

<sup>126</sup> Lieut. Colonel W. Reid, *An Attempt to Develop the Law of Storms by Means of Facts, arranged according to place and time; and hence to point out a cause for the Variable Winds with the view to Practical Use in Navigation*, John Wale: Library of Civil, Military, and Mechanical Engineering, London, 1838.

<sup>127</sup> *Ibid.*, p. 2.

<sup>128</sup> W. H. Drove, *The Law of Storms: Considered in Connection with the Ordinary Movements of the Atmosphere*, translated by Robert H Scott, Longman, London, Second Edition, 1862, p. 3.

<sup>129</sup> For detail see H. Piddington, A Seventeenth Memoir on the Law of Storms in India; being Storms of the China Seas from 1842–1847, and Some of the Northern Pacific Ocean from 1797, *Journal of the Asiatic Society of Bengal*, 18, 1849, pp. 1–45.

<sup>130</sup> Cited in Pratik Chakraborty, The Asiatic Society and its Vision of Science: Metropolitan Knowledge in a Colonial World, *Calcutta Historical Journal*, Vols. XXI & XXII, 1999-2000, P. 7.

<sup>131</sup> Cited in J. Elliott, *Report of the Vizagapatam and Backergunge Cyclones of October 1876*, p. 4.

<sup>132</sup> *Ibid.*

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<sup>133</sup> For detail see Sir John F. W. Herschel, *Meteorology*, Adam and Charles Black, Edinburgh, 1861.

<sup>134</sup> *Ibid.*, pp. 5-6.

<sup>135</sup> Government was very much choosy in terms of spending money for the temporary meteorological observatories and 'to limit their expenditure' it was restrained itself from investing any extra amount other than the amount budgeted for. For details see From H. L. Harrison, EsQ., Junior Secretary to the Government of Bengal, to the Secretary to the Meteorological Committee, - (No. 2644, dated Fort William, the 30th May 1868), Progs No. 117, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal (General Department)* Fort William, May, 1868, WBSA.

<sup>136</sup> From H. F. Blanford, EsQ., Secretary to the Meteorological Committee, to the Junior Secretary to the Government of Bengal, - (No. 398, dated the 5th May 1868), Progs No. 118, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal (General Department)* Fort William, May, 1868, WBSA.

<sup>137</sup> The Cyclone of the 25<sup>th</sup> May to the 2<sup>nd</sup> June 1881 in the Arabian Sea (VIII) in *Indian Meteorological Memoirs being Occasional Discussions and Compilations of Meteorological Data relating to India and the Neighbouring Countries*, Vol. IV, Part. V, Superintendent of Government Printing, Calcutta, 1888, pp. 261-262.

<sup>138</sup> Alexander Pedler, Account of the Cyclonic Storm of August 21<sup>st</sup> to 28<sup>th</sup>, 1888 in J. Eliot, *Cyclone Memoirs Part II: Bay of Bengal Cyclone of August 21<sup>st</sup> – 28<sup>th</sup>, 1888*, Superintended of Government Printing, Calcutta, 1890, p. 48.

<sup>139</sup> *Ibid.*, p. 49.

<sup>140</sup> John Eliot, *Handbook of Cyclonic Storms in the Bay of Bengal for the use of Sailors*, Superintendent of Government Printing, Calcutta, 1890, Preface.

<sup>141</sup> John Elliot, *Handbook of Cyclonic Storms in the Bay of Bengal for the Use of Sailors, Vol. I – Text*, Superintendent of Government Printing, Calcutta, 1900, second edition, p. i.

<sup>142</sup> *India Meteorological Department: The Handbook of the Cyclonic Storms in the Bay of Bengal for the Use of Sailors (Abridged)*, by Sir John Eliot, Manager: Government of India Press, Simla, 1944.

<sup>143</sup> Cited in Tirthankar Roy, *Natural Disasters and India History*, p. 102.

## **Chapter III**

### **Disaster, Vulnerability and State: Earthquake in Northern Bengal in 1897 and 1934**

The earthquakes caused by the earth movements are clustered along two belts of seismic activity, one around the Pacific and the other extending from the Alps to the Himalayas and over ninety per cent of the total number of earthquakes lay along these belts and the occurrence of earthquakes are subject to the variations in seismicity caused by the irregularity in the spread of seismic belts whether being great in some parts and small in others.<sup>1</sup> The geomorphological evolutions through the centuries had not only shaped the sub-Himalayan tract of which districts of northern Bengal form a major part but made significant contributions towards the formation of natural topographical atlas of Bengal as a whole. Being contiguous to the sub-Himalayan region which is very prone to the zone of seismic activity, districts of northern Bengal, more or less, in general had to witness a series of earthquakes that ravaged its different parts during the colonial rule. Though Geology as a scientific discipline was a product of colonial initiative to acquire knowledge about mineral resources of India but it had little contribution in mitigating the earthquake occurrences and its effects. The earthquake of 1897 is officially known as Assam Earthquake and the earthquake of 1934 has been termed as Bihar-Nepal earthquake. Several historical and scientific researches on 1897 and 1934 earthquakes have been carried out by the historians and social scientists that delve into the aftermath of the disasters in the northern and north-eastern parts of India but little importance has been given to the affected areas of north Bengal. Available documents and information on these two earthquakes for northern districts of Bengal are not only scarce but could only be obtained in a more scattered manner. Perhaps for this reason hardly any attempt has been made by the social scientists to find out the extent of destruction and suffering or recuperating of the society of north Bengal during and after the earthquakes. The study will focus on two major earthquakes, occurred in 1897 and 1934 which produced considerable changes in the existed state of land, water-bodies and drainage pattern,

public and private masonry buildings, the railways and also in the overall communication system of northern Bengal.

According to the *International Perspectives on Natural Disasters* earthquake is the result of the continuous cycle of stress accretion and pressure release along faults and seismogenic structures in the earth's layer. All parts of the earth's crust are subject to compressive (pushing together), tensile (tearing apart), and shearing stresses, which cause strain to accumulate gradually over time. Walter Hays argues that when the stress exceeds the strength of the rocks, sharp failure occurs, causing in slide or rupture and permanent twist along a fault zone and as a result rupture front spreads out from the focus of the earthquake (sometimes called the hypocenter) as elastic seismic waves.<sup>2</sup> In disaster research though scholars have focused much on the geologic, seismological and engineering aspects of the earthquakes, one cannot eschew the utter significance of historical developments and sociological magnitudes of a society prone to the earthquake. Vulnerability can also be estimated in terms of failure or availability of earthquake knowledge and the degree of prevention, mitigation, and preparedness measures that are adopted as public policy by the state and prescribed by the community assuming their traditional existence on a particular geographical region shaped and transformed by politics, business and 'subjugation'. The livelihood and survival of the people of India in the nineteenth century, however, was in provenance and reaction of the changing pattern of colonial domination and regulations derived from the administrative rules and laws imposed upon them time to time.

Himalayan belt is considered as vulnerable to great earthquakes of magnitude exceeding 8.0 and during the closing years of the nineteenth century and first half of the twentieth century in a short span of about 50 years, four such earthquakes have occurred: 1897 Assam (M8.7), 1905 Kangra (M8.6), 1934 Bihar-Nepal (M8.4), and 1950 Assam-Tibet (M8.7)<sup>3</sup>. One natural calamity, very often, succeeds by other calamities that aggravated the human suffering during these calamitous days. An earthquake which is instrumental to the causing of landslips or vice-versa (abrupt reducing of rock or soil-pressure sometime created the condition of earthquake in a local level), or flood, accelerated by excessive rainfall, that exposed the occurrence of serious landslips in the hilly region, emphasizes the necessity of investigating their influence in the social and material life of the inhabitants of the region concerned. The earthquake of 12<sup>th</sup> June of 1897, popularly

known as Assam Earthquake, had ‘three distinct types of wave motion having different rates of propagation’;<sup>4</sup> one succeeding the other and the total duration was just more than three minutes. Shillong, the summer capital of Bengal until 1874 and the capital of Assam thereafter, had to suffer a major setback in its idealistic image of pleasant hill-town that provided adequate space for British leisure and amusements was shaken by the earthquake beyond repair.<sup>5</sup> R.D. Oldham, the head of the *Geological Survey of India* (GSI) had described:

‘At about quarter past five in the afternoon of the 12th June 1897, there burst on the western portion of Assam an earthquake which, for violence and extent, has not been surpassed by any of which we have historic record. Lasting about two and a half minutes, it had not ceased at Shillong before an area of 150,000 square miles had been laid in ruins, all means of communication interrupted, the hills rent and cast down in landslips, and the plains fissured and riddled with vents, from which sand and water poured out in most astounding quantities; and ten minutes had not elapsed from the time when Shillong was laid in ruins before about one and three quarter millions of square miles had felt a shock which was everywhere recognized as one quite out of the common.’<sup>6</sup>

The *Imperial Gazetteer of India* highlighted the damage in the following words: ‘Nearly all masonry buildings in Gauhati and Sylhet were completely wrecked, and much damage was done in Goalpara, Nowgong, and Darrang. Two Europeans and 1,540 natives lost their lives, the majority of the latter being killed by landslips in the hills and by the falling in of river banks in Sylhet. Roads and bridges were destroyed, and the drainage of the country was seriously affected by the silting-up of streams and watercourses.’<sup>7</sup> Calcutta witnessed the earthquake on a minor scale but more constructions were ruined there. Though the incident had acquired a great place in the newspapers of Assam and Calcutta<sup>8</sup> but there was hardly any intervention on the part of the colonial state through any charitable grant.<sup>9</sup>

Several historical and scientific researches on 1897 earthquake have been carried out by the historians and social scientists that delve into the aftermath of the disaster in the north-eastern part of India, particularly the Assam and Shillong regions; however, little importance has been given to the affected areas of north Bengal. So far the available documents and information on 1897 earthquake are concerned they overwhelmingly concentrate on the Shillong plateau region and statistics or information for northern districts of Bengal are not only scarce but could only be obtained in a more scattered manner. Perhaps for this reason hardly any attempt has been made by the social scientists to find out the extent of destruction and suffering or recuperating of the

society of north Bengal during and after the earthquake.<sup>10</sup> In this background the present article seeks to draw from historical standpoint, the occurrence and consequences of the Earthquake of 1897 which originated in the region of Shillong plateau and affected lives and property in northern part of Bengal and the subsequent measures taken by the colonial Government during and after the events.

## I

### **Earthquake Society and Hazard: North Bengal in 1897**

Along with Assam and its neighbouring north eastern states, the districts of northern Bengal viz. Districts of Darjeeling, Rangpur, Pabna, Dinajpur and the Princely State of Cooch Behar had also become the victims of the earthquake. Although the earthquake was called as Assam Earthquake but large parts of Bengal had also felt the vibrations of the earthquake. C. E. Buckland has summed up the devastations caused by the earthquake in Bengal in the following manner:

“.....an earthquake shock, varying in severity, was felt throughout the province of Bengal.....The shock was far more severe over a larger area than that of any previous earthquake in Bengal of which any authentic record exists..... It was strongest in the districts of Rajshahi Division, the Kuch Bihar State, and the districts of Dacca and Mymensingh. The damage done to buildings, roads, and bridges was greatest in Rangpur, which lies on the western side of the Brahmaputra, opposite to the Garo Hills, in Kuch Bihar, in Mymensingh, south of the Garo Hills, in Bogra, in Dacca, and in Dinajpur. Many houses were damaged, and some destroyed, in Darjeeling. A remarkable feature of the earthquake was the opening of fissures in the ground through which water and sand were ejected..... In the towns of Rangpur, Bogra, Pabna, Dinajpur, Murshidabad, Berhampur, Dacca, Mymensingh, and Kuch Bihar nearly, all the masonry houses suffered; while .... in Malda a considerable proportion of the larger buildings were damaged. .... Heavy damage was done to the permanent-way, bridges and buildings on the Eastern Bengal State Railway, the Assam-Bengal Railway and the Kuch Bihar State Railway. The head-quarters of Government, which at the time were at Darjeeling, were for 3 days cut off from postal communication, and regular passenger traffic was suspended on the northern section of Eastern Bengal State Railway for a fortnight..... In Kuch Bihar the earthquake was very severely felt, and caused most serious damage to the Maharaja's palace, the state buildings generally, the State Railway and roads and bridges, the total loss being estimated at over 15 lakhs.<sup>11</sup>

Though the District of Darjeeling did not have to witness of becoming an epicenter of any major seismic activity but the district had felt the presence of earthquake, originated in north-east India, since 1842 and several shocks were felt between March and October in the year 1863. The District was affected by a major earthquake which occurred in the north-east on 12<sup>th</sup> June, 1897. Geologically the District of Darjeeling was comprised of unaltered sedimentary rocks, rested to the hills on the south, and various forms of metamorphic rocks over the rest of the area. The hilly parts of the district were consisted of soft rocks such as schists, shales, and clays or thick layers of soil and weathered rocks on steep slopes.<sup>12</sup> Darjeeling had to face ‘a good deal of destruction’ of the buildings ‘which being heavy, stone-built structures,.....oscillated out of their centres and flattened out like a pack of cards; while the lighter, wooden structures suffered little or no damage.’<sup>13</sup> The worst affected parts of the district were the Darjeeling town and the railway station at Tindharia. In many buildings cracks appeared or walls fell out and bungalows were damaged by the fall of stone-built chimneys rolling through roofs. Due to the loose nature of soil landslips were started near Tindharia station soon after the earthquake and in Siliguri ground fissures appeared at several places in the submontane tract to the north, near Sukna and beyond and the Cart road was cut up.<sup>14</sup> The head-quarters of Government, which at the time were at Darjeeling, were for 3 days cut off from postal communication, and regular passenger traffic was suspended on the northern section of the Eastern Bengal State Railway for a fortnight.<sup>15</sup> E. C. Dozey has described this event in following manner:

‘Assuming that the focus of disturbance to have been near Cherapunji in Assam, the shock appears to have travelled thence to the western extremity of Bengal and Behar in 6 minutes or less. Its duration varied greatly, according to the reports of local officers, the lowest being 5 seconds, the highest 5 minutes.’<sup>16</sup>

The news about the destruction caused by the earthquake of 1897 spread out to a larger populace far too quickly. The newspaper, *The Mercury* reported in Thursday morning on 22<sup>nd</sup> June, 1897 under the headlines - “*Indian Earthquake – Darjeeling Railway Destroyed – 6, 000 Lives Lost in Assam – Queen’s Massage of Sympathy*” - :

“The Darjeeling railway for fifty miles has been completely destroyed, cutting of all communication between the termini. Her Majesty Queen Victoria has forwarded to the

Viceroy of India (Earl of Elgin) a message, sympathising with her Indian subjects in their great tribulation.”<sup>17</sup>

In the hilly regions of Darjeeling district the earthquake produced landslides. The types of landslides that were occurred in Darjeeling were classified, according to the Swiss terminology, as *Schuttsturze*, i. e. soil sidles or soil slips <sup>18</sup> and this *Schuttrutschungen* was caused by slow movements of soil or unconsolidated material along the hill slopes and these movements of soil were common at the lands stretched between Mahanadi and Rangtong rivers.<sup>19</sup> The deduction of soil from the surface by the automated action of running water, and the concurrent accumulation of decomposed products below the sub-soil by chemical activity of infiltrating water are not simultaneously compensatory in slopes covered with vegetation and on the other hand the creation of soil-cap, obviously, does not in itself help to an increase in the surface slope but its erosion from the foot of a slope by watercourses increases the average slope of the hillside. This kind of destabilization or subsidence of the foot of a hill was recorded in the faulted area between the two branches of the Kagjhora in Darjeeling.<sup>20</sup> In recent time, a large amount of landslides have occurred due to the over exercise on nature by human being and thus, ‘there has been a rapid acceleration of landslide phenomena over this region due to anthropogenic abuse like unscientific settlement construction, severe deforestation, overloaded cargo (more than 80 ton trucks etc.) induced tremor, poor maintenance of tea garden areas, dumping of garbage behind the settled buildings, poor or non-maintenance of community drains etc.’<sup>21</sup>

H. H. Hayden, the Assistant Superintendent of Geological Survey of India has reported the damages in north Bengal caused by the earthquake of which Darjeeling occupied an overwhelming section, in comparison with the other districts of north Bengal. His account recorded the damages occurred at Tindharia railway station and its surrounding parts, at the Darjeeling town and its other adjoining areas. He noted – “Here the most striking effects of the earthquakes [were] seen in the large number of chimneys which have fallen. Many houses,.....[had] been badly damaged by the falling in of the great heavy chimney stacks which crashed through the roof, breaking everything before them.....In the old Bhutia Cemetery,.....several old tombs were partially thrown down.”<sup>22</sup>

The Princely State of Cooch Behar<sup>23</sup> had to suffer loss in its property in Darjeeling and the cost of which was amounted to Rs. 2½ lakhs, while for Cooch Behar zamindaries in the State, it was

Rs. 18, 000 and in Calcutta it was Rs. 7, 000.<sup>24</sup> The *Annual Administration Report* (1897-98) has summed up the severity of the earthquake in following manner:

“The state was visited by a terrible earth-quake on the 12<sup>th</sup> of June 1897. There were three distinct shocks, one succeeding the other, coming from the north-east, the whole lasting for a little over three minutes....The earth was fissured, sand and water spouting out from the fissures. The earth sank in places, while beds of rivers...were upheaved. Your Highness’ Palace, other state buildings, roads, bridges...suffered very serious damage. The damage in the State alone has been estimated to be about Rs. 17, 93, 847....There were also some petty losses in cattle, crops and cutcha houses....[and] small loss of life (8 only having been killed) is a noteworthy fact.”<sup>25</sup>

However, the cost of damage varied widely as estimated from different accounts. Calica Doss Dutt, the then Dewan of the State of Kuch Bihar has recorded that:

“There was not much loss of human life, the victims having been eight in number only, and that being confined to the town of Cooch Behar.... But loss to property was enormous. All the pucca buildings were more or less severely injured, roads were badly fissured, bridges damaged, and drain and wells choked and filled up. The damages done to the palace and the public buildings in the town amounted to about ten lacs of rupees, and that to private buildings, about seventy five thousand.... Successive shocks were felt throughout the night and even afterwards, all through the year at intervals. Springs of hot water with sands issued from many of the fissures; and at places ashes and cinders were thrown out. The beds of marshes and beels were upheaved, and many fisheries became dry.”<sup>26</sup>

T. D. LaTauche, Superintendent, Geological Survey of India, has recorded that “Several high bunds which ran due north from the bazar to the road connecting Dhubri with Kuch Bihar have been fissured transversely at intervals of a few feet, and settled down considerably.”<sup>27</sup> Considerable damage and destruction of bridges were observed in the different parts of Princely State of Cooch Behar and adjacent regions.

“Near Shampur,... the hexagonal brick piers of one of the bridges have been broken through horizontally and the upper portion has shifted slightly..... The same effect is seen in numerous places between Rangpur and Kuch Bihar, where bridges of small span cross canals or swamps.... In the neighborhood of Dewan Hat, however, the line has suffered severely, and the bridges, particularly that over the Manshai River, have been broken..... At about seven miles south of Kuch Bihar, a small bridge passing over a water channel in swampy land has been damaged by the thrusting-up of the central pier.”<sup>28</sup>

Sand was ejected in many parts of North Bengal that went through four or five yards in width even sometimes varied to few inches to 10 feet with an average width between 1 foot and 3 feet which were usually visible on the Cooch Behar branch between Teesta and Dewan Hat. The banks of river Torsa had been much cut up by fissures on both sides and had in many places caved in.<sup>29</sup> The shock of earthquake did not end on the 12<sup>th</sup> June; however, several waves of after-shock were felt in later time which had extended even in the month of July.<sup>30</sup> The earthquake hit hard to the area between the railways from Parbatipur to Cooch Behar where ground was fissured and the platform was sunk along with the railway stone posts at Shampur. The Princely State of Cooch Behar had to undertake serious observations regarding the modification of the annual budget of 1897-98 invoked by the critical situation produced by the earthquake while anticipating the necessity of improving the condition from the earthquake destruction. The State had sanctioned rupees one lakh as expenditure for the public works in addition to the sum of Rs. 73,681 that had already granted in the budget.<sup>31</sup>



Plate: 3.1

Broken bridge across Nallah at Haldibari

Source: Plate No. XVI - Earthquake of 12<sup>th</sup> June by R. D. Oldham. (WBSA)<sup>32</sup>



Plate: 3.2

### Damaged railway line between Haldibari and Moghal Hat

Source: Plate No. XVII - Earthquake of 12<sup>th</sup> June by R. D. Oldham. (WBSA)<sup>33</sup>

The district of Jalpaiguri was also suffered from this earthquake. In Jalpaiguri much damage was done to the roads by collapsing and by the opening of deep fissures, and many bridges was destroyed.<sup>34</sup> At Raninagar the earth was much fissured and these fissures were three hundred yards long stretched parallel to the railways which were often dislocated.<sup>35</sup> H. H. Hayden has further recorded that -

“[A]t Haldibari railway station the permanent way and platform were cut up by fissures running north and south and a large portion of platform was subsided....there [were]..... circular holes from which,... sand and water were ejected during the earthquake. In some cases the displacing force has been sufficient to break the solid steel rails, but, more frequently, fracture has taken place at the junction of the rails, the fish-plates being broken and bolts turn out. The rails also [were] often displaced [and] in some cases the displacing force [had] been sufficient to break the solid steel rails,..... fracture [had] take place at the junction of the rails, the fish-plates being broken and bolts torn out. At about half way between Haldibari and Mandalghat four telegraph posts have fallen....At Jalpaiguri..... a two

storied brick building, was ...badly cracked.....At Belakoba railway station house [was] cracked at its north-east corner...”<sup>36</sup>

In Jalpaiguri a two storage post office made of brick had severely cracked and the District Board Office had literally fallen down to the ground.<sup>37</sup> Between Belakoba and Siliguri fissures of 3 to 4 inches had appeared again for short duration until they disappeared. The railway station of Jalpaiguri town fell under considerable destruction ‘owing to the severe shock of earthquake that occurred.... about 5 p.m.’<sup>38</sup>

The effect of the earthquake of 12<sup>th</sup> June, 1897 was exceptional in Dinajpur which caused massive destruction to the buildings in comparison with the previous earthquakes. In Dinajpur the earthquake caused considerable damage to masonry buildings and created panic among the inhabitants of the town.<sup>39</sup> The Rajbari of Dinajpur suffered most of all and parts of it had to be rebuilt. The *pukka* houses in the town belonged to several zamindars were also seriously injured and the walls of the Judge’s and Collector’s houses were cracked.<sup>40</sup> In Rajshahi district the shock was severe, especially on the eastern side, but the loss of life was comparatively small, though four deaths were reported from Nator, two from Naogaon, and nine from Rampur Boalia.<sup>41</sup> In the district town of Rajshahi Government buildings, the Judge’s Court house, the Collectorate, the record-room, the Circuit house, the police barracks and subsidiary buildings, the post office, the educational buildings and the Para Kothi at Rampur Boalia were all more or less damaged.<sup>42</sup> The zamindars suffered seriously and the greatest loss fell upon the leading families resided at Nator, Dighapatia, and Puthia. Earth fissures occurred throughout the district, and the roads were badly cracked in places and moreover, large railway bridges over Atrai and Baral were much damaged, and many of the small bridges and culverts had to suffer loss.<sup>43</sup> H. H. Hayden, Assistant Superintendent, Geological Survey of India has reported that “....the *Atrai* river fissures were seen for the first time; here they run almost due east and west, parallel to the banks of the river, and continue for several hundred yards with a breadth of (on an average) 6 to 8 inches.”<sup>44</sup>

Among the earthquake affected districts of north Bengal, Rangpur was one of such districts which had fallen under severe destruction. H. H. Hayden has asserted that “Of all the places visited by me, Rangpur was undoubtedly that which had suffered the most damage....almost every brick building was irretrievably damaged, while several were almost completely overthrown....the Raja of Dimla’s house,...was almost completely surrounded by tanks and

consequently suffered very badly....In the cemetery at Rangpur two similar monuments were partially overthrown.”<sup>45</sup>The shocks started at 5.15 p. m. on 12<sup>th</sup> June and lasted for about five minutes.

“The crust of the earth was rent into great yawning fissures, east to west in direction, from which torrents of sand and water poured over the surrounding country. The same phenomenon was observed in rivers, tanks and wells. In many places there were explosions leaving cavities in the ground 4 or 5 feet in diameter, from which there was a similar discharge of sand and water. A great shrinkage of water and an accession of sand in khals, canals, streams, tanks, and wells was observed immediately after the earthquake. Large tracts of cultivated land were covered with a thick layer of sand, causing much damage to standing crops and rendering many lands unculturable.”<sup>46</sup>

The damage in Rangpur had been attributed not to the actual shock of the secondary effects of the earthquake, rather for the whole town was constructed by the loose and porous waterlogged sands which accelerated the opening of fissures under the houses that consequently led to the splitting of the walls.<sup>47</sup> In the cemetery at Rangpur two similar monuments were partially toppled and both had fallen inwards and the space between two was filled ‘with a confused mass of bricks and mortar.’<sup>48</sup> Throughout the district of Rangpur shallow wells were split up which filled by sands and particularly at Haripur rolled pieces of lignite were said to have been ejected in large quantities with sand that could possibly derived from the disintegration of the coarse tertiary sandstones found in large quantity on the lower slopes of the nearest range of the Himalayas.<sup>49</sup> Between Rangpur and Kaunia the railway line was much damaged and the permanent way was fissured. The bridges over Monas river were broken and rendering of traffic became impossible on the river.

The earthquake was resulted in interruption of all communications and sharp rise in the prices of food-stuffs and necessities in the District of Rangpur. The cost of damage amounted to over 30 lakhs of rupees. The earthquake produced great changes in the drainage of the country caused simultaneously by the upheaval in many streams and river beds and contraction by the slipping of their banks. In the process of upheaval in the rivers the district in many places appeared to have been a cup-shaped formation and as a result there did not remain any considerable outlet for accumulated rainfall which contributed to the conversion of large areas of cultivable land into *bhils*.<sup>50</sup> The loss of life, confined chiefly to Rangpur town, was rather small due to the fact that almost entire population of the district lived in thatched bamboo houses. Oldham has argued that

though in Rangpur a number of small aftershocks were felt but those were ‘not recorded at the neighbouring stations from which regular returns were beings received’.<sup>51</sup>

The District of Pabna was affected earlier by the earthquake of 1885 that caused much damage to masonry buildings, especially at Sirajganj. The district was further visited by the earthquake of 1897. At Sirajganj the upper storey of the sub-divisional office, the jail and the post-office were exhausted and almost every other masonry buildings were severely shaken or damaged.<sup>52</sup> The gunny-bag factory of Andrew Yule & Co. was completely shattered and the company had to remove its business. The court houses and other brick buildings were damaged in Pabna and in the interior of the district fissures opened in the earth and many wells were clogged with sand and silt.<sup>53</sup>

Malda was severely struck by the earthquake and brought large destruction to the town and neighbouring areas. W. B. Oldham, Commissioner of the Bhagalpur Division and Sonthal Parganas had informed that ‘at Malda the damage has been very serious’.<sup>54</sup> The Collector of Malda had demonstrated the descriptions of the damage done to the buildings and lands and reported to the Commissioner of the Bhagalpur Division in the following manner:

“..... the Earthquake of Saturday evening last was felt very severely here. The towns of English Bazar and Old Malda are practically in ruins as far as the pukka houses are concerned. The Government buildings at English Bazar have also suffered severely. I have only received information of five or six deaths in the district so far. Babu Bhagawan Chandra Chowdhury , the principal zamindar of English Bazar, was buried beneath the ruins of his house. Babu Ram Narain Banerji, Deputy Magistrate and Deputy Collector, has been severely injured. .... as my own house is in a ruinous state... The Civil Medical Officer and District Superintendent’s houses are also damaged, but can be repaired. It has been reported that in various places in the district, mostly in sandy diaras, great cracks have appeared, and in some places several bighas of land have sunk several feet, and water and sand bubbled up at the time of the earthquake, in some place near Gumastapur a column of water ascended some distance into the air.”<sup>55</sup>

The district of Bogra had fallen under a series of earthquakes during the last quarter of the nineteenth century. A violent earthquake struck to the district on 14<sup>th</sup> July 1885 and caused great damage to the *pucca* buildings and produced loss of property and took some lives. There were several after-shocks which ravaged different parts of the district. The *pucca* buildings at Sherpur were completely destroyed. Total 47 lives were lost of which 35 at Sherpur, 4 at Bogra town, and 8 in other places.<sup>56</sup> Buildings at Bogra town suffered severe destruction. Cracks were appeared in

the Kutchery building, the circuit house and the library building. The district was visited again in 1888 by a devastating earthquake. All the previous instances were, however, superseded by the earthquake of 1897 which imprinted a traumatic experience for the people of the district. Alike the previous earthquakes, Sherpur and Bogra town had to face the largest destructions of the buildings – in Bogra Magistrates-Collector's bungalow, the government offices, Circuit House were poorly damaged. The house of Nawab Syed Abdus Subhan Chaudhuri at Matidali was in complete ruins.<sup>57</sup> It is perhaps most interesting to mention here that the earthquake, as it was said to believe, had 'benefited' the rest of the district of Bogra. The opening of numerous fissures and outpourings of sand and water occurred in the surface of the soil in the land between Karatoya and Brahmaputra rivers, it was argued, 'that this convulsion of nature has shaken the soil into greater fertility.'<sup>58</sup> This observation was made with a view of gross simplification of the circumstances. The overall result of appearances of fissures had led to the disruption of communication system due to damages done to the roads and bridges which were again sometime caused by rising of river beds - as it was in this case, especially the upheaval of the river bed of river Karatoya.

The Superintending Engineer, Northern Circle, on his inspection of the Civil Buildings at Bogra, in the 9th to 11th July 1897 had made the following notes regarding the effect of the earthquake in the district of Bogra.

"As my notes refer principally to damage done by the recent earthquake, I think it right to notice that the soil in the vicinity in the Bogra is clayey, and that in no case have I seen cracks or fissures caused by the earthquake in such soil, while that across the river is sandy and alluvial and is considerably cracked. At Rangpur, on the contrary, the soil is sandy and there the rents in the ground are from 6 inches to 6 feet in width and down to 10 feet depth. To this I attribute the fact that the damage to buildings at Bogra has been less severe than that to those at Rangpur, in which place the foundations and plinths of those buildings under which the ground parted were necessarily destroyed.

From this I draw the conclusion that it is not advisable to roof any permanent building, which may have to be constructed in the sandy tracts of Rangpur or Bogra or Pubna with arched vaulted roofs, but that such roof had preferably be of terrace on T irons and rolled beams, while there is not the same objection to the use of jack arches in roof, where the sub-soil is of clay, as it is in parts of the district named."<sup>59</sup>

The way the earthquake struck to the areas of northern Bengal had widely varied from region to region according to the characteristics of soil, and the materials by which buildings were

constructed. However, it was frequently noticed that the houses which were built of bamboo and grasses felt little destruction in comparison with the *pucca* houses. Though the loss of lives as it was reported was surprisingly absent for this region, apart from 'minor' instances, but it raised questions about the depth of information collected by the respective officials who were assigned to collect data for this region. Communication system throughout northern Bengal had to suffer a great deal of disruption as a result of the earthquake. Damages of road and bridges amounted to a considerable loss in trade and regular circulation of commodities. However, there was little effort on the part of the government to pursue any prompt relief operation. The post-earthquake management was only aimed to repair government buildings and properties which were damaged in the earthquake.

## II

### **The Bihar-Nepal Earthquake of 1934 and North Bengal**

"Out of the great tragedy that has overwhelmed us, we earnestly hope that some good may permanently endure in the shape of a united Nations, joined together in common sorrow and common effort to overcome it, having faith in one another."

*Statement by the Central Relief Committee.*

February 3, 1934.<sup>60</sup>

The earthquake of 15<sup>th</sup> January 1934 is said to be as one of the deadliest earthquakes the Indian subcontinent could have ever been experienced till then. The country that was altered ruthlessly by this natural visitation was comprised of the British state of Bihar along with its neighbouring areas. The main shock of the earthquake which damaged the land in North Bihar and destroyed thousands of human lives occurred at 2. 15 p.m. on January 15, 1934.<sup>61</sup> The middle of January is the coldest time of the year in Bihar and on that very day a cold west wind was blowing which was accompanied with a rumbling sound was heard for a few seconds before the shock was felt.<sup>62</sup> The duration of the shock had varied from two and a-half minutes to five minutes in different places. The earthquake had produced the ejection of sand and water derived from the violent oscillation of the alluvial soil near the central zone of the earthquake. Sand and

water gushed up almost to a height of six feet and the geysers caused tapering mounds of sand and small carter-like openings and on the other hand, the wells being connected with the water bearing sand emitted sand and water with explosive force while at the disappearing of the earthquake remained filled by the sand.<sup>63</sup> In the central area of the earthquake the inclination for the buildings was more to sink than to collapse with a peculiar trend of having maintained the foundation intact or little suffered whereas the superstructure found to the state of debris or collapsed.<sup>64</sup> A large number of Hindus and Muslims was on the street at the very day and was about to join their religious festivals but “soon it became quit impossible to keep one’s balance, and most people were thrown down. Houses swung from east to west, and walls began to crack in all directions.”<sup>65</sup>

The shock was felt over an area of approximately 1, 900, 000 square miles (4, 920, 000 square kilometers) in India and Tibet and the Bihar shock ranked in intensity with any similar catastrophe that had taken place in historic times.<sup>66</sup> The shock was recorded in most of the seismological stations of the world but in India the shock was so strong that none of the seismographs in Calcutta, Agra or Dehra Dun was able to make a complete record of the earth waves. The earthquake took a heavy toll of life in its central tract and its adjacent regions sometimes which had not even been recorded or reported.

Table. 3.1

Number of loss of lives in different areas in 1934 Earthquake

| <b>Area affected in central tract of the earthquake</b> | <b>No. of deaths occurred</b> |
|---------------------------------------------------------|-------------------------------|
| Muzaffarpur Town                                        | 956                           |
| Muzaffarpur District                                    | 1,583                         |
| Darbhangra Town                                         | 310                           |
| Darbhangra District                                     | 1,839                         |
| Monghyr Town                                            | 1,260                         |
| Monghyr District                                        | 237                           |
| Champaran District                                      | 499                           |
| Saran District                                          | 193                           |
| Bhagalpur District                                      | 174                           |
| Patna District                                          | 142                           |
| Gaya District                                           | 34                            |

|                   |    |
|-------------------|----|
| Shahabad District | 22 |
| Purnea District   | 2  |
| Santal Parganas   | 2  |

Source: *Memoirs of GSI*, 73, p. 2

In Nepal the number of deaths was 3,400. However, the causes that had been attributed to ‘this comparatively low mortality’ in India were firstly, the shock took place in the early afternoon at a time when most people were awake, and many were out of their houses and secondly, the shock did not reach its extreme intensity until about two and a half minutes after its beginning, which allowed the people to run away to the safe place.<sup>67</sup> In Calcutta more particularly to Darjeeling, the news reached on the same day but the occurrence of the earthquake and damage done by it was not readily appreciated in the official circle until the next day. Over a large area roads were heavily damaged, railway tracts were completely destroyed, and telegraph and telephone communications were entirely dislocated.<sup>68</sup> Damage was so widespread that it was hard to specify the exact epicenter of the earthquake. However, the Geological Survey of India started preparations for the examination of the devastated area. Dr. J. A. Dunn, Mr. J. B. Auden and Mr. A. M. N. Ghosh were deputed to investigate the central area in Bihar and Nepal and Mr. D. N. Wadia was deputed to investigate the outlying areas in northern and western Bengal. Nonetheless, the objective of these reports was not to provide a scientific description of the earthquake, but to advise the Governments concerned on several essential aspects of reconstruction for both private and public buildings.<sup>69</sup>

There is a corpus of literature focusing on the geo-scientific aspects of the earthquake. Although the earthquake hit a large area spread across the Indian subcontinent but its effects varied from region to region. The northern Bengal which form the southern part of the sub-Himalayan tract did not get spared from the sufferings of the earthquake and a considerable part of this region was severely destroyed by the quake. However, there is hardly any attempt from the geologists or the historians to take into the account of the impact of this earthquake in the northern part of the Bengal. Among different parts of northern Bengal the district of Darjeeling was violently affected by the earthquake. The District was included within the higher isoseismals of the Assam earthquake of 12<sup>th</sup> June and again in the Bihar-Nepal Earthquake of the 15<sup>th</sup> January. Although

the loose nature of the Darjeeling soil was partially vulnerable for the destruction by the earthquakes, a remarkable feature of the 1934 earthquake was that, in the area of maximum damage, ferro-concrete structures remained almost unaffected as well as the properly constructed recent buildings of brick or dressed stone.<sup>70</sup> The surface layers of the sub-soil on the edge of the Darjeeling ridge and its outlying spurs, mostly on the western side of the town, caused fissures which damaged buildings. This time again (as was in 1897) the station building at Tindharia was damaged and a ground fissure of over 300 yards long occurred below the station yard whereas Kurseong and Kalimpong escaped with minor cracks in buildings but landslips occurred at several places in the Tista valley below Kalimpong.<sup>71</sup> Ground fissures appeared at several places in the submontane tract to the north, near and beyond Sukna and the cart road was much cut up. The duration of occurrence of the shock, as obtained from railway stations and telegraphs offices, was varied from 14.10 to 14.15 (according to the Indian Standard Time) for different parts of the hills with a minor agreement for 14.14-14.15.<sup>72</sup> Though there was no clear proof of any vertical movement but there was a general consensus of opinion that the first shocks were west-east, followed by roughly north-south and later by a distinct rotating movement of the ground.<sup>73</sup> At the Darjeeling cemetery a 2½ feet marble cross was slanted 10° to the west and another nearby cross was rotated 5°. Loose objects, like statues fell from their pedestals in various directions at the St. Joseph's College and a chimney in an adjoining bungalow fell towards E. 20° S., and another close by was broken and its top portion rotated on the base in a clockwise direction.<sup>74</sup> Houses were damaged by bulging and collapse of the east-west walls with a total fall of the centre or roof. The Queen's Hills School was built in the shape of a large U, with a quadrangle play ground between two wings. The school was widely damaged and both wings had been virtually destroyed and all of the interior partitions in the building had fallen like blocks.<sup>75</sup>

Cracks in the houses did not provide any clear information as to the nature and direction of the earth movements occurred at Darjeeling. The annihilation of the buildings such as the Government House, Campbell Cottage, Rockville Hotel, the Cantonment buildings of Jalapahar and Lebong, Burdwan House, the Jail, the Government High School, and to a lesser extent the Kutchery, the Gymkhana Club and the Planters' Club, Collinton, etc., could be attributed to oldness, weak construction and poor foundations.<sup>76</sup> Noticeable damage to buildings was mainly

restricted to the immediate vicinity of fissuring in the ground and western part of the town suffered much damage than the eastern part because the major damage to the main ridge seemed to have been for the western direction of the earth movement in addition with a north-south rocking of the ground in the spurs which was seemingly responsible for the major part of the devastation.<sup>77</sup> The tea estates and gardens had to face considerable loss in property. At Rimbeck the school collapsed together with parts of the walls of *pucca* buildings and at Budhwari cracks appeared in the police quarters.<sup>78</sup> There was no sign of considerable damage done to the Siliguri town. But heading to the northern side along the Darjeeling Himalayan Railway the visible signs were noticed at mile 2¼ above where a fissure in the embankment, two to three inches wide, situated N.20°W. – S20°E., parallel to the rail line for about 200 yards.<sup>79</sup> Another fissure was appeared near Gulma 5½ miles to the north-east of Sukna along the rivulet of that name and the fissure continued to spurt water and white sand for few hours after the shock visited the area.<sup>80</sup> In the deep canyon of Tista Valley two large slips had occurred with some minor slips but no damage took place.

The news of the overall destruction in several parts of India caused by the Bihar-Nepal earthquake spread to the wide audience and ‘a gracious message of sympathy was received from His Majesty the King-Emperor [George R. I] in the following terms’:

“I have been much shocked to hear of the grave loss of life and property which has been caused in India by the recent disastrous earthquake. I shall be glad if you will ask the Governors of the Provinces affected to convey to those who have suffered in this catastrophe a message of deep sympathy from the Queen and myself.”<sup>81</sup>

The messages of sympathy were received from the Secretary of State and from His Excellency, The Viceroy, as well as from Governors of other provinces, and many organizations and persons.<sup>82</sup> The earthquake was also reported through newspapers from abroad. The *Courier-Mail* received information reported from Calcutta and London on 15<sup>th</sup> January and on 17<sup>th</sup> January it was published in the following manner:

The earthquake.....rocked Calcutta....afternoon and caused damage in many other parts of India. It is regarded in many parts of the country as the most intense in living memory. The toll of deaths and damage is gradually trickling through to Calcutta, but the full facts will not be known for many days, owing to telephone and telephone wires being damaged. The centre of greatest intensity appears to be in the Bihar Province and the United Provinces. Patna City is described as a city of debris and ruins. .... Jamalpur is cut off from the rest of the district. Cawnpore reports that more than 7000 houses were damaged, at least 300 small

houses having collapsed. At New Delhi the Western and Eastern hostels were damaged. At Allahabad the palace of the Maharaja of Benares was badly damaged..... At Agra the shock was so great that the seismograph in the Observatory was upset. .... In French Chander nagore the Roman Catholic Church was badly damaged. The city is without water or electricity. Meagre news from Darjeeling suggests that serious damage has been done to business premises, while houses collapsed. An official has been dispatched from Calcutta to report on the situation. Darjeeling, which is built on rock, felt the full force of the disturbance, while Calcutta, which is built on mud, luckily escaped lightly. There was a dramatic incident at the Calcutta High Court. The earthquake occurred while the death sentence was being confirmed on Dinesh Majumdar, a terrorist. The judges left the bench and the whole Court dashed into the street. The shock came after two days of phenomenal floods and the coldest spell for half a century.”<sup>83</sup>

The Manager of the Bagdogra Tea Estate had informed that there was one severe and one slight shock in Bagdogra and the severe shock was strong enough to crack the walls of buildings and to cause larger damage.<sup>84</sup> Mr. S. D. Chatterjee of Sukna Tea Estate had informed that three shocks led by a sound like motor car that lasted to the end. Hanging objects were swinging and loose objects fell. Semi-*pucca* brick walls were cracked and the fissures in the ground were six inches wide.<sup>85</sup> The Manager of Mission Hill Tea Estate in Phagu narrated that the factory walls of the tea factory which was made of stone cracked and fell down. J. S. Lama of Tista Bridge Bazaar described that “a rumbling noise like that of an aeroplane preceded the shock. Everybody felt the shock which caused doors and windows to rattle and cracked the walls of many houses, some of which were damaged rather badly. Fissures half an inch wide were aligned north-south. The river swelled about nine inches from the normal level”<sup>86</sup> The Subdivisional Officer of Kalimpong reported that “a rumbling noise was heard and intensified by fall of rocks and earth down the precipices....difficult to stand without support. Landslides occurred. One semi-*pucca* mud and stone building was slightly cracked.”<sup>87</sup> Despite of this large-scale destruction, the district of Darjeeling had faced ‘moderate damage’, as argued by some scholars, in comparison with the unlimited devastation that took place in Bihar and Nepal, and this was due to the fact that ‘the epicentral area definitely lay west of Kalimpong, and quite possibly west of Darjeeling. The edge of the rupture zone, alternatively, may have lain between Darjeeling and Kalimpong.’<sup>88</sup>

Thus, as for the case of Darjeeling district, it can be noticed that the ecological vulnerability for the inhabitants was more aggravated due to the additional menace of landslides along with the persisting suffering resulted from the earthquake. It was observed especially for the district that

one calamity was frequently succeeded by any other calamities, such as – landslips caused by the earthquake or flood. Thus, landslides, rockfalls, and avalanches were frequently initiated by earthquakes, and these secondary factors may be responsible for much more damage than the initiating agent.<sup>89</sup> However, virtual absence of any sustainable method for protection from the landslides had been demonstrated from the further aggravation of the hilly slopes outraged by the occurrence of landslides. A meager amount of area by the government was handed over to the Forest Department for reducing the landslide propensity and improvement of the plight through afforestation. In 1940, an area of 188 acres was handed over at Dalapchan near Kalimpong, where a continuous damage to a Government road was taking place accompanying with a huge amount of repairing cost every time, and in addition with that in 1942, a small area of 173 acres was shifted to the Kalimpong Development Area emphasizing the necessity of constructing revetment walls and contour drains before developing the work of afforestation.<sup>90</sup>

Apart from the district of Darjeeling other districts of northern Bengal was also struck by the 1934 earthquake. In Jalpaiguri ‘a surface disturbance of the river bed’ was noticed.<sup>91</sup> A. N. Chakrabarty, Meteorological Observer had noted that “two distinct shocks preceded by a rumbling noise as of an aeroplane. Doors and windows rattled, hanging objects swung and loose objects were thrown down. Some of the buildings were badly cracked but not collapsed. Arched roof cracked in places and bricks fell down.”<sup>92</sup> The Subdivisional Officer of Alipurduar, Mr. R. N. McWilliams, had confirmed the description under his jurisdiction. The Subdivisional Officer of Goyerkata (Western Duars) had described that two shocks were accompanied with a booming noise and as a result doors and windows were rattled with a few slightly cracks on the walls.<sup>93</sup> To quote the information of the Subdivisional Officer of Eastern Duars Subdivision there appeared “a sound like that of a rushing storm was heard during the shock. Punkah poles, 16 feet long, swung upto five feet. Water from bath tubs all full, up to 16 inches, splashed out leaving about one-third. Arches of *pucca* buildings were slightly cracked and the floors and stairs of a wooden frame building were partially dislocated. A dry shoal, one foot high, in the bed of the Kaljani River was flooded over.”<sup>94</sup>

From Dinajpur, the Subdivisional Officer of Thakurgaon, Mr. D. N. Saha, had reported about ‘a rumbling sound....during and after the shock’ which caused damage to the hanging objects and

walls of the buildings whereas D. N. Mukherjee, the sub-postmaster had talked of the sound of earth as ‘rolling of the clouds.’<sup>95</sup> In Balurghat the shock was described by P. C. Sen, the Subdivisional Officer in the following words: “One vibration was followed by a pulsating upward movement and finally by another vibrating movement. A noise like that of a motor car was heard.”<sup>96</sup> In the Rajshahi town, Nator, Dighapatia and Naogaon of Rajshahi District shocks were felt from several places which damaged the buildings and walls.<sup>97</sup> In the district of Malda, the Nawabganj, Malda town and Chandpur were affected equally by the earthquake. The district of Bogra and Rangpur (Gaibanda, Rangpur, Kurigram, Lalmanirhat, Nilphamari) was also visited by the earthquake.<sup>98</sup> In Cooch Behar, M. N. Roy from Dinhata reported that three shocks were observed in this area and M. M. Ganguli, Inspector of Police, from Matabhanga told that one shock had noticed ‘with a sound like the distant rumbling of thunder was heard from the north-west’.<sup>99</sup> S. C. Chatterjee, the Subdivisional Officer of the Cooch Behar town had narrated in the following terms: “A low rumbling sound was heard during the one continuous shock. Trees and houses shook violently..... Walls of many buildings were cracked.”<sup>100</sup> The Victoria College and Jenkins School were also affected by this earthquake.

Among the major earthquakes that hit the Himalaya in twentieth century, the Bihar-Nepal earthquake of 1934 has still remained in ambiguity in terms of its location, nature and intensity.<sup>101</sup> It can be noticed from the above narratives that a large area of northern Bengal was severely affected by the 1934 earthquake. The narratives of the shock and earth movements which were occurred in these places are aimed to explain the extent and pervasiveness of the earthquake not only for the sake of its description but to categorically underscoring the amount of sufferings and fear that a society had experienced. Although Reports on this earthquake for the affected regions of northern Bengal made and forwarded by the government officials and private observers had demonstrated the damage and destruction the earthquake called off but these were not sufficient to record a comprehensive and detail description since all the region was not equally surveyed or noticed. The absence of any proper knowledge due to the lack of technological and scientific devices for identification of the occurrence of shocks had resulted in a confused and mere narrative of the earthquake. However, the casualties that took place during and after the incident did not include any exact statistics since the official and private information had not only varied but was also contradictory. Two more Bihar-Nepal Earthquake

were occurred in 1950 and 1988 which again ravaged the region but ‘the implementation of earthquake resistant design codes continues to be very poor in India.’<sup>102</sup> The extent and intensity of damage caused to the northern India was a result of slumping, fissuring, and tilting of the ground because the lack of any ideal direction of the fissures and the spouting up of sand and water from fissures highlighted that the disruption of the earth surface was restricted to surficial layers and not to faulting of the basement beneath that area.<sup>103</sup>

### III

#### **Geology, Earthquake and Colonial Policy: Some Observations**

Until the end of the first half of the nineteenth century there was no systematic effort to record and analyse the various phenomena of Indian Earthquakes, and the narratives of these were scattered throughout the pages of various works, without connection and without method which produced imperfect and inadequate information about earthquakes.<sup>104</sup> In Indian earthquakes, recording of the actual time of the shocks seemed to remain problematic as a result of existing variety of standard times employed throughout the country and in the magnitude of the epicentral area.<sup>105</sup> However, problems were overcome for the time by Oldham (1897) through the utilization of time records obtained from a few self-recording instruments, from the most busy telegraph offices, from the larger railway stations, and in some cases from private individuals.<sup>106</sup> For the 1897 earthquake geological officers and observers were advised by Oldham “to report only on the facts observed, and to refrain from any expressions of opinion as to the conclusions to be drawn, as this could only be profitably done after a review of the whole of the facts, of which only part could become known to each individually.”<sup>107</sup>

The earthquake of 1897 had contributed to the generation and collection of a package of information and knowledge on the part of the Government first time with a specific aim to discover earthquake conditions and seismic motions. The Geological Survey of India was at the crucial stage of its performance as the situation sought for a greater undertaking of knowledge and its implementation. This was a time when the science of seismology was passing from a pre-instrumental period to seismograph but a standard universal scale of earthquake measurement

was still awaited. The colonial government not only lacked resources and experiences to deal with such a devastating earthquake but the idea of state intervention to rescue affected population from disaster was yet to be part of the narrative of governance.<sup>108</sup> Moreover, ‘compatibility’ between private and social aims had been considered as the defining factor for the effectiveness of the state intervention that absolutely was depended on the very question of ‘state’s legitimacy’, as the modern researches have prescribed.<sup>109</sup> The disputed property rights had often become a matter of great complexities to run the relief operation by the state since the victims did not agree, as it is argued, on the plans taken up for the amelioration of the prevailing conditions.<sup>110</sup> The contested terrain of economic and social interests of the victims, both Indian and European, had no doubt, derived from the discourse of ‘rights’ and ‘power’ which was manifold and controlled and manipulated in a colonial atmosphere. Relief operation was not, however, always entirely a matter of charity or to dispense humanitarian responsibility but, very often, was unfolded with an overt agenda for rescuing ‘*ourselves*’ amidst from the disasters which not only serve, for several times, the justification of governance for the Indians but set a trend of British ‘efficiency’, not common in pre-British period, to deal with such unpredictable natural disaster, though failed in many respect in several occasions, sometimes even offered hardly any scope to provide recovery settlements.

The first half of the nineteenth century had witnessed the progress of geological research in India having a special emphasis on the collection of mineralogical knowledge for colonial capitalist exploitation. There is no doubt that the greatest impetus for the advancement of geological research was provided by the quest for accumulation of knowledge about Indian natural world and minerals. However, the process was not so easy and there were certain difficulties to carry out the geological research. Captain J. Campbell wrote in 1840 that:

“In collecting information on Indian geology, the greatest difficulty appears to be, that the number of people, who have time and opportunities of the pursuit, are very few; but if everyone who chooses to attend the subject, would apply himself, to compile accurate description of the part of the country, adjacent to their station, one should soon have a valuable collection of geology of isolated spots,... In furtherance of this end, a geological society would be of the utmost advantage, ... [to] compare specimens, have chemical examinations...any individual of the society..., could then afford the most valuable information, in identifying minerals...”.<sup>111</sup>

The efforts towards systemization and archiving the geological researches carried out so far and with a clear postulation of establishing an organization for more efficient and exhaustive future surveys were culminated in the foundation of Geological Survey of India in 1851. Deepak Kumar has put emphasis on the ‘economic compulsions’ behind the establishment of Geological Survey of India and comments that “[Thomas Oldham, father of R. D. Oldham] himself recognised that the original reason for his appointment was the study of the coal resources of India.”<sup>112</sup> The first geological map was prepared by G. B. Greenough in 1853 without visited the country even once.<sup>113</sup> Thomas Oldham, father of Richard Oldham, being ‘successor to Williams’, was appointed by the East India Company as a ‘Geological Surveyor’<sup>114</sup> who took geological surveys in India in a next level of regularity and creativity which served the British purpose of accumulating geological and mineralogical knowledge in an appreciating manner. However, Richard D. Oldham (1858-1936), son of Thomas Oldham, wrote accounts of four major Indian earthquakes – 1819, 1869, 1881 and 1897; and these accounts established a template for the study of earthquakes that occurred in Indian subcontinent subsequently.<sup>115</sup> Oldham clearly recognized the value of surface deformation as a quantitative measure of what happens in an earthquake, but the analytical tools to interpret these data were not to emerge for a further half century.<sup>116</sup> The *Report of Oldham* recorded the damage caused to the cemetery made for the Europeans. This evidently reflected the British concerns for their even very minor belongings in India which was no less important than the death toll resulted in the disasters. Since the disasters did not show any mercy to the ‘racially superior’ British, so they had to confront the ‘equal fate’ along with their Indian counterpart. The disruption in communication caused by the fissures appeared in road and broken railway tracks hindered the colonial endeavours of relief strategies made for the affected areas. The large scale deforestation of land and changing pattern of dwelling areas during the colonial period aggravated the intensity of the disasters. Preparedness for the disasters and state capacity to deal with this unusual responses of nature was attributed to the knowledge patterns acquired ‘in the past on how events were explained, how social cooperation formed or fell apart, and how states were constituted’ which undoubtedly disclosed the fact ‘that the state engaged in this activity late, and with variable success.’<sup>117</sup>

Earthquake engineering progresses commenced relatively early in India. Development of the first seismic zone map and of the earthquake resistant features for masonry buildings took place in

1930's, and formal teaching and research in earthquake engineering started in late 1950's.<sup>118</sup> However, the recent researches have modified the earlier versions which considered the earthquake of 1897 as the Himalayan earthquake. Seismologists have argued that the 1897 earthquake was a 'shield earthquake like that of the 1819 great Kutch earthquake.....or the 2001 Bhuj earthquake....in Western India.....The 1897 event [was] also a shield earthquake, the present broadband seismic data and the GPS data do not support it to be a Himalayan earthquake as was proposed earlier.'<sup>119</sup> However, the earthquake of 1934 seemed to have been no less devastating than the others. The frequent occurrence of earthquakes during the first half of the twentieth century was thus concluded by S. K. Banerje in the following words: "8 years [was] just the average value of the interval between two highly destructive earthquakes."<sup>120</sup>

While the hill stations (like Darjeeling and Shillong) of British India were regarded by the western observers as 'an island of Victorian values and symbols without a clientele'<sup>121</sup> but the imperial design behind the construction of sanatoriums or health-places in colonial India invites the scope for historical scrutiny of the colonial objective on the discourses of imperial practices which reinforced the distinction of this British enclave not only as a suitable place for colonial administrators, but also on the basis of a racial and spatial categorization that represented the sense of British superiority and difference spawned up from the fear of being degenerated.<sup>122</sup> Apart from this, the disasters provided a major psychological setback to the British perception of colonial amenities which were derived from the 'sites of colonial leisure and recreation; temperate places that represented socially, culturally and architecturally, derivations of metropolitan and imperial symbols of leisure' and in addition with an aim of its incorporation into the colonial economy.<sup>123</sup> Thus, natural disasters in the colonies occupied special consideration by the colonial administrators in respect to the exceptional characteristics of the disasters in their eyes because Europeans had also inhabited the same places where the Indians lived. It is most striking that the absence of any relief measure in the earthquake of 1897, not only in Bengal but in all the regions affected by the earthquake. However, colonial initiatives during the later earthquakes appeared to have been more crucial, though unknown in previous cases, because of their influence in society and if more broadly speaking for the ideologies that the enterprises revealed the colonial supremacy, in a different manner.

## Conclusion

There is no doubt that the earthquake of 1897 was the most severe earthquake till date which ravaged northern Bengal with such an intensity that is hardly comparable to any other earthquake. Its impact was long lasting and recovery from this disaster took a long time. It was said to be reported that there was no loss of life had been reported in northern Bengal during or after the occurrence of the earthquake of 1934. However, the central tract of the earthquake that is a large part of Bihar had witnessed a huge number of deaths although it was not sufficient for the colonial Government to recognize the number as big and fatal. However, for India as a whole, building constructions in terms of their methods and materials went through a considerable transformation as a result of the earthquake. The 1934 earthquake introduced changes in the architectural style and building materials for the future protection from such event. The advertisements published in the newspapers promoted for new types of cement, steels, lime and mortar for “permanent, economical and resisting” building materials, in addition with these new technologies had been invented for more sophisticated car, traction trucks, overhead cables and synthetic paints which were ‘twentieth century innovations.’<sup>124</sup>

The most striking feature of the earthquake was that it contributed to the awakening of nationalist responses for the victims of the earthquake. The participation of the national level leaders in the relief operations had manifested their grief and earnest concern for the poor. Gandhiji, Rajendra Prasad, Nehru, the foremost political figures of that time and the volunteers of Indian National Congress had ventured into the continuation and monitoring of relief works.<sup>125</sup> Apart from them, many Indian wealthy and capitalist individuals such as the Maharaja of Darbhanga, David Ezechiel of Calcutta, and the Tatas of Jamsedpur, donated money and material or conducted relief camps, whereas the some nationalist and religious organizations such as the Ramkrishna Mission, Marwari Relief Society and the Servants of India Society had responded enormously for volunteering during the relief works.<sup>126</sup> Women were the worst sufferer of the earthquake since they were settling at their homes when the earthquake occurred and the number of women was far greater than men.<sup>127</sup>

It is not well established so far whether the relief works in northern Bengal were affected due to the lack of available relief data for this region. The probable reason may be that since there was no death occurred in this part, as the Government reports did not figure it out, and damage or injury to the life and property was far smaller than the Bihar part, the official and popular concentration was shifted to the Bihar portion. The climate of Indian politics was charged up centering the earthquake issue to retrieve its strength and focus from the repeated failure of Round Table Conferences and colonial denial of political demands. The well-known controversy between Tagore and Gandhi had foregrounded once again the debate between scientific and moral aspects of human civilization that added a fresh discourse on the questions of human sin and natural phenomenon in a form of 'divine chastisement', whether separated from each other or connected integrally.<sup>128</sup> The debate received a larger audience to react and comment on this issue. Nehru affirmed that "anything more opposed to the scientific outlook it would be difficult to imagine. Perhaps even science will not be absolutely dogmatic today about the effect of emotional states and psychic occurrences on matter."<sup>129</sup> Leaving aside their arguments, at least for this section, what philosophy of disaster produced an unending interpretation of co-relation between the ecological vulnerability aggravated by interference of the human agencies and its successive responses to the natural calamities entangling the motivation for scientific knowledge about human settlement on the earth and about the construction of geological or planetary set-up for nature itself. However, the governmental concern regarding the relief operations was only confined to the recovery of European settlements in India and revival of official control by repairing the government buildings ruined by the earthquake. The natural calamities like earthquake or others, strong enough to deal with the colonial domination irrespective of any fear of punishment, had stirred the colonial perception of 'superiority' which felt equally helpless as their Indian counterpart felt during the time of great calamities. The Geological Survey of India had, no doubt, played an important role in the direction of geological research during the colonial period but it was hardly appointed to find any remedies or forecasting the earthquake occurrences in India.

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The Cachar earthquake of 1869 had also received a better coverage in the media that informed the death of few lives caused by the earthquake but very negligible destruction of buildings were held because houses in Cachar were built by bamboos, the elastic material.

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<sup>14</sup> Arthur Jules Dash, *op. cit.*, p. 10.

<sup>15</sup> C. E. Buckland, C. E., *Bengal under the Lieutenant Governors: A Narrative of the Principal Events and Public Measures during Their Periods of Office from 1854 to 1898, Vol. II*, S. K. Lahiri & Co., Calcutta, 1901, p. 1002.

<sup>16</sup> E. C. Dozey, *op. cit.*, p. 139.

<sup>17</sup> *The Mercury*, Thursday Morning, June 22, 1897, VOL. LXIX, NO. 8521, Hobart; retrieved from <http://trove.nla.gov.au/ndp/del/page/846813?zoomLevel=1> accessed on 11. 02. 2015.

<sup>18</sup> *Ibid.*, p. 131.

<sup>19</sup> Arthur Jules Dash, *Bengal District Gazetteer: Darjeeling*, p. 11.

<sup>20</sup> *Ibid.*

<sup>21</sup> Sudip Kr. Bhattacharya, *Zonation Mapping Techniques of the Landslide Hazard in Darjeeling Hills, West Bengal, India, Geo-Analyst*, Vol. 2, No.1, 2012.

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<sup>22</sup> Reports of officers of the Geological Survey of India despatched to investigate the effects of the earthquake. *Report* of H. H. Hayden; R. D. Oldham, *op. cit.*, p. 282.

<sup>23</sup> In the thesis the name of the Princely State i. e. 'Cooch Behar' has several times been written as 'Kuch Bihar'. The change in spelling has varied due to the differently mentioning of the name in different official reports or documents. But in general, 'Cooch Behar' has been followed by the researcher owing to its mentioning in several contemporary writings and present nomenclature.

<sup>24</sup> *Annual Administration Report of the State of Cooch Behar for the year 1897-98*, No. 972, 1898, p. 3.

<sup>25</sup> *Ibid.*

<sup>26</sup> Raj Bahadur Calica Doss Dutt, *The Cooch Behar State and its Land Revenue Settlements*, compiled by Harendra Narayan Chaudhury, The Cooch Behar State Press, Cooch Behar, 1903, p. 80.

<sup>27</sup> T. D. LaTauche's *Report* cited in Richard Dixon Oldham, '*Report on the Great Earthquake of 12 June 1897*', p. 261.

<sup>28</sup> Cited in Wm. Herbert Hobbs, '*A Study of the Damage to Bridges during Earthquakes*', *The Journal of Geology*, vo. 16, no. 7 (Oct. – Nov., 1908), pp. 644-645.

<sup>29</sup> R. D. Oldham, *op. cit.*, p. 287.

<sup>30</sup> From 15<sup>th</sup> to 30<sup>th</sup> June there were 64 aftershocks and from 1<sup>st</sup> to 15<sup>th</sup> July the number of aftershock was 31. *Ibid.*, p. 126.

<sup>31</sup> *Annual Administration Report.....1897-98*, p. 9.

<sup>32</sup> Proceedings of the Government of Bengal, Revenue Department, Miscellaneous Branch. (File No. 1E/1 of 1897) Proceedings B, No. 24-44, December 1897, No. 24 – 44. West Bengal State Archives (hereafter WBSA).

<sup>33</sup> *Ibid.*

<sup>34</sup> John F. Gruning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, Pioneer Press, Allahabad, 1911, p. 79.

<sup>35</sup> R. D. Oldham, *op. cit.*, p. 280.

<sup>36</sup> *Ibid.* pp. 280 – 281.

<sup>37</sup> *Ibid.*

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<sup>38</sup> From Rai Durga Das Das, Bahadur, Officiating District Engineer, Jalpaiguri, to the Deputy Commissioner, Jalpaiguri. – (No. 36P.W., dated Jalpaiguri, the 17<sup>th</sup> June 1897). Proceedings of the Government of Bengal, Revenue Department, Miscellaneous Branch. (File No. 1E/1 of 1897) Proceedings B, No. 24-44, December 1897, No. 24 – 44. WBSA.

<sup>39</sup> F. W. Strong, *Eastern Bengal and Assam District Gazetteers: Dinajpur*, Pioneer Press, Allahabad, 1912, pp. 64-65.

<sup>40</sup> *Ibid.*

<sup>41</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, Bengal Secretariat Book Depot, Calcutta, 1916, p. 93.

<sup>42</sup> *Ibid.*

<sup>43</sup> *Ibid.*

<sup>44</sup> *Report* of H. H. Hayden, in R. D. Oldham, *op. cit.*, p. 280.

<sup>45</sup> Cited in R. D. Oldham, *op. cit.*, pp. 284 - 285.

<sup>46</sup> J. A. Vas, *Eastern Bengal and Assam District Gazetteers: Ranpur*, Pioneer Press, Allahabad, 1911, pp. 77.

<sup>47</sup> R. D. Oldham, *op. cit.*, p. 284.

<sup>48</sup> *Ibid.*, p. 285.

<sup>49</sup> *Ibid.*, pp. 285-86.

<sup>50</sup> J. A. Vas, *op. cit.*, pp. 77-78.

<sup>51</sup> R. D. Oldham, *op. cit.*, p. 128.

<sup>52</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Pabna*, Bengal Secretariat Book Depot, Calcutta, 1923, pp. 46.

<sup>53</sup> *Ibid.*, p. 47.

<sup>54</sup> *No. 49 P.W., dated Bhagalpur, the 15<sup>th</sup> June 1897*. Proceedings of the Government of Bengal, Revenue Department, Miscellaneous Branch. (File No. 1E/1 of 1897) Proceedings B, No. 24-44, December 1897, No. 24 – 44. WBSA.

<sup>55</sup> *From J. H. Lea, EsQ., Collector of Malda, to the Commissioner of the Bhagalpur Division. – (No. 238 G., dated Malda, the 15th June 1897)* Proceedings of the Government of Bengal,

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Revenue Department, Miscellaneous Branch. (File No. 1E/1 of 1897) Proceedings B, No. 24-44, December 1897, No. 24 – 44. WBSA.

<sup>56</sup> J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, Pioneer Press, Allahabad, 1910, p. 74.

<sup>57</sup> *Ibid.*, p. 75.

<sup>58</sup> *Ibid.*

<sup>59</sup> *Memorandum by H. Cloete, EsQ., Superintending Engineer, Northern Circle. – (No. 2901, dated Bhagalpur, the 16th July 1897).* Proceedings of the Government of Bengal, Revenue Department, Miscellaneous Branch. (File No. 1E/1 of 1897) Proceedings B, No. 24-44, December 1897, No. 24 – 44. WBSA.

<sup>60</sup> Cited in C. F. Andrews, *The Indian Earthquake*, George Allen and Unwin Ltd., London, 1935. n. p.

<sup>61</sup> *Ibid.*, p. 15.

<sup>62</sup> W. B. Brett, *A Report on the Bihar Earthquake and on the measures in consequence thereof up to the 31<sup>st</sup> December 1934*, Superintendent, Government Printing, Patna, 1935, p. 5.

<sup>63</sup> *Ibid.*, p. 6.

<sup>64</sup> *Ibid.*, pp. 6-7.

<sup>65</sup> C. F. Andrews, *op. cit.*, pp. 16-17.

<sup>66</sup> The Bihar Nepal Earthquake of 1934. By officers of the Geological Survey of India, in *Memoirs of the Geological Survey of India*, vol. 73, Manager of Publications, Calcutta and Delhi, 1939 (hereafter *Memoirs of GSI*, 73.), p. 2.

<sup>67</sup> *Ibid.*, p. 3.

<sup>68</sup> *Ibid.*

<sup>69</sup> *Ibid.*, p. 5.

<sup>70</sup> A. J. Dash, *op. cit.*, p. 10.

<sup>71</sup> *Ibid.*

<sup>72</sup> *Memoirs of GSI*, 73, p. 259.

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<sup>73</sup> *Ibid.*

<sup>74</sup> *Ibid.*

<sup>75</sup> Kitty Katzell, *Lila: A Biography*, iUniverse, USA, 2006, p. 46.

<sup>76</sup> *Memoirs of GSI*, 73, p. 259.

<sup>77</sup> *Ibid.*, p. 260.

<sup>78</sup> *Ibid.*, p. 261.

<sup>79</sup> *Ibid.*, p. 271.

<sup>80</sup> *Ibid.*

<sup>81</sup> W. B. Brett, *op. cit.*, p. 20.

<sup>82</sup> *Ibid.*

<sup>83</sup> The Courier-Mail (Brisbane.Qld.: 1933-54), Wednesday, 17 January, 1934, p. 13.  
<http://trove.nla.gov.au/newspaper/article/1160939#>. Accessed on 18/09/2016.

<sup>84</sup> *Memoirs of GSI*, 73, p. 287.

<sup>85</sup> *Ibid.*

<sup>86</sup> *Ibid.*

<sup>87</sup> *Ibid.*

<sup>88</sup> M. R. Pandey and Peter Molnar, The Distribution of Intensity of the Bihar Nepal Earthquake of 15 January 1934 and Bounds on the Extent of the Rupture Zone, *Journal of Nepal Geological Society*, Vol. 5. No. 1, 1988, p. 27.

<sup>89</sup> Jack D. Ives, *Himalayan Perception: Environmental Change and the Well-being of Mountain Peoples*, Routledge, London and New York, 2004, p. 118.

<sup>90</sup> A. J. Dash, *op. cit.*, p. 14.

<sup>91</sup> *Memoirs of GSI*, 73, p. 271.

<sup>92</sup> *Ibid.*, p. 286.

<sup>93</sup> *Ibid.*, p. 324.

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<sup>94</sup> *Ibid.*

<sup>95</sup> *Ibid.*, p. 286.

<sup>96</sup> *Ibid.*, p. 323.

<sup>97</sup> *Ibid.*, pp. 321-22.

<sup>98</sup> *Ibid.*, pp. 322-24.

<sup>99</sup> *Ibid.*, p. 324.

<sup>100</sup> *Ibid.*

<sup>101</sup> Ganesh Kumar Bhattarai et al, Seismic Hazard Assessment for Eastern Nepal Using 1934 and 1988 Earthquakes, *Journal of Nepal Geological Society*, Vol. 42, 2011, p. 87.

<sup>102</sup> Sudhir K. Jain, On Better Engineering Preparedness: Lessons from the 1988 Bihar Earthquake, *Earthquake Spectra*, EERI, Vol. 8. No. 3, 1992.

<sup>103</sup> M. R. Pandey and Peter Molnar, *op. cit.*, p. 23.

<sup>104</sup> Lieut. R. Baird Smith, Memoir on Indian Earthquakes, *Journal of the Asiatic Society*, 1843, No. 136, pp. 257-58.

<sup>105</sup> Charles Davison, *A Study of Recent Earthquakes*, The Walter Scott Publishing Co. Ltd, London, 1905, p. 275.

<sup>106</sup> *Ibid.*

<sup>107</sup> R. D. Oldham, *op. cit.*, p. 257.

<sup>108</sup> For details see Tirthankar Roy, State, Society and Market in the Aftermath of Natural Disasters in Colonial India: A Preliminary Exploration, *Indian Economic and Social History Review*, Vol. 45, no. 2 (June 2008), pp. 261–294.

<sup>109</sup> *Ibid.* p. 264.

<sup>110</sup> *Ibid.*, p. 262.

<sup>111</sup> Captain J. Campbell, On the Advancement of Geological Science in India, *Madras Journal of Literature and Science*, Vol. II, 1840, p. 81.

<sup>112</sup> Deepak Kumar, Economic Compulsions and the Geological Survey of India, *Indian Journal of History of Science*, 17(2), 1982, p. 290. This study explores the objective behind the

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establishment of GSI which was primarily aimed towards the purpose of fulfillment of economic interests of the colonial rulers and underlines the phases of development of GSI throughout the colonial period as a tool of industrial growth for the colonial rulers for the economic extraction of coal, iron and other mineral resources from Indian soil.

<sup>113</sup> *Ibid.* p. 292.

<sup>114</sup> Cyril S. Fox, The Geological Survey of India, 1846 to 1947, *Nature*, 160, 27 December, 1947, pp. 889-891.

<sup>115</sup> Roger Bilham, 'Earthquakes in India and the Himalaya: Tectonics, Geodesy and History', *Annals of Geophysics*, vo. 47, no. 2/3, April/June, 2004, p. 845 and 846.

<sup>116</sup> *Ibid.*

<sup>117</sup> Tirthankar Roy, *Natural Disasters and Indian History*, p. 9

<sup>118</sup> Sudhir K. Jain and Navin C. Nigam, *op. cit.* (page not mentioned).

<sup>119</sup> The 1819 Kutch and the 2001 Bhuj events were the rift basin earthquakes in the western part of the Indian shield and these were caused by inversion tectonics. For details see J. R. Kayal, 'Seismotectonics of the Great and Large Earthquakes in Himalaya', *Current Science*, Vol. 106, No. 2, 25 January 2014, p. 7.

<sup>120</sup> S. K. Banerji, *Earthquakes in the Himalayan Region*, Indian Association for the Cultivation of Science, Calcutta, 1957.

<sup>121</sup> Judith T. Kenny, *Climate, Race, and Imperial Authority: The Symbolic Landscape of the British Hill Station in India*, *Annals of the Association of American Geographers*, Vol. 85, No. 4, Dec., 1995, p. 694.

<sup>122</sup> *Ibid.*, p. 699 and 700.

<sup>123</sup> Nandini Bhattacharya, *Leisure, Economy and Colonial Urbanism: Darjeeling, 1835–1930*, *Urban History*, August 1, 2013, 40(3), p. 442 - 43.

<sup>124</sup> Tirthankar Roy, *Natural Disasters and Indian History*, pp. 135-36.

<sup>125</sup> M. K. Gandhi, *Collected Works*, vol. 63, 18 January – 19 May, 1934; Jawaharlal Nehru, *An Autobiography*, Penguin Books, New Delhi, 2004; pp. 498-509; Rajendra Prasad, *Autobiography*, National Book Trust, India, New Delhi, First Reprint, 1994, pp. 364-372.

<sup>126</sup> Tirthankar Roy, *Natural Disasters and Indian History*, p. 127.

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<sup>127</sup> *Ibid.*

<sup>128</sup> For details see C. F. Andrews, *op. cit.*, pp. 40-47 and 68-77; Makarand R. Paranjape, 'Natural Supernaturalism?' The Tagore–Gandhi Debate on the Bihar Earthquake, *The Journal of Hindu Studies*, Vol. 4, 2011, pp. 176–204; Sabyasachi Bhattacharya (ed. & compl.), *The Mahatma and the Poet: Letters and Debates between Gandhi and Tagore, 1915-1941*, National Book Trust, India, New Delhi, Second Reprint, 2001, pp. 156-61.

<sup>129</sup> Jawaharlal Nehru, *op. cit.*, p. 507.

## Chapter IV

### **Rivers, Floods and Contagion: A Historical Survey on Rainfall, Embankments and Disease in Nineteenth and Twentieth Century North Bengal**

*“... Bengal is the gift of the Ganges (and of Brahmaputra). But along with gifts, not infrequently, come curses, and it was the sad lot of the people of North Bengal to have a taste of these...”*

----- Meghnad Saha, ‘The Great Flood in North Bengal’, *Modern Review* (vol. 32), November, 1922.

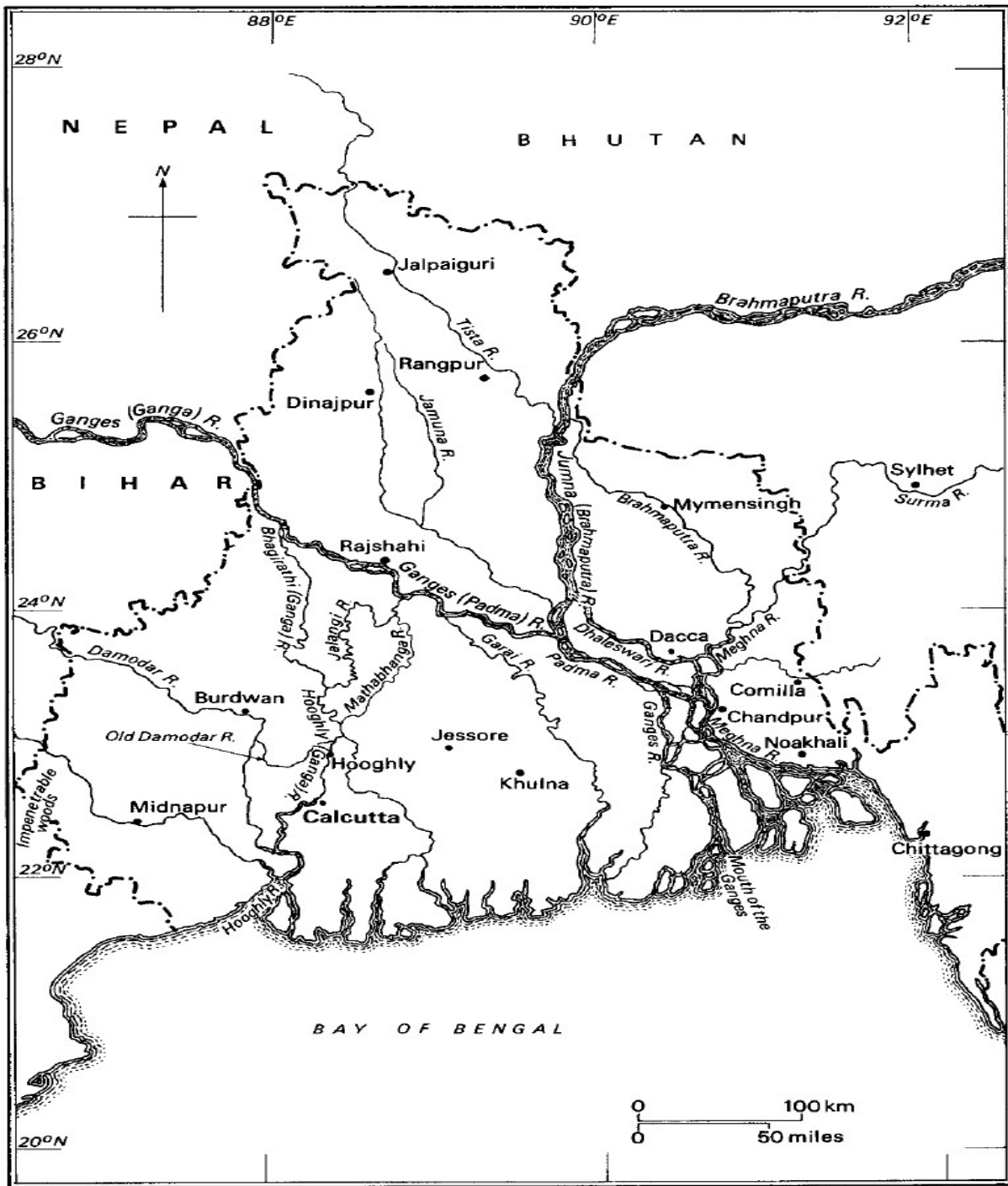
Bengal, as a whole, became wealthy in agricultural production and trade by the outstanding contributions of its rivers which nature has given to her. But the valuable offerings of rivers sometime got disturbed with the considerable increase in water level in the river-bed. The rivers of northern Bengal had their origin in the Himalayan hills which provided an undaunted supply of water throughout the year. But floods in this region caused both by the heavy or unseasonable rainfall in the plains and hills and unprecedented increase of water-level swept away the lands and people rested on its bank. Moreover, the intensity, duration and geographical distribution of rainfall throughout the region produced floods of varied in nature and severity. Duration of floods and their severity were determined by the quantity of inflow of waters caused by the cyclonic and general excess of local rainfall and outflow of waters depended on the subsequent evaporation, sloppy nature of the land or the drainage pattern (natural and constructed). Riverine morphology had a considerable impact towards the formation of topographical and agricultural settlement in

the northern districts of Bengal. Tista, the largest river of northern Bengal had many times brought about large quantity of water due to the melting of glacier or heavy rainfall in the hills which inundated a large tract of land spread across northern Bengal. Other rivers of northern Bengal like – Karatoya, Lish, Ghish, Torsa, Jaldhaka, Kaljani, Mahananda, Atrai etc. also flooded the region frequently. Ganges, rolling down to the southern part of northern Bengal mainly through the district of Murshidabad caused severe floods. Loosening of lands or rocks due to the heavy and sudden rains sometimes caused devastating landslides in the hilly part of northern Bengal which called for additional damage of human property and lives.

The entire North Bengal had been suffering from the devastating floods, especially during the monsoon months. The Himalayan origin of the rivers made them unpredictable and volatile in nature which could any time bring out large amount of water and mud in their streams caused by melting of snow or excessive rainfall. The loss of human and cattle lives and property had heightened the tension among the victims of the floods which frequently contributed to the impoverishment of the people. Destruction of crops and increase of food-prices called for famines when the human vulnerability had been overtly exposed to the mercy of State's charity or private philanthropy. Floods were not absolutely natural, but human interference with the nature helped to turn them in a more furious manner. Likewise, the intensity and duration of sufferings had been aggravated by the Governmental callousness and indifference. So, it is very much pertinent not only to detect the causes of the floods - whether natural or man-made, but also to examine the plight of the victims whose livelihood was affected by the floods but more critically endangered by the human agencies – whether State or market. The role of market in the post-flood scenario remained a crucial issue which should have to be dealt with utter seriousness and farsightedness. Moreover, embankment happened to be one of the most contentious issues during the colonial period and it was no less important for a region like northern Bengal which was intersected by numerous large and small rivers. River embankments, railway embankments contributed in a significant way to the occurrences of floods. The process of 'modernization' had brought with it signs of anxiety and agony for the Indians. Expansion of communication through roadways and railways had provided a fertile ground for the malarial germinations which were integrally connected with inundations. Embankments became a site of contestation between the colonizers and colonized, based on the issues of hierarchy and control. Rainfall which was

essential for the crop production, with its irregularity sometime had been blamed as to provide conditions for several diseases, like – malaria, cholera, diarrhea, small-pox etc. Widespread prevalence of disease, which sometime took epidemic shape, and increasing impoverishment was essentially connected with the colonial policy on embankments, irrigation and agriculture. Thus natural disaster like – floods call for a vivid analysis of the complex relationship between rainfall, rivers, crop production or failure, embankments, irrigation and diseases or epidemics.

This chapter is broadly divided into four parts. The first part deals with the famine of 1787 caused by the devastating flood which was instrumental to the change of course of the river Tista. The second part has described the causes and occurrences of floods took place in north Bengal from 1850s to the 1920s and the state of society, economy and market amidst the destructions of life and property. The third part of the article highlights the constructions and role of embankments, drainage and irrigation in connection with the occurrences of floods and examines the colonial ideology of construction and maintenance of these means to eradicate the severity of floods. Finally, the last part is related with the diseases and epidemics caused by waterlogging, embankments and contagion which had aggravated the sufferings and impoverishment for the people. Thus the chapter provides a detail analysis of floods and other collateral damages it brought about in form of destruction of lives, production and property in colonial north Bengal.



Map 4.1: Rivers of Bengal

Source: Sugata Bose, *The New Cambridge History of India III: 2; Peasant Labour and Colonial Capital: Rural Bengal since 1770*, Cambridge University Press, Cambridge, 1993, p. 10.

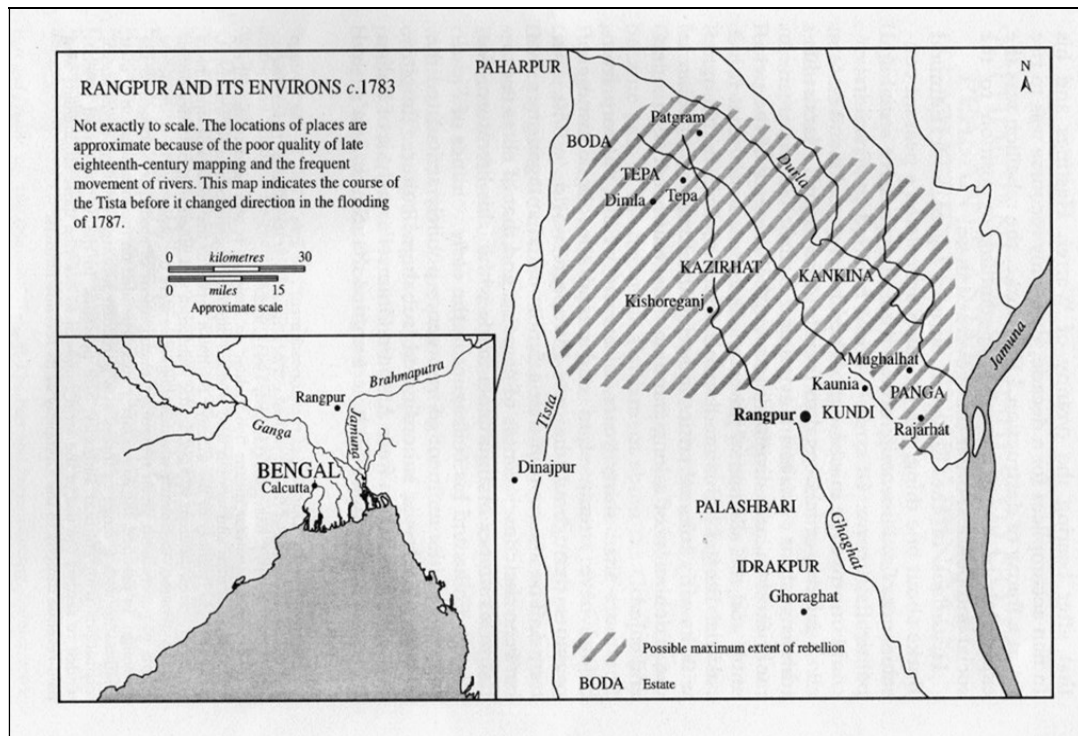
# I

## ***An Early History of Flood in North Bengal: Flood and Famine of 1787-88***

A devastating flood occurred in Tista in 1787 which changed the course of the river. The flood devastated the districts of Jalpaiguri and Rangpur. The flood of 1787 was triggered by couple of reasons. First, the beginning of the monsoon season in 1787 was too early, began from the month of March, in comparison with the average trend of the previous years and without having any suspension it continued till July. Second, there was a major cyclone in the early of November 1787. The cyclone devastated a large area of northern and eastern Bengal. This cyclone had also added to the growing intensity of the flood and these together had resulted in the considerable damage of cattle and crops. The worst was the case for Rangpur where the harvest failure and crop destruction, resulted from the flood, produced a famine situation; though the district of Jalpaiguri did not witness any situation like the former. Tista which is the largest river of the district of Jalpaiguri had entered into the district “from Darjeeling at its north-western corner, and flows in a south-easterly direction until it passes into Rangpur District from Patgram. The Tista forms “the boundary of the Duars, dividing from the permanently settled portion of the district, which, previous to 1869, belonged to Rangpur.....The Tista itself falls into the Brahmaputra, a little above the town of Raniganj in Rangpur District.”<sup>1</sup> Before the disastrous flood of 1787 Tista used to flow from a different channel. According to Major Rennel, “The Teesta is a large river which runs almost parallel to the Ganges for nearly a hundred and fifty miles. During the dry season, the waters of Teesta run into those of the Ganges by two distinct channels, situated about twenty miles from each other, and a third channel at the same time discharges itself into the Megna; but during the season of the floods, the Ganges runs into the Teesta whose outlet is then confined to the channel that communicates with the Meghna.”<sup>2</sup>

The change of river-course had also funded to the change of the physical aspects of the old channels from which Tista ran through and the parts of the district as a whole. Dr. Buchanan-Hamilton in 1809 observed that: “the floods of 1787 seem totally to have changed the appearance of this part of the country, and to have covered it with beds of sand, so that few of the old

channels can be traced for any distance; and the rivers which remain seldom retain the same name for more than three or four miles in any one part of their course....”<sup>3</sup> During the flood of 1787 Tista suddenly deserted its earlier channel and turned its waters into a small branch which was an ancient bed of Tista.<sup>4</sup> This narrow and comparatively shallow ancient river bed did not have the capacity to hold a huge amount of water caused by a sudden increase and this heightened the intensity of the flood in the district of Jalpaiguri.



Map 4.2: River Course of Tista in Rangpur before the Flood of 1787

Source: John E. Wilson, 'A Thousand Countries To Go To': Peasants and Rulers in Late Eighteenth-Century Bengal; *Past and Present*, No. 189, November 2005.

A normal monsoon which could be categorized by standard rainfall between the months of July and September was preferably suitable for the continuation of regular cultivation of crops. But a violent monsoon could cause a devastating flood when “the annual inundations if sudden in the mouth of Assar [June-July] are extremely destructive, for the Aumun [winter rice] is at that time growing and tender and the *Ous* [spring rice] is ready to cut.”<sup>5</sup> But in the case of 1787-calamity

the first account can be traced from the District Collectors report where it has been mentioned that:

“on the 28th May the zamindars of Kochwara attended in a body on the Collector, and presented a petition to him, while he was engaged in forming a Land Settlement for the year. Their petition set forth that three months' incessant rain had entirely destroyed the rabi or spring harvest, and that they were utterly unable to enter into fresh engagements for their lands based upon the amount of revenue paid by them in previous years.”<sup>6</sup>

The unprecedented heavy rain of the year which had started from 26th March resulted into the destruction of crops and caused a great distress for the peasants who abandoned their fields in large numbers. In this situation the cultivation of the *kharif* or winter rice crop could not possible due to the overflow of the rivers and the condition was farther aggravated by the coming of monsoon. The whole of the low and higher-low land and their production were collapsed as a result of submersion under the water which “prevented the seed from germinating, and that even the high lands, which they had attempted to bring under cultivation, could not be properly attended to or weeded, and that, in consequence of the growth of weeds and jungle, which had choked the rice, all such lands had been turned into pasture for the cattle.”<sup>7</sup> Even after more than three months of the commencing of the flood the Board of Revenue had yet to recognize the issue of crop destruction or other hazards, intensified by serious inundation; while in the meantime the situation became so extreme “that in all parts of the District the cultivators had been obliged to construct platforms to save themselves and their families from drowning, but that many lives had been lost.”<sup>8</sup> After a brief pause of few days' rains started again with increase violence on the 1st August when the peasants just began the cultivation. Board of Revenue now had to recognize the critical condition, arose out of the overflow of the rivers which caused a major damage to lands; and agreed to provide necessary assistance to the zamindars and peasants by extending any possible reduction of land revenue in accordance with the state of cultivation.

The situation was added to a violent discharge of waters of the river Tista, resulted from the continuous heavy rains in the monsoon. The course of Tista had always remained a matter of uncertainty which ever moved “its main stream through the western part of Rangpur and through Dinajpur, till it mingled its waters with the Atrai and other streams, and finally made its way into the Padma or Ganges.”<sup>9</sup> Due to the maximum rain of 1787 the Tista carried down a huge amount of sand from the hills holding within its main watercourse which formed an obstruction in its way

and this resulted in the overflow of waters in the both side of its banks. This increased water ran through another channel which reached to the Ghaghat.<sup>10</sup> The channel of this latter stream did not possess the capacity to carry off this large volume of waters and consequently the water of the Tista extended itself over the whole District which initiated immense destruction to life and property. But finally it found a new and spacious channel through which it began to flow during the post-flood period. This great flood took place on the 27th August; and on 2nd September the Collector of Rangpur reported to the Board of Revenue that " multitudes of men, women, children, and cattle have perished in the floods; and in many places whole villages have been so completely swept away, as not to leave the smallest trace whereby to determine that the ground has been occupied."<sup>11</sup>

The large scale destruction of crops and the lives of people eventually led to a famine. But it was not known, what was the actual number of people who died during the flood and famine. One account, however, informed that 152 households, out of a total number of 287 households in a village of Rangpur perished during the flood of 1787 and the famine which followed.<sup>12</sup> The damage of crops resulted in the unprecedented rise of food prices; coarsest rice, which was in earlier extraordinarily cheap, rose rapidly in price from 23 to 20 seers per rupee (from 4s. 9d. to 5s. 5d. per hundredweight), and it was almost impossible for the poorer to obtain at this rate.<sup>13</sup> In these circumstances, the Collector attempted to lessen the misery by preventing all exportation of grain from the district, and acknowledged the necessity of transportation of huge quantities of rice from the large grain storehouses (*golahs*) into the interior of the District where the crisis was more intense. But this restriction was withheld by order of the Board of Revenue early in October.<sup>14</sup> Moreover, in order to provide relief to the destitute, collections of revenue were suspended for a period of two months and decision was taken for feeding the starving poor who were daily flocking into the town in search for food.<sup>15</sup>

The situation was gradually developed and the winter crops (*kharif*) raised the expectation that the harvest might provide a good amount of production. But another recurrence of calamities of the season was yet to come; a cyclone afflicted over the stricken country. Early on the morning of the 2nd November, after a period of great loss of crops when rice was getting into some maturity, "the wind began to blow with great violence from the north-east, attended by heavy rain, and continued to increase in force until the afternoon, when the wind suddenly changed to the east, and came on to blow a furious hurricane which lasted for about ten hours."<sup>16</sup> This cyclone

ravaged the whole area with such violence that “hundreds of trees were blown down or torn up by the roots; the bungalows of the Europeans were almost all unroofed, and there was total disappearance of thatched houses which could hardly stand against the vigour of the cyclone.”<sup>17</sup> Six thousand poor during the period of these calamities were receiving daily rations of rice at the Civil Station, and among them, forty died in the course of the night near the Collector's house.<sup>18</sup> The mortality in the town of Rangpur was much greater and it was estimated that in the course of this disastrous year Rangpur District had lost one-sixth of its inhabitants.<sup>19</sup> In pargana Panga half the populations were disappeared.<sup>20</sup>

East India Company felt the necessity to intervene into this situation in order to improve the exiting norms of transport as well as to connect the distressed areas with better supply of grains. The Collector of Rangpur and other distressed Districts were instructed to estimate and acknowledge the amount of grain in store in the various marts and granaries of their Districts, and to communicate the current prices of grains to the Board of Revenue without any delay.<sup>21</sup> Company attempted with much rapidity to remove the barriers in the way of free exportation of grain on the part of the merchants and at the same time penalties were issued against the monopolists.<sup>22</sup> Moreover, the Collectors were instructed to initiate an enquiry on “complaints of the refusal of any one having grain in store to sell it at current prices, to ascertain whether he had more than was necessary for his own consumption and the probable wants of the locality; and if so, to put up the grain to auction in small lots.”<sup>23</sup> But all these measures had been undertaken by the Company only after the 4<sup>th</sup> June 1788; and until then “the Collector was directed to desist from interfering in any way with the purchase, sale, or transport of grain.”<sup>24</sup> The investigations estimated the losses of the year which was resulted from the remission of Government revenue to the extent of *sikka* rupees 234,622, or £ 25, 417 out of a total assessment of *sikka* rupees 1,242,484, or £ 134, 602.<sup>25</sup> In 1787 Rangpur had received added number of *ryots* from the Pargana Andua of Dinajpur which adversely effected the land possession ratio of the former and the situation got more intense in 1788 when *Jummabandi* (rent assessment) “caused great clamours, incredible desertions [which] affected the district in such a manner that.....years [would] be required to bring it into its flourishing state.”<sup>26</sup> The desertion of land of a district, caused by the migration of *ryots*; or peasant unrest or even the increasing emigration into one district resulted in the collapse of any possibility of inter-district transportation of crops since the pattern of cultivation was seriously affected by these tendencies which threw out the district into

the sphere of grave uncertainty. Thus, the Company had to concentrate into the intra-region transportations of crops of a particular district during the famine of 1787-88.

But in practice, the Company despite of having an unflinching attitude had to go through a process of negotiation with the local merchants or grain dealers. Arrangements for negotiations had been made even for the districts such as, Malda, Dinajpur which could not remain far from the hazards, produced by the famine. In regard to the dealing with the merchants, Company was not in a position to make any 'fair' bargain or strict instruction to the merchants since their (merchants') position were at the head of an organized network of trading activities, hierarchically arranged and extended over a large catchment area.<sup>27</sup> This enabled the merchants to go into the far-flung parts of the districts where they could circulate their stocks, accumulated by purchasing the internal surpluses of available food, with greater ease and profit and in exchange of that they sought for a free market of state control by temporarily suspending 'all gunge duties' and by elimination of all subjective duties in the prices of food.<sup>28</sup>

Silk industry in north Bengal was also seriously affected by these natural calamities. The destruction of mulberry and cotton during the cyclonic flood in 1787 created high prices for raw silk and between March and November 1788 the rate was increased to 100 per cent with a 200 per cent rise in the prices of rice.<sup>29</sup> On the other hand, since the famine of 1769-70 the diminishing rate of Company's investment in the silk industry of the province caused a sharp decline in the prices of silk-products. In fact, through the *dadni* system (advance payment to the weavers for selling their product to the Company at a minimum price) the Company had already fixed the subsistence of these artisans at the very lowest level. Moreover, the 'agency system' introduced in 1787- 9 had further restricted the entry of the Indian traders<sup>30</sup> which subsequently constricted the market availability and prices for the silk and cotton weavers. In addition to this the destruction of raw-material (i.e. mulberry and cotton) in 1787-88 aggravated the declining plight of the artisans to such an extent which could afford any further deterioration. These factors together eventually led to joblessness of the silk-weavers; and vanishing of their capacity to buy food. As a result a large numbers of silk-winders (*naqads*) were died in Malda and Rangpur during the famine of 1788.<sup>31</sup> The flood of 1787 (1194 B. S.) had been considered by the Company as an 'epoch in the history of Northern and Central Bengal' and alarmed by the constant loss of revenue resulted from the fickleness of the river Tista, the Collector of Rangpur was instructed to 'construct works to keep the river in its course' for which '[t]wo lakhs of rupees

were sanctioned and 12, 000 men employed in the work.<sup>32</sup> But such a river like Tista which could hardly help itself to remain in its course; as in the early part of nineteenth century it again abandoned its course and ran towards west upto forty miles in the upper part of its course.

## II

### ***Rainfall, Society and Economy: Floods and Crops in Nineteenth and Early Twentieth Century North Bengal***

In north Bengal half of the average rainfall of the year was concentrated during the months of July, August and September and this was caused by the monsoon winds coming from the Bay of Bengal. The hilly part of northern Bengal witnessed more rainfall than the other parts due to the presence of the Himalayas. The quantity of rainfall had varied during the monsoon season though sometime increased by cyclonic storms from the Bay. Variations in rainfall produced blights in the district of Darjeeling. In the *terai* part (foothill part) of the district there were two kinds of blights – *hatina*, caused by excessive rainfall and damaged rice crops; and *magha*, caused by the years of scanty rainfall.<sup>33</sup> On the other hand, in Malda, floods of a destructive character were of frequent occurrence and between 1850 and 1870 there were three severe inundations which caused great sufferings in all parts of the district, especially in the low lands along the rivers. These floods were not so much produced by the heavy rainfall on the spot but took place due to the abnormal rise in the rivers as a result of rainfall at the upper part of the rivers.<sup>34</sup> In 1856 a very severe flood was occurred in the Ganges. The Murshidabad embankments burst at Lalitakori, the whole country below was inundated, and the crops and large numbers of cattle were destroyed. The District of Murshidabad had to witness of several serious floods in 1856, 1866, 1870, 1885 and 1890 caused by the rivers. Among which the floods of 1870, 1885 and 1890 were most severe. The Laltakuri embankment in the Mushidabad district had been broken by the rising water during the floods. In the district of Rajshahi floods of severe magnitude which caused serious damage to the harvest took place in 1838 and 1865. The flood in 1865 was caused by the excessive rainfall.<sup>35</sup> Though the town Rampore Boalia, the sadar town of Rajshahi district was protected by a 7 miles long embankment but had suffered from the periodical overflow of

waters.<sup>36</sup> One such serious incident took place in 1864 when the embankment was flooded by the Ganges and a greater part of the town ‘including the Government officers, was swept away’.<sup>37</sup> However, the floods occurred since 1870-71 was different in nature and scale than the earlier floods. District-wise documentations of rainfall, embankment, agriculture, public health etc. in the *District Gazetteers* had reached to a moderate extent by the colonial administration to deal with the ‘facts’ about the floods and other issues. But the publication of these gazetteers was started only since the beginning of the twentieth century. It was until the beginning of the second decade of twentieth century when Government perceived the necessity to compile the scattered evidences and documents regarding the floods occurred in north Bengal. Government of Bengal has appointed the North Bengal Flood Committee in February, 1923 under the chairmanship of Mr. G. T. Huntingford, Officiating Chief Secretary, Public Works Department, Government of Bengal, in order “to prepare a series of maps showing the actual position and quantity of the rainfall immediately preceding some of the more important floods.....which had actually occurred in North Bengal during the period 1870 – 1922.”<sup>38</sup> After analyzing the Administration Report of Bengal from 1870 to 1922 and the District Gazetteers of all the districts of Rajshahi Division, the committee has presented a list of important floods. It had classified all floods under four heads - *Catastrophic* which involved considerable direct loss of human life and great destruction of cattle and crops; *Severe* that incorporated small loss of human life and significant destruction of crops and cattle; *Moderate* floods which did cost sizeable damage to crops and cattle but no loss of human life; and *Slight* which involved minor damage of crops but no direct loss of cattle or human life.<sup>39</sup>

### ***Floods between 1870 and 1879***

Occurrences of floods in north Bengal have been very often attributed to the excessive or abnormal rainfall and increase of water level in the rivers. In 1870 Murshidabad embankment at Lultakori on the Bhagirathi burst upon – as a result the whole district was flooded and the flood water swept across the district into Nadia; and great damage was done to the Eastern Bengal Railway. In the Bagri, or eastern half of the district, a great portion of the *aus* rice crop was demolished by the floods; and nearly all the *aman* rice growing in the low lands was plunged.<sup>40</sup> The rice crop, however, in the Rarh or western half of the district was good, and the outturn as it was informed to have been above the average. The cold-weather crops in many parts of the

district were destroyed by a third rise in the rivers.<sup>41</sup> Despite of prevalence of a good amount of food, though other than rice, as had been argued, it was ‘by no means an easy matter for many of the suffering cultivators, who were living on *machans*, or bamboo platforms raised above the waters.’<sup>42</sup> Though relief operations were conducted by the government but these ‘only entailed an expenditure of Rs. 3,000, for the land in many parts was benefited by the rich deposit of silt left by the receding waters.’ There was an exhibition during this period of a spirit of mutual assistance among the people which coupled with governmental relief assistance had prevented, as it was reported in the Annual Report of the Collector in 1870, any ‘single death from starvation.’<sup>43</sup> Even though the crops in low-lying places were almost entirely destroyed by submersion, but the peasants elsewhere were benefited by the floods which had brought down an abundant supply of water that allowed them to produce a higher quantity of rice from their lands than they had obtained for several years past.<sup>44</sup> The Collector attributed high range of prices prevailed during 1872-73, which were on an average above those of the previous years, to the serious diminutions in stocks which had been caused by the inundation of 1870 and its successive consequences.<sup>45</sup> In the exposed lands in the north of the district, the damage of the developing crops was excessive, but in the southern part of the district, due to its positional immunity from any devastating rush of flood water, produced an ‘unusually fine harvest’.<sup>46</sup>

The Bhadrihat thana of Murshidabad, as reported by Bankim Chandra Chatterjee, though had suffered from inundation only to a slight extent but three-fourth of *bhadoi* crops had been destroyed.<sup>47</sup> Part of thanah Dewanserai on the banks of the Bhagirathi had suffered a good deal. The land outside the embankments had been wholly submerged, and no crops were expected. The crop submerged was wholly *aus*; no *aman* was grown here. The rice bearing lands such as - Lakhijolah, Boojoomeah, Hichakhati, Babupoor, and Koolgatchi, were under water.<sup>48</sup>

Apart from the different parts of the district of Murshidabad, many parts of northern Bengal were affected by the floods of 1870. W. Campbell, the Officiating Deputy Collector of the district of Malda had mentioned about the report which depicted the condition in the following manner:

“...[in] Malda, Gomastapur, Kaliachuck, Gajol, Nowabganj, and Gargoriba, the rising of the rivers has put nearly all the *bhadoi* paddy under water, and if the rivers continuing rising, the greater portion of it will be destroyed.”<sup>49</sup>

N. S. Alexander, the Officiating Collector of Malda wrote to the Commissioner of the Rajshahi Division about the impact of the flood in different police stations of Malda: police station English Bazaar - a twelve *anna* portion of the *bhadoi* crop had been lost; police station Malda – a fourteen *anna* portion of the *bhadoi* crop had been lost; police station Kaliachack – eight *anna* portion of the *bhadoi* paddy had been lost and this was only paddy grown in this quarter of the district; police station Gomastapur – twelve *anna* portion of the *bhadoi* paddy and eight *anna* portion of the *aman* paddy had been destroyed; police station Shibganj – one *anna* paddy was expected while the rest was being destroyed; police station Khurba – only ten *anna* crop was expected; police station Gargoriba – only five *anna* crop was expected.<sup>50</sup> The delayed response of the government had prevented them to collect any further information about the extension of the flood in the Rajshahi Division. After the water had subsided, the Government had decided to ‘visit the localities affected by the inundation or depute a proper officer to do so’, but before doing that it was declared most surprisingly that ‘the almost entire destruction of crops which the Collector has reported ....has been very much exaggerated, and accordingly awaits a further and a fuller report.’<sup>51</sup>

The flood had ravaged a greater part of the district of Rangpur. Indigo, which was reported on from only one station, was all damaged by the heavy rain. The flood had also destroyed the *aus* crop in the district, whereas the *aman* crop had suffered only slight damage. F. G. Millett, the Officiating Collector of Rangpur while coming by the steamer from Sirajganj to Kaliaganj had noticed that:

“the houses and sheds built on the churs in the river Jumoona (or Dowkolea or Brahmaputra, for it is called by all three names,) were mostly under water up to their roofs, while the people in the villages on or near the mainland were gradually being swamped out of their houses, and some boats were kept anchored close by in readiness for flight should the water too rise.”<sup>52</sup>

Such a magnitude of inundation had not been witnessed by people of the region for 12 years. In a letter to C. E. Lance, the Officiating Commissioner of the Rajshahi Division, J. Tweedie, the Officiating Magistrate of Pabna had written the following accounts of the floods in the district:

“The rivers, great and small, the Ganges, Bramapootra, Oorasagur, Echamuttee, and others, have risen three feet above their ordinary high level. All along the borders of

the Jamoona and Oorasagur, and also on the extensive chur lands which extend between these rivers, the land has been submerged. Villages are seen rising as it were out of a huge still, inland sea. Cattle are left without shelter....The jute crop has suffered as badly as the amun rice.”<sup>53</sup>

The causes of the rise of the water had been attributed to the high tides or high winds, which was blowing from south-west for almost sixteen hours and had prevented the out-fall of the large rivers into the sea.<sup>54</sup> Rainfall within the district which was only slightly below the average was not, however, treated as the main cause of the rising of water or the inundation. Throughout the Sirajganj *thana* the *aus* crops on the low lying lands had suffered to a considerable extent being the estimate for this *thana* as 6-anna crop only.<sup>55</sup> Most of the jute crop on the churs in the Jamuna river had been swept away, and what was sown late in consequence of drought had been entirely submerged. To the north of the district of Pabna, many villages were entirely under water, some of which were partially abandoned, and there was difficulty in procuring fodder for the cattle.<sup>56</sup> The destruction of food crops in the district was so widespread that rice ships were allotted for visiting the flooded localities in order to prevent any rise in prices.<sup>57</sup>

River embankments had suffered great damages by the floods of 1870 when several embankments were broken by the floods. The Ganges river embankment had been broken through at Boalia and at Talaimari (about two miles from Boalia) by the force of the stream.<sup>58</sup> It was proposed after the floods that the complete flooding of the town could be averted by continuous fortification of the embankment. Narad river had also broken through the Nator road in two places near Kapasia, and measures had been taken to repair the damage.

The 1871 flood was caused by unprecedented rainfall in the monsoon period. The monsoon of 1871 had carried a large amount of water with it. Though the year 1871 had witnessed a great quantity of rainfall but it had widely varied from district to district in north Bengal. During the second half of August rainfall had increased considerably and in September there was excessive rainfall in different parts of north Bengal.

Table. 4.1

Rainfall in the second half of August and 12<sup>th</sup> to 16<sup>th</sup> September, 1871

| Place                       | % of Rainfall in August | % of Rainfall in September |
|-----------------------------|-------------------------|----------------------------|
| Rangpur                     | 87                      | 63                         |
| Dinajpur                    | 67                      | 153                        |
| Bogra                       | 80                      | 207                        |
| Rampur Boalia<br>(Rajshahi) | 69                      | 101                        |
| Sirajgunj                   | 11                      | 103                        |
| Pabna                       | 7                       | 298                        |
| Malda                       | 33                      | 136                        |

Source: Extracted from P. C. Mahalanobis, *Report on Rainfall and Floods in North Bengal, 1870 – 1922*, p. 51.

There was a huge elevation in terms of rainfall from August to September in the district of Rajshahi and Malda. On the other hand, rainfall for the whole month of August was low, in fact, deficient in some places. There were very minimum surplus of rainfall in Pabna, Dinajpur and Rangpur in August. However, in the first week of September considerably greater rainfall than the average took place in the eastern part of northern Bengal where the volume of excess had varied from 50 per cent to 150 per cent.<sup>59</sup> From 12<sup>th</sup> to 16<sup>th</sup> September rainfall was inexorably maximum in the south-eastern part of north Bengal. Though the month of September had witnessed moderate excess of rainfall in some places but rainfall at Jalpaiguri ‘was in defect by 46 per cent and at Buxa by 19 per cent’.<sup>60</sup> In Malda (1871), the river Mahananda overflowed its banks and flooded the adjacent villages and caused serious harm to the cattle, *bhadoi* crops (reaped in August or September) and mulberry; and the town of English Bazar and the lower portion of the police stations of Harishchandrapur and Kharba were flooded.<sup>61</sup> Floods occurred in Malda had been chiefly attributed to the abnormal rise of water-level in the rivers due to rainfall

in the hills instead of local rainfall. Most of the rivers and streams which were running through Malda had originated in the northern mountains and were vulnerable to sudden freshets produced by the melting of snow and excessive rainfall in the hills. In the *diara* tracts of the district the flood caused changes in the main stream of the river Ganges which was resulted in cutting away of cultivable and dwelling areas that turned ‘the inhabitants of whole villages ...in a night to the position of landless labourers.’<sup>62</sup> But this on the other hand had created opportunities for the formation of new *char* lands by the silt deposits which were fertile for cultivation. The excessive rainfall in the Rajshahi district in 1871 commenced from the end of August and continued till the second week of the October.<sup>63</sup> The district was flooded by water. This flood, which was said to believe the ‘highest floods on record in the district’, caused much damage to the cattle due to the want of fodder and the people were compelled to leave their original houses and take shelter to the high places.<sup>64</sup> When water had subsided cholera was broke out in an epidemic form in the district of Rajshahi.<sup>65</sup> Deaths were reported from the district, though the number was very small. But there was a terrible loss and mortality of cattle along with the destruction of crops.<sup>66</sup> The *Hindoo Patriot* informed that ‘The oldest man living does not remember to have seen such a deluge, several of the fairest villages have been swept over by the flood, looking like one vast sheet of water studded here and there with huts and trees.’<sup>67</sup> The embankments on the left bank of the Bhagirathi in the Murshidabad district gave away and the water from that and other directions swept into Nadia district and carried away portions of the Eastern Bengal Railway and poured into parts of Jessore.<sup>68</sup> The increasing quantity of rainfall had contributed to the rise of water-level in the Ganges which was primarily responsible for this flood in Malda and Rajshahi. In contrast to these areas rainfall in Darjeeling, Jalpaiguri and Buxa i.e. in the northern part was strikingly low. ‘Thus water coming from the north was not an important factor’ for the inundation at Malda and Rajshahi, especially in this case.<sup>69</sup>

In 1874 due to a high flood of short duration Murshidabad embankment was again broken at Lultakori; but the river fell rapidly and little damage was done. In 1874 August ‘moderate’ flood was occurred in the district of Rajshahi and Pabna. *Amrita Bazar Patrika* reported that:

“In the north-western part of the country [Bengal] the Ganges flooded the fields into a vast sheet of water... The Padma swelled so much that Goalundo is nearly under water and many parts of Pabna have been washed away, and crops have been destroyed... Gradually the water

will spread over Bengal and if the water of the Ganges increase at this rate then within a month a great flood will occur in Bengal.”<sup>70</sup>

The flood in Pabna was due to the rise of water level in the Ganges which was complemented by the rising water in Brahmaputra coupled with the local excess in rainfall. However, water was only limited to the extreme south east and the ‘extreme north’, and it flowed down swiftly without any obstacles as there was no ‘railway lines in existence at that time.’<sup>71</sup>

In 1875, floods occurred in Malda and Pabna. Rainfall in the month of August was high in some places and it was increased in average to 45 per cent in Malda, 92 per cent in Chanchal, 33 per cent in Sirajganj, and 58 per cent in Pabna throughout the month.<sup>72</sup> However, the percentage was glaringly increasing in day to day rainfall during the end of the month. There was very minimum rainfall in the extreme north. The flood was again attributed to the excess in local rainfall which triggered the rise in water level in the Ganges which seldom had the capacity to hold increase water in its river bed in this region.

The heaviest flood in Cooch Behar ‘remembered by the oldest men’ in the country occurred in July 1878, ‘the like of which had not been seen for 40 years’.<sup>73</sup> The rainfall in April was seasonable and in May it was 12 inches. But from June onwards rain was started to falling heavily and in July it appeared in its most violent form. The flood wrought havoc in the land. Early rice could not cope up with this maximum amount of water which washed away the fields.

“Starting from the river at the back of the Palace, the grounds of which [were] protected by a *bund* ...overstepped by the flood,...the people were all driven to the top of their houses by the flood when at its highest, and it was necessary to send out boats with loads of *chura* or dried rice to distribute, as in some places the cottiers were literally in danger of being starved.”<sup>74</sup>

The whole area from Cooch Behar to Dhubri came under one vast sheet of water. Crop yielding areas had gone under the water. Though the floods had subsided quickly from the high lands but it took several days to remove the low lying lands from water. As a result serious damage was caused to the standing crops. The early seedlings were more or less damaged and in some places were totally covered up by the floods, and recovery from this took a very late one which ‘was fatal to all hopes of a good harvest.’<sup>75</sup>

The flood of 1879 was due to heavy rainfall during the end of the August. The rainfall had increased to 100 per cent in many places and to '200 per cent over a large area.'<sup>76</sup> Rajshahi was affected by this flood. Despite of heavy raining in the north the situation did not rise in a condition of inundation in the south of the river Tista. The smooth flow of water by the tributaries of Tista helped the situation. Apart from the increased local rainfall, the considerable rise of water level in the Ganges in northern India (UP., Bihar) was also responsible for the overflow of waters in northern Bengal. It was observed that the flood of 1879 in Rajshahi was 'a typical river flood primarily caused by the heavy rainfall in U. P. and Bihar and the consequent rise of the Ganges level.'<sup>77</sup> But in Murshidabad the flood was very. 17 small breaches had appeared the embankments. As a result the whole district was flooded and rails were topped in many places on the Eastern Bengal Railway.

### ***Flood of 1885***

The flood of 1885 was lasted about one month spreading in many parts of north Bengal. In severity and duration, the flood was unequal to those of 1823 and 1871; the former of which was said to have persisted nearly two months, and the latter of which was known to have continued for six to seven weeks. The damage commenced by the breaking of the Murshidabad embankment on the 23rd of August near Laltakori where the water penetrated under the embankment and burst up in springs on the other side, and eventually the embankment was diminished and a breach of 200 feet wide was immediately formed.<sup>78</sup> This occurred at 11 p.m. and by 7 a.m. the next morning the breach had widened to 800 feet. On the 8th of September it was 2,000 feet in width, and it ultimately reached to 2,270 feet, or nearly half a mile. The discharge of water for the next three weeks (from the 24th of August to the 14th September) was amounted to about 50,000 cubic feet per second.<sup>79</sup> The flood had inundated a large tract of the district and expanded to 1,250 square miles or more than one-half of the total district area.<sup>80</sup> In the initial stage as the breach was comparatively narrow there was a high velocity of water whereas later on there was a wider breach and a lower velocity. On the 25th of September, the discharge had fallen to about 14,000 cubic feet, and was rapidly decreasing. The embankment having breached, the flood flowed over the country, and after filling up the low lands known as

*Kulluntra*, in the south of Murshidabad, reached the 61st mile of the Eastern Bengal Railway on the 29th of August. Meanwhile the Gangetic flood, pouring down the Mathabhanga, breached the embankment near the Ramnaghur station of the Eastern Bengal Railway on 28th August.<sup>81</sup>

The flood of 1885 was attributed to the floods in the Ganges, aggravated by an unusually heavy rainfall over the area affected, at the same time as the Ganges floods were at their worst. However it was calculated that very severe floods seemed to appear at the regular intervals of about 17 years.

|              |      |      |       |            |
|--------------|------|------|-------|------------|
| Between 1801 | and  | 1823 | ..... | 22 years   |
| ”            | 1823 | ”    | 1838  | ..... 15 ” |
| ”            | 1838 | ”    | 1856  | ..... 18 ” |
| ”            | 1856 | ”    | 1871  | ..... 15 ” |
| ”            | 1871 | ”    | 1885  | ..... 14 ” |

5/84 (Average about 17 years)<sup>82</sup>

It can be noticed from the above statistics that intervals between the occurrences of floods tended to be shorten and moreover, high floods caused to disastrous inundations had been ‘far more common in the last 30 years than the records show them to have been previously.’<sup>83</sup> For the temporary relief from the disaster relief circles were built in the affected areas, and a Central Committee had come into being in Calcutta to receive donations and ‘organized relief for those forms of distress with which Government agency could not adequately cope’.<sup>84</sup> In 1890 there was a similar inundation like that of 1885 due to the Lalitakuri embankment bursting again.<sup>85</sup>

Flood of 1885 in Malda was also the result of an abnormal increase of the water level in the Ganges. Throughout the August Ganges had to witness a maximum rainfall in its upper course which fell under northern India and this excessive rainfall contributed to a considerable increase in the water level in the river bed. In the flood of 1885, parts of Kaliachak, Sibganj and Nawabganj police stations of Malda were affected.<sup>86</sup> But it was observed that in the month of September rainfall in different parts of north Bengal was extremely high and on 1<sup>st</sup> September Malda, Gajol and Sibganj had 3.15, 3.75, and 4.02 inches of rainfall respectively.<sup>87</sup> It was observed that ‘heavy local falls in the flooded area itself together with a very high level of the Ganges were mainly responsible for the present flood.’<sup>88</sup>

However, though it was stated that the flood ‘was attended with little loss of life’ in Murshidabad but the poorer classes were, for some time, put to considerable straits for food, and the cattle

suffered from want of grass.<sup>89</sup> T. H. Wickes in the *Report on the Inundations of 1885 in the South-Western Circle* had summarized the impact of the flood in the following manner:

I saw many scores of villages in which the thatched roofs of the houses were alone visible, the country being completely submerged. There was no epidemic. The rice crops were destroyed over a large area, but the deposit left by the flood will have fertilized the soil. Bumper *rubbee* crops have followed, and the harvest will be improved for some years to come. In the immediate neighbourhood of breaches the soil is injured by the deposit of pure sand; but where the rivers naturally overflow, and beyond the immediate neighbourhood of breaches, the country receives a rich deposit of silt – an invaluable blessing in a country where the use of manure is practically unknown. The railways suffered very severely both in loss of traffic and by the lines being topped and breached.<sup>90</sup>

The *Report*, however, did not include any number of casualties. ‘The first and most necessary’ step which was undertaken to avert any future occurrence like this, was ‘the retirement of the embankment from the treacherous soil near Laltakori, to good ground where it can be held against any flood.’<sup>91</sup> The proposed measure was to be followed by the construction of seven miles of embankment at a cost of Rs. 1, 80, 000 but it did not materialize due to shortage of funds. The next method was the provision of sufficient waterway on the Eastern Bengal Railway between Ramnagar and Aranghata. Moreover, ‘for the safety of the country liable to damage in case of high floods, orders [had] issued for the immediate construction of a short retired line in the rear of the breach of last year, which it [was] hoped [would] be sufficient for present safety...’<sup>92</sup> The Central Committee which was constructed for conducting relief in the district of Murshidabad had received Rs. 65,665 in subscriptions, and expended Rs. 37,000 for the victims. The residual amount was devoted ‘to form the nucleus of a distress fund to be applied promptly on the occurrence of future calamities by famine or inundation in Bengal’.<sup>93</sup>

However, situation was not identical in all the parts of northern Bengal. As a result of total loss of rice in the fields there were many places where the people were suffering from want of food. *Amrita Bazar Patrika* wrote on 17<sup>th</sup> September that:

“...in many parts of Bengal the people [had] eaten up their last grain. What they had has been washed away by the great inundation which [had] flooded almost all the districts of the Province. Hundreds of villages [had] been totally destroyed, and men, women and cattle swept away by the torrent. Thousands of people in those places [had] been rendered homeless and [were] likely to die of starvation, if no material help [was] sent to them at once....”<sup>94</sup>

For Malda, too, relief measures were undertaken by the Government. Through this relief work, it was claimed that, 42,491 persons were relieved gratuitously at a cost of Rs. 11, 579 and 6, 944 persons were backed up with work.<sup>95</sup> Though the floods did not cause loss of any human life but it had profound impact on the changing tracts of main stream of the river. There were considerable loss of property and standing crops in the *diara* part of the district which reduced the villagers 'in a night to the position of landless labourers'.<sup>96</sup> But in a sharp contrast to this, it was said to believe that the layer of silt deposits brought out by the floods could ensure a good crop in the forthcoming years. Water had flowed down in a regular basis in many parts where there was no rail line which seemed to be a major obstruction in the smooth flow of water. The absence of Sara-Sirajganj (1913-15) and the Santahar-Bogra (1893-96) lines had provided had provided the condition for a 'good drainage'.<sup>97</sup>

### ***Floods between 1886 and 1898***

Some parts of north Bengal had witnessed heavy rainfall in September of 1886. This heavy rainfall caused floods to some areas. Ganges level above Rampore Boalia raised very high towards the end of August and the beginning of September. This time, however, northern part of northern Bengal had suffered from the flood which reached to as far as Cooch Behar. The diversion road from Matigarrah to Kurseong near the 5<sup>th</sup> Mile was washed away by heavy rains of October. The unprecedented excessive rains in the month of June, July, August and September produced devastating landslides on the Hill Cart Road, Peshoke, and Tista Valley Roads.<sup>98</sup> Bogra had a massive rainfall in the month of June, 1886, 'when the extraordinary rainfall of 18 inches took place between the hours of 11.30 p.m. and 1 a.m. on the night of the 30<sup>th</sup> June'.<sup>99</sup> As a result, the town of Bogra and a greater part of the district were flooded and portions of railway lines were swept away.<sup>100</sup> Cooch Behar was also flooded by the overflowed water.<sup>101</sup> Though the damage done to the crops was comparatively low in this case, but there were many cases of loss of cattle in the State.

The 1890 flood in Pabna Sadar Subdivision, produced by the river Ichhamati and Padma caused serious damage to the roads and '[a]lmost the whole of the town was more or less under water for nearly a month'.<sup>102</sup> In the town of Pabna the southern portion of the civil and criminal courts

were flooded by the Ichhamati. For protecting the district from future inundations ‘an embankment with sluice-gates was constructed along the right bank of Ichhamati...’.<sup>103</sup>

The 1892 flood had extended to a greater part of north Bengal. In the first week of July, 1892 there was unprecedented rainfall in Raiganj, Balurghat, Kurigram, Siliguri, Mathabhanga, Cooch Behar. River Dharla rose to an abnormal height due to the excessive rainfall. The district of Dinajpur was considerably affected by the flood. In Dinajpur the flood, started on 9<sup>th</sup> July, 1892 caused by the heavy inundation from the Atrai River and, combining with the Gabura and Ghagra streams on its way. The flood ‘swept down on the town of Dinajpur from the north-east and washed large numbers of the inhabitants of the northern and eastern quarters out of their houses’.<sup>104</sup> Floods in Dinajpur were of almost annual occurrence. But what took place in 1892 was exceptionally disastrous in the history of the district.

At one time it seemed likely that the whole of the central portion of the town might be destroyed, but the timely cutting of the Darjeeling road let the water off and relieved the pressure. A dangerous feature of this flood was that its first appearance in the evening, and the darkness which ensued added greatly to its terrors.<sup>105</sup>

The flood caused serious damage to the houses. Money was allocated to the sufferers for their maintenance and repairing of their houses. Though the river Atrai and Punarbhaba rose to the flood but it was Atrai which violently hit the country with maximum force of its water. The enquiry which was conducted to decipher the main reason of the flood found that ‘the railway line, which bisects the district from east to west, was in large measure responsible for the damage done by holding up the flood water coming from the north’.<sup>106</sup> The Raiganj-Parbatipur-Kurigram railway line held water of Atrai for long time. Increased water from the hills expanded and fulfilled the rivers which contributed to the serious overflow from the Mahananda above Kisengunj, from Atrai below Siliguri and near Dinajpur and Chirirbander and from the Dharla below Magalghat and near Kurigram.<sup>107</sup> Mathabhanga and Cooch Behar Suddar Sub-divisions of the Cooch Behar State were flooded extensively in this flood.<sup>108</sup> There was excessive rainfall in several parts of the district of Darjeeling. The *Report on Rainfall and Floods in North Bengal* (1927) has summarized the flood-condition of the Darjeeling district in 1892 in the following manner:

“...on the Tista Valley road traffic was stopped for 22 days, owing to the scouring away of the timber bridge over the Galijhora. ....On the road from the Tista bridge to Rishi the heavy rains of the 12<sup>th</sup> July 1892 caused serious damage, a 60-feet timber bridge and three of 30-feet being carried away and traffic interrupted for some time.....[F]rom Darjeeling to Tista *via* the Runjeet there were heavy slips and the road sunk badly in the 14<sup>th</sup> Mile.... Serious slips occurred on the road from Jore Bungalow to Tista via Peshoke,....

Considerable damage was done to the Terai roads by the extraordinary heavy rainfall between the 2<sup>nd</sup> and 7<sup>th</sup> July 1892; one span of the Champta bridge on the road from Mattigurah to the Hill Cart Road was destroyed by floods, the wing walls of bridge No. 15 on the road from Mattigurah to Kurseong were scoured away, while the road from Mattigurah to Naxalbari suffered most severely, several sections of the bank were breached, .... Several slips occurred, which required the hillside to be cut back in order to obtain the full width of road again...”<sup>109</sup>

Sirajganj was also flooded this time massively. The *Statesman* reported on 21<sup>st</sup> July that “There [h]as been a very high flood this year .... There was a very good harvest both in *dhan* and jute but the field [were] under water and cultivators [were] in great distress...”<sup>110</sup> In Sirajganj the flood occurred as a result of maximum increase of water in Brahmaputra which overflowed the river. In July 1895 the whole Cooch Behar State was inundated by the excessive rainfall and Pargana Tufanganj was completely ravaged by the flood.<sup>111</sup> There was again a chance of heavy flood, which remained though a ‘moderate’ flood, in 1898 in north Bengal due to increased rainfall in the month of September. There was more than 100 per cent increase in rainfall in greater part of north Bengal between 1<sup>st</sup> and 22<sup>nd</sup> September and extraordinarily heavy falls were on the 16<sup>th</sup> September in Mathabhanga (13.10 inches), Falakata (10.65 inches) and Siliguri (8.15 inches).<sup>112</sup> District of Darjeeling had an excessive rainfall which caused damage ‘.. on the hill roads in consequence, traffic on the Tista Valley road being interrupted for seven days’.<sup>113</sup> However, the worst had yet to come for Darjeeling district.

### ***Flood of 1899 in the district of Darjeeling***

The year 1899 has been regarded as the year of the great disaster in the Darjeeling district. Darjeeling’s rainy season of 1899 was exceptionally heavy, with an unprecedented downpour on September 23<sup>rd</sup>, 24<sup>th</sup> and 25<sup>th</sup>. The beginning of the disaster was brought forth by a cyclone on

23<sup>rd</sup> September. (The course of the cyclone has already been described in Ch. II) The cyclone was accompanied with heavy rainfall which continued for three days and the downpour was varied from places to places, as shown in below:

Table: 4.2

Rainfall (inches) at different places of Darjeeling on 24<sup>th</sup> and 25<sup>th</sup> September, 1899

| Place      | Rainfall on 24 <sup>th</sup><br>September | Rainfall on 25 <sup>th</sup><br>September |
|------------|-------------------------------------------|-------------------------------------------|
| Darjeeling | 5. 30                                     | 19. 40                                    |
| Kalimpong  | 4. 80                                     | 9. 16                                     |
| Kurseong   | 4. 67                                     | 15. 18                                    |
| Pedong     | 4. 42                                     | -                                         |
| Mongpoo    | 3. 25                                     | 12. 96                                    |
| Siliguri   | -                                         | 3. 98                                     |

Source: P. C. Mahalanobis, *Report on Rainfall and Floods in North Bengal, 1870 – 1922*, p. 66.

At this same time Tista arose with a flood of huge elevation and spilled over its banks which resulted in pervasive destruction especially at Tista Bazar where almost all the houses were swept away. The flood severely affected the tea gardens and the area of tea actuality ruined was 2000 acres and the value of property destroyed such as – tea, buildings etc. cost more than 10 lakhs of rupees.<sup>114</sup> Large areas of forest were washed away. River Balasan had also come down with huge amount of water which caused serious destruction to the Balasan forest and took away three quarters of forest area into the valley. The carrying down of mud, water, and stones etc. by the constant stream were scattered over a large area and the roads were somewhere obstructed by the trees, electric wires, and several other debris or were utterly wrecked away. The roads were broke in with several cracks, ‘the Cart Road being seriously damaged throughout its whole length from Darjeeling to Ghum, and also at many places between Ghum and Kurseong; while large portions of Tista Valley road practically disappeared.’<sup>115</sup> The railway network had also suffered extremely and the rail lines in several places were hanging in ‘mid-air’ gaps.

The four consecutive natural calamities - cyclone, excessive rainfall, flood and landslips- took a heavy toll in the district of Darjeeling where deaths were occurred among both the Indians and Europeans.<sup>116</sup> Apart from the mortalities, heavy destruction was done to the buildings, railway lines and the tea gardens. E. C. Dozey had provided the following account of sufferings caused by these calamities -

“The railway also suffered considerably, which in some places, notably near 'Mary Ville', had its lines suspended in the air compelling passengers to cross this chasm on a wire-ropeway to which a seat was attached....The rushing waters swept away the heavy machinery and buildings ,of the old Cedar Tea Estate, not to speak of doors and windows, and landed the debris at the Tirrianna crossing, which is fully 10 miles below in the Terai. The Poole ridge suffered a similar fate, while animals both tame and wild were drowned in the flood. Finally the total loss to property as computed by competent authority has been estimated to amount to one *lakh* of rupees.”<sup>117</sup>

The river Little Rangit accumulated huge amount of water in its upper stream that triggered the pace of the occurrence of numerous landslips at its banks. At the eastern side of the Mall of Darjeeling there was a series of continuous landslips, most of which were generated from near the top of Observatory Hill. The destruction and the loss of life in Darjeeling had received a broader audience than it had during any previous calamities occurred in the district so far. Quoting from *The Darjeeling Advertiser*, the first issue of this newspaper was published in March, 1899 - E. C. Dozey has mentioned that:

"There is no house, there is no plantation, there is scarcely a road or highway in the district which has not suffered. Owing to the line being washed away at 'Mary Ville' and several other places between Ghum and Darjeeling the up mail was held up at the former station where passengers were forced to shift for themselves and spend the night as best they could in all possible discomfort, arriving the following morning in dandies or rickshaws. . . . About 320 privates and Noncoms of the Munster Fusiliers under Capt. Tizzard and Lt. Henderson worked all Monday and Tuesday in their efforts to unearth the wounded, and dead from the debris of the houses to the east of Observatory Hill which had been engulfed by the landslide.”<sup>118</sup>

*The Fairfield News and Herald* had reported the following description and aftereffects of the calamities of 1899:

“Lieut. Gov. Sir John Woodburn announced to the council Thursday that 400 lives were lost through the floods at Darjeeling, capital of the district of that name, in addition to those drowned on the plains. Great havoc has been caused at Kurseong. The Margaretehope estate lost 100 acres and Mealand factory was destroyed. Some coolies

were buried in the ruins of the manager's house, which was partially destroyed. The Avongrove estate lost 30 acres, and 4000 tea bushes. The coolie lines were swept away and many persons were killed, but the exact number is not known. A factory was also destroyed at this place. A huge landslide below St. Mary's seminary destroyed the railroad bridge and completely blocked the road. A breach 30 yards wide has been made and the rails are hanging in the air. It is thought the break cannot be repaired within 30 days.”<sup>119</sup>

*The Argus*, published from Melbourne, provided the account of the natural calamities which was reported from London on 29<sup>th</sup> September, 1899 under the caption ‘*Darjeeling Disaster: Sad Incident – a Family Overwhelmed*’, in the following manner:

“In connection with the terrible disaster at Darjeeling in India caused by heavy rain and landslips, a very and incident is reported. A missionary named Lees and his six children, while on their knees offering up prayers for the protection, were overwhelmed by a landslide. One of the children was saved, but Mr. Lees and all other children perished.”<sup>120</sup>



Plate: 4.1.

Mall-Villa – The Lee House which was destroyed in 1899 floods.

Source: Ada Lee, *Seven Heroic Children: A Great Sorrow and a Great Victory*, p. 145.

Deaths occurred in Lee family had invoked a great sensation among the contemporary European population. Ada Lee, one of the victims among the Lee members, who fortunately succeeded this

disaster, had written a memoir titled *Seven Heroic Children: A Great Sorrow and a Great Victory* which provided an eye witness's account about the disaster. This memoir is of great importance as it depicted the dreadful events accompanied by the live descriptions about the state of suffering of the people. Deaths of Europeans were reported by the Commissioner of Darjeeling to the Lieutenant Governor of Bengal in following terms: "Mall Villas destroyed; lives lost as follows: D. H. Lees's children, eldest girl found dead, eldest boy saved, rest missing. At Ida Villa, Phoebe and Ruth Wallace, Eric Anderson, all dead."<sup>121</sup> Ada Lee had described their apprehension standing amidst the horrible times:

"...steady downpour continued. Added to this began to be the roar of swollen streams and the river below, the crash of landslips, and the fierce uproar of the tempest. Many a timid heart believed that night to be its last on earth; and, .. in many parts of the station a desperate struggle for life was going on— fighting against mud and water, and falling rocks and trees..."<sup>122</sup>

The boys of St. Joseph College, Darjeeling had displayed great effort and bravery as they 'rushed to the scene of the catastrophe and systematically set to the rescue work'. Praising their rescue operation *The Englishman* reported, 'Among the deeds of heroism worthy of mention is the rescue work done by the boys of St. Joseph's College.'<sup>123</sup>

The types of landslides which were occurred in Darjeeling were classified, according to the Swiss terminology, as *Schuttsturze*, i. e. soil sidles or soil slips and this *Schuttrutschungen* <sup>124</sup> was caused by slow movements of soil or unconsolidated material along the hill slopes and these movements of soil were common at the lands stretched between Mahanadi and Rangtong rivers.<sup>125</sup> The deduction of soil from the surface by the automated action of running water, and the concurrent accumulation of decomposed products below the sub-soil by chemical activity of infiltrating water are not simultaneously compensatory in slopes covered with vegetation and on the other hand the creation of soil-cap, obviously, does not in itself help to an increase in the surface slope but its erosion from the foot of a slope by watercourses increases the average slope of the hillside. This kind of destabilization or subsidence of the foot of a hill was recorded in the faulted area between the two branches of the Kagjhora in Darjeeling.

The severity of these natural disasters prompted the colonial Government to appoint a committee, consisted of engineers and residents of Darjeeling and to formulate strategies to cope with such

situation in case of future occurrence and to minimize their consequences as well. The committee under Mr. Holland of the Geological Survey of India, after a thorough inspection of roads, buildings, rails and drains; reported that “the landslips were confined to the soil cap, and that there was no reason to entertain any apprehension as to the stability of the site of the station, which [was] founded on massive rock and [was] thus secure” and the causes of the landslips, according to them, were the “defective drainage of sites, excessive lead of drains, imperfect or badly-constructed revetments, neglect to reduce or protect steep slopes, defective supervision of building sites, quarrying in unsafe localities, etc.,...” and at the same time, also hinted out the counteractive methods that were to follow in order to avert the future danger.<sup>126</sup> Moreover, these measures took a final shape in 1900 when Bengal Act I of 1900 was introduced, based on the recommendations of the committee, which conferred increased power and responsibilities to the local authorities, and on the other hand a complete set of building regulations had come into force that vested full power to control the diggings and construction for buildings and banned the erection of buildings on any site considered vulnerable to the natural disasters; as a result the following years had witnessed more efficient prevention and comparatively less damage of life and property as well.<sup>127</sup>

### ***Floods in early Twentieth Century North Bengal***

#### ***Floods between 1902 and 1915***

The district of Jalpaiguri was severely flooded in 1902 and in 1906 floods which were among the most severe floods the district had ever witnessed till the nineteenth century. It has been argued that the uninterrupted rainfall in the Darjeeling Hills and in the Jalpaiguri and Cooch Behar contributed to an exceptionally maximum quantity of water into the Tista which probably overflowed its banks and resulted in floods.<sup>128</sup> However, it is necessary to take into account that in the central part of north Bengal i.e. in the district of Rangpur and Dinajpur rainfall was considerably high in the month of September – Rangpur had 107 per cent and Dinajpur had 75 per cent excess in the rainfall.<sup>129</sup> On 26<sup>th</sup>, 27<sup>th</sup> and 28<sup>th</sup> September rainfall was remarkably heavy in Bogra, Pabna, Rajshahi and Malda, though no flood was reported from any of the places.<sup>130</sup>

The rainfall at Jalpaiguri during the month of August (1902) was above the average and in September, rainfall was excessive (100 per cent. or more than that in excess) which caused a great increase in the water-level of Tista. The flood was restricted to the basin of the Tista river and was the result of overwhelmingly excessive rainfall in the Darjeeling Hills on the 27<sup>th</sup> September.<sup>131</sup> Mr. Forrest, the Deputy Commissioner of the district of Jalpaiguri had provided a useful description of the flood.

“The sudden rise in the flood came as a surprise to everybody in Jalpaiguri...Large pieces of drift wood were being carried along over the road...the water was within a couple of inches of the floor of the strong room [of the treasury]... and had flooded the strong room...[though] no damage was done...the line was breached between Jalpaiguri and Haldibari...some people living in the lower parts of the town were flooded out for a time... Most offices and other public buildings [had] their floors covered with mud but no serious damage was done.”<sup>132</sup>

Thus it can be noticed that though the flood arose to a considerable height but it did not cause any serious harm to the property and crops, so far the Deputy Commissioner's testimony was concerned. Tista started to flow with a good force but its pace was checked by the railway embankment made for Eastern Bengal State Railway. The flood caused an extensive breach in the embankment and continued to destroy the rice fields to reach to the Ghoramara river. There appeared a number of breaches between the main breach and Mandalghat railway station where a bridge was washed away.<sup>133</sup> Bengal-Duars Railway had also suffered from the breaches that had been created by the flood which caused ‘a large breach [of] 200 feet wide south of Domohani station, rushed down an old *khal* in the direction of Mainaguri.’<sup>134</sup> The southern part of Jalpaiguri was flooded heavily by the Tista.

The flood caused deaths to the indigenous population. The total number of lives lost in the flood was ‘only’ ten including ‘three herdsmen’, ‘three women and two children’ who were belonged from poor families and were exposed to the danger very frequently due to their failure ‘to reach the high bank in time’.<sup>135</sup> Loss of cattle was estimated a great number – 350 head of cattle and 20 buffalos were lost – the Deputy Commissioner reported. There was a large herd of about 500 buffalos on the Nathua Khal when it was submerged in the flood and 79 among them were only rescued.<sup>136</sup> But most surprisingly, it was reported at the same time that ‘little damage was done to the crops’. One would be surprised to think that the flood had taken the cattle and buffalos,

whereas crops remained standing in the field! Parts of Cooch Behar were also affected. The Cooch Behar Narrow Gauge State Railway was reported to have been badly damaged by the flood.<sup>137</sup>

There were also heavy floods in Murshidabad due to the rise of water level in the Ganges in 1904, when the whole of the Lalgola *thana* in the Jangipur subdivision, the Bhagwangola *thana* in the Lalbagh subdivision, and parts of the Sadar and Kandi subdivisions were affected.<sup>138</sup> About fifty villages in the west of the Lalgola *thana* and the whole of the Bhagwangola *thana* were submerged owing to breaches in the embankment, and the water did not subside till after a month.<sup>139</sup> Considerable loss was done to the *aus* and *aman* crops, and grants of money and advances of agricultural loans had to be extended for the relief of the distressed.<sup>140</sup>

‘Severe and extensive floods occurred in the districts of Cooch Behar, Jalpaiguri, Rajshahi, Pabna and Malda in August and September’ of 1906. In Jalpaiguri it appeared in a most severe way. Though the flood of 1902 was limited to the basin of the Tista but in 1906 it spread throughout the district. From the month of July onwards rainfall was considerably increasing in all the parts of the district and near the hills it was excessively high. The main ‘feature of 1906 was the long succession of rainy and sunless days.’<sup>141</sup> The flood commenced when Tista ‘had been rising steadily’ on the night of 3<sup>rd</sup> August and by ‘6 O’clock’ of morning of 4<sup>th</sup> August ‘much of the town was flooded by all the rivers and streams spread across the district had risen at once.’<sup>142</sup> Collection of detail and extensive accounts of the flood, as argued, was hindered by the considerable interruption caused in overall communication system since the flood had destroyed rail lines and roadways in the district.<sup>143</sup>

This time the flood covered a wide range area within its current. At the west of Mal Bazar several bridges were washed away including the bridge over the Kumlai river and a series of breaches were made in the embankment, among which the breach near the Chel river was the widest. Apart from these, the flood brought about heavy destruction in many parts of the district.

“The eastern branch suffered most severely; there was a large breach in the embankment between Mal and Chlasa stations, but the worst damage was done between Chlasa and Nagrakata. North of the railway line the Jaldhaka river divid[ed] into two streams ...between which there [was] a high embankment, which was protected by a rocky islet covered with trees. The flood cut away the island and about, 1,100 feet of the embankment; the Hathinalla bridge stood, but not a yard of embankment remained attached to it,... All the protective

works were swept away and not a vestige of them was to be seen after the floods had subsided. Further east the Daina river cut away 900 feet of embankment, and there were numerous smaller breaches including one rather large one near Madari Hat. It was not until November that this section of the line was open to traffic again.<sup>144</sup>

Though in many parts of the district the telegraph lines were interrupted for some time but there were soon repaired. The considerable disruption of communication affected the movement for people and commodities in a significant way. Nagrakata and the surrounding tea gardens situating at the east of it fell heavily relied on the Ramshai Hat railway station for their purchases of rice and coal and for the means of carry across the tea in the open market. The flow of traffic which was frightened on the Ramshai Hat-Sulkapara and Ramshai Hat- Gaikata roads ‘was in consequence very great and efforts were directed to make these roads passable for traffic to keep them open.’<sup>145</sup> In order to normalize the ferry system increased number of boats was called upon from Burnes Junction and was rapidly stationed on the ferries over Jaldhaka and Daina river.<sup>146</sup> The major damage in the Bengal-Duars Railway caused by flood had contributed to the propping up of the necessity to build upon alternative roadways between Ramshai Hat and the tea gardens between the Jaldhaka and Torsa rivers. In fact, a road was started to construct within the Tondou forest in anticipation of its natural immunity from the occurrence of any flood in future. A protective embankment was proposed to build along the line of Tista in order to protect the town of Jalpaiguri from the floods.<sup>147</sup> Western Duars of Jalpaiguri district was devastated by the 1906 floods. Destruction of crops led to abnormal rise of prices of food grain which reached to the famine prices. This severely affected the poor tea garden workers who looted a tea garden *haat* at Bataigol near Malbazar and a few shops near Chalsa railway station.<sup>148</sup>

In the district of Malda during the post-flood period the price of rice increased to 6 seers per rupee, and as a result relief measures were initiated by the Government through the extension of advance a lakh of rupees under the Agriculturists’ Loans Act.<sup>149</sup> It was due to the fact that the high prices of rice was resulted in sudden increase of demand from East Bengal since the crops were adequate in the *barind* region of the district which was escaped from the flood as being positioned in the high lands.<sup>150</sup> *The Bengalee* had reported that – In Malda

“rice and all the vegetables and other eatables [had] been selling at famine price for these two months and a half and the state of things [had] at last assumed a fearful aspect...the present famine [was] almost unprecedented in the annals of the district of Malda...the *aus* crop ...[had] also been washed away by the persistent and high flood of the last few days.”<sup>151</sup>

Rajshahi was also suffered from the scarcity of food grains. Due to the large scale destruction of *aus* crop situation was further aggravated to the famine condition. The Rajshahi Famine Relief Committee had attempted to relief operations ‘on a moderate scale helping able-bodied men and women with relief works and men of limited resources with cheap rice sold to them at a rate considerably below the market price and with gratuitous distribution of food to those who by long starvation have become unfit for work.’<sup>152</sup> Long lasting starvation took away life of a woman whose two infant daughters suffering from chronic starvation had turned into ‘skeletons’. Since Government funds were not sufficiently helping the distress for their recovery from this situation so ‘kind heated ladies and gentlemen [were] earnestly requested to come to the help of suffering humanity.’<sup>153</sup> Thus it can be noticed that in Rajshahi the post-flood famine had turned into a ‘humanitarian crisis’.

The Princely State of Cooch Behar was visited by a terrible flood in the first week of August 1906. Though the flood had spread to the all parts of the State but it caused maximum damage to the 28 Taluks in the Mathabhanga Sub-division. Roads were damaged throughout the State and due to the ‘destruction of two large bridges and some other breaches on the line from Gitaldah to Cooch Behar, railway communication was suspended for four days from the 5<sup>th</sup> August.’<sup>154</sup> *The Annual Administrative Report for 1906-07* stated about the relief operations conducted in the State, in the following words:

“...the loss to Bitri paddy was about four annas, and the late paddy also suffered. Rs. 1,500 were spent in gratuitous relief to the really needy, and a loan, under the Agricultural Loans Act XII of 1884, of Rs. 6,000 was given to the cultivating Jotedars and Chukanidars who really stood in urgent need in affected Taluks, the maximum amount of the loan not exceeding Rs. 50 in each case.”<sup>155</sup>

The flood had brought out with it conditions for cholera which broke out in the most parts of the tract which had been inundated. In addition to this problem high prices of food grains had added to the sufferings of the people. The Administration of Cooch Behar Maharaja had spent a good amount of grant in the post-flood period for repairing work in several parts of the State. The principal works which had been done were – “i) filling up gaps in the Emigration Road and reconstructing on a separate alignment a bridge over Teesta Char at Mekligunj and repairing a bridge at the 46<sup>th</sup> mile; ii) filling up 3 big gaps and many small ones on the Cooch Behar-

Shitalkhuchi Road; iii) filling up seven gaps on the Kakina Road; iv) filling up one large gap in the Dinhata-Mekligunj Rangpur Road; v) restoring the washed away portions of the Lowkuty Road; and vi) re-constructing wooden bridge on the Patgram, Bhutan, Kashiabari and Mekligunj Roads.”<sup>156</sup> The reconstruction description had underscored the massive damage of roads in several parts of the State where road-communication was severely affected by the floods of 1906. Cooch Behar was again flooded in the month of July 1910 when river Torsa had overflowed its both sides of banks. The flood was resulted in desertion of houses and dwellings by the poor and occurrence of breaches in the railway line between Dinhata and Dewanhatta which disrupted the communication system.<sup>157</sup> Other parts of north Bengal especially Jalpaiguri district and the Duars region had witnessed a considerable amount of rainfall throughout the month of July. Sirajganj was flooded in the month of August as a result of excess in local rainfall coupled with the abnormally high level of Brahmaputra.

The flood which occurred in the month of September of 1915 had inundated a large tract of Duars region and caused noticeable damage to crops and communication of the region. ‘700 feet of embankment at 102½ on the Bengal Dooars railway have been carried away by the Jaldacca river’ – *The Englishman* reported.<sup>158</sup> The river Jaldacca had risen to an abnormal height due excessive local rainfall in the month of August in the district of Jalpaiguri and Darjeeling. Floods occurred in the district of Pabna in September. Floods in this district had created much damage and led to a famine situation. *Amrita Bazar Patrika* had reported that –

“...many houses are under water and the cattle are dying for want of food. Scarcity is prevailing in almost all parts of the district...the whole village of Sthal (Pabna) is under water...the floods are still increasing and it is feared that famine will soon follow...there has been heavy floods in Mathura and Shahzadpur thanas. Several houses in nearly all villages are under water.”<sup>159</sup>

### ***The Flood of 1918***

The district of Rajshahi and Bogra were severely affected by the flood occurred in 1918. The extreme rainfall in the district of Rajshahi coincided with an equally abnormal fall in its neighbouring districts of Dinajpur and Bogra, from where water was draining into the northern parts of the district of Rajshahi.<sup>160</sup> About one-half of the district (about 1,200 square miles) was

affected by the 1918 flood, 'the height of which varied from 2 to 4 feet above any previously known in the locality.'<sup>161</sup> The flood of 1918 had been characterized as 'such a flood [which] had not occurred for over a century...'<sup>162</sup> The flood traversed the districts of Rajshahi, Dinajpur, Bogra, and Pabna, 'causing much damage to crops, homesteads, and cattle over an area of about 1,300 square miles, particularly in the districts of Rajshahi and Bogra.'<sup>163</sup> The Collector of Rajshahi had provided the following account of the 1918 flood –

“... The effect of the August rainfall on the region already saturates with rain was to cause a wide inundation not violently sudden, but steadily extending in a few days over the face of the whole countryside. On the West the waters pushed their way to beyond the fringe the *bils* which run north and south dividing the higher Barind tract from the Atrai. Eastward they penetrated into the borders of Nandigram where the Barind again rises from the wide depression of Singra. Part of the flood water flowed south through the channels and swamps of Bagmara into the Baranoi to region the Atrai lower down; most of it found its way by the main stream of Atrai and the other waterways crossed the railway line into the numerous river channels of Nator subdivision and was carried off through Chalan *Bil* and Pabna to the Brahmaputra.... Nator town had a rainfall of 24.60 inches in August against a normal of 11.35, and of this, 13.21 inches fell in two days, 21<sup>st</sup> and 25<sup>th</sup>. Excessive rainfall in Pabna also... the Brahmaputra and Ganges were in high flood at this time. The flood water of the Padma coming in through the Barals and its channels was added to the Atrai waters and the high level of the Brahmaputra retarded the flow through this district and the district of Pabna.”<sup>164</sup>

The main line of the Eastern Bengal Railway was also affected by the flood of 1918. From 24<sup>th</sup> August the water level began to rise abnormally and it reached its highest point in 30<sup>th</sup> August. 'Two aged persons and three children were killed by the fall of mud walls and three children were drowned' – reported by the Collector of Rajshahi.<sup>165</sup> In addition to this, Collector further asserted that more than 7000 houses were severely destroyed and cattle were suffering from want of fodder and shelter since they were standing into the water for days. The *aman* crop was severely damaged and this 'loss was directly due to the long immersion in the flood water.'<sup>166</sup> In the month of September, the situation had more aggravated. The severity which was reported by *Amrita Bazar Patrika* was as followed:

“Heartrending details of distress occasioned by high flood continue to come from the districts of Rajshahi and Bogra. Naugaon...has suffered most and thousands of people have been rendered homeless... Relief work has been started at Naugaon...a sum of Rs. 50,000 will be

necessary for the relief of the people in the affected area ... Of the 4,000 villages affected by the flood the Committee has been able to extend relief operations to 100 villages only.”<sup>167</sup>

It is important to note here that the relief committee did not succeed to provide relief to all the distress despite of the alleged declaration that the relief was ‘promptly rendered’ through ‘a novel method of...the distribution of seeds by way of loan.’<sup>168</sup> It was assumed that about four lakhs of rupees were distributed in agricultural loans.<sup>169</sup> In spite of all these measures suffering of the people was aggravated to such an extent that people were starving for days or some were ‘being ill-fed with un-boiled rice which sells 5½ seers a rupee.’ The flood water had spread up to a far area in the district of Bogra. In the district of Bogra, it was reported that, 2,000 families were homeless and about 1,000 people were foodless.<sup>170</sup> Apart from Rajshahi and Bogra, the district of Dinajpur was also inundated by the heavy rainfall which started to increase considerably since the last of June. Numerous houses were drowned away and roads were under water when the river Punarbhaba had arisen with high floods and penetrated into the low lying areas of the town.<sup>171</sup>

The Princely State of Cooch Behar had to suffer from the excessive rainfall during the year 1918. From the month of June rainfall was increasingly heavy, in fact the month of June had witnessed the maximum rainfall of the year (45.11 inches), and the rainfall registered at the Sadar Station was 158.37 inches against 114.97 of the previous year.<sup>172</sup> The excessive rainfall caused serious damage to the crops. Bitri crop ‘could not be harvested owing to the heavy rainfall and the out-turn which promised to be a bumper one turned out to be 12 *annas* only.’<sup>173</sup> The *Annual Administration Report* had described the plight of the crops which were affected by the heavy rainfall during the year 1918 –

“For the jute crop the showers of April and May were not helpful... The excessive rainfall in June and July arrested the growth of the plants which did not attain their normal height...jute yielded an out-turn of 8 *annas* only. The price range between Rs. 3 and Rs. 12 per maund. The heavy rainfall recorded in July retarded the transplantation of Haimanti seedlings especially in low-lying lands...”<sup>174</sup>

67 lives had been perished in floods by drowning in different parts of the State.<sup>175</sup> The year 1918 for the Princely State had been characterized as the year of having erratic rainfall. Though the month of June-July had produced excessive rainfall but in the month of August, September, and October there was remarkable shortage of rainfall – 27.14 inches, 8.40 inches and 2.98 inches

only for the August, September and October respectively. The scanty rainfall affected the jute production by prohibiting the steeping and washing necessary for the jute plants. Due to this sort irregular rainfall cholera broke out in all the sub-divisions and excepting Mathabhanga small-pox also raged everywhere. The loss in production of crops had triggered the necessity of importing commodities from the neighbouring areas which was resulted in the abnormal rise of prices of the articles required for ‘necessaries of existence’.

### *The Flood of 1922*

One of the most disastrous floods took place in the Rajshahi Division in 1922 due to the excessive rainfall throughout north Bengal. The rains were brought into the land by a strong depression formed in the Bay of Bengal on 21<sup>st</sup> September which passed through the north and produced exceptional rainfall on the 23<sup>rd</sup>, 24<sup>th</sup>, 25<sup>th</sup> and 26<sup>th</sup> September. The heaviest rainfall had occurred in the Atrai and Punarbhaba Basins.<sup>176</sup> Balurghat, Gangarampur, Gazol, Naogaon, Natore had witnessed abnormal rainfall which constituted the central rainfall areas where ‘almost as much rain fell in one week as during the course of three months in a normal year.’<sup>177</sup> Rai Bahadur Lala Ram, the late Chief Engineer of Eastern Bengal Railway had conducted an investigation and submitted a report on the 8<sup>th</sup> December 1922. The Report stated that –

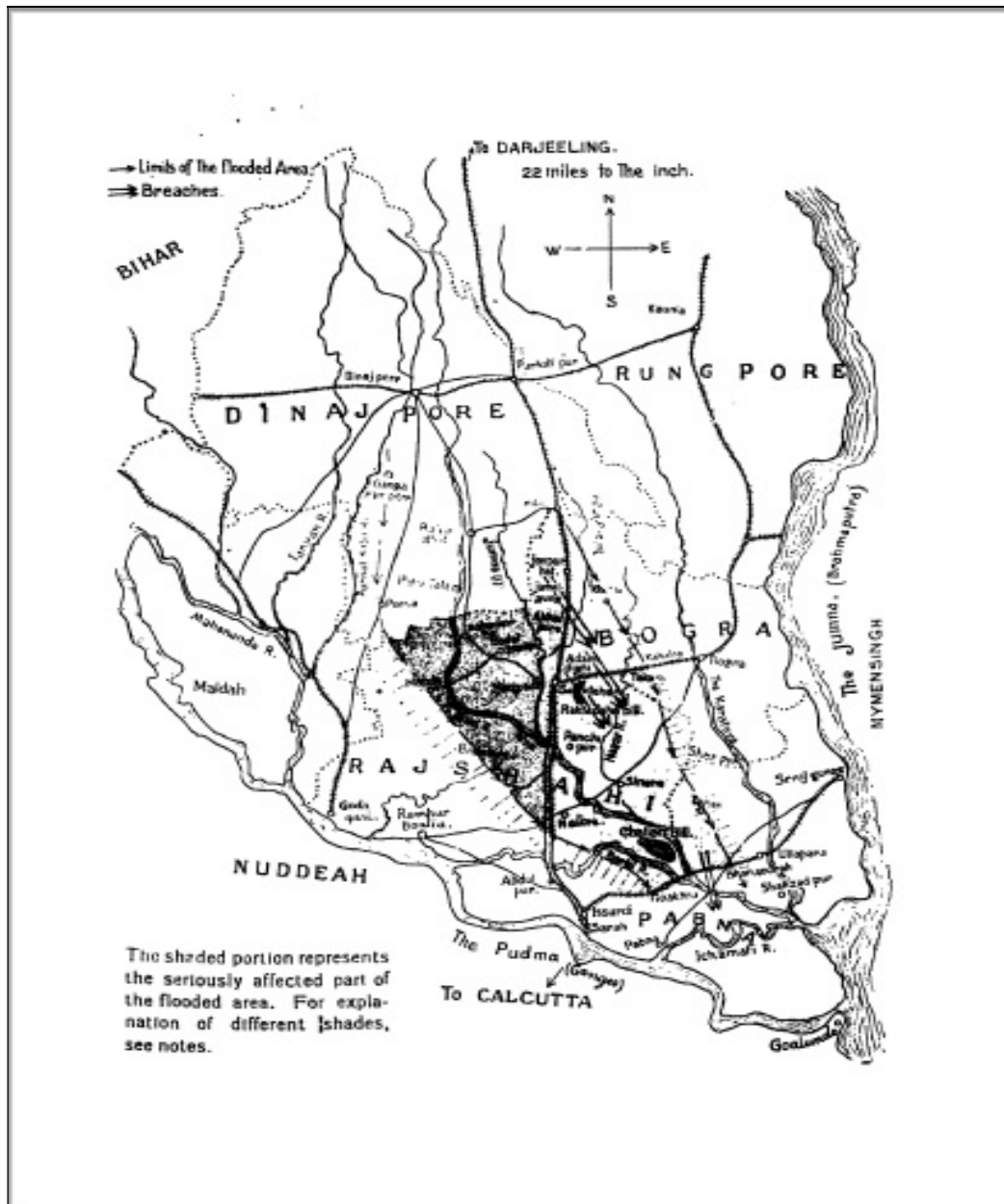
“The rainfall at Dinajpur and in the neighbourhood of Balurghat flooded the Jumuna and Atrai rivers; and this coupled with the local fall at Naogaon and in the north-west corner of Bogra District, which is drained across the main line by the Tulsidanga (a tributary of the Jamuna river) caused an unprecedented flood in the low lying country west of the main line, from a point about 15 miles north-west of Santahar to about 15 miles south of Santahar.... The section ...from Santahar to Bogra...suffered most damage, extensive breaches having formed on both sides of Adamdighi station...”<sup>178</sup>

Lieut. –Col. C. R. Hearn, the then Chief Engineer of Eastern Bengal Railway wrote a note on the above Report where he was of the opinion that the high floods of 1922 were caused by a concentration of three unfavourable circumstances. These were, according him, a) heavy rainfall east of the main line, b) heavy rainfall west of the main line, and c) a relatively high level in the Ganges.<sup>179</sup>

Meghnad Saha, Professor of Physics, Allahabad University, Publicity Officer of the North Bengal Flood Committee had written an article titled *The Great Flood in North Bengal* in the *Modern Review* (vol. 32), November, 1922 ‘for the benefit of the readers of the Modern Review, out of official and non-official communiqués...for a proper understanding of the of the flood and the situation caused thereby.’ Saha had divided the river system of north Bengal on two major groups – The Ganges (or the Padma) on the south and south-west with its tributary the Mahananda; and the Jumna or the Brahmaputra on the east with its tributary the Tista on the north-east.<sup>180</sup> Atrai, another major tributary of the Jumna received waters from numerous small streams of this region and the course Atrai roughly indicates the line of the greatest slope.<sup>181</sup> The flood of 1922 which occurred in the Atrai basin was largely owed to the complexities created by the railway lines spread across the region.<sup>182</sup>

“The rain-water descending from the Balurghat Subdivision swept across the Balurghat-Hilli District Board road, and brushed against the railway line. Up Santahar, this volume of water bifurcated. The upper part broke through the upper section of the line, between Jamal-gunge and Akkelpur at several places, on the night of the 25<sup>th</sup> September...the flood water came at right angles against the Bogra-Santahar line and breached it at several places, east and west of Adamdighi... The only way of escape was through the channel of the Atrai and some other small rivers... [but] very insufficiently provided with culverts, and often times the culverts of the meter gauge line have no corresponding culverts on the parallel broad gauge section.”<sup>183</sup>

The poor or even the absence of minimum drainage had brought considerable misery to the district. In fact, the closing of many small outlets of water held it for long time until it obtained significant height or covered a wide region. Moreover, it was observed that during the time of ‘reconstruction of the new broad gauge line, many openings on the original line were either closed or much shortened in width. As a result, water could not pass easily, the flood got blocked by the railway line.’<sup>184</sup> The flood in Eastern Rajshahi, in the Panchupore Singra area was caused by the flood water which was coming from Bogra through the Raktadaha - Chalan bil line. Water was slowly subsiding from the inundated area due to ‘the obstruction offered by the broad gauge line from Sara to Serajgunj’ which implied that if the Sara-Santahar line did not exist there then the ‘flood water west of this line would have spread into this area, and would have ultimately passed through Pabna to the Jumna thus relieving the pressure west of this line.’<sup>185</sup>



Map. 4. 3: The flooded area along with the breaches and railway lines in 1922 Flood.

Source: Meghnad Saha, 'The Great Flood in North Bengal', *Modern Review*, vol. 32, November, 1922.

The breach in the railway line between Adamdighi and Nasaratpur (Bogra-Santahar) line appeared nearly three quarters of a mile wide which was totally washed out. The families had to take shelter on the top of the roof as the houses were drawn away by the floods.

The official version, however, had differed from the above version. The colonial assertions did not include 'the course of western section of the flood-water which poured into Naogaon and

Nator, and was held up by the double line running from Sara to Santahar, causing a devastating accumulation of water for upwards of a fortnight.’<sup>186</sup> The Official Committee, as had been argued, intentionally overlooked the disastrous impact of the railways and put all the blames upon the ‘freaks of nature’. The flood had brought havoc to the crops in the district of Rajshahi and Bogra where 70 to 75 per cent and 90 per cent crops were damaged respectively. The area affected in the district of Rajshahi was three times the area affected in Bogra and was also greater in terms of the loss of crops and cattle.

The above narratives of the floods in north Bengal has not only underscore the effect of rainfall upon crops and society but has generated a scope for investigating the circumstances which led to the occurrence of floods, other than the excessive rainfall which had hardly been controlled by the means of any human agency. As it is already noticeable in the above description, floods were frequently intensified by the impediments came across the normal flow of water. Thus it is indispensable to examine the issues of embankment and irrigation along with their ecological relationship in colonial north Bengal.

Table. 4.3

## List of Floods in North Bengal, 1870 – 1922

| Year                                                   | Affected District                            | Intensity of Flood   | Extent of Damage                                                                               | Remarks                                                                                                                                          |
|--------------------------------------------------------|----------------------------------------------|----------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1870<br>(July and August)                              | Rajshahi and Pabna                           | Moderate             | Great damage to crops                                                                          | Overflow of the Ganges. High level of the Brahmaputra                                                                                            |
| 1871<br>(End of Aug. to 2 <sup>nd</sup> week of Sept.) | Malda and Rajshahi                           | Severe and extensive | Considerable loss of cattle                                                                    | Excess rainfall. Exceptionally high level of the Ganges.                                                                                         |
| 1874<br>(Sept.)                                        | Rajshahi and Pabna                           | Moderate             | Great damage to crops                                                                          | High level of the Ganges and of the Brahmaputra.                                                                                                 |
| 1875<br>(August)                                       | Malda and Pabna                              | Moderate and slight  | Damage to crops                                                                                | Local excess of rainfall. High level of the Ganges.                                                                                              |
| 1879<br>(August)                                       | Rajshahi                                     | Slight               | Damage to crops                                                                                | High level of the Ganges caused by heavy falls in the United Provinces and Bihar.                                                                |
| 1885<br>(Sept.)                                        | Rajshahi, Malda, Dinajpur                    | Severe               | Considerable loss to human lives and cattle and destruction of property.                       | Heavy local falls. Very high level of the Ganges.                                                                                                |
| 1886<br>(Sept.)                                        | Bogra, Malda, Rajshahi and Pabna             | Moderate             | Destruction of houses and property                                                             | Excess rainfall. High level of the Ganges and the Brahmaputra..                                                                                  |
| 1890<br>(August)                                       | Pabna                                        | Moderate             | Roads seriously damaged                                                                        | Overflow of Ganges                                                                                                                               |
| 1890<br>(August)                                       | Darjeeling                                   | Slight               | Roads seriously damaged                                                                        | High level of the Tista                                                                                                                          |
| 1892<br>(July)                                         | Jalpaiguri, Darjeeling, Rangpur and Dinajpur | Very severe          | Considerable loss of human life and destruction of cattle; great damage to roads and property. | Very heavy falls. High level of the Tista, Mahananda, Pharia and Atrai. Serious holding up of water in Dinajpur and Rangpur by the railway line. |
| 1892<br>(July)                                         | Pabna                                        | Slight               | .....                                                                                          | Overflow of the Ganges                                                                                                                           |
| 1898                                                   | Darjeeling                                   | Moderate             | Damage to crops                                                                                | Local rainfall                                                                                                                                   |
| 1899<br>(Sept.)                                        | Darjeeling                                   | Very severe          | Destructive landslips. Considerable loss of                                                    | Very heavy rainfall on the 24 <sup>th</sup> and 25 <sup>th</sup>                                                                                 |

|                                                         |                                                     |                           |                                                                      |                                                                                                |
|---------------------------------------------------------|-----------------------------------------------------|---------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
|                                                         |                                                     |                           | human life and unprecedented damage to roads, bridges and buildings. | September.                                                                                     |
| 1902<br>(August)                                        | Cooch Behar and Rangpur                             | Slight                    | .....                                                                | Excess of rainfall                                                                             |
| 1902<br>(Sept.)                                         | Jalpaiguri                                          | Severe                    | Ten lives lost, damage to railways, serious loss of cattle.          | Heavy falls in the hills. Overflow of the Tista.                                               |
| 1904<br>(August)                                        | Malda                                               | Slight                    | .....                                                                | Exceptionally high level of the Ganges.                                                        |
| 1906<br>(August and Sept.)                              | Jalpaiguri, Cooch Behar and Darjeeling              | Severe                    | Extensive damage to crops and property                               | Heavy rainfall.                                                                                |
| 1906<br>(August and Sept.)                              | Pabna, Rajshahi and Malda                           | Slight                    | Famine conditions in Malda and Rajshahi                              | Abnormal rise of the Brahmaputra.                                                              |
| 1910<br>(July)                                          | Cooch Behar and Jalpaiguri                          | Moderate                  | Several breaches in railway lines                                    | Excessive local rainfall.                                                                      |
| 1910<br>(July)                                          | Pabna                                               | Slight                    | .....                                                                | Abnormally high level of the Brahmaputra.                                                      |
| 1915<br>(August)                                        | Duars                                               | Slight                    | Damage to crops                                                      | Heavy local rainfall                                                                           |
| 1915<br>(first week of Sept.)                           | Pabna                                               | Slight                    | Villages under water                                                 | A high river level                                                                             |
| 1918<br>(End of August)                                 | Rajshahi, Bogra, Dinajpur, Rangpur, Pabna and Malda | Severe                    | Several deaths and considerable damage to crops and property         | Heavy cyclonic rainfall on the 24 <sup>th</sup> , 25 <sup>th</sup> and 26 <sup>th</sup> August |
| 1919<br>(End of Aug. and 1 <sup>st</sup> week of Sept.) | Pabna                                               | Slight                    | .....                                                                | Overflow from the Ganges.                                                                      |
| 1922<br>(Last week of Sept. to middle of Oct.)          | Bogra, Rajshahi, Pabna and Dinajpur                 | Very severe and extensive | Estimated loss of property worth 6 crores                            | Exceptionally heavy cyclonic precipitation in the week ending 27 <sup>th</sup> September.      |

Source: P. C. Mahalanobis, *Report on Rainfall and Floods in North Bengal, 1870 – 1922*, pp. 9-

### III.

#### ***Embankment, Drainage and Irrigation in Northern Bengal***

James Rennell in his *Memoir of a Map of Hindustan* had stated the following patterns of inundations in Bengal:

“The inundations in Bengal, differ from those in Egypt in this particular, that the Nile owes its floods entirely to the rain-water that falls in the mountains near its source; but the inundations in Bengal, are as much occasioned by the rain that falls there, as by the waters of the Ganges; and as a proof of it, the lands in general are overflowed to a considerable height, long before the bed of the river is filled. It must be remarked, that the ground adjacent to the river bank, to the extent of some miles, is considerably higher than the rest of the country, and serves to separate the waters of the inundation, from those of the river, until it overflows.”<sup>187</sup>

Recent researches have unfolded that the colonial Surveys on water resources of Bengal for the sake of ‘water management’ and ‘embankment construction’ was followed by a long drawn official engagements of the company officers and surveyors who conducted these surveys since the 1760s.<sup>188</sup> In the northern Bengal there were embankments maintained in three districts—Rajshahi, Malda, and Murshidabad. In the Rajshahi districts there were two small embankments, which were kept up for the protection of Government property when the ordinary embankments were abandoned in 1819-20. In Malda there was only one public embankment, which seemed originally to have been constructed for the protection of the mulberry cultivation and the Government silk trade. Both in Rajshahi and Malda embankments were maintained at the Government expense. The Murshedabad embankments were somewhat under 100 miles in extent, and the annual expenditure on them from 1799 to 1834 averaged Rs. 5,128. In spite, however, of the consensus of opinion on the subject, the Government expenditure continued to increase. On the occasion of the inquiry in 1835-37, the Board reported that numerous embankments were repaired at the Government expense though they had been unable to discover any document binding the State to do so. The Board reported that no liability was attached to the Government, but also they did not consider that any liability attached to the zamindars, and they recommended the abandonment of the bunds, except where necessary to protect stations or cantonments. However, in 1875 it was declared that apart from the earlier expenditure which had already been

paid 'any future expenditure, if incurred by public officers, must be recovered from the zamindars and 'proprietors' benefited.'<sup>189</sup>

From the beginning of the second half of the nineteenth century, embankments and drainage issues attracted a considerable attention of the British administration. Controversies had still remained there regarding the possession, supervision, expenses and maintenance of embankments in Bengal. It was not before 1855, the British Government introduced any systematic effort towards codifying the rules and regulations related to the embankment. Though the Act of 1855 had endeavoured to settle embankment issues but 'as experience proved', the Act was 'insufficient'. It was only in the Bengal Embankment Act of 1873 that all the difficulties, it was said to believe, had been grappled with and a legislative measure passed which would lead to 'a satisfactory solution of the difficulties which had hitherto beset the Government.' While delineating the 'definition' of 'embankments' as a 'separate notice' in the *Embankment Manual* (1875), all the subsidiary works necessary for the maintenance of embankments including inspection bungalows were incorporated in the existing embankment manual, but it hardly resolved the issue - 'whether the side lands from which the engineer used to take earth when they needed it, but which the owners used also to sow with rice or other crops' would be included in the embankment.<sup>190</sup> Zamindars appeared to hold significant place in the embankment discourse since the expenses of construction, alteration, or extension of all works and the cost of maintenance and repairs related to embankment were to be paid by the zamindars of the estates in which might be situate the lands benefited or protected thereby. As the Government in necessity would increase the amount of revenue demandable in respect of any estate in consideration of making provision for the embankment and maintaining the said embankment, the increased amount so demandable would be remitted to the zamindars.<sup>191</sup>

In the last quarter of the nineteenth century considerable interest had been shown on the part of the colonial government to 'acknowledge' the so-called 'obligation towards the agricultural community at large – to afford protection from inundations.' The obligation was generated from the belief that 'the time had passed away when the people were ready to accept a paternal Government as an arbitrator to do justice between individuals and the public at large.'<sup>192</sup> The section 53 of the 1873 Act proposed that

“Every person who, without the previous permission of the Engineer, shall erect, or cause or willfully permit to be erected, any new embankment, or shall obstruct, or divert, ... if such embankment or water course is likely to interfere with, counteract, or impede any public embankment or any public water course, ... shall be liable on conviction to a fine not exceeding five hundred rupees, or, in default of payment, to imprisonment of either description for a period not exceeding six months.”<sup>193</sup>

Thus a clear-cut division in terms of hegemonic possession of embankment had come into vogue which delineated the distinction between ‘State’s embankment’ and ‘public embankment.’ The necessity for defining the ‘liability more precisely’ had turned out to be as the enactment of the laws ‘to the stricter construction which was now put on the restrictions.’ Drawing from several regional instances, In response to this act Indians damaged or cut embankments, acts which were characterized by the railway administration as sabotage. The Act delineated that ‘the perpetrators be charged with criminal action’ for the ‘malicious interference’ with railway property.’<sup>194</sup> Embankment appeared to be a contentious site of colonial domination which again put in the background the division between *we* and *they*. Tirthankar Roy is of the opinion that colonial objective for constructing embankments had a ‘political’ ‘desire to control peasant societies’ and like many other forms of control the embankments were applied as ‘tools of the empire’.<sup>195</sup>

The embankments constructed in the districts of Rajshahi and Malda during the early part of the nineteenth century were meant to protect Government property and to serve the Government’s silk trade. Hardly any attention on the part of the Government had been displayed to protect either the Indians or their interests. The Act of 1873 re-enacted the procedure which empowered the Government to enter upon lands as necessary, and allowed the Government with their desirable ‘maintenance’ of the public embankments through its own Engineer officers. The Act of VI of 1873 had been placed for necessary amendments in 1882 before the Council. As a counterpart of the punishment imposed upon the Indians, the 1882 Amendment of the 1873 Act had proposed that any damage caused to the inhabitants by any work which was done under the Act, compensation was to be made to him.<sup>196</sup> However, the clauses and provisions for the compensation allowed to the victims were too complex to understand and in the official circles there was persisting ambiguities even in the last quarter of the nineteenth century regarding the scope and method of compensation. Mentioning the Act XXXII of 1855 it was stated in the *Embankment Manual of 1875*, that:

“Act XXXII of 1855 prescribed that in fixing their award the arbitrators were to allow for any benefit which the claimant derived from the work as a set-off against the injury for which he claimed compensation. It is not equally clear whether the Judge and Assessors should allow for this under Section 33. If the claimant proves a certain damage in one way, and consequent diminution in value, it seems open to question whether the court is bound to allow, as a set-off, advantages derived by him in another way. Perhaps it may be intended that such advantages or benefits should be considered by the Collector when apportioning the cost, and if provable, be then assessed, leaving it to the compensation court to look to the injury only. Still this would often be very inadequate, and in all cases inconvenient, as a claim for compensation is the very time when these advantages would most probably come to light, and then it would be too late.”<sup>197</sup>

Not only the human, but cattle had also been drawn under the *Manual* which proposed if “any person who shall cause, or knowingly and willfully permit, any cattle to graze on any public embankment, or shall tether or cause or willfully permit any cattle to be tethered upon such embankment,” was liable to a maximum punishment of six months' imprisonment or Rs. 200 fine.<sup>198</sup> Despite the Lieutenant Governor's sympathy for ‘every old woman who permitted a goat to graze upon an embankment’ the Legislative Council, by passing this section, had shown their conviction to the, what they had already identified, as ‘very common offence of the villagers tying their cattle to graze upon embankments by hundreds.’<sup>199</sup>

Railway embankments in northern Bengal frequently acted as obstructions to the natural drainage of the water and thus contributed to the lengthening of the duration of floods. Radhakamal Mukerjee had argued that the increasing expansion of railways in northern Bengal had ‘obstructed drainage and recurrent floods being inevitable results, especially in the south-east of this region.’<sup>200</sup> Though ‘a full examination’ of the river channels for building railway embankments in north of the Ganges had been proposed in 1870s but the idea hardly had any substantial capacity to counter the necessity of providing ‘a sufficient outlet for the teeming population, and for the products of those fertile districts’.<sup>201</sup> In 1872 the Government of India instructed to the Government of Bengal that

“...the best that can be chosen for a trunk line through Rajshahye, Bograh, Dinagepore, and Rungpore. This line starts from the vicinity of Dhaparee on the River Ganges, and proceeds, through Nattore, Hillee, and Tengamaree, to Julpigoree. Such a railway passing through the heart of a rich country will not only be extremely valuable in itself, but will be situated so that branches may be readily constructed to Rungpore, Bograh, Dinagepore, and other centres of trade both to the east and west of the railway. A second,... aim has been to give access to

the hill station of Darjeeling, the tea plantations, and to the Darjeeling Terai ... [for] giving a better approach to the tea districts than a road through Titalya or Silligoree...The line from Hillee to Tengamaree is to be surveyed; and if His Honor has no desire that the railway shall pass absolutely through Tengamaree, a route slightly to the westward may be aligned nearer to the river Kurto, as the upper portion of the Atrai is called...a section taken for a railway from some suitable point between Hillee and Tengamaree to Rungpore and cross the Teesta and Dhurla rivers, on to Doobree and thence to Goalpara, assuming that the minor rivers shall be bridged, but that the Berhampooter will be crossed by means of a ferry.”<sup>202</sup>

Thus it can be observed that commercial interests for the colonial government had become the first priority in constructing railways in northern Bengal. Little concern on the part of the Bengal Government had been displayed while bridging the minor rivers, but this could only be seen in the case of large rivers like Ganges, Tista and Brahmaputra which involved improvised technologies and investment of huge money. Otherwise the Government did care very little about the consequences of railway lines and embankments in the close proximity of rivers. What motivated them to expand railway lines in northern Bengal was nothing but their ever increasing interest in the lucrative trade of valuable commodities of northern Bengal. The construction of railway line nearer to the rivers, no doubt, had produced floods by holding up water for a long time or by obstructing the outflow of water from the inundated area.

The enquiry regarding the 1892 flood in Dinajur had concluded that the railway line, which divided the district from east to west, was responsible for the damage by holding up the flood water coming from the north.<sup>203</sup> Though embankments which were constructed to protect flood was of very rare but sometime this was perceived that “as such works generally effect[ed] more mischief than they obviate[ed] because they prevent[ed] the river water reaching land where it [might] be essential that it should go, and when an emergency [did] occur, they generally [gave] way to the flood, and render[ed] the violence of the pent-up water ten times more destructive than it would have been....”<sup>204</sup> Embankments in 1870 at Lalitakuri of Murshidabad on the rivers Bhagirathi caused serious floods during the subsequent years which swept across the district into Nadia and furthermore, and these embankments accelerated the rise of water level to a maximum height which flooded the district in 1885 and 1890.<sup>205</sup> Ritika Prasad in her seminal research addresses the fallouts of construction of railway embankments which aggravated the unseasonable or excessive floods through blocking drainage and damaging crops.

The Eastern Bengal Railway had caused the circumstances which could create severe floods by blocking the passages for natural drainage of water. The construction of north-western division of the Eastern Bengal Railway (EBR) had resulted in the worsening of the water regime of northern Bengal as it interfered into the existed pattern of the Chalan bil.<sup>206</sup> The railway expansion in the district of Rajshahi and Pabna had increasingly engulfed the surrounding areas of the bil and in the beginning of the twentieth century it can be noticed that the bil was encircled by the EBR main line to the west and the Santahar - Bogra line in the north. The passage of water from the bil had to encounter the obstacles created by the Bogra - Santahar branch line and the EBR main line and the Sara Sirajgunj branch line.<sup>207</sup> Moreover, the further construction of a broad gauge line between Atrai and Santahar had deteriorated the condition by reducing the number of spans on the bridges in the second decade of the twentieth century when between 'Atrai and Santahar, the total existing water way [was] reported to be 440 feet as compared with 967 when the line was first made.'<sup>208</sup> The frequent flooding of the Chalan bil area prohibited the 'cultivators of the vast area to the north-west of the Sara-Sirajgunj line ...the cultivation of rabi (winter) crops as the fields did not dry up in time for cultivation.'<sup>209</sup>

Larger bridges stood as a great source of mischief to the water system of the region. The great Goalundo spur which was constructed in the 1920s at a cost of £120,000, did not turn out to be profitable for the region. The Hardinge Bridge over the Padma at Sara seemed to be an ideal example of the problems created by the railway bridges. The Hardinge Bridge was opened on 4<sup>th</sup> March, 1915. The construction of a railway bridge over the Padma was proposed in 1889 by the Eastern Bengal Railway for easier communication between Calcutta and the Eastern Bengal and Assam. The Report prepared by Sir F. J. E. Spring recommended for the construction of a bridge at Sara-Sirajgunj line. The most stupendous task in constructing the bridge was to prevent bank erosion and to hold the continuation of the river flow under the bridge.<sup>210</sup> Lands surrounding the bridge had to suffer a lot during and after the years of construction which caused a complete upset in the Ganges below and above' and the coming years had witnessed some devastating floods in the neighbourhood of the bridge.<sup>211</sup> The 1922 flood, as argued by some scholars, was the creation of the notorious impact of the railway expansion in north Bengal and railways has been characterized as the 'Frankenstein's Monster' which trapped the water for long time until the flood occurred.<sup>212</sup>

Drainage system which controlled a greater degree of occurrence of floods was insufficient over the greater part of north Bengal and was abnormally vulnerable to even very minimum changes of water level. The ground level of the central area of the rivers had continuously risen by the deposit of silt and the river channels in the interior areas of the districts were more and more deteriorating.<sup>213</sup> Though in the late nineteenth century health issues became a matter of concern in the realm of drainage pattern but it did not acquire sufficient attention that it demanded and health only remained ‘one of the grounds specified as justifying interference with drainage.’<sup>214</sup> Though drainage seemed to appear important in the embankment discourse but the ideas dominating the official circle put extraordinary emphasis on the embankments since it believed that “the Egyptian agriculturists could hardly have made a greater mistake had they dammed out the inundation of the Nile than was made by the people of Rajshahye and Jessore in constructing and keeping up the embankments which formerly existed in those districts.”<sup>215</sup> The Collector of the district of Rajshahi was of the opinion that –

“The drainage of Rajshahi can best be represented by supposing the District to be the segment of a somewhat irregular circle, of which the Ganges river forms the limb and the Chalan *bil* the centre. The lines of drainage would then be represented by a series of concentric lines running from the Ganges, and from the high country in Dinajpur to the north, towards the southern extremity of the Chalan *bil*. The Ganges bank being higher than the general level of the country, the water drains away from it. The drainage from all parts of the District converges in the Chalan *bil* from whence it flows away castward.”<sup>216</sup>

Forest reclamation or de-forestation for agricultural extension on a large scale had cleared a vast area surrounding the river banks in the district of Jalpaiguri and Western Duars. Colonial lust for maximum revenue generation through the expansion of agricultural settlement and tea gardens coupled with looting of precious timber resources unleashed an unrestrained reclamation of forest tracts in the district throughout the nineteenth century. Though the later implementation of ‘scientific forestry’ had to some extent endeavoured to mitigate the disastrous effect of de-forestation but the effort fell too short to cope with the problem. In fact, in the early twentieth century the Government had to admit that –

“A great mistake has been made in the past in not leaving a strip of jungle along the banks of all such water courses, for this has proved itself to be the only natural means of exercising any real control over their movements. Not only have the banks in too many cases has been cleared for cultivation, but no effective check has been possible over the cutting of irrigation

channels, locally known as jampoies, and other forms of activity in the beds of rivers. The result has been that huge areas have been ruined by the rivers changing their courses and such changes in very many cases are directly traceable to a jampoi...much land in the Duars will go out of cultivation if irrigation is entirely prohibited and much damage will be caused to tea gardens, jote lands, railways, roads and forest if river training is entirely vetoed...’’<sup>217</sup>

Therefore, the solution had been ‘scientifically placed’ by proposing erection of sluice gate and ‘protective works’ for tapping mountain torrents. Moreover, river training appeared to be the most ‘necessary’ step for all the rivers - be it large or small.<sup>218</sup> Having a closer look at the ideology of river training, one may come across to the fact that this had been undertaken for the protection of Governmental properties and European settlement along with their capital and trade. The Bengal Duars Railway, Jalpaiguri Cantonment, tea gardens, Alipur Duar Civil Station for which the river training was proposed all were the sites of imperial control and European profits, nothing was meant to serve the indigenous purpose. The clearing of forests and planting of tea which had altered the entire ecology of the district within a very short span of time had reinforced the ‘question of the obligation of the men below to accept and dispose of the drainage water of the men above and the liability of the men above in converse cases.’<sup>219</sup> The sloppy nature of the district allowed the water to rush through the lower parts or to the plains of the district. Clearances of upper forest tracts for suitable tea garden land had resulted in a great disaster during the time of flood since the powerful torrent did not receive any resistance from any natural force. To protect the river channels from any ‘unauthorised’ interference, Deputy Commissioner was empowered which was, however, was not the complete solution of the problem because the Deputy Commissioner was depended upon the Executive and District Engineers who were devoid of any necessary local knowledge. The floods which ravaged a large tract of the district of Jalpaiguri and Duars in the early decades of the twentieth century had proved the governmental inefficiency and failure of the above measures.

Irrigation was not common in Cooch Behar. Wells were made either by sinking baked earthen rings, about two feet in diameter, in the earth on the top of one another, or else the wells were protected by a square framework of *saal* timber.<sup>220</sup> Sometimes wells were constructed by digging a mere hole in the ground, without any protection to the sides. There was no embankment in the State in the closing years of the nineteenth century. The Deputy Commissioner was of the opinion that since the rivers which were flowing through the State was ‘large’ so it would be

impossible to embank the rivers ‘both on account of the great expense, and their liability to change their courses.’<sup>221</sup>

Till the end of the nineteenth century ‘the rivers and marshes [had] nowhere been embanked with the object of extending cultivation.’ Though there were, however, ‘a countless number of old embankments’ in the surrounding areas of old ruins of Gour, but these were constructed with the object of protecting the city from the inundations of the Mahananda.<sup>222</sup> The numerous marshes or bils which were found in the district were the result of the inundations of the Mahananda and its tributaries. District of Malda had inherited ‘a large number of tanks’ which were scattered all over the *Barind* tract of the district. It was said to believe that these tanks were signs of the existence of an irrigation system during ‘an earlier civilization’ and in the colonial days there were proved to be helpful for the *aman* crop and paddy land during the season of deficient rainfall. There were two methods of irrigation which were locally known as ‘sechan’ and ‘melan’. *Sechan* consisted of raising water when the land to be irrigated was on a higher level than the water of the tank; whereas *melan* was the reverse case, when the level of water was higher than that of the land to be irrigated.<sup>223</sup> The general custom for the peasants of the district regarding irrigating their field was to take water each year from the same tank, over the same fields of their neighbours to their own land; but the custom had not been crystalized to the same extent as in districts like Burdwan. On the other hand a less elaborate and informal system was devised for recording irrigation rights. It was noticed that the river-banks or sometime even the banks of the tanks were inhabited by the people drove to settle there to meet the revenue pressure imposed by the zamindars which resulted in the flattening out of the banks. Moreover, the settlement of *jalkar* rights in tanks was another misguided policy which created disputes among the tenants which was nothing but an encroachment on the irrigation right of easement. Though Mr. Adams-Williams had provided a solution in form of a development of an irrigation scheme for the Barind, by using the Mahananda as the source of water supply, and running pipe lines from centres located along the river bank, but it was not materialized as being ‘extremely expensive.’<sup>224</sup> Landlords and tenants of Malda were accused of being reluctant to execute any contribution towards the Collector who ‘prepared’ ‘scheme after scheme’ under the Agricultural and Sanitary Improvement Act (Act VI of 1920), some of which were of great practical value, but had to be abandoned because ‘Government was expected, as usual, to provide the entire sum

required, and the method of recovery from the tenants benefited, was conveniently shelved.<sup>225</sup> But in the earlier discourse it was already admitted in the end of the nineteenth century that ‘to embank all the Mahananda river system would be a task entirely beyond the powers of the local *zamindars*; nor does the Collector think that it could be any means be turned into a profitable enterprise.<sup>226</sup>

However, few private embankments existed in Malda for the necessity of a regular water supply. There were two embankments of adequate size - one was in the mauzas between Kotalpur and Adampur which was one-third of a mile in length and served the dual purpose of storing water in winter and summer and keeping out flood water during the rains; and another was in the mauzas between Khochakandar and Gopalnagar which was about a quarter of a mile in length and worked as reservoir from which water was taken for irrigation. There were also two large embankments in the district – one was near the boundary between Dolachhola and Patharmandal, and another was near the boundary between Saidpur and Pathar Amarpur. Both of these embankments had served the irrigation purpose and belonged to the Habibpur *thana*. There were two large embankments in Jalkar Bithan and in Koar, which regulated the water supply to the main *boro*-growing area in the Malda *thana* covering an area of about 2,500 acres.<sup>227</sup> The annual cost of maintenance of these embankments was between Rs. 200 and Rs. 300 which was released from the tenants by the *patnidar*. Thus it is evident from the facts that hardly any intervention had been conducted by the colonial government which could be regarded as its own; since the irrigation tanks and embankments were either early construction or maintained by the landlords or *patnidars*. So far the minimum investment required from the governmental part, were either designated as ‘expensive’ or ‘abandoned’, because of without receiving any indigenous ‘contribution.

In the district of Murshidabad irrigation was conducted either from tanks, or by leading the water from the natural channels. Irrigation-wells and canals were not known to the district even in the closing years of the nineteenth century.<sup>228</sup> Irrigation system in the district of Murshidabad was consisted of disputed property rights centering on the question of how much water one could procure from the tanks. In order to expand the irrigational facilities among the people of the district five steps were suggested, these were – re-excavation of older tanks, excavation of new tanks, utilization of the existing natural channels known as *kandars*, storage and effective

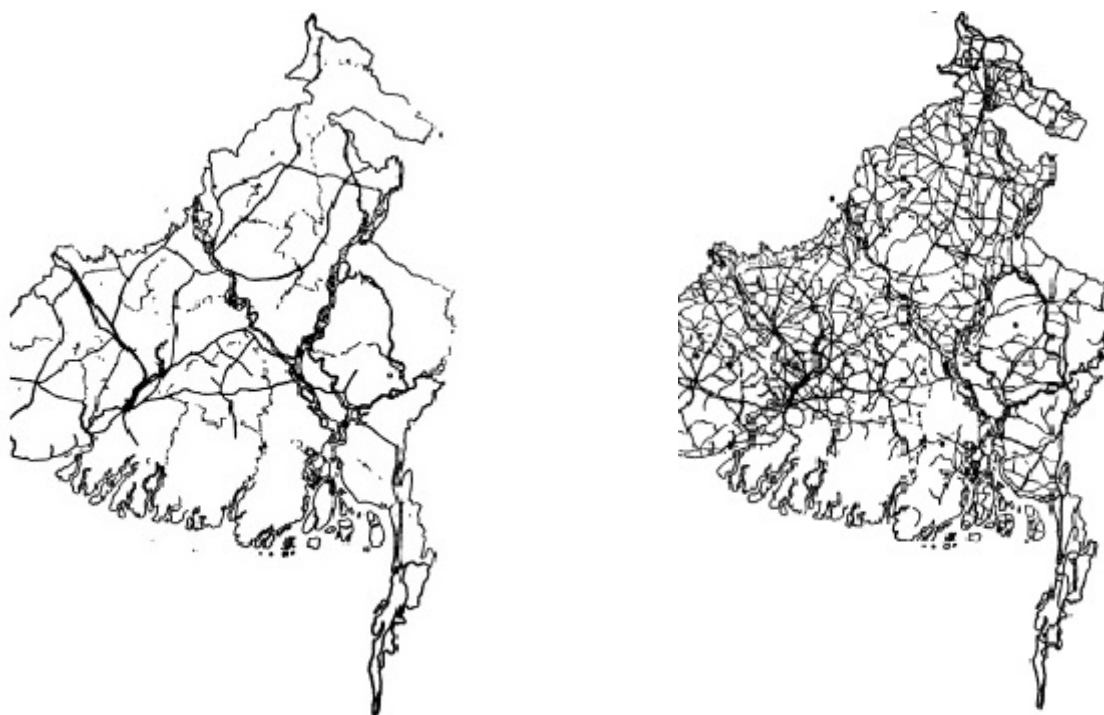
canalization of river water at the time of its maximum flow, and construction of wells.<sup>229</sup> The 1870 flood had foregrounded the necessity of strengthening the existed embankments especially those protecting the populous city Murshidabad, and proposed construction of large number of embankments to be constructed for the future menace of the floods. The most important protective work in the district constructed in the late 1870s was a line of disconnected embankments along the left bank of the Bhagirathi, which was extended from Plassey bazar to Dadmuti – a distance altogether of about ninety-three miles.<sup>230</sup> Though Government had been paying from the *Pulbandi* allowance under section 44 of the Bengal Act II of 1882 to the zamindars, but the zaminadars had been criticized for their serious neglect in ‘maintaining’ the embankments properly.<sup>231</sup> The later developments demonstrated that the Public Works Departments should be allowed to administer the *Pulbandi* allowance and maintain the embankments by mutual arrangements with the zamindars. But there was some exceptions regarding the position of the zamindars. In North Bihar zamindars did not appear as a weak candidate to adhere all the terms and conditions imposed upon them by the colonial State. Infact, big zamindars like Darbhanga Raj was strong enough to fight for shaping ‘the direction and pace of flood control in the region.’<sup>232</sup> Tirthankar Roy shows that in Northern India, embankment construction was mostly a state responsibility and the colonial State had initiated programmes to this end because embankments on the river bank would provide necessary water for irrigation which would subsequently help to expand cultivable land.<sup>233</sup> Embankments, however, would be a permanent solution for a river with non-erodible boundary and carrying no silt but carrying of silt either from its catchment basin or from its erodible boundary on the way created problem for lasting of embankments. Confinement of the flood within the narrow river channel as a result of construction of embankments hampered the natural activity of silt, which through its flow used to create fertile lands, but on the contrary it was deposited into the river bed that caused higher flood level. S. C. Majumdar, the Superintendent Engineer of Irrigation Branch, pointed out that these sorts of developments had let to the deterioration of the river channels which would be continued to deteriorate up to such an extent that could not be protected by earthen embankments.<sup>234</sup>

## IV

### ***Rainfall, Rivers and Contagion: Disease and Epidemics in North Bengal***

S. C. Majumder was of the opinion that before 1787 northern Bengal was healthy and prosperous due to the existence of large number of spill and drainage channels which had intersected this region in a beneficent way. But after the diversion of Tista in 1787, ‘completely cutting off the head-water supply laden with fertilizing silt from the Himalayas’, these channels had gradually deteriorated caused by water-logging which was resulted in ‘inadequate drainage and progressive deterioration of the country as regards health and productivity of the soil’.<sup>235</sup> Since the latter half of the eighteenth century river problems in terms of inundation, silting, drainage problems and blocking had led to the occurrences of diseases which sometime took epidemic shape. The colonial inefficiency to deal with the diseases through providing enough and successful outlet for the flood water or maintaining balance supply of water during scanty rainfall had been proved to be detrimental to public health. The epidemiological construction of disease like – malaria, cholera, small-pox etc. has revealed an integral connection and mutual interdependency between the multitude of social, economic, and biological factors and in this way epidemiology also incorporates certain issues of famines that took place in colonial India. However, recently scholars have interrogated this much discussed issue more critically which involves the investigation on specific entomological and social conditions shaped and nurtured by climate, hunger, monsoon rainfall, and demographic fluctuation.<sup>236</sup> However, malarial occurrences had been attributed to the ‘modernization’ process. Sheldon Watts and Ira Klein have underscored the integral relationship which existed between the spread of malaria and the rapid commercialization of agriculture, extension of the railways, construction of embankments deforestation, and development of urban centres.<sup>237</sup> In these researches, rainfall has not been regarded as important factor for the malarial visitations. Rainfall and inundations had a great influence upon the occurrence of malaria – heavy rainfall and widespread inundations of the land surface generally had checked the widespread breeding of anopheles mosquitoes, whereas short rainfall and scanty inundations favoured their increase. But sometime flooding of the rivers and their surrounding tracts had produced conditions for malaria by blocking the flood water which

was ripe for malarial germinations. According to some estimate the prevalence of malarial fever was three times greater in Northern Bengal (23.7%), four times more prevalent in Central Bengal (32.3%) and five times greater in Western Bengal (40.9%) than in Eastern Bengal (7.5).<sup>238</sup> The remarkable lessened occurrence of malaria in Eastern Bengal had been attributed to better health provided by the expansion of agriculture and good pattern of land use which was prevailed in this part of country. However, the central part of northern Bengal was also rich in agricultural production because of the fact that this part had been inundated every year by the spill waters of the big rivers, which besides providing an ample supply of moisture for the purposes of cultivation, bring with them a rich supply of silt which was deposited upon the surface of the country. Northern Bengal contained portions of the Gangetic and the Brahmaputra deltas, together with the delta of the Tista, the lower portions of which had been appropriated by the Ganges and the Brahmaputra.<sup>239</sup>



Map. 4.4

a. Roads and Railways in Bengal in 1870.

b. Roads and Railways in Bengal in 1920.

Source: C. A. Bentley, *Malaria and Agriculture in Bengal*, p. 28 (a.) and p. 29 (b.)

The above maps have shown the relative expansion of roadways and railways between 1870 and 1920, the increasing development of communication through these two means had considerable impact upon the occurrence of malarial fever. Central Bengal and Northern Bengal possessed a greater mileage of unmetalled road than the Western and Eastern Bengal. Northern Bengal had 314 miles of railways and roads per 1000 square miles of area, whereas for Western, Central and Eastern Bengal it was 308, 349 and 163 respectively.<sup>240</sup> The increasing expansion of roads and railways had contributed to the blocking of water at the time of inundations which resulted in confinement of water in a certain place which seemed to be conducive to the anopheles germination. C. A. Bentley had put much emphasis on the relation between railways and agriculture while determining the causes of malaria. However, a great deal of weightage had been provided to the railways embankments which, it was said to believe, acted as catalyst to the formation and spread of malarial conditions in colonial Bengal. The construction and expansion of Northern Bengal and North-Western Bengal Railways contributed to the outbreak of malaria. Furthermore, fever became intensely prevalent from 1896 onwards in Naogaon during the construction of the Assam-Bengal Railway from Guauhati to Lamding. Malarial visitations had been recorded in the case of embankments connected with the Sara Bridge and in the case of Sara-Sirajganj Railway.<sup>241</sup>

Table. 4.4

Fever indices and malarial vulnerability of Northern Bengal

| Fever Indices           | Rajshahi | Dinajpur | Jalpaiguri | Darjeeling | Rangpur | Bogra | Pabna | Malda |
|-------------------------|----------|----------|------------|------------|---------|-------|-------|-------|
| 1920                    | 297.7    | 38.4     | 38.1       | 20.2       | 28.0    | 42.0  | 37.8  | 42.4  |
| 1912                    | 28.6     | 33.1     | 21.2       | 23.0       | 17.1    | 16.6  | 23.0  | 30.4  |
| Mean                    | 29.2     | 35.8     | 29.7       | 21.6       | 22.6    | 29.3  | 30.4  | 40.9  |
| Intensely malarious (%) | 0.0      | 15.0     | 27.2       | 9.0        | 7.5     | 16.6  | 14.2  | 23.5  |
| Malarious               | 77.7     | 82.6     | 63.6       | 54.5       | 52.5    | 77.7  | 71.4  | 76.4  |
| Slightly malarious      | 23.2     | 4.3      | 9          | 36.3       | 40.0    | 5.5   | 14.2  | 0.0   |

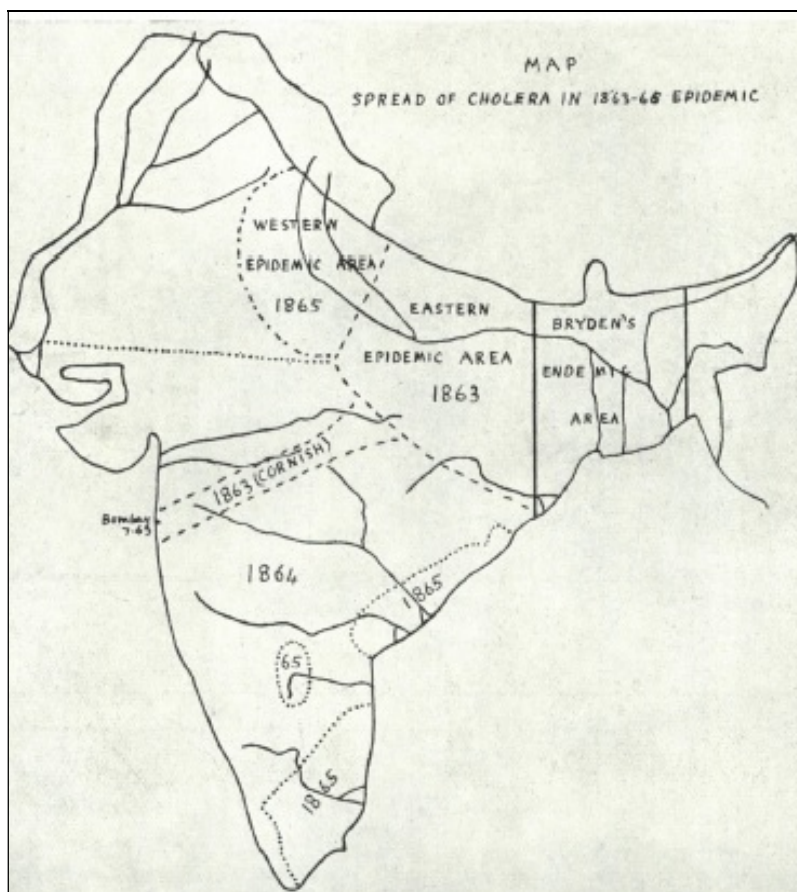
Source: Extracted from C. A. Bentley, *Malaria and Agriculture in Bengal*, pp. xxiv – xxv.

Examining the estimated normal rate of growth of population since 1872, Rajshahi, Pabna, Rangpur and Dinajpur seemed to have suffered severe checks of normal expansion. In 1920 Malda, Dinajpur, Bogra, Jalpaiguri and Pabna were the most fever-affected districts whereas eight years earlier Bogra was relatively less malarious and Malda, Dinajpur and Rajshahi were ahead in this respect.<sup>242</sup> The main fever death-rates of the decade 1911-1920 demonstrated that the districts of Dinajpur, Malda, Rajshahi, Pabna and Jalpaiguri were less healthier than the other districts of northern Bengal.<sup>243</sup> Thus de-population was closely associated with the advent of malaria in the affected tracts which was influenced by 'some definite change in the climate or other ecological conditions.'<sup>244</sup>

During the early part of the nineteenth century there was a widespread belief that Jessore district was the centre of cholera from where the disease spread other parts of Bengal in 1817 and from Bengal cholera traversed the upper part of India. The search for climatic and environmental explanations of cholera began in the latter half of the nineteenth century in Bengal and other regions of the Indian subcontinent. Cholera provoked the outcome of a distinctive genre of writings on several theories which prevailed at that time – blood poisoning theory of Dr. Johnson, Drinking water theory of Dr. Bayer and J. Snow, Fungus theory of Dr. Bud and others, damp-subsoil theory of Professor Pattenkofer, Dr. Bryden's theory, Dr. Pacini's theory, the vibrionic theory of Dr. Macnamara, bacillus theory of Dr. Koch and others.<sup>245</sup> Dividing on a broader category, during this time onwards, a very potent debate had been arising centering on the issue of not only the climatological aspects of cholera but also the case of human intervention in aggravating the disease in Bengal. The debate on the whole bring into the focus the conflict of two distinctive set of ideas between the localists and contagionists - 'localists', who emphasized geography and environment, and the 'contagionists', who instead invoked man and sanitary conditions for the propagation of infection.<sup>246</sup> There was a strong believe that cholera was often 'manifested in extreme virulence, along the bases of natural barriers to its advance, and in the river basins and ravines that lie in between great mountains.'<sup>247</sup> However, the main issue of the debate included the aspects of monsoon influence upon the appearance of cholera. Mr. Cornish who had been preparing a report for cholera in Southern India, had summarily rejected Dr. Bryden's view which emphasized the monsoon dimension of the problem instead of any human causes of cholera. Mr. Cornish had stated that:

“There is a movement of cholera independent of strength or direction of winds... There has been no relation shown as yet between the velocity of movement of cholera and of monsoon winds. It is abundantly clear that the development of cholera in a province (? invasion of a province), has no sort of relation to the rapidity of movement of the air. The theory, that the cholera miasm is in its nature wholly independent of man, is without any trustworthy evidence in its favor.”<sup>248</sup>

On the other hand, Dr. Bryden again responded that cholera was, a ‘air-borne’ disease which had ‘no relation to the routes traversed by man’, and it demonstrated ‘the grand truth that man play[ed] no part in the vast leaps characteristic of all epidemic movements of cholera in India.’<sup>249</sup> Another contemporary work (1884), however, had reinforced ‘an undoubted relation between the meteorology of a place and its liability to cholera activity.’<sup>250</sup> Rainfall, however, had always been a serious factor for cholera epidemic which was aggravated by floods and droughts that produced the condition for the survival of bacteria ‘through the effect of salinity (pH) or nutrient concentrations, as well as human exposure to the pathogen, sanitary conditions and susceptibility to disease.’<sup>251</sup> Although hot dry conditions were unfavorable to the survival of the generally water-borne cholera bacillus, dearth and drought drove villagers to frequent wells, tanks and stagnant pools, which quickly became contaminated with cholera.<sup>252</sup> The colonial investigation traced out the spread of cholera from Bengal to the rest of India through several phases and durations.



Map. 4.5: Spread of Cholera in 1863-65 Epidemic

Source: Leonard Rogers, *The Forecasting and Control of Cholera Epidemics in India*, 1927, p. 324.

Leonard Rogers had summarized Bryden's description regarding spread of cholera from Bengal to the other parts of Bengal in the following manner:

“Bryden included in his Bengal endemic area, from which all cholera spread over India, Western Assam, all Lower Bengal, Orissa and Eastern Bihar, from which the disease spread in the first year of an epidemic over his Eastern epidemic area extending north-west as far as Agra, and travelled in the second year into the Punjab, this route constituting his Northern epidemic highway ; or it might spread to the Central Provinces in the first year, and in the second to Sind and Gujarat by his Southern epidemic highway as it did in 1863 and 1864, also infecting Bombay and most of Madras in the latter year as shown by Cornish ; and in 1865 both the Punjab and the remaining south-east parts of Madras were overrun, thus completing the spread, an epidemic usually lasting four years before dying down again completely.”<sup>253</sup>

Bryden pointed out that the expansion of cholera from Bengal over Northern India could not be explained as a spread through human intercourse, as the disease first increased in the sub-Himalayan divisions of the United Provinces where there was no railway at that time, and only became epidemic in the Punjab in June with the onset of monsoon.<sup>254</sup> In 1871-72, Bengal was overwhelmingly affected by cholera, and Rajshahi Division placed in the top of the list in terms of deaths occurred during the period.

Table. 4.5

Deaths from cholera in 1871 in Rajshahi Division

| District    | Deaths occurred | Per 1000 (%) |
|-------------|-----------------|--------------|
| Rajshahi    | 1,546           | 1.17         |
| Murshidabad | 669             | .49          |
| Malda       | 603             | .88          |
| Bogra       | 356             | .51          |

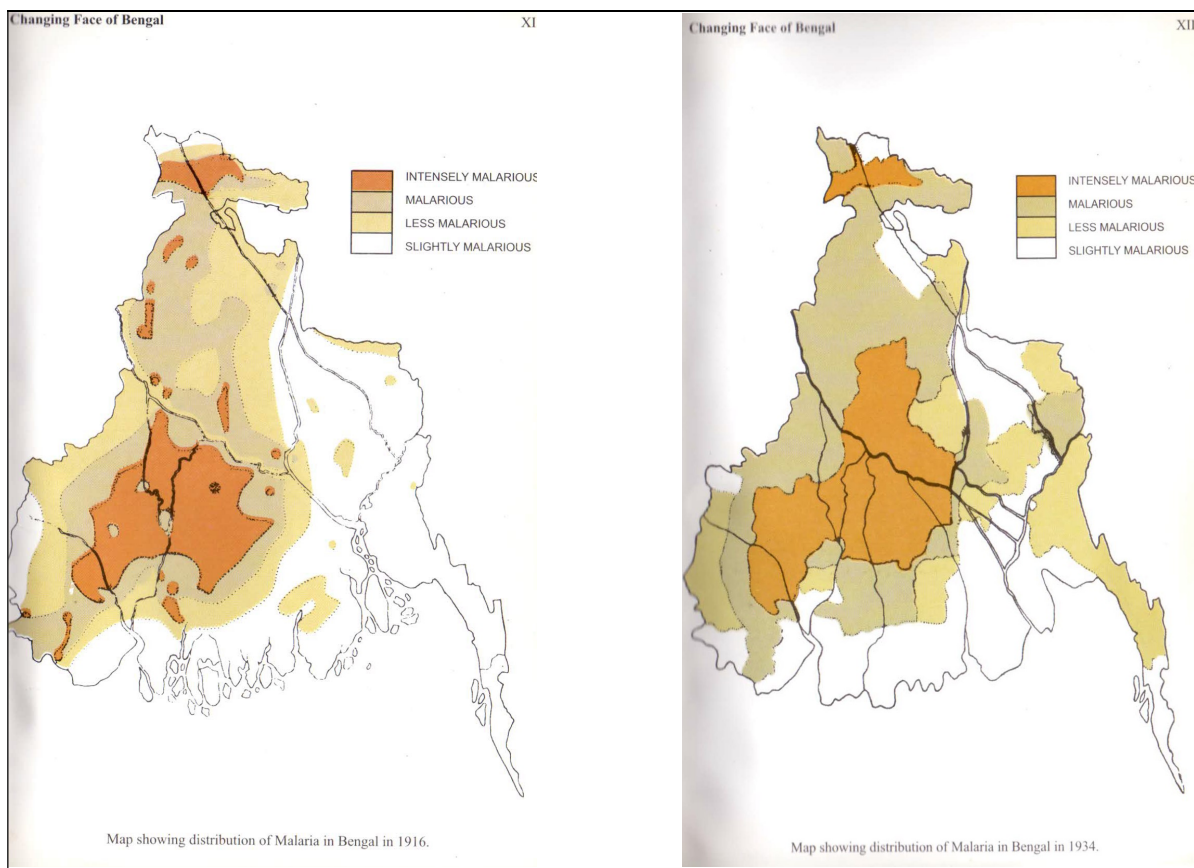
Source: *Report of the Sanitary Commissioner for Bengal for the year 1871*, p. 13

Due to the severe flood in 1871 cholera was broke out throughout the Rajshahi Division. Disease was generally limited to the submerged tracts and their neighbourhood. Deprivation, improper food and exposure to wet and cold were believed to have been greatly instrumental in causing the mortality. It is worth mentioning here that a great many of the cases set down as cholera were categorized as simply bowel complaints.<sup>255</sup> The seasonal distribution of small-pox was between March to May. Small-pox existed in Rangpur, Dinajpur, Bogra and Rajshahi during April, May, and June 1871, but gradually decreased during July and August. Though it disappeared in the rainy season, but reviving again, especially in Rangpur and Rajshahi, in the cold season.<sup>256</sup>

The *Sanitary Report* in the early years of the first decade of twentieth century envisaged that the northern part of the district of Dinajpur was unhealthier than the southern part. The Civil Surgeon of the district was of the opinion that the unhealthiness of the district was due to its water-logged condition caused by the periodical floods and inundations. Most of the deaths reported from the district were ascribed to the malarial fevers. The district was full of old tanks which, being choked with Jungle, form an excellent breeding ground for mosquitoes.<sup>257</sup> Major Rogers in his

Report talked about ‘a remarkable relationship between a high ground water level and high spleen rates and fever mortality of the *thanas* and vice versa.’<sup>258</sup> But the great majority of deaths from chronic fevers of from one to three months duration occurred during the late autumn and early cold weather months while on the other hand the deaths from long-duration fever of nearly six months occurred mostly in the hot weather season with an uniform distribution of chronic malaria over the years – so what remaining ‘the latter half of the cold weather and early part of the hot season’ was the season of ‘minimal’ prevalence of fever.<sup>259</sup> Apart from these cases of diarrhea, dysentery and bowel complaints prevailed throughout the year in the district. In March 1909, Dr. Bentley, a specialist in malaria visited the district of Dinajpur, proposed the clearance of jungle and removal of rubbish which was to be followed by speedy distribution of quinine among the inhabitants of the town . The infection from cholera in Dinajpur was carried by river water because the disease usually seemed to follow the course of one of the bigger rivers flowing through the district.

District of Jalpaiguri had been frequently visited by malarial fever brought into by the coming and prevalence of monsoon season. The malarial fever was rampant from the beginning and end of rains, in the months of March and April, and in September and October.<sup>260</sup> The river Tista divided the Jalpaiguri district into two parts – western part which was moderately malarious and eastern part which was intensely malarious. The latter, i.e. the eastern part which was known as the Western Duars, had a malicious status for malaria and black-water fever which was comparable only to the deadliest regions of Central Africa, was intersected by numerous rivers and streams and with an extra-ordinary heavy rainfall, which was indeed an ideal breeding ground for the anopheles mosquito.<sup>261</sup> Though malaria prevailed in the district throughout the year but it took a violent shape during and after the rains.<sup>262</sup> The fever appeared in the district in 1872 had extended into Purnia, Dinajpur and Rangpur, and affected the people in such a way that sometimes as many as half the inhabitants in a village were down with it at one time. There was a failure in the October rains, causing a prolongation of the hot weather, which might have assisted to originate it.<sup>263</sup>



Map. 4. 6

a. Malarial prevalence in Bengal in 1916

b. Malarial prevalence in Bengal in 1934

Source: Radhakamal Mukerjee, *The Changing Face of Bengal*, Calcutta, 1938.

The relief-work was commenced in November in continuation of that of previous seasons, and went on without interruption till March. Then small-pox appeared in the villages of Bhagoonee and Saldanga in the Boda-Chukla *thannah* jurisdiction.<sup>264</sup> This was suppressed with considerable difficulty on an account of the opposition of Muslim dominated villages, but finally it was overcome. Backett wrote in 1872 that 'After the month of March the Duars are very unhealthy.'<sup>265</sup> The constant necessity of opening the large tracts of Duars for tea plantation exerted the exigencies of investigation regarding the prevalence and deadliness of malaria. Therefore, it was in the imperial interest of the European planters that an enquiry into the occurrence of malaria and especially of black-water fever in the Western Duars had conducted by Dr. Bentley, M. B., and Captain Christopher, I. M. S. in 1907.<sup>266</sup> The enquiry, however, put

forward the theory of Laveran and Ross, which identified the malarial parasite and the causes of its expansion. The enquiry concluded with the remarks that –

“Among Europeans, of whom over 200 reside in the Duars, the incidence of malaria is very high....the mortality among [European] community which consists almost entirely of strong adults in their prime, ranging from 20 to over 75 per 1,000 as compared with a death rate of 7 per 1,000 for the whole of the European population of India... So far the enquiry has been confined mainly to the tea gardens,...among these people, malaria is present to an extraordinary degree... The examination of the blood of young children in the Duars has shown the endemic index to be very high...”<sup>267</sup>

It was not only Falakata and Alipur, but Boda and Patgram blocks were also severely infected by the disease. The ‘true explanation’ of appearance and prevalence of malaria, the enquiry suggested, was rested on the factor namely ‘soil disturbance’ caused by the opening of soil occurred during the ‘course of railway, road or canal construction or extensive building operations’ which engaged the employment of considerable numbers of labourers.<sup>268</sup> Throughout the Duars, as direct result of its numerous labour camps, with their shifting population of mixed character, there existed epidemic manifestations of the disease. As a result of the passing of *Duars Labour Act* in 1912, ‘sanitation and the collection of vital statistics on tea gardens [were] subject to inspection by Government officers’ since there was ‘room for much improvement in the rest of the district.’<sup>269</sup> Colonial intervention in reducing malarial deaths in the Duars region, which was comprised of precious tea leaves, was guided by the economic exigencies to open the area and subsequent increase of plantation lands for commercial purposes. Nandini Bhattacharya has characterized this colonial initiative of malarial research in connection of her thesis of ‘logic of location’ which ‘demonstrates the duality of locality in colonial malaria research.’<sup>270</sup> Not only in the months of monsoon, but malaria happened to be an important phenomenon during the winter time also. In 1930 investigations had been carried out by the Government which recognized a widespread presence of anopheles mosquitoes in the tea garden areas of Duars. The investigation went on for six years (1930-35) which noted an acute presence of infectious mosquitoes between the months of January to March, on the other hand Manson and Ramsay in 1932 found no infected mosquitoes during these months in the tea estates of Sibsagar District of Assam.<sup>271</sup> Apart from malaria peculiar cases of cholera occurred in the Duars where many streams and wells contained the germ of the disease. When the winter rains remained short and streams and wells were in consequence much reduced or dried up, then cholera becomes

epidemic. The worst affected tracts were the *tahsils* of Falakata and Alipur where a considerable number of Mech population resided. The Mech did not bury their carcasses and threw them into the nearest streams which carried those bodies into the forests and thereby polluted the entire water of the streams.<sup>272</sup> The outcome was that the streams outside the forests got infected and the residents in settle tract, dependent on streams for their water, could not avoid infection which frequently aggravated to an epidemic condition.

District of Rajshahi had acquired the status of 'the most feverish districts of the province' due to its alleged condition of 'un-healthiness'. Although cholera occurred extensively in some parts of the district of Rajshahi in 1869, but it was nowhere in an epidemic form. On the contrary, in 1871, produced by the floods, cholera broke out in an epidemic form and it persisted throughout the year accompanied by fever and smallpox.<sup>273</sup> Cholera existed for the whole year, from northern portion of Pooteah the disease travelled rapidly to the north-western and west and reached to Beaulia in the month of November.<sup>274</sup> Though by the end of that year the disease had subsided in almost all the parts of the district but it still prevailed at Singra, Baragaon, and Bagmara. In 1883-84, the district occupied the first place in the list of fever-stricken districts in Bengal. In 1892 and 1893 it again stood at the top of the list and in seven out of the ten years ending in 1900 it appeared as the 'the most feverish districts of the province'.<sup>275</sup> At the same time the district had been frequently visited by severe malarial fever. The cause of this widespread un-healthiness was partly due to the configuration of the district. There was a comparatively high and well drained strip of sandy soil along the Ganges, on the other hand the *Barind* part was another upland tract, and therefore the whole of the centre and east of the district fell within a swampy water-logged depression which acted as the breeding place of the anopheles.<sup>276</sup> The early decades of the twentieth century had witnessed decrease in the number of population in the Rajshahi district to an 'alarming extent' in the southern and eastern part and this decadent area was consisted of Nator Subdivision, Charghat and Puthia thanas.<sup>277</sup> Though a probable cause which had been ascertained with this phenomenon, was perhaps due to a decrease in the means of subsistence, e.g. the decline in the silk industry or to the diminishing fertility of the land, but the reality was something different. The 'bad climate' was the main 'reason' for the decadence of these areas where 'a serious change for the worse in the climate' had been 'operating during the last forty years at least'.

“The change for the worse that [had] taken place in the drainage of the area probably account[ed] for the change in the climate and the deterioration in public health. The Atrai from the north, the Narad and the Baral from the Ganges used to be active streams. Now the Narad [had] dried up entirely, and the Baral and the Atrai streams [were] dying. The Eastern Bengal Railway embankment had been built across the line of drainage. The impaired drainage possibly account[ed] for the prevalence of malaria in these areas. The evil [was] cumulative. Owing to depopulation land, especially homestead, [went] out of use and [was] quickly covered with jungle. Tanks and unrestrained vegetation [bred] mosquitoes and cause[d] further disease and depopulation.”<sup>278</sup>

Thus a large portion of the district had fallen under an adverse natural transformation which was followed by the drying up of the important river channels and further aggravated by human interference in the name of railway embankment.

The year 1870 in the district of Murshidabad had brought havoc by the continuation of cholera which was further aggravated by the severe floods of that year.<sup>279</sup> Cholera, small-pox, fever, diarrhea, and dysentery often took an epidemic form and carried off a large number of people in Bogra district. Cholera was common in *thanas* Dhunot and Shariakandi in the district of Bogra, chiefly in the rainy season when the filthy water speedily spreads the epidemic among the villages.<sup>280</sup> As an anti-malarial campaign Jangipur flood and flush scheme was introduced which helped to flush-out the flood water instead of blocking which caused widespread malaria in the previous years.<sup>281</sup>

Between 1872 and 1881 though there was an increase in 5 per cent in total population in the district of Malda, with the total number of 7, 10, 484 but at the same time southern part of the district lying west of the Mahananda had witnessed a decrease due to spread of malaria during the closing half of the decade.<sup>282</sup> The decade of 1901-11, was the eventful one from the perspective of health and natural conditions, when in 1905, 1906 and 1907 fever prevailed in the district and was accompanied with the heavy floods in 1906. The 1921 census had shown a population of 10, 12, 109 or a decrease of 1.3 per cent that was resulted from the spread of malaria, subsequently came out as an epidemic and lasted for few years, was particularly intense in the central part of the district.<sup>283</sup> On the other hand the District of Malda had been appeared to Hunter as ‘less unhealthy than the Districts of Purnia, Dinajpur, and Rajshahi’ although the eastern portion of the district that was ‘covered with jungles and swamps, and where the soil [was] a damp clay, [was] exposed to the same malarious fever which prevail[ed] in the neighbouring Districts.’<sup>284</sup> Disease

like- epidemic fever (commonly known as ‘Burdwan fever’) with the malarial traits usually appeared ‘after the close of the rains.’ Raja Digamber Mitter, the Indian member of the first Committee appointed by the Government in 1863 to enquire into the causes of the epidemic, traced the occurrence of epidemic fever in Malda, along with the other districts, in the following manner –

“...the fever which goes by the name of the Burdwan fever is not new to the country but is simply an aggravated form of that disease, which rages periodically all over the country after the close of the rains ; the cause of the fever must, therefore, be ever present in the country, though its rigor in an epidemic form can be avoided if proper precautions are taken.”<sup>285</sup>

The environmental conditions prevailed during and after the floods or failure of crops created the background for the disease which was sometime aggravated to epidemics and in these cases the district was credited to the infection from the *Barind* tract and from Gaur.<sup>286</sup> Cholera, gradually dispersing from the outlying parts to the central and most populated and cultivated portions of the district, used to make visit during the two separate seasons - October, November and December, this time along with fever; and another during March, April and May. In many cases of its sudden appearance cholera took away the life of few people. Cholera usually was caused by the hot weather during the mango season (summer season) and towards the end of the rains, when *bhadoi* paddy became the main diet of the common people. On the other hand, fever broke out ‘at the close of the rains and beginning of the cold weather, followed by small-pox which continues occasionally into the rains.’<sup>287</sup> Sporadic cases of cholera were reported from many parts of the district during the first six months of the year 1871, especially when rainfall was deficient. In July it assumed an epidemic form at Monoharpur and gradually spread to the surrounding villages; by the first week of August the disease had travelled to the sudder *thana* and then extended to the north and north-west to *thanas* Khurba, Gajol and Gorgoriba.<sup>288</sup> The rainy season of 1872 had produced small-pox in the country.<sup>289</sup> There was no significant difference in respect of sanitary condition between the municipalities and the villages, and it was informed that Old Malda, particularly, was ‘notoriously insanitary and unhealthy’. The insanitary condition of the district was partly caused by the sedimentation occurred in the Kalindi river in 1881 which affected the flow of water.<sup>290</sup> The outbreak of fever was due to the construction of Kathihar-Godagari railway line which brought out a large number of coolies into the district that produced the collapse of the existed pattern of drainage of the district. Construction of railways sometime

led to the embankment of rivers or lakes, or the process of embankments exclusively, introduced massive diggings that resulted borrow pits which were, according to C. A. Bentley, the Director of Public Health, were ‘far more dangerous than large water surfaces, because they invariably possess a lower temperature much more suitable for mosquito larvae than the high temperature to which large collections of water speedily become raised.’<sup>291</sup> In 1910 Major Mc Combie Young had mentioned about the outbreak of malaria in the district during the construction of railway into the district.<sup>292</sup> Malaria also produced great distress for the life of the people and from 1894 to 1899 deaths from malaria were very high which were affected by the considerable inflow of labour across the Mahananda during the cold weather of these years.

The ‘un-healthiness’ of the district of Rangpur had been attributed to the heavy rainfall combined with an imperfect natural drainage, which was further obstructed by several roads and this made the climate of the district damp and malarious. In addition to the stagnant marshes and swamps which disfigured the country, every village and town site was honeycombed with innumerable pits and hollows, excavated to provide earth for the plinths of houses.<sup>293</sup> The seasonal variation in malarial occurrence was slight rising a little from October to December and declining from February to May<sup>294</sup>, thus showed an extraordinary concentration during the months of rainy season. A very great proportion of the deaths in the district could be ascribed to malaria, for which Dr. T. H. Bonnar had opined that –

“The general level of the district [was] low, especially in the south and east, where the whole country [was] submerged in the rains, the village sites standing out here and there as islands. The country [was] ill-drained and large swamps and marshes occupy the depressions left in the deserted courses of old rivers...The marshes, tanks and pools form[ed] suitable breeding-places for mosquitoes and their mephitic exhalations poison[ed] the atmosphere. These circumstances account[ed] for the widespread prevalence of malaria...there could be no doubt that malaria levie[d] a very heavy toll on the population and that its ravages show[ed] a tendency to increase.”<sup>295</sup>

In 1872 the ‘whole country seemed prostrated with fever’. There was also cholera or a severe form of bowel complaint in places where the people used to drink the water in which jute had been stepped.<sup>296</sup> The flood of 1915 had produced dysentery and diarrhea throughout the Presidency and the diseases took considerable lives which was higher in the Rajshahi Division than the other divisions.<sup>297</sup> The yearly death-rate between 1911 and 1935, however, had been

shown in a rather fluctuating mode, and particularly there was a steady rise in death rates between 1931 (25.23) and 1935 (27.55), except that was in the year 1932 (20.72) when it was comparatively low.<sup>298</sup> Cholera, was endemic throughout the year, but took an epidemic form twice a year – from April to June, and from November to January, which was largely affiliated with insanitary habits of the people of the district. Small-pox occurred in epidemic form along the navigable rivers and the infection had been brought into by the migratory boatmen.<sup>299</sup>

Drainage seemed to be an evocative question for the colonial administration regarding the ameliorations of the conditions and there was increasing exertions of the ideas that sufficient drainage could solve the issue of malarial visitations. On the contrary Bentley had argued that it was inappropriate to undertake any conclusive remark regarding the malaria mitigation through the development of drainage conditions. He was of the opinion that ‘malaria in the delta tracts [was] not associated with a great excess of surface water, even when that excess produces actual water-logging of the land and damage to the crops’ rather ‘an intensification of the disease occur[ed] wherever the partial drying up of the country [was] carried beyond a certain point’.<sup>300</sup> Moreover, floods were considered as helpful in confronting the malarial attack. In support of his argument Bentley had quoted from Hirsch’s *Handbook of Geographical and Historical Pathology* –

“The fact that when the water is high and the ground completely covered by it, the endemic or epidemic disappears, fresh cases of the disease appearing only after the water has run off and the surface of the country has been laid bare. ...the fact in those rice-fields in India which are always under water,...are the least dangerous to health...the complete flooding of marshy ground, and the feeling up of standing pools, ditches, and the like causes the endemic to disappear as certainly as if they had been dried up.”<sup>301</sup>

A Bill to facilitate drainage in certain parts of Bengal was introduced into law as Act V of 1871.<sup>302</sup> Drainage pattern which largely depended on the nature of land and soil remained problematic for many of the districts of north Bengal. Drainage condition affecting the inflow and outflow of water had contributed to the lengthening or shortening the period of inundations. Drainage had seemed to be a major problem in Rangpur even during the 70s of the nineteenth century and the unhealthiness of Rangpur had been ascribed to its poor drainage condition.

Cholera had prevailed in certain parts of the Princely State of Cooch Behar during the months of August and November 1886 chiefly in the areas of Daribash in the Haldibari Sub-division, and at Kholta in the Sudder Sub-division.<sup>303</sup> Though it subsided by the end of the year but in the end of March 1887 cholera again began to assume an epidemic form, and during the whole of the hot weather especially in the months of April, May and June, again towards the end of the rains, it raged furiously all over the State.<sup>304</sup> Haldibari, part of Mekhliganj, Dinhata, Mathabhanga, Sitalkhuchi, Foolbari were the places which were affected severely, but with a striking absence of any serious cases in the town of Cooch Behar. Out of a total population of 6, 02, 624 no less than 3,178 persons were attacked of which 2,779 died and only 399 recovered.<sup>305</sup>

Table. 4.6

Deaths caused by cholera in 1887 in Cooch Behar

|                                   | No. of cases | Deaths | Recoveries |
|-----------------------------------|--------------|--------|------------|
| Those treated in Hospital         | 15           | 2      | 13         |
| Treated by Compounders and Police | 879          | 650    | 229        |
| Treated by Kabirajes              | 1,113        | 1,000  | 113        |
| Not treated                       | 1,186        | 1,129  | 57         |

Source: *The Annual Administration Report of the Cooch Behar State for the year 1887-88*, p. 26.

The flood of 1906 had brought out numerous cases of cholera which broke out in the most parts of the State of Cooch Behar. Not only cholera, small-pox was also prevalent in the State. There were 1816 cases of cholera as against 671 and 132 cases of small pox as against 81 in the previous years.<sup>306</sup> The adverse condition for the year 1906 was due to severe inundations. Due to erratic rainfall throughout the year 1918 in the Princely States of Cooch Behar, cholera broke out in all the sub-divisions and small-pox also erupted everywhere. 996 persons against 62 of the previous year died of cholera all over the State. The disease broke out in virulent form in the Sudder and in the Tufangunj sub-divisions where 253 and 449 persons had succumbed to death out of total attack of 301 and 531 persons respectively. The number of deaths from small-pox in the State was 56 against 271 of the previous year.<sup>307</sup> During the year 1934-35, 249 people were

attacked by cholera out of which 180 persons were died and the percentage of death was 72.28 which in the previous year was 74.18.<sup>308</sup> Small-pox which broke out in epidemic form took 203 lives while attacked 998 persons in the Sudder and other parts of the State - the highest number of death was reported from the Kotwali area where the number was 185.<sup>309</sup>

## ***Conclusion***

There was enough evidence to believe that colonial ideology of riparian legislation related to embankments, drainage and irrigation were meant to serve the colonial purpose instar of providing any sustainable relief to the Indians. Sir William Willcocks, original designer of the Aswan Dam in Egypt, who began his career as an irrigation engineer in Bengal, accused the British in the 1920s of purposely preventing irrigation systems within the Bengal Presidency where irrigation system was introduced to protect their roads and railways and thus secure a continuing flow of raw materials to the industries in England.<sup>310</sup> Floods sometime proved to be good not only for the crops which had been provided with ample sources of water and silt deposits that contributed to the fertilization of the soil, but flood produced new land for cultivation by the silt deposits which frequently were used for the increasing areas of cultivation from which increasing revenue could be drawn for the imperial authority. The natural supply of flood water had been by justified by the Government of having ‘only in a minor degree that irrigation for cultivation [came] within the Department’s scope.’<sup>311</sup> This sometime prevented the landlords to adopt any flood-preventive measure and inspired them to encourage the silting up of river channels. In a report to the Bengal Land Revenue Commission in 1939, the Bengal Provincial Kisan Sabha, a peasant organization, noted:

“Not only do the landlords fail to clear away the silt and to re-excavate the blocked channels and waterways and tanks; on the contrary, they often encourage the silting up of these waterways so as to form new fields which they can lease out to new tenants. A very common form of litigation...is where cultivators attempted to keep open long-established waterways but have been forcibly driven off the land by the hired gangsters of the landlords who are preparing to sow a crop in the silted up river bed.”<sup>312</sup>

Sometime continuous silting of river channels transformed the nature of the soil and aggravated peasant distress. The formation of new lands for cultivation was lucrative for the colonial State. But the constant silting of deposits had affected the flow of water in the river channels and the Irrigation Committee which was constituted under the Chairmanship of Mr. W. S. Hopkins in 1930 had reported that in the northern districts ‘where the rivers which once built up the delta of the Ganges now lie stagnant, the most important problem is to restore the flow of water in the rivers.’<sup>313</sup> Though during the second half of the nineteenth century efforts had been made to restore the existing irrigation canals in Bengal, but Wilcocks had prescribed for the discontinuation of this process of restoration of any ‘ancient artificial systems of irrigation’. Problems in restoring flood water were manifested in a different way for Malda and Rajshahi districts where the floods were so heavy that it obstructed the monsoon harvest and the water receded so quickly that no water was remained available for cold weather irrigation.<sup>314</sup> Thus flood water were wasted in these districts along with Dinajpur which were peculiarly liable to the failure of crops, but if it could have been properly used through appropriate construction of further canals or any other way then it would definitely prove to be beneficial for the people of those regions. As a part of anti-malarial campaign sometime the surplus flood water had been driven to flow in the country so they could submerge as large an area as possible and thus destroying the breeding grounds of the anopheles.<sup>315</sup>

The impact of artificial embankments can be best understood in the words of Sir Wilcocks who was borne ‘in a tent or an irrigation canal’ in India in some 1853:

“If you embank the rivers and prevent their overflowing altogether and leave no openings in the banks, you doom the country to malaria and impoverishment of soil; but that is not all the harm you do. By confining high floods to their river channels, you congest the rivers to bursting point and expose the country to various serious inundations and devastations.”<sup>316</sup>

Wilcocks had warned the Government that excessive dependence on rainfall could impoverish the soil and produce malaria. The consecutive river irruptions in northern Bengal were no less caused by the sporadic embankments constructed according to the needs and profits of the colonial Government. Embankments which supposed to be a major concern for reducing the danger of flood occurrences sometimes even heightened the tensions among the flood victims because the colonial hydrology had yet to tap new tools or solutions for diminishing the

hazardous effects of inundation in the northern part of Bengal. Thus Christopher Hill argues that: “Indeed, perhaps more than any other proprietary action taken by the British in South Asia, riparian law exemplifies the pitfalls and ramifications of the attempt to universalize a flawed, imported land policy.”<sup>317</sup> It can be observed from the above discussions that the colonial Government was more inclined to ‘control’ the rivers on their own terms which proved injurious for the colonized people and mere designating the rivers as source of profit overlooked the very existence of rivers as source of life and livelihood. Kuntala Lahiri-Dutt has argued that ‘...the move from ‘mother’ nature to ‘obedient daughter’ river has been detrimental to human welfare.’<sup>318</sup> Rohan D’Souza is of the opinion that ‘Colonial water technologies such as weirs, dams and barrages, oriented towards delivering perennial irrigation for settled agriculture, in most instances, proved unable to not only coexist with traditional systems but were sharply aimed at eliminating the latter as well.’<sup>319</sup>

Floods had produced famine conditions at several occasions. South Asian famines, as addressed by the scholars so far, generally owed to the shortage of rainfall, but the chapter demonstrates the occurrences of famine conditions or famines which were caused by the excessive rainfall. The large scale destruction of crops and commodities had resulted to widespread increase of prices and aggravated enduring poverty of the people who had to move through a complex relationship between environment, social ecology and subsistence at the time of floods. Floods in the hilly tracts brought about considerable loss of forest and plantation lands which provided a major blow to the bare subsistence of the forest dwellers and tea plantation workers. Soil erosion, loss of crops and cattle had been instrumental to transform the agricultural and economic setting of the region where the floods occurred. What the colonial government lacked was the understanding of the fact that flood should have to be controlled first at the ‘local level’ where the floods first appeared instead of bringing large artificial barriers to the natural flow of water.<sup>320</sup> Colonial period witnessed a massive phase of deforestation of the subcontinent which is said to believe a major cause of floods. But recent researches have shown that afforestation could not solve the problem of frequent flooding of the Himalayan rivers which could be rarely controlled by the embankments because ‘the Himalayan mountains constitute an extremely fragile ecological system [which] are the youngest mountains of the world and, therefore, highly erodible.’<sup>321</sup>

## Notes and References:

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<sup>1</sup> W. W. Hunter, *A Statistical Account of Bengal, vol. X: Districts of Darjiling, and Jalpaiguri and State of Kuch Behar*, Trubner & Co., London, 1876, p. 226.

<sup>2</sup> James Rennel, *Memoir of a Map of Hindustan; or the Mughal Empire*, W. Bulmer & Co., London, Second Edition, 1792, p. 352.

<sup>3</sup> John. F. Gruning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, Pioneer Press, Allahabad, 1911, p. 7.

<sup>4</sup> W. W. Hunter, *op. cit.*, p. 226.

<sup>5</sup> Rajat Datta, *Society, Economy and the Market: Commercialization in Rural Bengal, c. 1760-1800*, Manohar, New Delhi, 2000, p. 250.

<sup>6</sup> W. W. Hunter, *A Statistical Account of Bengal, vol. VII*, p. 294

<sup>7</sup> *Ibid.*

<sup>8</sup> The members of the Board of Revenue failed to understand the gravity of the situation and displayed a sense of insincerity through recruiting “a staff of surveyors (*amins*) ... to inquire into the extent of the losses sustained, and the zamindars continued to hold their estates on the understanding that they would be allowed remissions corresponding to their losses, on the termination of the inquiry.” *Ibid.*, p. 295.

<sup>9</sup> J. A. Vas, *Eastern Bengal and Assam District Gazetteers: Rangpur*, Pioneer Press, Allahabad, 1911, p. 75.

<sup>10</sup> In the northern part of Rangpur Tista flowed through a small stream, “which found its way by a circuitous course past Ulipur to the Brahmaputra, a little north of the confluence of the Ghaghat with that river.” The new stream caused by the overflow of waters turned itself into the Ghaghat. *Ibid.*

<sup>11</sup> W. W. Hunter, *A Statistical Account of Bengal, vol. VII*, p. 296.

<sup>12</sup> Estimate of D. H. MacDowall, Collector of Rangpur, 28 June, 1789. Cited in, Rajat Datta, *op. cit.*, p. 256.

<sup>13</sup> W. W. Hunter, *op. cit.*, p. 296.

<sup>14</sup> *Ibid.*

<sup>15</sup> *Ibid.*

<sup>16</sup> J, A. Vas, *op. cit.*, p. 76.

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<sup>17</sup> *Ibid.*

<sup>18</sup> *Ibid.*

<sup>19</sup> W. W. Hunter, *op. cit.*, p. 297.

<sup>20</sup> *Ibid.*

<sup>21</sup> *Ibid.*

<sup>22</sup> J. A. Vas, *op. cit.*, p. 76.

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.*

<sup>25</sup> W. W. Hunter, *op. cit.*, p. 297.

<sup>26</sup> Binay Bhushan Chaudhury, *Agricultural Growth in Bengal and Bihar, 1770-1860: Growth of Cultivation since the Famine of 1770; Bengal Past and Present*, 95, 1976. Though the peasant unrest in Birbhum triggered by the introduction of *Jummabandi* but the halting of reclamation process suffered a serious setback throughout the districts of Dinajpur and Rangpur. p. 300 and 303.

<sup>27</sup> Rajat Datta, *op. cit.*, pp. 292-93.

<sup>28</sup> *Ibid.*, p. 291.

<sup>29</sup> *Ibid.*, p. 301.

<sup>30</sup> B. Chaudhury, *Eastern India*, in Daharma Kumar (ed.), *The Cambridge Economic History of India, Vol. II: c. 1757-2003*, Orient Blackswan & Cambridge University Press, New Delhi, 2008, p. 290.

<sup>31</sup> Rajat Datta, *op. cit.*, p. 301.

<sup>32</sup> J. A. Vas, *op. cit.*, p. 5.

<sup>33</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X*, pp. 124-25.

<sup>34</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, Trubner & Co., London, 1876, p. 90.

<sup>35</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, Bengal Secretariat Book Depot, Calcutta, 1916, p. 92.

<sup>36</sup> *Ibid.*

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<sup>37</sup> *Ibid.*, p. 93.

<sup>38</sup> P. C. Mahalanobis, *Report on Rainfall and Floods in North Bengal, 1870 – 1922*, Bengal Secretariat Book Depot, Calcutta, 1927, p. 1.

<sup>39</sup> *Ibid.* p. 2.

<sup>40</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Murshidabad*, Bengal Secretariat Book Depot, Calcutta, 1914, pp. 116.

<sup>41</sup> *Ibid.*

<sup>42</sup> *Ibid.*, p. 117.

<sup>43</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Districts of Murshedabad and Pabna*, Trubner & Co., London, 1876, p. 132.

<sup>44</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Murshidabad*, p. 117.

<sup>45</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Districts of Murshedabad and Pabna*, p. 133.

<sup>46</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Murshidabad*, p. 117.

<sup>47</sup> [Proceedings No. 141.] From Baboo Bunkim Chander Chatterjee, Deputy Collector, to the Collector of Moorshedabad, - (No. 37, dated Berhampore, the 6th September 1870), progs no. 141, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, West Bengal State Archives (henceforth WBSA).

<sup>48</sup> *Ibid.*

<sup>49</sup> Daily reports from the officer in charge of the Maldah district of all correspondences, information of which was received on the 30th July 1870, dispatched same date at 3 p.m., progs. No. 77, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

<sup>50</sup> From N. S. Alexander, EsQ., Officiating Collector of Maldah, to the Commissioner of the Rajshahye Division, - (No. 500, dated Maldah, the 16<sup>th</sup> August 1870), progs. No. 78, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

<sup>51</sup> From H. S. Beadon, EsQ., Officiating Under Secretary to the Government of Bengal, to the Commissioner of the Rajshahye Division. – (no. 3416, dated Fort William, dated the 29<sup>th</sup> August 1870), progs no. 79, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

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<sup>52</sup> From F. G. Millett, EsQ., Officiating Collector of Rungpore, to the Commissioner of the Rajshahye Division, - (No. 175, dated Rungpore, the 6<sup>th</sup> August 1870), progs no. 81, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

<sup>53</sup> Letter from J. Tweedie, Officiating Magistrate to C. E. Lance, Officiating Commissioner of the Rajshahye Division (dated Pubna, the 31st July 1870), progs. No. 84, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

<sup>54</sup> *Ibid.*

<sup>55</sup> From J. C. Veasey, EsQ., Assistant Collector of Serajgunge, to the Collector of Pubna, - (No. 111, dated Serajgunge, the 29<sup>th</sup> July 1870), progs no. 86, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

<sup>56</sup> *Ibid.*

<sup>57</sup> [Proceedings No. 88] From J. Tweedie, EsQ., Officiating Collector of Pubna, to the Commissioner of the Rajshahye Division, - (No. 340, dated Pubna, the 9<sup>th</sup> August 1870), progs. no. 88, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

<sup>58</sup> From J. Ward, EsQ., Officiating Magistrate of Rajshahye, to the Commissioner of the Rajshahye Division, - (No. 69A., dated Beaulah, the 12<sup>th</sup> August 1870), progs. No. 92, *Proceedings of the Lieutenant-Governor of Bengal during September 1870 (Revenue Department)*, WBSA.

<sup>59</sup> P. C. Mahalanobis, *op. cit*, p. 51.

<sup>60</sup> *Ibid.*

<sup>61</sup> Jatindra Chandra Sengupta, *West Bengal District Gazetteers: Malda*, Sree Saraswati Press, Calcutta, 1969, p. 97.

<sup>62</sup> G. E. Lambourne, *Bengal District Gazetteers: Malda*, The Bengal Secretariat Book Depot, Calcutta, 1918, p. 50.

<sup>63</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 92.

<sup>64</sup> *Ibid.*

<sup>65</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, Trubner & Co., London, 1876, p. 79.

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<sup>66</sup> C. E. Buckland, *Bengal under the Lieutenant Governors: A Narrative of the Principal Events and Public Measures during Their Periods of Office from 1854 to 1898, Vol. I.*, S. K. Lahiri & Co, Calcutta, 1901, p. 495.

<sup>67</sup> *The Hindoo Patriot* – week ending September 11, cited in P. C. Mahalanobis, *op. cit.*, p. 51.

<sup>68</sup> C. E. Buckland, *op. cit.*, Vol. I., p. 494.

<sup>69</sup> P. C. Mahalanobis, *op. cit.*, p. 52.

<sup>70</sup> *Ibid.*, p. 53.

<sup>71</sup> *Ibid.*

<sup>72</sup> *Ibid.*, p. 54.

<sup>73</sup> Harendra Narayan Chaudhury (compl.), *The Cooch Behar State and its Land Revenue Settlements*, The Cooch Behar State Press, Cooch Behar, 1903, p. 78.

<sup>74</sup> *The Annual Administration Report of the Cooch Behar State for the year 1878-79*, Cooch Behar State Press, Cooch Behar, 1879, p. 11.

<sup>75</sup> *Ibid.*, p. 12

<sup>76</sup> P. C. Mahalanobis, *op. cit.*, p. 55.

<sup>77</sup> *Ibid.*

<sup>78</sup> T. H. Wickes, Superintending Engineer, South Eastern Circle, *Report on the Inundations of 1885 in the South-Western Circle*, Encloser Of Govt. Of Bengal, P. W. D (No. 807½ of 9-6-1886) in *Government Of Bengal, Revenue Department, Famine Branch – Proceedings for February 1887 (File No. 7, Serial No. 9/18)*, WBSA.

<sup>79</sup> *Ibid.*

<sup>80</sup> C. E. Buckland, *Bengal under the Lieutenant Governors: A Narrative of the Principal Events and Public Measures during Their Periods of Office from 1854 to 1898, Vol. II.*, S. K. Lahiri & Co., Calcutta, 1901, p. 822.

<sup>81</sup> T. H. Wickes, *Report on the Inundations of 1885 in the South-Western Circle*, WBSA.

<sup>82</sup> *Ibid.*

<sup>83</sup> *Ibid.*

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- <sup>84</sup> C. E. Buckland, *op. cit.*, Vol. II., p. 822.
- <sup>85</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Murshidabad*, p. 117.
- <sup>86</sup> G. E. Lambourne, *op. cit.*, p. 50.
- <sup>87</sup> P. C. Mahalanobis, *op. cit.*, p. 56.
- <sup>88</sup> *Ibid.*, p. 57.
- <sup>89</sup> T. H. Wickes, *Report on the Inundations of 1885 in the South-Western Circle*.
- <sup>90</sup> *Ibid.*
- <sup>91</sup> *Ibid.*
- <sup>92</sup> Government of Bengal, Revenue Department, Famine Branch – Proceedings for February 1887 (File No. 7, Serial No. 9/18) Collection. I - No. 26b February /87; Subject: *Fate of The Crops in Bengal*, Proceedings No. B- 12-29, WBSA.
- <sup>93</sup> C. E. Buckland, *op. cit.* Vol. II., p. 822.
- <sup>94</sup> Cited in P. C. Mahalanobis, *op. cit.*, p. 56.
- <sup>95</sup> G. E. Lambourne, *op. cit.*, p. 50.
- <sup>96</sup> *Ibid.*
- <sup>97</sup> P. C. Mahalanobis, *op. cit.*, p. 57.
- <sup>98</sup> *The Bengal Administration Report*, cited in P. C. Mahalanobis, *op. cit.*, p. 58.
- <sup>99</sup> J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, Pioneer Press, Allahabad, 1910, p. 74.
- <sup>100</sup> *Ibid.*
- <sup>101</sup> Harendra Narayan Chaudhury, *op. cit.*, p. 79.
- <sup>102</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Pabna*, Bengal Secretariat Book Depot, Calcutta, 1923, pp. 45-46.
- <sup>103</sup> *Ibid.* p. 46.
- <sup>104</sup> F. W. Strong, *Eastern Bengal and Assam District Gazetteers: Dinajpur*, Pioneer Press, Allahabad, 1912, p. 64.
- <sup>105</sup> *Ibid.*

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<sup>106</sup> *Ibid.*

<sup>107</sup> P. C. Mahalanobis, *op. cit.*, p. 63.

<sup>108</sup> Harendra Narayan Chaudhury, *op. cit.*, p. 79.

<sup>109</sup> P. C. Mahalanobis, *op. cit.*, p. 63.

<sup>110</sup> *Ibid.*, p. 64.

<sup>111</sup> Harendra Narayan Chaudhury, *op. cit.*, p. 79.

<sup>112</sup> *Ibid.*, p. 65.

<sup>113</sup> *The Bengal Administration Report*, cited in *Ibid.*

<sup>114</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 129.

<sup>115</sup> *Ibid.*, p. 130.

<sup>116</sup> See Ch. II.

<sup>117</sup> E. C. Dozey, *A Concise History of the Darjeeling District since 1835 with a Complete Itinerary Tours in Sikkim and the District*, N. Mukherjee, Calcutta, 1922, pp. 140 - 41.

<sup>118</sup> Cited in E. C. Dozey, *op. cit.*, pp. 141 – 42.

<sup>119</sup> *The Fairfield News and Herald*, Winnsboro. S. C., Wednesday, October 4, 1899. Vol. LIV, No. 8.

<sup>120</sup> *The Argus*, Melbourne, Monday, 2 October, 1899.

<sup>121</sup> Ada Lee, *Seven Heroic Children: A Great Sorrow and a Great Victory*, Morgan and Scott, London, 1906, p. 32.

<sup>122</sup> *Ibid.*, p. 38.

<sup>123</sup> [http://www.sjcnorthpoint.com/1899\\_08.php](http://www.sjcnorthpoint.com/1899_08.php). Accessed on 5/5/2015.

<sup>124</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 131.

<sup>125</sup> Arthur Jules Dash, *Bengal District Gazetteers: Darjeeling*, Bengal Government Press, Alipore, 1947, p. 11.

<sup>126</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Darjeeling*, p. 136.

<sup>127</sup> *Ibid.*, pp. 136-37.

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<sup>128</sup> P. C. Mahalanobis, *op. cit.*, p. 68.

<sup>129</sup> *Ibid.*, p. 69.

<sup>130</sup> *Ibid.*

<sup>131</sup> John. F. Gruning, *op. cit.*, p. 74.

<sup>132</sup> Deputy Commissioner's report of the flood. Cited in John. F. Gruning, *op. cit.*, pp. 74-75.

<sup>133</sup> *Ibid.*, p. 75.

<sup>134</sup> *Ibid.*

<sup>135</sup> *Ibid.*, p. 76.

<sup>136</sup> *Ibid.*

<sup>137</sup> *Amrita Bazar Patrika*, August 18, cited in P. C. Mahalanobis, *op. cit.*, p. 68.

<sup>138</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Murshidabad*, pp. 117.

<sup>139</sup> *Ibid.*

<sup>140</sup> *Ibid.* Another severe inundation occurred in Murshidabad in 1907, when 'the Lalitakuri embankment gave way in the Lalbagh subdivision', and as a result there was a partial failure of the winter rice crop.

<sup>141</sup> John. F. Gruning, *op. cit.*, p. 76.

<sup>142</sup> *Ibid.*

<sup>143</sup> *Ibid.*

<sup>144</sup> *Ibid.*, p. 78.

<sup>145</sup> *Ibid.*

<sup>146</sup> *Ibid.*

<sup>147</sup> *Ibid.*

<sup>148</sup> Ranajit Dasgupta, *Labour and Working Class in Eastern India: Studies in Colonial History*, K. P. Bagchi and Co., Calcutta, 1994, pp. 263-264.

<sup>149</sup> G. E. Lambourne, *op. cit.*, p. 56.

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<sup>150</sup> *Ibid.*

<sup>151</sup> *The Bengalee*, 15 September 1906, cited in P. C. Mahalanobis, *op. cit.*, p. 73.

<sup>152</sup> *The Bengalee*, 11 September 1906, cited in *Ibid.*

<sup>153</sup> *Ibid.*

<sup>154</sup> *The Annual Administration Report of the Cooch Behar State for the year 1906-07*, Cooch Behar State Press, Cooch Behar, 1907, p. 4.

<sup>155</sup> *Ibid.*

<sup>156</sup> Annual Administration Report of the Department of General Administration and Criminal Justice of the Cooch Behar State for the year 1906-1907 in *The Annual Administration Report of the Cooch Behar State for the year 1906-07*, p. 15.

<sup>157</sup> *Amrita Bazar Patrika*, July 18, 22, 1910, cited in P. C. Mahalanobis, *op. cit.*, p. 75.

<sup>158</sup> *The Englishman*, August 16, 1915, cited in P. C. Mahalanobis, *op. cit.*, p. 77.

<sup>159</sup> *Amrita Bazar Patrika*, September 3, 6, 8, 1915, cited in *Ibid.*

<sup>160</sup> W. N. Nelson, *Final Report on the Survey and Settlement Operations in the District of Rajshahi, 1912-1922*, Bengal Secretariat Book Depot, Calcutta, 1923, p. 8.

<sup>161</sup> Rainfall in the neighbouring districts was also considerably high. In the month of August, six of the rainfall stations in the district of Dinajpur had recorded a fall of over 35 inches against a normal figure of 12.15, while in Bogra, the rainfall was 26.33 inches as compared with an average of 11.12. *Ibid.*

<sup>162</sup> *The Administration of Bengal under the Earl of Ronaldshay, G.C.I.E., 1917-22*, p. 39.

<sup>163</sup> *Ibid.*, pp. 39-40.

<sup>164</sup> *Final Report on the Survey and Settlement Operations in the District of Rajshahi, 1912-1922*, p. 8.

<sup>165</sup> *Ibid.*

<sup>166</sup> *Ibid.*, pp. 8-9.

<sup>167</sup> *Amrita Bazar Patrika*, September 7, 1918, cited in P. C. Mahalanobis, *op. cit.*, p. 78.

<sup>168</sup> *The Administration of Bengal under the Earl of Ronaldshay, G.C.I.E., 1917-22*, p. 40.

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<sup>169</sup> *Ibid.*

<sup>170</sup> *Amrita Bazar Patrika*, September 5, 1918, cited in P. C. Mahalanobis, *op. cit.*, p. 79.

<sup>171</sup> *The Bengalee*, September 1, 1918, cited in *Ibid.*, p. 78.

<sup>172</sup> *The Annual Administration Report of the Cooch Behar State for the year 1918-1919*, Cooch Behar State Press, Cooch Behar, 1919, p. 3. The excess of rainfall for the year 1918 was 43.40 inches.

<sup>173</sup> *Ibid.*

<sup>174</sup> *Ibid.*, p. 4.

<sup>175</sup> The number of lives lost in different places of the State was as follows – Kotwali Police Station – 12, Tufangunj – 13, Dinhata – 19, Mathabhanga – 10, Shitalkhuchi – 1, Mekligunj Police Station – 6, Haldibari – 6. Report submitted by the Vice-President, State Council in *The Annual Administration Report of the Cooch Behar State for the year 1918-1919*, p. 7.

<sup>176</sup> Mahalanobis, *op. cit.*, p. 82.

<sup>177</sup> *Ibid.*

<sup>178</sup> Cited in *Ibid.*, pp. 83-84.

<sup>179</sup> *Ibid.*, p. 84.

<sup>180</sup> Meghnad Saha, 'The Great Flood in North Bengal', *Modern Review*, vol. 32, November, 1922, p. 605.

<sup>181</sup> Saha had commented that the country was consisted of two well-defined geological tracts – the old alluvia to the west locally known as the Barind, which is a colloquial form of Varendra, the classical name of the country, and the newer diluvial formations of the Brahmaputra to the east. The bank of Karatoya may be taken to be the watershed dividing the basin of the Atrai from that of the Jumna. The Atrai was flowing through the confines of the old alluvial formation. The lower course of the Atrai, near about Nator, crossed through a natural depression, the centre of which was occupied by the Chalan *bil*, lying between the Pabna and the Rajshahi districts. *Ibid.*, p. 606.

<sup>182</sup> "The railway system in this tract consist[ed] of two sections, the lower one, from Sara to Santahar being a double line, in which the old meter gauge line exist[ed] side by side with the new broad gauge line constructed a few years ago. The upper part, from Santahar to Jalpaiguri consist[ed] of the meter gauge line,... Santahar [was] an important railway junction, from which another line [had] breached off,...to Bogra... Besides these lines, there [was] the Sara-Serajgunj

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line, further south, a broad gauge line which the Chalan bil area, thus effectively blocking the chief water course of Northern Bengal.” *Ibid.*, pp. 606-607.

<sup>183</sup> *Ibid.*, p. 607.

<sup>184</sup> *Amrita Bazar Patrika*, November 6, 1922.

<sup>185</sup> Meghnad Saha, *op. cit.*, p. 608.

<sup>186</sup> *Ibid.*, p. 609.

<sup>187</sup> James Rennell, *Memoir of a Map of Hindustan or the Mughal Empire*, W. Bulmer & Co., London, 1792, p. 349.

<sup>188</sup> For details see Ujjayan Bhattacharya, ‘From Surveys to Management: The Early Colonial State’s Intervention in Water Resources of Bengal,’ *Indian Historical Review*, Vol. 44, No. 2, 2017, pp. 225-251.

<sup>189</sup> Henry Leland Harrison, *The Bengal Embankment Manual*, Bengal Secretariat Press, Calcutta, 1875, p. 75 (v).

<sup>190</sup> The Manual had also re-defined certain terms such as – ‘estate and zemindar’, ‘tenure and proprietor’ especially for this case. “The word ‘zemindar’ means any holder or holders of an estate, which term includes lands on the lakhiraj register and lands acquired under the waste land rules. Thus lakhirajdars, who have hitherto escaped, will have to bear their fair share in the works by which their properties benefit. Proprietors, that is, owners of *tenures*, are by Section 45 made to contribute their fair share of the cost; but it will be observed that the definition of ‘tenure’ limits it to interests held *permanently* at a fixed rental, or held lakhiraj. Thus a liability to have his rent enhanced protects a person possessing any interest in land from being assessed, an obviously just provision. Owners of lakhiraj plots of land will, under all circumstances, have to contribute if benefited. Section 46 giving the Collector the fullest powers to assess them. On the other hand, unless the definition of tenures will include public property—such as canals, roads, railroads,—such property will not be liable to contribute.” *Ibid.*, p. 22.

<sup>191</sup> *Ibid.*, p. 10.

<sup>192</sup> *Proceedings of the Council of the Lieut.-Governor of Bengal for the Purpose of Making Laws and Regulations*, Vol. XIV – 1882, Bengal Secretariat Press, 1883, p. 2.

<sup>193</sup> *Ibid.*, p. 6.

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<sup>194</sup> For details see Ritika Prasad, *Tracks of Change: Railways and Everyday Life in Colonial India*, Cambridge University Press, New Delhi, 2015, pp. 99-101.

<sup>195</sup> Tirthankar Roy, *Natural Disasters and Indian History*, Oxford University Press, New Delhi, 2014 (first edition 2012), p. 76.

<sup>196</sup> *Proceedings of the Council of the Lieut.-Governor of Bengal for the Purpose of Making Laws and Regulations, Vol. XIV – 1882*, p. 4.

<sup>197</sup> *The Bengal Embankment Manual*, p. 24.

<sup>198</sup> *Ibid.*

<sup>199</sup> *Ibid.*, pp. 24-25.

<sup>200</sup> Radhakamal Mukerjee, *The Changing Face of Bengal*, Calcutta University Press, Calcutta, 1938, p. 70.

<sup>201</sup> ‘Northern Bengal Railway Survey’, *Proceedings of the Hon’ble the Lieutenant-Governor of Bengal during November 1872* (General Department), WBSA.

<sup>202</sup> From Colonel C. H. Dickens, R.A., Secretary to the Government of India, Public Works Department, to the Officiating Secretary to the Government of Bengal, General Department (Industry and Science). – (No. 1534S. – R., dated Simla, the 24th October 1872.), progs no. 42, *Proceedings of the Hon’ble the Lieutenant-Governor of Bengal during November 1872* (General Department), WBSA.

<sup>203</sup> F. W. Strong, *op. cit.*, p. 64.

<sup>204</sup> J. A. Vas, *Eastern Bengal and Assam District Gazetteers: Rangpur*, p. 70.

<sup>205</sup> L. S. S. O’Malley, *Bengal District Gazetteers: Murshidabad*, pp. 116-117.

<sup>206</sup> The first railway line in eastern Bengal was built on the floodplain of the Ganga, which, along with its numerous branches and tributaries, poured its waters into the Bay of Bengal. At the primary stage there seemed to be no outlets for the passing of water through the embankment on which this line was constructed. The necessity of constructing outlets through the embankment had been repeatedly exerted only when there was the occurrence of floods. About 2000 lineal feet of ‘opening’ were added between 1868 and 1885. After the floods of 1890, a further 400 feet were added. For details see Iftekhar Iqbal, *The Bengal Delta: Ecology, State and Social Change, 1840-1943*, Palgrave Macmillan, U. K., 2010, p. 130.

<sup>207</sup> *Ibid.* The main line of the Eastern Bengal Railway was the line between Calcutta and present day Siliguri which spread across the Rajshahi plains, the natural slope of which was towards the east. *Ibid.*, p. 131.

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<sup>208</sup> W. N. Nelson, *Final Report on the Survey and Settlement Operations in the District of Rajshahi*, p. 8.

<sup>209</sup> Iftekhar Iqbal, *op. cit.*, p. 131.

<sup>210</sup> It was estimated that the amount of stone used in ‘pitching’ these guide banks of sand and clay would fill a broad gauge train extending from Kolkata to Darjeeling, a distance of around 300 miles. On the left bank the approach was about 4 miles long and for 2000 feet of that length the approach had the unusual height of 50 feet above the surrounding area. On the right bank the approach was three miles long with the same characteristics. For more details see *Ibid.*, pp. 134-137.

<sup>211</sup> *Ibid.*, p. 136.

<sup>212</sup> For details see Amitabha Bhattacharyya, *Meghnad Saha’s Paradoxical Story: Railways and the 1922 North Bengal Floods*, CSSP Electronic Working Paper Series, Paper No. 6, Jawaharlal Nehru University, Sept., 2015, pp. 1-10.

<sup>213</sup> P. C. Mahalanobis, *op. cit.*, p. 6.

<sup>214</sup> *The Bengal Embankment Manual*, p. 19.

<sup>215</sup> *Ibid.*, p. 29.

<sup>216</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, p. 30.

<sup>217</sup> *Final Report on the Survey and Settlement Operations in the Jalpaiguri District, 1906-1916*, Bengal Secretariat Book Depot, Calcutta, 1919, p. 18.

<sup>218</sup> There was hardly any river which was not included in the river training programme. Tista, Chel, Diana, Rethi, Pagli and Sukti, Pana, Kaljani, and Rydak – all were ‘placed’ under the river training programme to fulfill the colonial interests.

<sup>219</sup> *Final Report on the Survey and Settlement Operations in the Jalpaiguri District, 1906-1916*, p. 19.

<sup>220</sup> W. W. Hunter, *A Statistical Account of Bengal, vol. X: Districts of Darjiling, and Jalpaiguri and State of Kuch Behar*, p. 394.

<sup>221</sup> *Ibid.*, p. 395.

<sup>222</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 31.

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<sup>223</sup> M. O. Carter, *Final Report on the Survey and Settlement Operations in the District of Malda, 1928-1935*, Bengal Government Press, Alipore, 1938, p. 34.

<sup>224</sup> *Ibid.*, p. 35.

<sup>225</sup> *Ibid.*

<sup>226</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 31.

<sup>227</sup> When the northern embankment was opened and the southern one closed, the water from the river Tangan was allowed to flow out in such a way that it could not be escaped to the south so that the middle-lying tract remained well covered with water. On the other hand, comparatively less water had been required in early transplantation period when the southern embankment was opened and the surplus water was sent back into the Tangan. As the soil became was getting dry the northern embankment was again opened up, and this process continued at regular intervals until the crop was harvested.

<sup>228</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Districts of Murshedabad and Pabna*, p. 130.

<sup>229</sup> Rai Bijay Bihari Mukharji Bahadur, *Final Report on the Survey and Settlement Operations in the District of Murshedabad, 1924-1932*, Bengal Government Press, Alipore, 1938, p. 71.

<sup>230</sup> This was a Government embankment and by Act VI of 1873 was vested in Government and placed under the charge of the Collector and an Engineer. W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Districts of Murshedabad and Pabna*, pp. 133-134.

<sup>231</sup> *Final Report on the Survey and Settlement Operations in the District of Murshedabad, 1924-1932*, p. 74.

<sup>232</sup> Praveen Singh, Flood Control for North Bihar: An Environmental History from the 'Ground-Level' (1850-1954), in Deepak Kumar, Vinita Damodaran, and Rohan D'Souza (eds.), *The British Empire and the Natural World: Environmental Encounters in South Asia*, Oxford University Press, New Delhi, 2011, p. 164. Praveen Singh argues, 'colonial zamindars pushed vigorously for constructing private embankments to safeguard their lands and crops from possible damage from inundations.'

<sup>233</sup> Tirthankar Roy, *op. cit.*, p. 75.

<sup>234</sup> S. C. Majumdar, *Rivers of the Bengal Delta*, Calcutta University Press, Calcutta, 1942, p. 16.

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<sup>235</sup> S. C. Majumdar, *River Problems in Bengal*, (a paper read at the Symposium on January 9, 1938 and published on December 15, 1938), Vol. IV, No. 4, Calcutta, 1938, p. 448.

<sup>236</sup> For details see Sheila Zurbrigg, Did Starvation Protect from Malaria? Distinguishing between Severity and Lethality of Infectious Disease in Colonial India, *Social Science History*, Vol. 21, No. 1 (Spring, 1997), pp. 27-58.

<sup>237</sup> Sheldon Watts, 'British Development Policies and Malaria in India 1897–c.1929', *Past and Present* - 165, 1999, 141–81 and Ira Klein, 'Death in India: 1871–1921', *Journal of Asian Studies*, 32, 1973, 639–59.

<sup>238</sup> C. A. Bentley, *Malaria and Agriculture in Bengal: How to Reduce Malaria in Bengal by Irrigation*, Bengal Secretariat Book Depot, Calcutta, 1925, p. 6. The remarkable lessened occurrence of malaria in Eastern Bengal was due to the better health provided by the expansion and good culture of land use and agriculture which was prevailed in this part of country.

<sup>239</sup> C. A. Bentley, *op. cit.*, p. 26.

<sup>240</sup> *Ibid.*, p. 30.

<sup>241</sup> *Ibid.*, p. 37.

<sup>242</sup> *Ibid.*, p. xxiv.

<sup>243</sup> *Ibid.*, p. xxv.

<sup>244</sup> Arabinda Samanta, Crop, Climate and Malaria: Ecological Construction of an Epidemic in Colonial Bengal, *Economic and Political Weekly*, Vol. 36, No. 52, (Dec. 29, 2001 – January 4, 2002), p. 4887.

<sup>245</sup> For details see D. N. Ray, *Cholera and its Preventive and Curative Treatment*, A. L. Chatterton Publishing Company, New York, 1884.

<sup>246</sup> R. Pullitzer, Cholera, Monograph WHO, 1959 cited in Mercedes Pascual, Menno J. Bouma, and Andrew P. Dobson, Cholera and Climate: Revisiting the Quantitative Evidence, *Microbes and Infection* (4), 2002, p. 237.

<sup>247</sup> James L. Bryden, M. D., *Note on the Epidemic Connection of the Cholera of Madras and Bombay with the Cholera Epidemics of the Bengal Presidency*, Office of the Superintendent of the Government Printing, Calcutta, 1871, Proceedings of the Sanitary Commissioner with the Government of India, December 1871, p. 1.

<sup>248</sup> *Ibid.*, p. 2.

<sup>249</sup> *Ibid.*, p. 4.

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<sup>250</sup> H.W. Bellew, *The History of Cholera in India from 1862–81*, 1884, cited in Mercedes Pascual et al, op. cit., p. 237.

<sup>251</sup> Cited in Mercedes Pascual et al, op. cit., p. 238.

<sup>252</sup> David Arnold, Cholera and Colonialism in British India, *Past and Present*, No. 113, Nov., 1986, pp. 125-126.

<sup>253</sup> Leonard Rogers, The Forecasting and Control of Cholera Epidemics in India, *Journal of the Royal Society of Arts*, Vol. 75, No. 3874 (February 18th, 1927), pp. 323-324.

<sup>254</sup> *Ibid.*, pp. 324-325.

<sup>255</sup> Charles J. Jackson, *Report of the Sanitary Commissioner for Bengal, for the year 1871*, Central Press Company Ltd., Calcutta, 1873, p. 13.

<sup>256</sup> *Sixth Annual Report of the Darjeeling Circle of Vaccination, for the year 1871-72*, WBSA.

<sup>257</sup> F. W. Strong, *Eastern Bengal and Assam District Gazetteers: Dinajpur*, p. 47.

<sup>258</sup> At Porsa the ground water level was 33 feet down, and the spleen rate was only 28.3, the lowest met with, while the fever death rate of 29.05 per thousand was also the lowest of all the thanas. On the contrary, the highest ground water level coincided with the highest spleen and fever rates. Similarly Dinajpur, Birgunj and Thakurgaon thanas showed high ground water levels and spleen and fever rates, whereas Balurghat and Churaman had lower rates approaching those of Porsa. *Ibid.*, pp. 47-48.

<sup>259</sup> For details see Leonard Rogers, *Special Report on the Prevalence of Fevers in the Dinajpur District*, 1904, pp. 23-33.

<sup>260</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. X: Districts of Darjiling, and Jalpaiguri and State of Kuch Behar*, p. 321.

<sup>261</sup> John. F. Gruning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, p. 46. Jalpaiguri town, representing the western region was moderately malarious but across the Tista in the Duars the percentage of contagion had rapidly increased and reached its maximum point at Nagrakata.

<sup>262</sup> The types of malaria found in the district were – simple tertian, malignant tertian, quartan fever and the deadly black-water fever. Mixed infections and double infections of the same parasite often made it difficult to recognize the variety from the temperature chart. The cycle of simple tertian fever was 48 hours and the fever occurs every third day. The malignant tertian had a cycle of from 24 to 48 hours and the fever occurs every other day or more commonly daily. The quartan parasite had a cycle of 72 hours and the fever paroxysm appeared every fourth day.

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<sup>263</sup> Surgeon R. Lidderdale, M. D, *Sixth Annual Report of the Darjeeling Circle of Vaccination, for the year 1871-72*, Appendix No being No.1 of Medical Proceedings for October 1872, WBSA.

<sup>264</sup> *Ibid.*

<sup>265</sup> Cited in the *Final Report on the Survey and Settlement Operations in the Jalpaiguri District, 1906-1916*, p. 16.

<sup>266</sup> Dr. Bentley's investigation was, however, also directed towards the exploration and addition of knowledge in the preparation of the ongoing Gazetteer for the district during the opening years of the twentieth century. Though since the early days of British occupation, the *Terai* region was known to be a place of acute malarial activity, but it was not until the visit of the Royal Society's Malaria Commission in 1901 that anything really definite was known as to the actual incidence of malarial disease in this part of the country. The investigations conducted in this occasion by Drs. Stephens and Christophers and Captain S. P. James, I. M. S., showed that the malarial endemicity of the Duars was extraordinarily high and that black water fever was a common disease as it was in the Central Africa. John. F. Gruning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, p. 47.

<sup>267</sup> *Ibid.*, pp. 49-50.

<sup>268</sup> *Ibid.*, p. 52.

<sup>269</sup> *Final Report on the Survey and Settlement Operations in the Jalpaiguri District, 1906-1916*, pp. 16 – 17.

<sup>270</sup> Regarding the colonial concern for malarial prevalence in the Terai and Duars regions of north Bengal, Bhattacharya has argued that "The site of research assumed significance as a primary factor both in the identification of the causation of disease, as well as in the economic concerns of colonialism. Yet, this focus on specific localities in terms of research and economic activities did not extend to sustained implementation of anti-malarial policies at those very sites." Nandini Bhattacharya, The Logic of Location: Malaria Research in Colonial India, Darjeeling and Duars, 1900–30, *Medical History*, 55, 2011, p. 184.

<sup>271</sup> S. K. Niogi and Bhupendra Mohan Khan, Winter Malaria Infection in the Bengal Dooars, in *Records of the Malaria Survey of India, Vol. VII*, The Indian Research Fund Association, 1937, p. 218.

<sup>272</sup> John. F. Gruning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, p. 55.

<sup>273</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, p. 122.

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<sup>274</sup> Charles J. Jackson, *Report of the Sanitary Commissioner for Bengal, for the year 1871*, p. 17.

<sup>275</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 67.

<sup>276</sup> *Ibid.*, p. 68.

<sup>277</sup> W. N. Nelson, *Final Report on the Survey and Settlement Operations in the District of Rajshahi*, pp. 20-21.

<sup>278</sup> *Ibid.*, p. 21.

<sup>279</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Districts of Murshedabad and Pabna*, p. 133.

<sup>280</sup> J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, p. 52.

<sup>281</sup> Section- I On the State of the Public Health in British India, *Annual Report of the Public Health Commissioner with the Government of India for 1924*, p. 33.

<sup>282</sup> G. E. Lambourn, *op. cit.*, p. 27.

<sup>283</sup> Asim Kumar Sarkar, *Social, Economic and Political Transition of a Bengal District: Malda, 1876-1953*; Unpublished Ph. D thesis, University of North Bengal, 2010, p. 30.

<sup>284</sup> Hunter was of the opinion that the banks of the Mahadnanda and the large part of the land stretched between Mahananda and the Ganges with their favourable soil and climate were perhaps 'less obnoxious to disease than the average of Bengal' and for this reason there was no disease 'of a strictly endemic type' prevailed in the district of Malda. But the subsequent information provided by Hunter, however, contradicted his own argument of being 'less unhealthy' of the district because the district had fallen under severe attack of several diseases time to time. W. W. Hunter, *A Statistical Account of Bengal, Vol. VII: Districts of Malda, Rangpur and Dinajpur*, p. 145 and 146.

<sup>285</sup> For details see Digamber Mitter, *The Epidemic Fever in Bengal*. Reprinted from the *Hindoo Patriot*, 1876, *Preface*.

<sup>286</sup> G. E. Lambourn, *op. cit.*, p. 41.

<sup>287</sup> *Ibid.*, p. 40.

<sup>288</sup> During September, the disease prevailed in a mild form all over the district, but increased in virulence as the inundation subsided. The disease was severe in Gorgoriba *thana* in the north-west and Kliachuck in the south. Charles J. Jackson, *Report of the Sanitary Commissioner for Bengal, for the year 1871*, p.17.

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<sup>289</sup> *Sixth Annual Report of the Darjeeling Circle of Vaccination, for the year 1871-72*, WBSA.

<sup>290</sup> *Ibid.*, p. 42.

<sup>291</sup> C. A. Bentley, *Malaria and Agriculture in Bengal*, p. 50.

<sup>292</sup> *Ibid.*, p. 36.

<sup>293</sup> J. A. Vas, *Eastern Bengal and Assam District Gazetteers: Rangpur*, p. 49. For the district of Rangpur, average mortality was highest in 1909, when the rainfall was most abundant. During the first decade of the twentieth century drainage system had been improving as a result of government initiative which successfully checked the mortality rate and provided a better condition for the Rangpur town than the other parts of the district. Despite of these, malarial mortality did continue in some parts of the district very frequently and appeared sometime with an unprecedented severity.

<sup>294</sup> Arthur Coulton Hartley, *Final Report of the Rangpur Survey and Settlement Operations, 1931-1938*, Bengal Government Press, Alipore, 1940, p. 8.

<sup>295</sup> The fever death-rate in the decade from 1893 to 1902 stood at 28.6 per mile, in the quinquennium from 1900 to 1904 it was 29 per mile, and in the succeeding quinquennium it rose further to 30.6 per mile. J. A. Vas, *Eastern Bengal and Assam District Gazetteers: Rangpur*, p. 51.

<sup>296</sup> *Sixth Annual Report of the Darjeeling Circle of Vaccination, for the year 1871-72*, WBSA.

<sup>297</sup> *Forty-eighth Annual Report of the Sanitary Commissioner for Bengal 1915*, WBSA, pp. 8-9.

<sup>298</sup> The death rate was constantly changing. 1911-20 – 31.59; 1921-30 – 27.00; 1931- 25.23; 1932 – 20.72; 1933 – 28.05; 1934 – 27.11; 1935 – 27.55. *Final Report of the Rangpur Survey and Settlement Operations, 1931-1938*, p. 7.

<sup>299</sup> *Final Report of the Rangpur Survey and Settlement Operations, 1931-1938*, p. 8.

<sup>300</sup> This condition was noticeable in the districts of Burdwan, Hoogly, Nadia, Jessore, Murshidabad, and in a few parts of the Dacca and Rajshahi Divisions. C. A. Bentley, op. cit., p. xxxix.

<sup>301</sup> Cited in *Ibid.*, Appendix. V, p. xlvii.

<sup>302</sup> David B. Smith, *Annual Report of the Sanitary Commissioner for Bengal for the year 1870-71*, Bengal Secretariat Press, Calcutta, 1872, p. 1.

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<sup>303</sup> “Special Cholera Report” in *The Annual Administration Report of the Cooch Behar State for the year 1887-88*, Cooch Behar State Press, Cooch Behar, 1889, p. 26.

<sup>304</sup> *Ibid.*

<sup>305</sup> *The Annual Administration Report of the Cooch Behar State for the year 1887-88*, p. 26.

<sup>306</sup> Annual Administration Report of the Department of General Administration and Criminal Justice of the Cooch Behar State for the year 1906-1907 in *The Annual Administration Report of the Cooch Behar State for the year 1906-07*, p. 24.

<sup>307</sup> The people of the State also suffered heavily from severe attacks of Influenza in 1918-19 which caused deaths of 637 persons throughout the State out of a total number of 1320 attacks. Report of the Vice-President, State Council in *The Annual Administration Report of the Cooch Behar State for the year 1918-1919*, p. 13.

<sup>308</sup> *The Annual Administration Report of the Cooch Behar State for the year 1934-35*, Cooch Behar State Press, Cooch Behar, 1935, p. 92-93.

<sup>309</sup> *Ibid.*

<sup>310</sup> Cited in Christopher V. Hill, *Water and Power: Riparian Legislation and Agrarian Control in Colonial Bengal*, *Environmental History Review*, Vol. 14, No. 4 (Winter, 1990), p. 16.

<sup>311</sup> *Report on the Administration of Bengal, 1922-23*, Bengal Secretariat Book Depot, Calcutta, p. 95.

<sup>312</sup> Government of Bengal, *Report of the Land Revenue Commission, Bengal, Vol. VI*, Bengal Government Press, Alipore, 1940, cited in Christopher V. Hill, *Water and Power...*, p. 16.

<sup>313</sup> *Report of the Irrigation Department Committee 1930*, Government of Bengal: Irrigation Department, Bengal Secretariat Book Depot, Calcutta, 1930, p. 6.

<sup>314</sup> *Ibid.*, p. 9.

<sup>315</sup> ‘The Work of the Irrigation Depart’, *Report of the Irrigation Department Committee 1930*, p. 8.

<sup>316</sup> William Wilcocks, *Lectures on the Ancient System of Irrigation in Bengal and its Application to Modern Problems*, University of Calcutta, Calcutta, 1930, pp. 29-30.

<sup>317</sup> Christopher V. Hill, *Water and Power...*, p. 2.

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<sup>318</sup> Kuntala Lahiri-Dutt, Imagining Rivers, *Economic and Political Weekly*, Vol. 35, No. 27 (Jul. 1-7, 2000), p. 2395.

<sup>319</sup> Rohan D'Souza, Water in British India: The Making of a Colonial Hydrology, *History Compass* 4/4 (2006), p. 624, 10.1111/j.1478-0542.2006.00336.x.

<sup>320</sup> For the present day problem of floods Misra has talked about the control of floods in the local level and in doing so 'people's science and technology' will be the chief instruments. This is equally applicable for the colonial India where none of these measures were practically understood neither these kind of initiatives had been taken by the colonizers who 'understood the people's wisdom but only after destroying it.' Dinesh Kumar Mishra, 'Living with Floods: People's Perspective', *Economic and Political Weekly*, Vol. 36, No. 29 (Jul. 21-27, 2001), p. 2756 and 2757.

<sup>321</sup> The Himalayan mountains are not only intensely liable to the severe cyclones and hailstorms but many of the devastating earthquakes had been taken place since its creation. The mountains had already witnessed great floods brought by its river due to the melting of snow or excessive rainfall in the hills. Thus deforestation or afforestation, as argued, does not alter the situation in any comprehensive manner. For details see B. D. Dhawan, 'Coping with Floods in Himalayan Rivers,' *Economic and Political Weekly*, Vol. 28, No. 18 (May 1, 1993), pp. 850.

## CHAPTER V

### **Drought, Scarcities and Famines: Ecology, Subsistence and Economy in Northern Bengal (1866-1909)**

Famine signifies a situation caused by acute shortage in subsistence and even starvation that ultimately lead to mortality or crisis in human existence. The ecological dislocations, produced by the nature or human factors which are intensified by famine and subsistence crisis, have been very crucial in respect of identifying and analyzing the severity of famine.<sup>1</sup> Ecology is the systematic relationship between human and natural situations. When this methodical (or regular) connection breaks it creates crisis and aberrations in the socio-economic pattern. As the world ecology has been profoundly changed by western capitalism, first through trade and later by colonialism, in view of this alteration the ecological transformations in India during the colonial period deserve special interest in regard to the intimate connection that recent research has made between British imperialism and environmental degradation.<sup>2</sup> But this could not be attributed exclusively to the natural causes while artificial or human elements had played a decisive role in the outcome of famine or making ecological crises so intense.

Famine was a periodic event in British Indian history and since 1860s it grew in frequency and dimension. Famine-literature on colonial India is fairly rich by having diverse interpretations, varied from colonial officials to the nationalists and modern scholars; however, few have dealt with the vital questions of regional peculiarities and problems. Among the official versions of the colonial Government, the work of G. W. Forrest (1897) highlights the Government policy and relief measures during the famines of 1866, 1873-74, and 1896-97 in Bengal. Though Forrest has supported government's policy of non-interference in private grain trade during famines but at the same time he criticized government's attitude of such general principles irrespective of local circumstances, as it was evident during the Orissa famine of 1866.<sup>3</sup> Another representation from British official circle of C. W. McMinn (1902) shows a clear outlook of political bias. In his opinion, this work (his book) is "not a monogram on famines" but an effort to "expose" the so-called famine

falsehoods “employed by several Bengali writers and Congress orators to blacken the character of English officials and administration.”<sup>4</sup> On the other hand nationalist economic thinkers like, Romesh Chandra Dutt and Dadabhai Naoroji underscored the over assessment or revenue pressure on Indian peasants and drain of wealth from India to England as the chief causes of famines. Nationalist argument of increased food shortages due to growing food export and peasants’ inclination towards non-food crop for its high export-value has been countered by the colonial administration by clarifying that food exports increased in times of low prices and fell in times of high prices which eventually stabilized food prices and helped the peasants to get the actual returns.<sup>5</sup>

Among the modern scholars, Michelle Burge McAlpin (1979) while explaining the famines in western India between 1870 and 1920, stresses the role of climatological factor in causing crop failures. This analysis, based on rainfall statics and climate influence, underlines the natural or ecological issues, rather than the institutional or policy background of famines.<sup>6</sup> But David Arnold (1988) has assigned climatic conditions as an “instrumental” and not ‘a causative role’ in stimulating crises of production or subsistence by eschewing the theory of ‘climatic determinism’.<sup>7</sup> On the other hand it is also an important aspect that the agricultural dependence on natural supply of water sometime aggravated the risk of crop failure and that single cropping heightened the failure tendency of the monsoon crop. Moreover, El Nino – type disturbances of the tropical oceanic atmospheric occurrence could make rainfall more erratic.<sup>8</sup>

The Malthusian theory of disparity between production (and resources) and population (or demand) in the region illustrates the interrelation between the total output, current supply and per capita consumption (or availability) of food grains as the central point of famine. But an essential rather more valuable argument has been put forward by Amartya Sen in his entitlement thesis where entitlement relations in a private ownership market economy involve ‘*trade-based entitlement*’, ‘*productions based entitlement*’, ‘*own labour entitlement*’, and ‘*inheritance transfer entitlement*’.<sup>9</sup> Sen in his theory of the Failure of Exchange Entitlements (FEE) questions the above approach of Food Availability Decline (FAD). He is of the opinion that “[I]n a market economy, a person....can do [the] exchange either through trading, or through production, or through a combination of the two. The set of all the alternative bundles of commodities that he can acquire in exchange for what he owns may be called the ‘exchange entitlement’ of what he owns.”<sup>10</sup> Sen, thus, argues that most famines are

caused largely by an unexpected blow in the prevailing pattern of exchange relations rather than by a decline in food supply.

While commenting on the Famine of 1770 Vinita Damodaran has remarked that ‘the 1768–1770 droughts and famines were a profound blow not only to the system of revenue but also to the whole rationale of empire’, as ‘they provided an impetus for the evolution of a famine policy.’<sup>11</sup> Famine in colonial India had unleashed a continuous disagreement between the dominator and the dominated, when the later had to frequently adapt with their subsistence level and further survival. Sugata Bose has argued that ‘the structures and trends of demography, commercialization, production and appropriation were fashioned by the contest between the forces of domination and resistance.’<sup>12</sup> The ever-increasing lust of revenues in form of several taxes imposed upon the peasantry heightened tensions among peasant society of Bengal as well as India. R. C. Dutt was of the opinion that: ‘The uncertainty of the State demand hangs like the sword of Damocles over the heads of Indian agriculturists, deadens their energy, and withdraws all motives for improvement.’<sup>13</sup> Exchange of money, credit relations and cash-based economy appeared to be most powerful elements in the realm of market economy under the colonial rule. Famine had, time to time, provided a major blow to the continuation of these elements which collapsed or shattered either by the human exploitation or ecological disruptions, or sometime by the combination of both of these. Governmental concern for famine relief was, however, motivated by a single agenda – to normalize the source of revenue as fast as possible from the ruins of the economic disaster caused by the natural abnormalities. But governmental response in terms of famine relief was not identical throughout the colonial rule, in fact, it varied so widely that any single explanation could hardly reveal the mechanism and dynamics of colonial justification of ‘charitable’ or ‘gratuitous’ relief. Along with Governmental relief operations, there were also numerous instances of active private charities which contributed to the lessening of the intensity and duration of famines in colonial India. Georgina Brewis argues that the unwillingness of the administration to acknowledge full accountability for saving lives, and the apprehensions regarding the increase of impoverishment, provided the background for the appearance of a parallel system of charitable relief which included indigenous traditions of relief with British models of organizing philanthropy.<sup>14</sup> The chief aspects of voluntary famine relief in the 1890s ‘was careful selection of recipients, the principle that labour should be exacted in exchange for relief, and strict discipline and routine in poor-houses or kitchens.’<sup>15</sup>

Over a last few decades famine studies have been appeared as a distinctive genre of study which deserve to be treated as a separate ‘discipline’ with an interdisciplinary viewpoint. Among these there are many recent studies which delve into the regional famine conditions in several parts of colonial Bengal which became vulnerable to the ecological and environmental changes that acted as the catalyst of the famines.<sup>16</sup> But there is hardly any effort to explore the different aspects of famine in northern Bengal where one may come across the prevalence of diverse complexities and elements which were not only distinctive for the region, but also provide the scopes for the development of new arguments and interpretations for the famine studies. The present chapter does not intend to focus on any particular viewpoint but to analyze the important aspects of famine-affected areas of colonial northern Bengal during the period from 1866 to 1909 which has hitherto been overlooked by the modern scholars. This chapter intends to find the magnitude of unpredicted ecological disturbances which could be hazardous for the normal continuation of the economy or society of a particular region. Moreover, it attempts to demonstrate the impact of short-run ecological dislocations caused by shortage of rainfall or drought on productions, food prices and subsistence. In 1770 Bengal had witnessed the first major famine under the colonial administration which caused death to thousands of people and great distress. Bengal- Orissa famine of 1866 mostly ravaged the areas of Orissa though affected some parts of northern Bengal. “The Bengal-Bihar famine of 1873-74” as C. E. Buckland puts it “began while Sir G. Campbell was Lieutenant-Governor and came to an end after Sir R. Temple had succeeded him”<sup>17</sup> and in this famine northern districts of Bengal had to suffer exclusively in comparison with the other districts of Bengal.

The previous chapter has dealt with the excessive or heavy rainfall and its effect in economy and society in colonial northern Bengal. But on contrary, the present chapter intends to draw the impact of drought or shortage of rainfall in the economy, ecology and society of northern Bengal. The present chapter has been divided into three major parts viz. the first part explores the hitherto uncharted history of 1873-74 Bengal-Bihar famine in northern Bengal; the second part seeks to unearth the specific and distinctive aspects of the famine of 1896-97 along with a comparison of other parts of Bengal; and the third part deals with the scarcity of 1908-09 which was limited to some particular areas of northern Bengal. However, the main objective of the chapter is to critically examine the ecological and environmental changes took place in northern Bengal in terms of variations in rainfall, short and long lasting drought and their impact on the human-nature relations in form of agricultural production and

subsistence, which in turn had influenced the complex social-ecology of survival and livelihood, depended on State's and private charity and relief. Famines had brought into all these elements together in a single fold which was characterized by a consistent tension existed between market, politics and society.

## I

### **The Bengal-Bihar Famine of 1873-74 in Northern Bengal**

Before going into the discussion about Bengal-Bihar famine of 1873–74 it is necessary to look into the famine-affected areas of northern Bengal during the famine of 1866 because during these eight years i.e. between 1866 and 1874 northern districts of Bengal had to go through a major crisis in regard to the production and prices of agricultural crops. An agricultural economy, like Bengal, which relied almost exclusively on the natural supply of waters or the monsoons for irrigating its fields, was naturally sensitive to the periodic cycles of droughts or floods. These ecological or environmental phenomena had an inevitable impact on the production and prices of the food grains. There are four chief harvests in the Bengali agricultural year – a). the *Aus* rice, sown in April- May (in the Bengali month of *Baisakh*), reaped in August or September (*Bhadro*); b). the *Aman* rice or the winter rice (the great harvest of the year), sown in lowlands in April, May, and June or on highlands in June or July (*Assar*) ; reaped in November and December (*Aghrahan*); c). the *Boro* rice, an intermediate crop producing the coarsest quality of rice, sown in March-April (*Chaitra*), and harvested in either *Assar* (i.e. June-July) or *Srawan* (i.e. July-August); and d). the *Rabi*, or spring crops, consisting of peas, pulses, oilseeds, and miscellaneous green crops, sown in October, reaped in February.

Along with Bihar, the districts of Rajshahi Division (comprised of seven districts) of colonial Bengal were affected during the Bengal-Bihar famine of 1873-74. The chapter also draws a brief continuation since the Bengal-Orissa famine of 1866. The 1866 famine was created by several seasons of erratic rainfall and the situation was further deteriorated by the continuous unwillingness of the local administration to import food. W. W. Hunter has summarized the famine condition of Rajshahi Division in the following manner<sup>18</sup> -

Table: 5.1

## Famine condition of Rajshahi Division in 1866

| Total Population | Agricultural Population | Labourers and Poorer Craftsmen | Highest Price of Rice per maund in 1866 | Famine Prices Rice per maund; District Average. | Famine Warnings. Rice per maund in January; District Average. |
|------------------|-------------------------|--------------------------------|-----------------------------------------|-------------------------------------------------|---------------------------------------------------------------|
| 8, 893, 738      | 5, 384, 868             | 1, 761, 654                    | Av. Rs. 4-10                            | Av. Rs. 4 - 4                                   | Av. Rs. 2-10                                                  |

Source: W. W. Hunter, *Famine Aspects of Bengal Districts*, p.10. Collected from the Tabulated Famine Warnings.

Malda, Dinajpur and Rangpur did not have to suffer much (in comparison with the severity of famine prevailed in the districts of Orissa) from this famine though there was a sharp rise in the prices of food grain, specially rice. In the district of Malda, there was a serious failure of the *aman* crop which coupled with great rise in prices in January and February and this accelerated the situation towards a famine. The District mainly depended on the *aman* or winter rice crop and even the *aus* or autumn crop could not make up for the total loss of the former. According to the report of the Collector of Malda district “....during the famine of 1866 the price of rice rose to 10 seers a rupee, or 4 rupees a maund ; and that of paddy to 18 seers a rupee, or Rs. 2-4 per maund.”<sup>19</sup> The overall agricultural scenario of the district of Malda in 1866 was as follows –

Table: 5. 2  
Crop condition in the district of Malda, 1866

| Total Cultivated Land (in acre) | Crops Cultivated Land (in acre)                          | Outturn of Rice (Rs./ <i>bigha</i> )     | Outturn of Pulses and other Crops (Rs./ <i>bigha</i> ) | Collective Outturn of Rice and winter Crops (Rs./ <i>bigha</i> ) |
|---------------------------------|----------------------------------------------------------|------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------|
| 426, 583                        | Rice-250,000<br>Wheat-25,000<br>Other Food Grains-10,000 | Normal Land- 15-18; Inferior Land- 10-15 | Rs.7- Rs. 10                                           | Rs. 20 – Rs.25                                                   |

Source: W. W. Hunter, *Famine Aspects of Bengal Districts*, pp. 119-20.

But Hunter's account had to face difficulties in displaying the actual total number of agricultural and labour population since the Census Report of 1872 failed to provide any authentic data about the Muslims "who live[d] by agriculture, and of the aboriginal and semi-aboriginal castes living by cultivation" and on the other hand the Census remained silent about the agricultural and labouring women of this district during the time of famine. The aboriginal and semi-aboriginal tribes of Malda were mainly cultivators but on the approach of famine they gave up their fields in search for hired labour, and were thus thrown on the labouring population.<sup>20</sup> Since River communication in the District is abundant at all seasons of the year, the Collector of the district suggested to build a 'good metalled' road to "connect English Bazar and other towns with the Ferry that crosses the Ganges opposite Rajmahal ; and further, that a similar road should be run to meet the new line of rail to Darjiling."<sup>21</sup> In Dinajpur (extended from Champaran district on the west to Rangpur on the east) though the *aman* or winter rice did not fall short but still the price of best cleaned rice was Rs. 4-7 per maund and for common rice, it was Rs. 4-1-6 per maund and in 1871 it had returned to its ordinary rates prevailed before the famine.<sup>22</sup> The increase in agricultural land caused by the large scale reclamation by the Santhals, as was the case in Malda, was affected in Dinajpur due to the non-availability of the necessary credit.<sup>23</sup> But the scarcity in this district was confined to a comparatively small area and it was not suggested to adopt any special measures for the relief of the distress.<sup>24</sup> In Rangpur (bounded on the north by the District of Jalpaiguri and Cooch Behar, on the east by the Brahmaputra river and the Districts of Maimansingh, on the south by Bogra ,and on the east by the Districts of Dinajpur) the unusual prices during 1866 caused considerable inconvenience in the District, but the scarcity fortunately never rose to a famine. At the beginning of November, just before the winter harvest, the price of rice had risen to the maximum; the cost of ordinary rice was eight seers per rupee, while the price of very cheapest rice was as dear as 9.5 seers. Though these prices, however, lasted for a short time, i.e. up to the gathering in of the new crop but with such rates prevailing, the winter crops were very scanty to feed the people, and the possibility to substitute it by the spring crop was also very poor.<sup>25</sup> Anticipating the approaching of famine in the district the Collector suggested for the import of grain from the other neighbouring districts so that "[T]he State purchases might induce neighbouring Districts to pour in supplies," but at the same time was frightened by the result that "too much imported, prices would fall, and the confidence of the merchants might be shaken, and private enterprise brought to a stop."<sup>26</sup> Still there was increasing fear in the official circles that if there would be "no import at all, the scarcity might turn into famine even for the provident portion of the

community, and irretrievable disaster might ensue.”<sup>27</sup> The continuous decrease in the wages of labour and the absence of any quick transport further worsened the situation. The years from 1864 to 1866 had witnessed a general collapse of stocks that disclosed considerable and rapid decline in the average quantity of rice obtained for one rupee at the major grain markets of the rice producing districts of north Bengal.

Table: 5. 3

Variation in food-grain prices from 1864 to 1866 in northern Bengal

| Districts | September 1864 | September 1865 | September 1866 |
|-----------|----------------|----------------|----------------|
|           | <i>Seer</i>    | <i>Seer</i>    | <i>Seer</i>    |
| Malda     | 30             | 19             | 11             |
| Dinajpur  | 27             | 21             | 9¾             |
| Rangpur   | 27             | 22             | 11             |

Source: *Document 17. Famine Report: Famine in Behar and Sonthal Parganas, 1866. Papers and correspondence, including the report of the Famine Commission and the Minutes of the Lieutenant Governor of Bengal and the Governor General.*<sup>28</sup>

After the Bengal-Orissa famine of 1866 the northern districts of Bengal had fell into another severe scarcity of food crops which eventually lead to a famine in 1873-74. During the three successive years, from 1871 to 1873, the rainfall in Bengal had been irregular. Though the rainfall was fairly good in 1871, but it did not help to bring good production of crops. In 1872, inspite of insufficiency there was proportionate distribution of rainfall. But the year 1873, was “dry almost beyond precedent” and “[T]o the North of the Ganges ..... the rain was far below the average.”<sup>29</sup> The crop failure of 1873 due to drought and its subsequent impact on agriculture has been aptly put forward by George Campbell, the then Lieutenant-Governor (on 22<sup>nd</sup> October, 1873) in the following manner: “in Bihar and North Bengal the rains, late in coming, had been so heavy as to do great injury to the *bhadoi* crop, and they had stopped so prematurely that the winter rice was almost all lost, and there was great fear that the ground would be too dry to admit of the *rabi* being sown. In East and Central Bengal the crops would be poor, but not extremely so: in Orissa alone they were good.”<sup>30</sup>

But as the days of October, 1873 were passing by and no rain came, apprehension increased. When a considerable portion of October had passed without rain the Lieutenant Governor ordered a circular which was issued on the 13th October, and which directed that the crop and

price-current returns regularly submitted should be supplemented by further reports giving fuller details of the food supplies of the country. Lieutenant Governor said that:

“The reports we have from Northern and Central Bengal and the whole of Behar are as bad as they can be; from East , West and South Bengal they are bad. There is an area north of the Ganges, comprising most of the Rajshahye Division, Purnea, and North Tirhoot, in which the rain has been extraordinarily short, and in which I fear, nothing can now save us from great dearth and distress. If the next two or three weeks should pass without good rain, the consequences in these districts would be painful .....”<sup>31</sup>

Meantime the reports from the Commissioners became more alarming. The Commissioner of Patna wrote that there was no rain, nor sign of rain. The Commissioner of Rajshahi reported a panic in the district of Bogra, where rice had risen from 24½ to 12½ seers to the rupee within two days. It fell, however, to 18 seers within two or three days afterwards. The Commissioner of Rajshahi added: Now I fear rain would do little good, and there is no probability of any further fall. On the 22nd October, the Lieutenant Governor wrote to the Secretary to the Government of India in the Agricultural and Commercial Department, that:

“In parts of this (northern Bengal and north-east Bihar) usually moist tract the rainfall [had] hardly exceeded that which is usual in the driest parts of North Western Provinces. It is in this tract that the greatest failure has taken place....”<sup>32</sup>

In the districts of Dinajpur, Rangpur, Bogra, and parts of Rajshahi, Malda and Murshidabad of the Rajshahi Division the whole yield of all the food crops of 1873-74 was estimated to be less than three-eighths of the yield of an ordinary average crop, and relief works on a more or less extended scale would be required soon. The Government had sent a steamer and flats to ply on the Ganges from Kooshtea to Rajshahi, and had ordered a small light-draught steamer, with flats, to ply on the inland waters of Rajshahi. He had further directed the formation of bullock trains on certain traffic routes in Rajshahi for the carriage of railway material and of food grains to depots.<sup>33</sup> Apart from this various minor road works, have been sanctioned in different districts. In regard to the food supply of the distressed districts the Viceroy had laid down the general rule, that Government should trust to the trade and to the improved means of communication for the natural flow of food from other parts of India to make up the deficit in Behar and Northern Bengal. The Viceroy had authorised the Lieutenant Governor to arrange for supplying and storing food at centres of relief works where many labourers were likely to be gathered together, and where local supplies might be insufficient to bear any extra strain.

George Campbell, the then Lieutenant Governor of Bengal had narrated the advent of the famine in 1873 in the following manner:

The rainy season of 1873 commenced late and rather scanty, but during July and August the rain was sufficient for agricultural operations, ... after that the rains failed more suddenly and completely than had been known in the present century, and the effect on the main rice crops over great tracts was most disastrous... When September passed with scarcely any rain the situation became serious, and as October advanced without a drop of the final rainfall usually expected at that season, the reports from all sides became alarming in the highest degree. ... I had ... the extreme difficulty of making a sure forecast, especially where a statistical information was so very imperfect in Bengal. ... There were still slight hopes of an unusually late fall of rain, but nothing came; and in the first half of November the prospects became very black indeed. ... there was an excessive failure of the rice crop in Behar and parts of Bengal north of the Ganges, a short crop in a wider area; ... the prospects for the spring crops in Behar were very bad... owing to the failure of the latter rains, the ground was so dry that the seed could not possibly germinate.”<sup>34</sup>

It is to be noted here that the famine of 1873-74 had introduced a template for the famine-relief operations in Bengal. In fact, organization and execution of famine-relief works had now been accentuated directly and responsibly for the first time in Bengal as well as in India. To quote Sir Richard Temple, the then Lieutenant Governor of Bengal:

“Lord Northbrook had, in the first place, to consider the question whether the Government should undertake the responsibility for counteracting the effects of this drought, and for averting the famine which would otherwise result. He decided that it should, although such a task had never yet been accomplished in India. During the former famines of this century, so much mortality had occurred despite the efforts put forth by the State, that loss of life had come to be regarded as inevitable. Nevertheless, it was announced in the Gazette that a widespread famine was anticipated, that much was expected of the people in the way of self-help and from the trade in respect of enterprise, but that the Government would interpose to do whatever could not otherwise be done in order that none should perish who might possibly be saved.”<sup>35</sup>

Since the private enterprise was not capable enough to meet the situation, Government had decided to import large quantity of food-grains from the outside part of the country.

Over the greater part of the Bengal proper there would be, it was hoped, from half to three quarters of a full average crop, while in North Bengal and Behar (containing a population of 26 millions) the yield of the food crops was estimated to be from one-quarter to one-third of

full average years.<sup>36</sup> It was hoped that northern Bengal, which was ordinarily an exporting tract might have considerable stocks of previous years, and it was decided that from the other exporting districts (Sylhet, Backergunj, and Orissa) considerable old stocks would have to be brought to the market. In the Patna, Bhaugulpore, and Rajshahi Divisions the late rice crop, the main staple of the country, was said to be as bad as it had been anticipated by the Government and during the last week of November, 1873 there had been no rain. For a small parcel of rice (only 1300 maunds) which was loaded on the Government steamers transferred for service in the Rajshahi Division, where Government had to pay three rupees a maund, or very nearly the rate then prevailing in Calcutta.<sup>37</sup> The colonial administration was observing ‘a healthy private trade [which] was going on between Eastern Bengal and Rajshahi in small boats, from which rice was eagerly brought by the residents along the rivers.’

The erratic rainfall of 1873 in north Bengal resulted in a large scale loss of crops. In 1873, the rainfall in Malda was 27.26 inches, or half of the average (i.e. 53.88 inches).<sup>38</sup> In Malda, the monthly distribution of rainfall for the year 1873 was as below:

Table: 5. 4

Monthly Distribution of Rainfall in Malda in 1873 (in inches)

| Janu<br>ary | Febru<br>ary | Mar<br>ch | Ap<br>ril | M<br>ay  | Ju<br>ne | Jul<br>y | Aug<br>ust | Septe<br>mber | Octo<br>ber | Nove<br>mber | Decem<br>ber | Total<br>Rainf<br>all |
|-------------|--------------|-----------|-----------|----------|----------|----------|------------|---------------|-------------|--------------|--------------|-----------------------|
| 0.45        | ...          | 0.29      | 1.1<br>9  | 0.0<br>6 | 4.3<br>6 | 7.<br>08 | 7.76       | 4.91          | 0.92        | ...          | 0.24         | 27.2<br>6             |

Source: A. P. MacDonnell, *Report on the Food Grain Supply and Statistical Review of the Relief Operations in the Distressed Districts of Behar and Bengal During the famine of 1873-74*, Calcutta, 1876, p. 251. (Henceforth *Report on the Food Grain Supply*).

As a result of this erratic rainfall the outturn of *aus* or autumn rice was very poor and it returned on an average only a six-anna crop, or less than half of that of an ordinary year and the *aman* or winter lowland rice was short of half an average.<sup>39</sup> The proportion of the consumption of food grains of the people, while the prevailing ratio was seven-eighths of rice and one-eighth of all other sorts of grain, had declined drastically due to the damage of five-eighths or three-fourths of those crops in 1873.<sup>40</sup> The failure in the harvest consequently affected the markets. In January 1874 the price of rice had increased to more than double to the normal price in that month and the prices continued to rise and in April they reached to 10½ seers for the rupee. This situation was further worsened by the declining import of food

grains from Dinajpur, as this region was also affected by natural irregularities. Government had to intervene into this situation by extending relief measures to the victims. The relief statistics are mentioned below (all figures are in *tons*) –

Table: 5. 5

Relief Statistics for the district of Malda, 1866

| Total Rice Stored | For Charitable Relief | For Cash | For Wages | For Advanced Loan |
|-------------------|-----------------------|----------|-----------|-------------------|
| 3, 946            | 1, 315                | 1, 253   | 243       | 907               |

Source: G. E. Lambourn, *Bengal District Gazetteers, Malda*, Calcutta, 1918, p. 51.

Apart from the distribution of rice, government had also speeded up the relief measures through the distribution of money directly to the distress people. The costs of relief have been mentioned below (all figures are in rupees):

Table: 5. 6

Statement of Government Expenditure in the District of Malda in 1874

| Charitable Relief | Wages for Relief Work | Advance for Loan |
|-------------------|-----------------------|------------------|
| 26, 951           | 1, 06, 762            | 48, 450          |

Source: G. E. Lambourn, *Bengal District Gazetteers, Malda*, p. 51.

The outcome of these efforts was quite impressive – “[T]he number of persons charitably relieved rose from 1, 036 in the middle of April, to 6, 340 in the middle of May, and 13, 009 in the middle of July, but fell to 4, 458 in the beginning of September, and to 469 in the first week of October.”<sup>41</sup> This data clarifies the improvement in the plight of the distressed and their reducing number displays the subsequent recovery of the region within a short span of time.

Dinajpur had to suffer a lot from the shortage of rainfall. The average rainfall in the district from 1868 to 1872 was as followed:

Table: 5. 7

Average Monthly Rainfall in the District of Dinajpur from 1868 to 1872

| January  | February | March    | April    | May      | June      | July      | August    | September | October  | November | December | Total     |
|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|----------|----------|----------|-----------|
| In. 0.57 | In. 0.78 | In. 1.28 | In. 1.52 | In. 5.08 | In. 23.88 | In. 17.12 | In. 15.40 | In. 13.13 | In. 5.61 | In. .... | In. 0.05 | In. 84.48 |

Source: A. P. MacDonnell, *Report on the Food Grain Supply*, p. 223.

In 1872 though the rainfall was 5½ inches under the average, but the harvests did not fall into any trouble. In 1873 the rainfall was noticeably short from the average (84.88 inches); it was only 43½ inches, i.e. more than half of the normal. The September-October rains which were much essential for the winter rice crop were almost in a vanishing condition. The table below shows the monthly rainfall of the year 1873 in Dinajpur:

Table: 5. 8

Monthly Distribution of Rainfall in Dinajpur in 1873

| Janu<br>ary | Febru<br>ary | Mar<br>ch   | Ap<br>ril       | M<br>ay         | Jun<br>e         | Jul<br>y        | Aug<br>ust       | Septem<br>ber | Octo<br>ber | Novem<br>ber | Decem<br>ber | Tot<br>al        |
|-------------|--------------|-------------|-----------------|-----------------|------------------|-----------------|------------------|---------------|-------------|--------------|--------------|------------------|
| In.<br>0.50 | In.<br>0.28  | In.<br>0.61 | In.<br>0.6<br>6 | In.<br>0.4<br>1 | In.<br>18.<br>27 | In.<br>8.<br>24 | In.<br>12.6<br>2 | In.<br>1.62   | In.<br>...  | In.<br>....  | In.<br>0.32  | In.<br>43.<br>53 |

Source: A. P. MacDonnell, *Report on the Food Grain Supply*, p. 224.

As a result of the total deficiency in rainfall in the early months of rainy season, as the Collector, of the district, Mr. Robinson had mentioned, the early rice and other rainy season crops “were in the best parts one-fourth and generally one-eighth of an average crop, while in many parts the outturn was *nil*” and on the failure of the winter rice he further observed that “crop would certainly not yield more than three-eighths of an average crop in any part, in most parts not one-fourth of the average, and in very large tracts nothing at all.”<sup>42</sup> The outturn of the autumn crop in 1873 was 9, 308 tons and for winter rice crops it was 1, 24, 462 tons which were too insufficient to meet the total deficiency of 4, 38, 000 tons of food grain.<sup>43</sup> In January 1874 the produce of the rice harvest raised to 1, 48, 310 tons and the total supply in grain which the district drew from local sources from January to September (1874) was 1, 50, 000 tons which was about six months’ supply at ordinary rates of consumption.<sup>44</sup> In spite of this, rice export from the district was much greater than the import quantity. In 1873 the quantity of rice exported from the district was 10, 93, 520 maunds while the quantity of import was 650 maunds. And in 1874 it was imported only 1, 121 mound whereas the quantity of export of rice was 20, 059 mounds, and this had operated exclusively through the river traffic. This tendency, however, resulted in the increase of price of rice and in January it was two and a half times as dear as it usually was in that month. The district had witnessed the fluctuation of prices of common rice throughout the year of 1874. The table below shows the monthly price of common rice in 1874.

Table: 5. 9

Monthly Price of Common Rice in 1874 (all figures are in *seers* for one rupee)

| Janua<br>ry | Februa<br>ry | mar<br>ch | Apr<br>il | Ma<br>y | Jun<br>e | Jul<br>y | Augu<br>st | Septem<br>ber | Octob<br>er | Novem<br>ber | Decem<br>ber |
|-------------|--------------|-----------|-----------|---------|----------|----------|------------|---------------|-------------|--------------|--------------|
| 12.5        | 13.8         | 12.1      | 9.5       | 8.3     | 8.9      | 10.<br>4 | 12.5       | 16            | 19          | 24.9         | 28           |

Source: A. P. MacDonnell, *Report on the Food Grain Supply*, p. 226.

The government had collected information from the local officers as to the extent of the scarcity and subsequently preparations had been made to import large stocks of rice from Burma and elsewhere. As a result of the breakdown of the ordinary machinery of the grain trade relief funds were opened and in April 1874 relief works were commenced in the severely affected areas of Kaliaganj, Raiganj, Hemtabad, Pirganj, Ranisankoil and Thakurgaon *thanas* and Government depots for the sale of grain at reasonable rates were opened at Raiganj and many other important places.<sup>45</sup> The relief works had been conducted mainly through public works like, construction of new roads, the repair of the old ones and digging of tanks. The daily number of labourers employed in this relief works reached nearly 95, 000 in May 1874 and by the end of the year the money spent by the government on the relief amounted to nearly Rs. 24, 00, 000., including the value of rice paid as wages and distributed as cost-free relief.<sup>46</sup>

Table: 5. 10

Statement of Grain and Cash Expenditure by the Government in Dinajpur in 1874

|              | Charitable Relief | Wages of Labour | Advanced on Loan |
|--------------|-------------------|-----------------|------------------|
| Grain (tons) | 2, 732            | 2, 934          | 12, 533          |
| Cash (rupee) | 37, 633           | 11, 61, 492     | 23, 300          |

Source: A. P. MacDonnell, *Report on the Food Grain Supply*, p. 227.

From the outcome of the sales and advances of grain and money, MacDonnell had assumed that each 20 seers of grain relieved an individual for a month and each thirty *annas* another individual for a similar period and in aggregate the number of people relieved by these measures during these days were 14, 71, 059. The zamindars of Dinajpur had also contributed according to their own way by extending cultivated areas in the district. The famine of 1873-74 encouraged the zamindars “to bring colonies of Santhal tribes from the Santhal parganas to clear huge Barind tract covered by jungle with the result that the cultivated area of the district was increased one third by the beginning of the twentieth century.”<sup>47</sup> For the reclamation of jungles the zamindars used to provide capital as advance and they acquired the

return of this loan by enhancing the rent of this new cultivable land. In Rangpur, the case was little different. Here the reclamation process was carried out under the *jotedars*' enterprise and the result was, the zamindars could obtain only a smaller portion of the profit, made by the increased rent of the land.<sup>48</sup>

Cultivation of land or agriculture as a whole had possessed some exceptional characteristics in the district of Rangpur. The minimum increase in cultivation in Rangpur between Buchanan's time and 1872-73 could be attributed partly to the effects of recurring fever that resulted in the considerable decline in the population and partly to a "considerable deterioration" in the productive powers of the land in some parts of the district.<sup>49</sup> Gopal Chandra Dass, the Special Deputy Collector of Rangpur, had observed that the holding size of 50 per cent of the cultivators was below seven or eight *bighas* (i.e. less than three acres) of land and they were capable of using only one plough and a pair of bullocks.<sup>50</sup> The plight of the more poor peasants was too horrible to obtain their bare subsistence. Even in the pre-famine period, during the latter half of 1871 the ryots started to shift from their old land which they cultivated and frequently abandoned one and take another holding.<sup>51</sup> Due to the lack of any permanent establishment in land a large section of peasants could not secure occupancy rights which caused an atmosphere of uncertainty and inconsistency in agricultural production. On the other hand the rates of rent in Rangpur, a district of large absentee landlords had already reached to its height that could afford any further enhancement.<sup>52</sup> Indicating to the surprising difference between rental and revenue, being respectively Rs. 86, 89, 750 and 9, 74, 088, MacDonnell remarked, "In no other district of Bengal where condition has been reviewed is there such a great disproportion between the revenue and rental as in Rungpore."<sup>53</sup> All these factors together had made the whole agricultural sector so easily vulnerable to any climatic disorder.

There was not only serious deficiency in the rainfall in 1873; it was also very unseasonably distributed. In every month the rainfall was noticeably under the normal quantity. In May there was no rain, July it was only one-third of the average fall and it came to an abrupt end in the month of September when an ample rainfall was in utmost necessity for the maturity of the winter crop of the year.<sup>54</sup>

Table: 5. 11

## Monthly Distribution of Rainfall in the District of Rangpur in 1873 (in inches)

| Janu<br>ary | Febru<br>ary | Mar<br>ch | Ap<br>ril | M<br>ay  | Jun<br>e  | Jul<br>y | Aug<br>ust | Septem<br>ber | Octo<br>ber | Novem<br>ber | Decem<br>ber | Tot<br>al |
|-------------|--------------|-----------|-----------|----------|-----------|----------|------------|---------------|-------------|--------------|--------------|-----------|
| 0.05        | 0.24         | 1.10      | 6.5<br>4  | 0.9<br>7 | 12.<br>91 | 5.<br>88 | 13.2<br>3  | 4.90          | 0.16        | ...          | 0.54         | 46.<br>32 |

Source: A. P. MacDonnell, *Report on the Food Grain Supply*, p. 237.

The impact of the rainfall felt differently in the different parts of the district. The rainfall was much heavier in the east, along the line of Brahmaputra and this region produced the best harvest within the district; half of the average which was parallel to the production of eastern parts low-lying lands. There was shortage of rain also in the southern and western parts of the district but the central part suffered the worse by having a total loss to one-eighth or three-sixteenths of an average harvest.<sup>55</sup> The district was so hard hit by the shortage of rainfall that at the harvesting time in January 1874, the average produce of the whole district was of three annas or one-fifth of an average crop. The total outturn of autumn (*aus*) and winter crops (*aman*) in 1873 was 201, 318 tons with the total deficiency of 573, 000 tons of an ordinary year while in January 1874; the food-supply of Rangpur derived from all internal sources was 209, 000 tons.<sup>56</sup> But this deficiency was encountered by the end of the winter season of 1874 with its overall outturn which yielded a full average harvest.

Table: 5. 12

Prices of Common Rice and Wheat in Rangpur in 1874 (in *seers*)

|                | Jan. | Feb. | Mar. | Apr. | May  | Jun. | Jul. | Aug. | Sept. | Oct. | Nov. | Dec. |
|----------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| Common<br>Rice | 11.7 | 11.3 | 11.2 | 9    | 8.3  | 9.6  | 12.1 | 18.1 | 16.2  | 18.8 | 22.3 | 25.9 |
| Wheat          | 10   | 10.8 | 11.9 | 12.5 | 12.3 | 12.1 | 12.3 | 13   | 14.2  | 12.7 | 12.5 | 12.5 |

Source: A. P. MacDonnell, *Report on the Food Grain Supply*, p. 239.

In the beginning of 1874 the price of common rice, which was the staple article of diet of all classes, was two and one-third times the usual price in that month. The continuous import of rice from Cooch Behar, Assam and Dacca was not capable enough to minimize the price and in April the trade had collapsed due to “a general failure of the supplies in the market throughout the district....”<sup>57</sup> As a result of this, prices at the headquarters market raised to 5-

8-0 maund which was nearly four times than the usual rates at that time of the year and in the remote areas they rose to Rs. 6. The high prices of grains produced a lot of distress to the poorer people who by no means had any scope to purchase grains during this time of scarcity and the crisis reached to that extent that a man, as it was reported, had to sale his wife for Rs. 10.<sup>58</sup>

To prevent this famine situation, as Hunter remarked, the Collector of the District considered to make arrangements for “[E]their the food must be taken to the people, or the people to the food; and in that practice both courses would have to be followed” but at the same time realized that this would not have been possible without the improvement in the exiting communication system.<sup>59</sup> The construction of new and repair of old roads formed the major work initiated by the Government as a means of relief for the laboring and cultivating classes. The Northern Bengal State Railway which had been started earlier now expected to cover all areas of the district. But the greatest relief had been provided by the nature - sufficient rain during the rest of the months enormously contributed for the betterment of the condition. Government, thus, needed to provide minimum expenditure for the relief operations in comparison with the intensity of crises prevailed in the district.

Table: 5. 13

Statement of Grain and Cash Expenditure in the District of Rangpur in 1874

|              | Charitable Relief | Wages of labour | Advance on Loan |
|--------------|-------------------|-----------------|-----------------|
| Grain (tons) | 1, 517            | 922             | 1, 823          |
| Cash (rupee) | 1, 54, 975        | 4, 50, 909      | 1, 75, 934.     |

Source: A. P. MacDonnell, *Report on the Food Grain Supply*, p. 241.

This nominal help of the state was substituted by the private charity on which the common people were more dependent. Relief centers were opened by Rai Lachmipat Bahadur who was known by his “liberality and benevolence” as “specially recognized by the Government” and his private charity helped to raise the confidence of the people in the early months of 1874. Apart from Rai Lachmipat Bahadur, “landed proprietors and wealthy classes of Rangpur” came forward to help “their tenantry in their hour of need.”<sup>60</sup> In addition to this the relief provided by the Government relieved “760, 889 individuals, or 35 per cent of the population,...for the period of one month.”<sup>61</sup>

George Campbell had stated that ‘The supply of funds to meet famine on a large scale rested wholly with the Government of India, so that I could have done little without their

sanction.’<sup>62</sup> Apart from the execution of the provision of work and supply of food for the labourers, Campbell had argued for the prohibition of the export of rice from the affected areas for which ‘...Viceroy in Council was expressly empowered to take such action, and native opinion was all in favour of such a course.’<sup>63</sup> Campbell’s suggestion had triggered a debate in the official circle and the idea was negated by the British administration. In the final discourse ‘Her Majesty’s Government approved the decision of the Government to meet the emergency by the purchase and import of food rather by prohibition of export, and so it was settled.’<sup>64</sup>

The situation became worse in the May of 1874. Richard Temple stated that:

“The month of May had now set in, and the famine had thoroughly declared itself. Employment, agricultural and other, was at a standstill, and there were no wages for the poor to earn. No supplies of grain were brought out and the corn markets were all closed. The Government, before opening its stores, waited to the latest safe day, in order to afford every possible chance to the trade. Its officers were however obliged to sell their grain in vast quantities, the prices being fixed at what were regarded as famine rates. Still starvation stared the people in the face, unless the Government should give them employment and pay their wages in grain.”<sup>65</sup>

Among the districts of northern Bengal particularly Malda, Dinajpur and Rangpur where the deficiency of rainfall and price-rise were more prominent, were the worst sufferers of the famine of 1873-74. These parts were mostly dependent on the winter rice crop which had managed to overcome the scarcities of the famine period and the much desired rainfall during the winter and a favourable cold weather harvest delivered a great relief to the distressed. Southern and northern districts of Bengal showed a considerable difference in regard to the quantity of crop failures. In the former areas Government had merely to supplement the food supply of the districts through private trade or by supplying a small quantity of grain as a precautionary measure, whereas it had to undertake the responsibility to feed a large portion of population for the later and for this purpose it had to import into the three districts nearly 83 lakhs of maunds of grain.<sup>66</sup>

Large scale imports had been continuing from the upper-Bihar and other surrounding places. The Luckeeserai consignments for the South of the Monghyr District had been sent. The Rajmahal consignments laden on 500 carts were sent to the Northern Bengal Railway, and Major Lindsay, the Superintending Engineer, had reported that some of it had already reached Parbatipur, the place of storage. Lindsay had reported that engineers were deputed



Map. 5.1. Extension of Bengal-Bihar Famine, 1873-74

Source: Correspondence between Government of India and the Secretary of State in Council relative to the Famine in Bengal, Part- I, 1874. (British Library).

along the line from Durwani in the north of the Rangpur District down to the swampy lands in the Rajshahi District where work had already begun and it was resolved that since there was no great demand for employment, all the able bodied *Boona* coolies (the “navvies” of this part of India) who were working on local roads would have to be transferred to the railway works, while the local roads would be kept for the destitute of the districts.<sup>67</sup> In Northern Chumparan, parts of Rungpur, Eastern Rajshahi, and South-eastern Purnia food had already been scarce. Despite of sincere effort in order to obtain information regarding the stocks held, the administration could acquire little information from the people who were ‘suspiciousness... in regard to such inquiries.’ However, the general outcome of the opinions given by local officers was that the stocks held were ‘small, not more than equal to a three months’ supply’ and this was corroborated by the fact that the new rice was in some places already coming into consumption. As parts of relief works various new roads had been marked out, and work had been commenced both upon new roads and upon the repairs of old roads. In parts of Saran, Monghyr, Purnia, Rajshahi, and Rangpur the demand for

employment was higher than in ordinary years.<sup>68</sup> Places of storage for Government grain had been selected, and the constructions of storage houses had been commenced during middle of December, 1873. It can be noticed here that the Government had made considerable delay in constructing storage houses or distribution of government grain among the sufferers, and on the other hand, no actual relief operations had been commenced, nor had any preparatory arrangements been made, except in Malda. The prevalence of cholera at Gualundo and on the banks of the Meghna made it desirable to avoid the Calcutta and Gualundo route. On the other hand, Government grains from Madras and Burma had continued to come in and further shipments from Saigon, Burma, and Madras had been advised. But the despatches to the Rajshahi Division were not going on so rapidly from Gualundo and Koosthea; and in this circumstances Government had decided to send more Bengal rice from Calcutta by a steamer and two flats for Kaliaganj and Chilmari on the mouth of the Tista.<sup>69</sup>

Government had decided to promote emigration from the distressed tracts and in response to that a good number of emigrants had started for the Assam tea gardens via Durbhanga, Nathpur, Titalya, Julpaiguri, and Dhubri.<sup>70</sup> The Government of India has set aside the sum of five lakhs of rupees to promote a system of State emigration to British Burma.<sup>71</sup> Apart from the appointment of a superintendent of State Emigration, District Officers were provided with a power to exercise discretion in selecting persons likely to prove useful colonists.<sup>72</sup>

In Bogra, the scarcity of 1874 had produced a greater failure of the crops due to the premature cessation of the rains.<sup>73</sup> However, Government had informed the people 'two or three months before the winter crop was cut, so that the peasantry were alive to the danger that was imminent, and accordingly preserved for their own consumption whatever grain they were able to save by artificial irrigation or other means.'<sup>74</sup> About the middle of the March, Sir Richard Temple, the Famine Commissioner, visited the district and marched through some of the worst parts of it, and recorded in his minute-

"I consider, having regard to all the circumstances, that 240,000 mans ought to be provided for this district, of which 50,000 mans have been already ordered, leaving 190,000 mans remaining. Out of the 50,000 mans ordered, 20,000 mans have arrived. No time should be lost in bringing up fresh supplies, as the amount in hand is small as compared with the extent of possible distress."<sup>75</sup>

In the months of April and May the scarcity became more intense and the situation had aggravated more in the backward parts of the districts, such as the police division of Panchbibi

and the western jungle tracts of Sherpur. The condition of Bogra had been narrated by the Collector of the district on 1<sup>st</sup> June 1874 in the following manner:

“I have travelled a good deal in the interior during the fortnight and from ocular observation I am in a position to say that in no place which I visited was the condition of the country or the people such as to cause very great anxiety; although, undoubtedly, the great price of food must have inflicted hardship and some hunger on the very poor. The price of food everywhere is high, as will be seen from the following quotations, which represent almost accurately the bazaar rates down to this day, giving the number of pakka seer per rupee at which rice was selling during the last fortnight:-Bogra town, 9½ to 10 ½ seers; Dhupchanchia, 10½ seers; Panchbibbi, 9 seers, Khetlal, 10½ seers; Sherpur, 7½ seers; Sibganj, 9 to 10½ seers. Notwithstanding the great dearness, which must cause pinching to very many, I cannot say that I anywhere observed upon the persons of the people signs of hunger or of deficient sustenance. Men, women and children have an appearance of being sufficiently nourished. Everywhere the village bazaars were adequately supplied with food, although at very high rates. Wherever I have been, I have found the people, with few exceptions, in their usual state, although it is universally said that if Government had given no help there would have been great distress. Nowhere have I observed any general depression. There is certainly no difficulty in getting food for anyone who has money to buy it. The very poor must be straitened, but measures for their relief are in full operation, and they have not been slow to take advantage of them.”<sup>76</sup>

Hunter, however, had stated that ‘even in the low-lying lands the crops [were] for the most part destroyed.’<sup>77</sup> Babu Govinda Kanta Bidyabhusan, the Deputy Collector who visited the eastern part of the district had reported that ‘in *thana* Sibganj the *aus* crop did not yield an average crop in consequence of the want of the usual supply of the rain; and varied from a quarter to a half; and the general appearance of the crops ... [was] discouraging.’<sup>78</sup> From the month of December the situation began to change in many parts of the district and this change was brought by the use of irrigation, but the situation was not identical for all parts of the district.<sup>79</sup> Since the local production was not sufficient for the local people, so pulses were imported into the district and in addition to that it was reported that the failure of the crops in the east and south of the district was more prominent than to the west.<sup>80</sup> Government had to think about large scale importation of grains and maximum accommodation of labour recruitment in the tracts where crops had failed. Seven relief roads, including feeder roads were planned to distribute the reliefs as well as for the inclusion of labourers through public works.<sup>81</sup> Even till the month of March 1874, the prices rose abnormally high and the Government thought of establishing storehouses for rice. During the month of April and May

the scarcity seemed to be increasing and in June it was worst. Situation became somewhat better due to the favourable rainfall of a total of about 4 ½ inches. However it was not known that how did the Collector on the 27<sup>th</sup> July become able to report that the scarcity was substantially at an end. It was believed that 'no part of Government action during the famine was attended with better results than the manner in which the whole country was kept informed of the actual and possible extent of the failure in each district.'<sup>82</sup>

On the 28th December, 1873 there was a little rainfall on Bihar and one or two parts of the Rajshahi Division. Although the letters from the Relief Commissioner's Camp in Dinajpur had confirmed of 'rain doing good, and of more rain being expected' but on the whole the spring crop did not greatly improve the condition of purely rice tracts, like Northern Tirhut, Soopole, Dinajpur, and Bogra.<sup>83</sup> In Rangpur the prices were from 15 to 11¼ seers per rupee. At the same time, at two places on the Ganges the upward trade was registered – 'at Gualando at the junction of the Ganges and Brahmaputra, and at Sahebganj, where the hills of Western Bengal about on the river.'<sup>84</sup> This upward trade was consisted of rice and pulses which came chiefly from Murshidabad and Rajshahi. On the other hand, 85,000 maunds had been despatched from the stations of Koosthea and Goalundo on the Eastern Bengal Railway to places in the Rajshahi Division. Both in Bihar and Rajshahi the local officers seemed to be more and more disposed to trust to carts rather than boats for carriage to places off the very great rivers. In the Saran, Monghyr, Tirhut, Bhagalpur, and Dinajpur Districts considerable bodies of men were employed on relief works which demonstrated the critical conditions prevailed in those districts and the great majority of the people had belonged from the ordinary labouring classes.<sup>85</sup> Foods in exchange of works were obtaining by the people either from petty dealers who set up shops there, or at neighbouring markets. The Government had proposed that while roads and waterways would be constructed as relief works from district funds and from such additional grants as the Government would make time to time; tanks and other landed improvements should have to be undertaken by the landlords themselves from the advances, and on the other hand river embankments and water courses would be brought under the new Embankment Act (VI of 1873).<sup>86</sup>

After receiving the information from several local officers that their amount was decreased for importations cooperative associations had been formed at Murshidabad and Puthia (Rajshahi District) for importing grain and selling it at cost price. Some zamindars of the Rajshahi Division asked the Government to import rice for their estates and sell it to them at cost price but the Lieutenant Governor considered that it would be better to refer the

zamindars to dealers in the Calcutta market. The arrangements for sending grain to Malda, Rajshahi, Dinajpur, and the Northern Bengal Railway works were all part of one scheme.<sup>87</sup> Some 5,000 maunds were sent from Rajmahal by cart to Dinajpur, but as the route was tedious and costly, from Goalundo the river route by the Oorasagur, Baral, and Atrai was tried, and some 20,000 maunds had been supplied by that route. But the correspondences revealed that rivers were low and boats of the upper draught were few. Major Lindsay was of the opinion that the route from Rampur Boalia and Dhapari could be used, partly by land and partly by inland steamers. The district of Bogra had been supplied with grain purchased in Eastern Bengal, and sent up the Brahmaputra in native boats. For Rangpur grain from Eastern Bengal and Calcutta was sent to Kaliaganj and Chilmari at the mouth of the Tista, both by boat and by steamer. Part of the trade was to be carried up to the Tista in boats to the *ghats* opposite and above Rangpur, and rest of the part would be carted to the store houses in the interior from Kaliaganj.<sup>88</sup> In some parts of Bogra, complaints had been raised about the scarcity of drinking water which was, however, happened to be one of the greatest needs of rural Bengal and the chief cause of the bowel complaints of most of the population.

In Rajshahi, the year 1873 was ended with a deficient rainfall.<sup>89</sup> The deficient rainfall was resulted in an extensive failure of rice crops in the district and the *Barind* tract was the most severely affected area of the district where the outturn of *aman* rice (winter rice) was estimated only 3 *annas*, while elsewhere it was 6 to 7 *annas*.<sup>90</sup> The failure of crops had eventually led to the rise of prices of food grains to an abnormal level. In January 1874, the price of rice was twelve seers for the rupee which was more than twice in comparison with the normal rates. During the month of May and June there was sudden rise of the prices and in July it was reported that ‘several persons so emaciated that they could scarcely walk and a large number of children [was] in a very reduced condition.’<sup>91</sup> This could be evident from the increasing number of people who received gratuitous relief. The number of people who received gratuitous relief in the middle of April was 1500 whereas at the end of July it increased to 59, 000. But from the August the situation had changed and by the end of August the number was reduced to 40,000 and by the end of September it was 8000.<sup>92</sup> W.H. D’Oyly, the Collector of Rajshahi had provided the following account of Government grain expended for the purpose of Charitable Relief in the district from July to November 1874.

Table. 5.14

Expenditure of Government grain from July to November, 1874 in Rajshahi District

|                                                                                                    | Mds.   | Rs.      |
|----------------------------------------------------------------------------------------------------|--------|----------|
| Government grain actually expended in Charitable relief Up to the end of July 1874                 | 36,812 | 1,06,714 |
| Estimated expenditure of Government grain in charitable relief From 1st August up to November 1874 | 34,590 | 98,828   |
| Total                                                                                              | 71,402 | 2,05,542 |

Source: From W.H. D'Oyly, EsQ., the Collector of Rajshahi, to the Commissioner of Rajshahi Division. –( No. 281C, dated Boalia, the 17<sup>th</sup> October 1874), WBSA.

In the district of Pabna, the rice production had been half of the average and the pulses were five-sixth of an ordinary year.<sup>93</sup> During the month of May 1874, peasants of few parts of Sirajganj subdivision had suffered from want of food. In order to determine the causes of shortage of rice production it can be said as a result of extension of jute cultivation, a great portion of rice land were converted to jute-land which had not only affected the rice production but also produced a condition when people got deprived of local supply and exposed to the export of rice from the outside area.<sup>94</sup> Government had organized relief operations through the local authorities in form of charitable relief, and also provided cooked and uncooked food to the people who were unable to work. The recipients of charitable relief mostly were the 'widows with families, sick labourers, old men without children.'<sup>95</sup>

The difficulties in the way of rapid transport were much greater in the Rajshahi Division. Boat transport in shallow inland waters was very slow during the winter season and as a result the local officers had begun to open cart routes on a large scale, and to organise a large number of carts and bullocks. The failure of the water routes had convinced the Lieutenant Governor of the great need of the Northern Bengal Railway. Still the Government had taken some special measures to improve facilities for transporting grains. The Government river-steamer, Koladyne, had been sent to help the Tista at Koosthea. Since the Tista was proved too weak for the duty required of her, and native boats took from 12 to 15 days to go up-stream from Koosthea to Godagare; so it was expected that with help of the Koladyne the work of crossing grain from Koosthea to the river-side depots in the Rajshahi District would proceed more rapidly.<sup>96</sup> The tracts in which distress was most imminent were the eastern part of Purnia, the northern part of Malda, and all the north-western half of Dinajpur. The

Rajshahi Division was not, however, dependent on water carriage only, into the north and centre of Dinajpur grain was being carried by six routs, namely – (a.) by the East Indian Railway to Caragola, then by the Darjeeling road to Dengra Ghat and by cart across into Dinajpur; (b.) by the East Indian Railway to Rajmahal, and then by cart from the right bank of the Ganges to Malda and Dinajpur; (c.) by steamer from Koosthea to Godagari, and then by boat up the Mahanadi to Raiganj; (d.) to Godagari as before, and then by cart up to the old Darjeeling road to Dinajpur; (e.) from Koosthea by steamer to Rampur-Boalia, then by cart to the upper Atrai and by small boats up the river; (f.) from Koosthea to Dhapari, and then by cart to the Atrai above Natore and onward both by cart and by boat; (g.) by the Oorasagur, Baral, and Atrai rivers to Nowgong, and then by cart or by very small boats to the north of the district.<sup>97</sup>

In Dinajpur, a district where intense famine conditions had prevailed 14,000 labourers were employed besides the labourers on the Northern Bengal Railway. The practical result of the comparisons instituted by Colonel Nicolls was that in North Bihar, wages were low and labourers were bring their women and children to the roads; while in the Rajshahi Division wages were high, and it was quite contrary to usage for labourers to bring their women and children to work.<sup>98</sup> Although Major Lindsay reported that the river Atrai would be navigable during February and March of 1874 but the Commissioner, Mr. Molony, was of the opinion that this river route was to be extremely tedious and uncertain and a boat could only make one trip into the Upper Atrai in the season.<sup>99</sup> Military officers for relief works were sent by the Government of India, Major Ker, of the Quarter-Master General's Department, and Captain Grant was sent to the Rajshahi Division. As the distress parts of Rangpur, Bogra, Malda, and Rajshahi were near to the Brahmaputra and the Ganges, so these areas could be supplied with certainty; but Dinajpur was the most depressed district of all – it had required from 600,000 to 10,00,000 maunds (37, 000 tons) and the latest reports showed that only from 35,000 to 40,000 maunds a week were moving forward.<sup>100</sup>

The supply of food grain was still insufficient in all the large marts, except in north Bihar, and at occasional places in the interior of the Rajshahi Division. The Magistrate of Rangpur reported the condition of the people to be worse, and that a police officer employed on inspection reported severe distress leading to the sale of wives and children.<sup>101</sup> The Commissioner's report showed that he had constituted six relief sub-divisions in Dinajpur district. In Malda district only one relief subdivision besides the district head-quarters had been opened. But in the worst tract of the district seven relief centres were in operation,

where from 140 to 200 people were relieved daily. The Magistrate of Rangpur had reported about the following relief centres and persons relieved in this centres – Pyraband (400), Mithapukur (231), Pirganj (76), Govindganj (34), Gaibanda (39), Sundarganj (150), Kalligunj outpost (16), Naldanga (120), Luckhipur (80) where total 1146 persons were relieved.<sup>102</sup> The Commissioner of Cooch Behar had reported that in the protected state of Cooch Behar and in the young Raja's zamindaries, situated in the Rangpur District, there was much scarcity due to the reason that rents could not be collected by tenure holders, and that distress was prevailing among the old and infirm. In these circumstances the Commissioner had imported and stored grain from the revenues of Cooch Behar, had opened relief works, and arranged for indoor works for the women and infirm.<sup>103</sup>

In Malda, Rajshahi, and Bogra, and especially in Rangpur, private trade in grain was rapid but rice from eastern Bengal was being carried largely into the districts on the Brahmaputra. The Magistrate of Rangpur wrote:

“The rice which is brought for sale is nearly all imported; very little of it is home produce. The southern part of the district is mainly supplied by boats from Dacca and Sirajganj, the west from ... Dinajpur and Bogra, and the north and east from Cooch Behar and Jalpaiguri.”<sup>104</sup>

The Government, however, possessed no statistics of the private importations, which reached the distress districts by many rivers and channels. From Rangpur it was further reported that ‘in some parts there .... and at the relief houses there were a considerable number of people suffering from disease and starvation combined.’<sup>105</sup> In this circumstances, the Government of India had agreed to help Dinajpur and other districts by ordering selected native officers of the army to the famine districts for work as Assistant Superintendent of Relief Circles and in addition to that Richard Temple put the grain requirements of Dinajpur at 12 00,000 maunds, ‘a quantity somewhat in excess of the estimate framed by the local officers and the Bengal Government.’<sup>106</sup>

Table. 5. 15

## Selling price of rice in the districts of Rajshahi Division

| District | Number of seers of common rice sold for a rupee |                          |                           |                           |
|----------|-------------------------------------------------|--------------------------|---------------------------|---------------------------|
|          | On 31 <sup>st</sup> Jan                         | On 28 <sup>th</sup> Feb. | On 14 <sup>th</sup> March | On 28 <sup>th</sup> March |
| Dinajpur | 13¼                                             | 14                       | 12¾                       | 10¾                       |
| Malda    | 11¾                                             | 12                       | 12                        | 9½                        |
| Rangpur  | 11¼                                             | 11¼                      | 11⅛                       | 11½                       |

Source: Fourteenth Special Narrative of the Drought from the 20th March to the 2nd April 1874.

It is evident from the above table that in course of the time though the rate of common rice in Dinajpur and Malda gradually became low, but the high prices were still stagnant in the district of Rangpur. The numbers of work-people on the Northern Bengal Railway were increasing, about the 15th March there were 9, 000 labourers on the railway bank, besides about 3,000 on the feeder roads and the earth-works completed was equal to a bank 24 miles long and 4 feet high; which showed the increasing intensity of the famine.<sup>107</sup> On a sharp contrast to this, the Lieutenant Governor's reports based on his tour of several north Bengal districts during this time were very 'favourable and creditable' to the Commissioners and Additional Commissioners who made it possible for Richard 'to express himself as thoroughly satisfied with the conduct of the Rajshahi officers and with the forwardness of their preparations.'<sup>108</sup> In Rajshahi silk crop faced a great loss and the accounts from Rangpur were also less favourable. Near Sadullapur and Govindganj of Rangpur the village inspection has disclosed "greater distress than was anticipated." The district report informed that:

"In the tract lying west of the Kurotya the state of the villages is wretched beyond description; the people have sold everything they possessed, and are now solely dependent on Govt. Many have sold their plough cattle, the last thing which a Bengalee ryot parts.... a man had sold the roof over his head. Many ryots have deserted the place altogether and gone Bogra and elsewhere..... the people seem to be most grateful for the relief works.....Everyone is to be found on the road; the women are now coming readily, bringing their children with them. All are most anxious to get Govt rice. The want of water is felt nearly as keenly as the want of food..... A few cases of cholera, with one death, have occurred among the coolies."<sup>109</sup>

The number of people who received charitable relief of all kinds according to the latest returns from the districts was as follows:

Table. 5. 16

Number of people received charitable relief in Rajshahi Division from the 3rd to the 16th April, 1874

| District | No. of people |
|----------|---------------|
| Dinajpur | 4,464         |
| Malda    | 931           |
| Rajshahi | 185           |
| Bogra    | 583           |
| Rungpur  | 6,827         |

Source: Fifteenth Special Narrative of the Drought from the 3rd to the 16th April, 1874.

Exports from the affected districts had been proved disastrous for the administration because it was resulted in the intensifying of famine condition in the affected tracts. There were many instances which proved the unplanned exports as harmful for the affected areas. Although some supplies had been reached to the riverside districts as Malda, Rajshahi, Pabna, Bogra, and parts of Rangpur; but no relief worth estimate had come to Dinajpur, which has the broadest area of distress in all North-Eastern Bengal. In this situation, the Dinajpur marts had already supplied all their own neighbourhood, and export largely to Rajshahi and Pabna and the east tract of Dinajpur, although had good crops, exported rice to the neighbouring tract of Rangpur, which was in distress, to such an extent that it became itself distressed in its turn.<sup>110</sup> In the Cooch Behar Division (including the Jalpaiguri District, the Cooch Behar State, and part of Bhutan Duars) though there was but slight failure of crop (chiefly in a locality to the south of Jalpaiguri itself), but grain was exported rapidly to parts of Purnia and Dinajpur. Then in the Jalpaiguri district there arose panic in the grain markets regarding the amount of depletion of stocks and the quantity of grains stored by the dealers in their stocks.<sup>111</sup> The Rangpur and Bogra districts had obtained much of their food supply for many weeks from Mymensing across the Brahmaputra. The original allotments of rice for the five districts of Dinajpur, Rangpur, Bogra, and Malda, were stated as below:

Table. 5.17

Amount of allotment of rice in the Rajshahi Division between 12<sup>th</sup> to 25<sup>th</sup> June, 1874

| District      | Qnt. Of rice (Mds.)          |
|---------------|------------------------------|
| Dinajpur      | 12,00,000                    |
| Rangpur       | 3,00,000                     |
| Bogra         | 2,40,000                     |
| Malda         | 1,50,000                     |
| Rajshahi      | 1,00,000                     |
| Railway works | 1,00,000                     |
| Total         | 20,90,000<br>(=76,849 tons.) |

Source: Twentieth Special Narrative of the Drought from the 12<sup>th</sup> to the 25<sup>th</sup> June 1874.

In Rajshahi and parts of Pabna, difficulties arose chiefly from a deficient supply of food grains, owing to the falling off in importations, and sanction had been given for the sale of Government rice in those places where the deficiency was serious. Due to the smallness of the executive machinery in Bengal the Government had endeavoured to set up 'large special machinery' to deal with the famine. The *Report of the Indian Famine Commission 1878-80* had summarized the famine condition and subsequent relief works in the following manner:

“The monsoon of 1873 was not abnormal during the 3 months, June, July and August, but in northern Bengal it ceased prematurely in September ; and much of the winter rice crop, which ripens in November, was consequently lost. The Bengal Government, from inquiries instituted for the purpose, was led to believe that the inevitable effect of this loss would be to involve the inhabitants of a large part of the province in a severe famine; it accordingly set about making preparations with the utmost energy to carry out relief measures on a scale and with a thoroughness which had never been equalled before. The principles adopted by the Government were very different from those accepted on any former similar occasion. It was considered that the operations of private trade could not be relied on, and therefore that it would be necessary to accept the responsibility of providing the distressed districts with the whole quantity of food likely to be required. After elaborate estimates had been framed, it was decided, with the approval of the Government of India and the Secretary of State, to import 480,000 tons of rice; and the greater part of this stock was purchased for

the Government in Burma, sent up-country by railway, and distributed to depots scattered over the famine area by the agency of Government officers. The estimates provided against every possible contingency, the failure of contractors, murrain among the cattle, the recurrence of drought in the ensuing monsoon. Relief was administered mainly in the form of employment on works and of gratuitous assistance to the infirm; but under rules which in their details were very different from those previously followed. Tests were not to be stringently enforced in localities where the distress was excessive and widespread. In place of the self-acting tests which on previous occasions had been held to be useful and to some extent necessary, reliance was placed on personal knowledge, on the part of the relieving officer, of the applicant's condition and want. A large special establishment of inspecting officers was appointed, and the country subdivided among them, in the hope that, with the help of the resident *zamindars* and leading *raiya*s, they might obtain such personal knowledge of the condition of every village and its inhabitants.”<sup>112</sup>

It had been further stated that about 340,000 tons of grain were disposed of in the relief operations, ‘a quantity sufficient to provide sustenance for not less than 3,000,000 people for 7 months.’<sup>113</sup> Rice had been imported from Burma to Calcutta ‘with entire efficiency and punctuality’ by the vessels of the British India Steam Navigation Company. Apart from this, where private trade was exhausted and failed to supply the people shops were established at a later period for the sale of Government grain.<sup>114</sup> However, this time the Government ‘had a treasury full beyond all precedent and a large quantity of available cash’<sup>115</sup> which denoted the successful and organized collection of land revenue during the previous years of the famine. Government had to face great difficulties for the transport of supplying rice in the remotest corners of the affected districts especially during the supplies of large quantity of grains, but the problem had been solved by the indigo planters who were under a contract with the Government.<sup>116</sup> This practise had generated much criticism against the Government which promoted the exercise of the feudal authorities of the planters in such a critical time.

The great bulk of the relief operations in that district of Jalpaiguri had been carried on spontaneously at the cost of the Cooch Behar State under the guidance of Sir W. J. Herschel, Bart., the Commissioner of the Cooch Behar Division by a combination of Government officials with the zamindari agency of the distressed tract of Boda. The district was not expected to be badly distressed, and was not therefore classified as a distressed district. The relief had been organized and an improvised system of accounts and superintendence was in full operation when a panic occurred which threatened to reduce the rest of the district to famine. About 41,000 maunds of Government rice were poured rapidly into the district

outside of the Cooch Behar estates and another a sum of about Rs. 25,000 had been spent from Government funds almost entirely on carriage.<sup>117</sup> The entire cost of the famine in the Jalpaiguri district and in the Chuklajat estates (as the zamindaris belonging to Cooch Behar State) were about 4½ lakhs, of which 3 lakhs had been spent by Cooch Behar and 1 lakh represented the value of 41,000 maunds was supplied by Government, and Rs. 25,000 was the cash outlay of Government.<sup>118</sup> Despite of these circumstances it was believed that since the district of Jalpaiguri was ‘bounded on the north throughout its entire length by the lofty range of the Himalayas, it [was] very probable that either the local rainfall, or the supply of water brought down by the rivers and streams would be affected by even the severest drought...’,<sup>119</sup>

However, for Dinajpur which was the worst sufferer of the famine in Bengal, the Officiating Secretary of the Scarcity and Relief Department informed about the ‘collection of advances direct from the ryots by a Government establishment, without the aid or intervention of the zamindars’ as contemplated by the Relief Commissioner of the District of Dinajpur.<sup>120</sup> The Lieutenant-Governor had sanctioned temporarily for six months the agreements as proposed by the Commissioner for beginning the collection of the advances at the end of which i.e. at the end of April, the position should be reconsidered that whether such ‘large establishment’ would be retained or not ‘through the rainy season.’<sup>121</sup> The Relief Commissioner of the District was entrusted with the ‘discretion as to how far [he would] direct the employment of zemindars on the work of realizing advances’ was instructed to ‘make proposals for realization of advances in other districts.’<sup>122</sup> The *haimanti* late rice crop yielded a full crop in many parts of the district and the surplus stock of the Government had almost been disposed of. However, no cash advances had been made in this district to the traders for purchase of grain.<sup>123</sup>

In Malda the amount of grain advanced was only a little over 25,000 maunds. The Collector of the District proposed to employ Baboo Ishan Chunder Sen as a Special Deputy Collector on a consolidated allowance of Rs. 200 a month, with two pyadas on Rs. 5 each a month, for the collection of the advances. Apart from him, Inspectors, Mohurir were also appointed to assist him and expedite the collection.<sup>124</sup> Being the Manager of Chunchal estate Mr. Raily was expected to realise all advances made to his own ryots along with the other ryots to whom he also made advances in that relief circle. In the month of December the reaping of the great winter rice crop was conducted and it was reported that rice was ‘very plentiful in the district.’<sup>125</sup> There were few cases of cholera reported in Kaliachak, Shibganj, and Gazole

*thanas* of the Malda district.<sup>126</sup> In Bogra the advances amounted to 73,000 maunds, and a Sub-Deputy Collector, Mohurir, Inspectors were appointed since a larger establishment would be necessary.<sup>127</sup> Regarding the collection of advances W. LeF. Robinson, the Relief Commissioner of the Rajshahi Division had anticipated that a very large proportion could be realised in full after the harvesting of the winter rice crop, which was the main staple in all four districts.<sup>128</sup> This idea, however, gained the sanction of the Lieutenant Governor of Bengal who shared the same view 'that a second instalment may be collected in April 1875 in those parts of the country which yield a cold-weather crop.'<sup>129</sup>

Table. 5. 18

Relief-woks in the Rajshahi Division till November 1874

| Famine Districts | No. of relief centres | Amount of grain actually stored | Amount of grain in transit | Daily avg. no. of persons employed on relief works |                   |       | Rate of wages expressed in money and grain                                                        | No. of persons receiving gratuitous relief | Amount of grain consumed |
|------------------|-----------------------|---------------------------------|----------------------------|----------------------------------------------------|-------------------|-------|---------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|
|                  |                       |                                 |                            | By P.W.D                                           | By Circle Offices | Total |                                                                                                   |                                            |                          |
| Murshidabad      | 10                    | 4,281                           | .....                      | 1,008                                              | 1,138             | 2,146 | 2½ annas worth of grain per 100 cubic feet.<br><br>½ seer rice, 1 chittack dal, with salt and oil | 3,630                                      | 3,393                    |
| Rajshahi         | 9                     | 4,175                           | .....                      | 376                                                | 269               | 645   |                                                                                                   | 261                                        | 2,905                    |
| Pabna            | 2                     | 1,195                           | .....                      | .....                                              | .....             | ..... |                                                                                                   | 1,458                                      | 1,014                    |
| Total            | 21                    | 9,651                           | .....                      | 1,384                                              | 1,407             | 2,791 |                                                                                                   | 5,349                                      | 7,321                    |

Source: From the Officiating Secretary to the Government of Bengal, Scarcity and Relief Department, to the Deputy Secretary to the Govt. of India, Department of Revenue, Agriculture and Commerce. – (No. 6643 – S. R. , dated Calcutta, the 14th Nov. 1874), progs. no. 132, *Proceedings of the Lieutenant Governor of Bengal, Scarcity and Relief Department*, January, 1875, WBSA.

With regard to the execution of relief-works, Sir G. Campbell's, the then Lieutenant Governor of Bengal (1873), view was that-" to render effectual aid to the people, it is of all things most necessary that work should be offered in good time, so that the existence of public works may be known to the people at large, and those who stand in need of work may find their way to the work and be suitably provided for, before the greatest stress comes."<sup>130</sup> Water routes were used for the movement of grain wherever it was possible, but the dryness of the season hindered navigation. Steam ferries were established to cross the grain over to the north of the Ganges, and steamers were bought or built in the country, and overall 41 steamers ordered from England; and about 7,000 country boats and canoes were employed on the ferries and the water routes.<sup>131</sup> Another important step to overcome the shortage of production was the import of food grains from the better yielded areas. But as imports collapsed in the April of 1874, Government's estimates of import were affected due to the nature and extent of the shortage in the districts concerned. In 1873-74 the crop failure was so intense in nature in comparison with the 1865-66 periods that private trade was almost incapable to meet the deficiency. Furthermore, it contradicted the Government's perception that high prices would obviously entice supplies from surplus to deficient zones. In 1866 private trade in the famine areas was stuck at several points by the physical difficulties of transport and communication; and in addition to this the underlying problem of exchange failure and the persistence of existing trade pattern made it almost impossible to cut through the prevailing lines of inflow and outflow or to repair a system of imports in the face of a crisis for normally surplus district.<sup>132</sup> On the other hand inspite of having normal quantity of production; exports from the affected districts, sometime, increased to such a magnitude that the balance was reversed and famine rates continued in the district.<sup>133</sup> The Government measure of public works did not serve the purpose of their own because the peasants or artisans were not trained to do such work and ultimately this could not help to bring out any permanent solution of the improvement of communication system. But at one extent it had been admitted by the Government that ".....methods of relief administration were devised during the Behar[-Bengal] famine, upon which subsequent experience has only improved."<sup>134</sup> Finally it was believed that:

"It was also a subject of great satisfaction and congratulation that the event proved that the people were by no means pauperised and demoralised by the liberal relief given. When the rainy season of 1874 commenced in due course, very large numbers of the people receiving relief voluntarily went off to their own fields; before long they had almost wholly disappeared. The new crop was

cultivated, and- the famine ' came to an end. The advances made to the cultivators were eventually recovered with wonderful punctuality...”<sup>135</sup>

Sir Richard Temple was of the opinion that: ‘Thus the famine of 1874 was over ; the deaths from starvation were so few compared to the many millions concerned, that practically there had been no loss of life.’<sup>136</sup> He further stated that: ‘this disaster affected 20 millions of people in a greater or less degree.’<sup>137</sup> But regarding the mortality in the famine periods (1873-74) Romesh Dutt was of the opinion that “...there was no loss of life from this famine.”<sup>138</sup> It had been observed in the ‘*Census of Bengal, 1881*’ that “[t]he Bengal famine of 1873 was fortunately not attended with any great loss of life, so that persons have been found to deny the occurrence of any famine at all in the strict sense of the word.”<sup>139</sup> The fact of the absence of ‘*any great loss of life*’ was corroborated by several other official documents of colonial administration, though these documents identified the year 1873-74 as the famine year, however, it was not known to acknowledge that whether in any ‘*strict*’ sense or not. The deficient rainfall of 1873-74 was substituted in 1875-76 with the increase in average rainfall and this caused an outstanding harvest of autumn crops. The production of winter crops was also great in the districts of northern Bengal with the exceptions of Dinajpur and Rangpur where the rainfall in 1875 was respectively half of the average and thirty per cent short of the average.<sup>140</sup>

Table: 5. 19

Rainfall in 1875 in the Districts of Malda, Rangpur and Dinajpur (in inches)

| Districts | Rainfall in 1875 | Average Rainfall |
|-----------|------------------|------------------|
| Malda     | 54.40            | 53.33            |
| Rangpur   | 60.45            | 83.93            |
| Dinajpur  | 43.60            | 78.92            |

Source: *Document 12. Annual Report 1875-76: Weather, crops, and Prices of Bengal.*<sup>141</sup>

Shortage of rainfall, once again, contributed to the rise of prices in Dinajpur and Rangpur. In 1875, the price of rice gradually rose from April to July and though reduced for the time being after the harvesting of the *aus* or *bhadoi* crop, it was increasing gradually from October to December and fell again in January and February; and this reduction was caused by the major production of the autumn or *haimanti* crop.<sup>142</sup> But this crisis was too intense to call for a Government intervention. An agrarian crisis caused by a shortage of production eventually turned into a famine due to the failure in exchange relations. With the introduction of railways and the successive diffusion of market economy into the agricultural field in the latter half of the nineteenth century, the effect of crop failure was less intense, but more

widespread in nature. A famine or acute dearth now came more frequently in the form of a noticeable rise in prices which generally caused suffering over a wider area as in 1873-74 in Bengal rather than a severe hunger, starvation and mortality confined merely to the famine area.

The south-west monsoon rains of 1884 were ill-distributed and insufficient in greater part of the province of Bengal. A prolonged break occurred during August in North Bengal, Behar and Chota Nagpur. This was in a measure made good by favourable rain in September and October over most of the province, but the crops were generally below the average, and a more or less pronounced failure of the winter rice crop was reported in November to have occurred in the Sadar and Nawada subdivisions of Gaya, the Behar sub-division of Patna, the Sadar sub-division of Darbhanga; in parts of Nuddea and Murshidabad; and in parts of the Burdwan, Birbhum and Bogra districts.<sup>143</sup> The prolonged cessation of the rains in August alarmed the local Government, and inquiries were instituted in all divisions as to the state of the crops and the condition of the people, but with the copious rainfall of September and October these anxieties were greatly allayed, and it was considered that distress would at the most be now confined to strictly limited areas in the above mentioned districts and would nowhere be very severe. Accordingly in November, further and more minute enquiries were directed to be instituted in those areas in order to determine the villages likely to be actually affected, the classes of people in each village likely to need relief, the best means of affording it and the probable cost.<sup>144</sup> Special attention was also directed to be paid to stimulating private charity and enlisting the co-operation of local residents of influence and public spirit in meeting such distress as might be expected to occur. The total State expenditure on relief in the province amounted to 3½ lakhs of which Rs. 2,41,900 were for loans and advances, and the rest chiefly for gratuitous relief. Relief works were, as stated, provided by the district boards.<sup>145</sup>

The district of Dinajpur had again fallen into a scarcity in 1891-92.<sup>146</sup> The rains were very deficient in the months of September and October 1891 in parts of Bengal, especially in Behar and districts lying north of the Ganges. The *bhadoi* or early rain crop was generally a full average, and the districts where this crop was largely sown enjoyed, mainly on this account, comparative immunity from distress in spite of the failure of the succeeding winter and spring crops. The general good harvests of 1890 were another helping fact. The winter rice crop of 1891 in the affected parts of Behar was nowhere above 50 per cent of an average crop and in the most affected parts it was considerably less.<sup>147</sup> On the high lands the crop in many parts of Darbhanga and Muzaffarpur totally failed. In the cold weather no rain fell till February,

and the *rabi* crop was exceedingly bad in all districts.<sup>148</sup> The total area affected in Dainajpur was 1,030 acres where 447,000 numbers of people were influenced by this scarcity. It was believed that since the districts were well stocked and trade was active, therefore, no anxiety was at any time felt as to food supplies. Prices of the chief staple grains were high, rice being at 11 and 12 seers and wheat at 12 and 13 seers the rupee throughout the scarcity; but the commoner grains of the early rain crop were procurable at 16 to 20 seers, and this had a great effect in limiting distress.<sup>149</sup> For the district of Dinajpur, Rs. 27,000 was spent on charitable relief from the District Funds, which was, according some other estimates, Rs. 23, 076; for establishments and other charges Rs. 3,582; and for loans and advances Rs. 5838.<sup>150</sup> The distinctive features of the relief works of 1891-92 was the substitution of piece-work or rather payment by results for task work for all able-bodied labourers, and these proved to be the immense majority of the relief workers who were classified into three categories – (a.) persons who were paid by piece-work, (b.) persons who were paid by task-work, (c.) persons paid by daily wage.<sup>151</sup> After the prices became moderate and even over the whole distressed area then it was thought to fix a uniform wage in all districts in Behar and North Bengal to avoid the danger of emigration from the neighbourhood of home to a district where a labour could receive a higher wage.

## II

### 1896-97 Famine in Northern Bengal

The overall meteorological condition in India which instigated the advent of famine in 1896, as mentioned in the ‘Narratives’ of the famine was as follows:

“The cause of the famine of 1897 was the early cessation of the autumn rains of 1896. The south-west monsoon was late in establishing itself in June 1896 on the West Coast, and from its first appearance was ill-distributed and fitful in character. Throughout July the rainfall was more or less deficient in Bengal and Central and Northern India, and gave rise to apprehensions. In August the monsoon appeared to have recovered strength, and frequent cyclonic storms gave heavy rain to the Central Provinces, Central India, and Rajputana. Elsewhere in Upper India the rainfall was in defect. Early in September the hopes of an improving monsoon were disappointed.”<sup>152</sup>

The famine of 1896-97 in Bengal had caused by the failure of the monsoon rain and subsequent remarkable rise of food-grain prices. The failure of the September rice of 1896

had made the *aman* prospects doubtful which contributed to the abnormal price-rise in the market. Throughout the year of 1896 prices had been much upwards and it rose suddenly since the mid-October and persisted for a long time.<sup>153</sup> Although the harvesting season of 1895 was on the whole favourable to *bhadoi* crops but it was good for the production of winter rice and the rainfall of 1896 was very nearly as short as it was in 1873 and had been un-proportionately distributed.<sup>154</sup> The *bhadoi* crops had to suffer from short rainfall in all parts of the province except in Orissa, and the average outturn of the whole province was estimated at 10½ annas. The harm caused to the winter rice crop by deficient rainfall during the sowing and transplanting season had been affected by the overall cessation of the rains at the most crucial period when no rain fell after the 19<sup>th</sup> September.<sup>155</sup> The acute scarcity of grains had produced grain-riots in many areas of Bihar, and even though the government had provided a subsidy grant of 8 annas per maund on the import of rice in the affected areas but the hindrances in transporting the grains through roads and shortage of carts had greatly caused inconvenience in trading food-grains.<sup>156</sup> However, many regional or local factors which were closely associated with broad ecological changes had brought out the peasant-society in an acutely vulnerable position. Lance Brennan and other argue that behind the famine of 1896–1897 in Nadia District in Bengal lay a series of ecological disasters, from the drying up of some of the Ganges tributaries to the debility of the population caused by epidemics of malaria (linked to stagnant water from atrophying rivers and railway embankments).<sup>157</sup> On the other hand, Bihar and Lower Bengal was the worst sufferer of the failure of the winter rice which coupled with excessively low wages ‘remained practically unaltered for the past 20 years or more’ had been altered in a zone of acute scarcity and starvation.<sup>158</sup> Although it was widely accepted in the contemporary official and semi-official documents that the districts of northern Bengal were ‘slightly affected’ by the famine, but detail investigations and objective analysis of the fact had provided sufficient evidences to place these areas at par with the other areas which were critically affected by the famine of 1896-97.

Famine operations in the province of Bengal was commenced in the Patna division, where test• works were opened in October and were followed by relief works in November 1896. The only clear direction of the provincial Code on the point of relief administration was that each affected district should be divided into relief circles and a relief inspector should be appointed to each circle to discharge prescribed duties, the chief of which were concerned with the preparation of gratuitous relief lists in villages and the superintendence of this form .of relief.<sup>159</sup> Vinita Damodaran

in her essay titled *Famine in a Forest Tract* has shown the larger implications of colonial forest policy among the tribes of Chotanagpur region where colonial denial of forest use for the tribals triggered famines as a result of the absence of even minimum access to the forest products during the times of scarcities. Constant reduce of forest areas and openings of new coal mines in the cultivable land made the tribal population more vulnerable to any slightest fall in their entitlement. Though the famines of 1866-67 and 1873-74 were mitigated by the use of forest product but the 1896-97 famine, which ‘developed in the context of a failure of the monsoon’ which was intensified by the destruction of forests that ‘led to a decrease of jungle products and ... deprived the people of one of their chief means of resistance to famine.’<sup>160</sup> The famine in Chotanagpur was accompanied by cholera epidemic which took a heavy toll due to the ‘hesitancy in instituting relief’ by the colonial state which ‘reluctantly set in motion a system of famine relief.’<sup>161</sup> The consecutive famines in this area since 1866 had contributed to a large scale migration of tribal population as coolies for the tea garden areas of northern Bengal and Assam which eventually resulted in the increase of population in these areas.<sup>162</sup> However, most ironically, ‘specific regulations with regard to forests and fodder were proposed during the famine of 1896-97.’<sup>163</sup> The most authoritative study on 1896-97 famine has come from Malavika Chakrabarty who in her book *Famine of 1896-97 in Bengal: The Availability or Entitlement Crisis* (New Delhi, 2004) has vividly depicted all the aspects of 1896-97 famine in Bengal. The book has provided new insights in studying the famine of 1896-97 and adds new dimension in the realm of famine-studies. Though there is hardly any space left by the book in discussing the famine of 1896-97, but the distinctive and critical conditions which prevailed in the districts of northern Bengal deserve to be mentioned and analyzed separately.

In Bogra, rainfall was deficient during the years of 1895-96 and 1896-97 and as a result crops had to suffer a great loss. Although there was a widespread failure of crops in the district but the ‘actual scarcity [was] only in the portion of the district east of the Karatoya in *thanas* Shariakandi and Dhunot and a famine charitable relief fund had to be opened towards the close of the year.’<sup>164</sup> The famine in Murshidabad was called forth by the failure of crops caused by the shortage of rainfall. This time prices rose in an unprecedented manner during the later part of the famine which severely had affected parts of Sadar subdivision, which was located on the east of the river Bhagirathi and was known as the Bagri, along with a few areas on the west of the river in the Kandi subdivision.<sup>165</sup> Short rainfall and the lowness of the

rivers in 1895 was resulted in a partial failure of the autumn and winter crops and in 1896 in many parts of the district autumn rice had completely failed to yield a full turn.<sup>166</sup>

Table. 5.20

Comparison of the outturns of the various crops in 1895-96 and 1896-97 and 1873-74 in Murshidabad

| Crop                    | 1895-96 | 1896-97 | 1873-74 |
|-------------------------|---------|---------|---------|
|                         | Annas   | Annas   | Annas   |
| <i>Aman</i> paddy       | 8       | 7       | 6       |
| <i>Aus</i> paddy        | 9       | 8       | 12      |
| Wheat                   | 8       | 3       | 12      |
| Pulses                  | 14      | 7       | 12      |
| Other <i>rabi</i> crops | 10      | 8       | 12      |

Source: L. S. S. O'Malley, *Bengal District Gazetteers: Murshidabad*, p. 112.

This time the situation was worse than it was in 1873-74. Test-works had been introduced in February and the maximum wages which the workers were allowed to earn in a day was 1½ annas for a task of 66 cubic feet. Since increasing number of people were engaged in the tasks so the administration towards the end of April found it necessary to convert the test-works into ordinary relief works under the Famine Code. The supply of gratuitous relief was started in March in Barwa and Bharatpur thanas which were the most severely affected parts of the district.<sup>167</sup> The suffering was predominantly experienced by the landless and labouring classes, and by those who in ordinary years were relied on the charity of the others.<sup>168</sup> During the month of July the situation became more severe and the price of common rice was prevailing between 6 to 7½ seers per rupee in the affected areas. The Government had to open new relief centres at Nawada at the end of April and later on at Jalangi. The whole of the Sadar subdivision was more or less affected, and where circles were not opened, relief was administered by private enterprises like zamindars, big landlords of the district.<sup>169</sup> Mention can be made of Maharani Swarnamayi, the Nawab Bahadur of Murshidabad, Bai Sitab Chand Nahar Bahadur, Rai Budh Singh Dudburia Bahadur of Azimganj, Babu Jogendra Narayan Rai of Lalgola, Bibi Hani Mena Kumari and Babu Narpat Singh and many others.<sup>170</sup>

There is no doubt that these private charities were in many respect had contributed to the lessening of the severity and duration of the distress caused by the famine and had complemented the Government relief operations in the district.

In Rajshahi, crop was half the average in 1896 and as a result boro rice was planted on an abnormally large area of field (77,000 acres). Though there was no such great deficiency in rainfall during the early monsoon period but by the coming of August there was a serious shortage and the drought persisted even till the middle of September.<sup>171</sup> October went rainless. The crop production in lands which were nearer to the river beds was also below the average due to the short-lasting of the floods of this year. However, it was the 'abnormal meteorological conditions and the abnormally low inundations of the Padma [which] injured the year's winter harvest, prejudiced the prospects of the coming spring crop, and affected the condition of the people at large.'<sup>172</sup> There were contradictory estimates put forward by the Collector and Commissioner of the district.<sup>173</sup> There was complete absence of any work in the agricultural fields between mid-October and end-November and the price of agricultural labour had become drastically low viz. 1 *anna* per diem in the Boalia and Durgapur outposts.<sup>174</sup> Though in 1873 the worst affected part of the district was the Barind tract but in 1896-97 famine the areas which were severely affected were located in *thanas* Boalia, Puthia, Charghat, the southern half of Bagmara and that portion of the Nator *thana*. The prices of rice had eventually increased - the market price of common rice was 7½ seers per rupee at Rampur Boalia in October 1896 and at Nator in November and it rose abnormally high in July 1897 when rice was selling at 6 seers to 7 seers 12 *chittaks* and in August it was 6½ seers at Puthia and 8 seers at Mahadebpur.<sup>175</sup> In these circumstances gratuitous relief was undertaken by the Government and as a result 9,000 persons were relieved from the Charitable Fund who were mostly impoverished women and children and a great portion of the relief was extended in form of gratuitous doles of rice.<sup>176</sup> When the test works were started it was initially found that except from the place near to the Ganges, where the people were hard hit by the decline of silk industry and there was constant want of employment, no such demand was raised for it. The test works in the primary stage was aimed to bring the Ganges water into the inland *bils* and was limited in the two canals of Narad Khal and Bairagi Khal for this purpose, the former was 5½ miles and the later was 3 miles long.<sup>177</sup>

Table. 5. 21

Statement showing the actual expenditure incurred in Pabna and Rajshahi for 1896-97.

| District | Relief work and gratuitous relief |                                          |                                             |                                                  |                                               | Amount advanced for village works under the modified rules under the Land Improvement Loans Act. | Total expenditure debited to general revenues |
|----------|-----------------------------------|------------------------------------------|---------------------------------------------|--------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------|
|          | Amount paid as wages              | Amount spent in giving gratuitous relief | Cash of establishment tools and plant, &c., | Total cost of relief works and gratuitous relief | Portion of cost defrayed from District Funds. |                                                                                                  |                                               |
| 1        | 2                                 | 3                                        | 4                                           | 5                                                | 6                                             |                                                                                                  |                                               |
|          | Rs. A. P.                         | Rs. A. P.                                | Rs. A. P.                                   | Rs. A. P.                                        | Rs. A. P.                                     | Rs. A. P.                                                                                        | Rs. A. P.                                     |
| Rajshahi | 3,748 13 3                        | 136 3 0                                  | 1,336 8 6                                   | 5,221 8 9                                        | 5,221 8 9                                     | 1,400 0 0                                                                                        | 1400 0 0                                      |
| Pabna    | 51 94 0                           | -----                                    | 78 15 3                                     | 598 3 3                                          | 598 3 3                                       | 1000 0 0                                                                                         | 1000 0 0                                      |

Source: Extracted from letter from P. Nolan, EsQ., Commissioner of the Rajshahi Division, to the Secretary to the Government of Bengal, Revenue Department.<sup>178</sup>

P. Nolan, the Commissioner of the Rajshahi Division on his *Resolution on the Rajshahi Report* had noted the impoverished condition of the people of the Rajshahi Division and asserted that ‘the general condition of the people was said to have got worse during the fortnight; a result which is unfortunately to be expected as the season advances and with reference to the insufficient fall of rain.’<sup>179</sup> The assertion had show an attendance at test-works averaging 670 male units during the first week and only 626 in the second which overall demonstrated that no woman or child was employed, since as it was believed, ‘the result of the test in regard to the existence of famine [was] negative.’<sup>180</sup> But it was noticed

that there had been a marked increase of participation in test works since the close of the fortnight probably due to the opening of new works. The gratuitous relief under the Famine Code, which was also an indication of the degree to which scarcity prevails, had been reported as nominal, the cost being Rs. 3-10. Public health is reported fair, although cholera has appeared, as is usual in this season. As a method of test works coolies were sought by the administration. Nolan stated that:

“I called the Collector’s attention to the demand for 5,000 coolies on the Bogra Railway adjoining his district, and would glad if he can state in his next report under the head of emigration, whether the labourers of Rajshahi have availed themselves of this opportunity. The opening of new test-works is in accordance with my instructions. .... It is to be recommended that a work not conducted in strict accordance with the Code is no “test” so far as Government is concerned.”<sup>181</sup>

In his letter on 19<sup>th</sup> April 1897 N. K. Bose, The Collector of Rajshahi wrote to the Commissioner of the Rajshahi Division that ‘The general condition of the affected tracts [was] gradually becoming worse and worse, particularly portions of Boalia, Nowhatta, Charghat and Rajapur Circles.’<sup>182</sup> There was 6.30 inch of rainfall in Naugaon till the third week of April, but practically there was no rain elsewhere. Although it was reported that the condition of *boro dhan* in Tanor was good, and *boro dhan*, onions and jute in Bagmara were also good, but in parts of Godagari, *boro* and *jail dhan* was said to be drying for want of rain. Only a quarter crop of *til* and sugarcane were expected in Charghat and elsewhere in the Sadar Subdivision the prospects were not positive and in Rajapur the condition was noticeably worst.<sup>183</sup> Importation from Panchupur and Singra *thanas* into Boalia and from Dinajpur had been going on, but not in sufficiently large quantities to meet the demand. In ordinary years the price of rice did not get much higher but in 1897 the condition was alarming due to the shortage of rainfall, as the *rabi* crops did not turn out well. In these circumstances the District Superintendent reported that ‘only the well-to-do cultivators had any food-stocks; many poor persons [were] subsisting on fruits or berries, greens, kachu, &c., and [had] to do without cooked food for a day.’ The scarcity of food and water had been accompanied by severe cases of cholera in Boalia, Putia and Baraigram *thanas* and there were 31 cases reported in Boalia town alone. Till the middle of April there had been three test relief works open and the price of rice at the relief works had fluctuated between 8 to 9 seers per rupee. Besides the above test works initiatives had been taken there to open several works in which the labourers were paid wages according to the Famine Code. Two tanks near Purila

were being excavated under the modified piece-work system where 80 persons on an average could work daily. Eight works were being carried out with the loans granted under the modified rules under the Land Improvement Loans Act. Besides these works, opening of several tanks were being executed throughout the district by some private individuals either from their own funds or from loans granted under the ordinary rules under the Land Improvement Loans Act.<sup>184</sup> The Collector of the district of Rajshahi had informed about the opening of three new test- works in the district which were ‘ready to be started at a moment’s notice’ – in Boalia the Narad Khal, Tank at Hat Godagari and Tank at Sridharpur. In the meanwhile the work at Narad Khal had already begun, and regular estimates had been sanctioned for the tanks at Hat Godagari and Sridharpur. But despite of all these initiatives there were only 16 cases of gratuitously relieved people informed by the police under section 12 of the Famine Code. Till the end of 15<sup>th</sup> April, nearly 8,000 people were gratuitously relieved from the Charitable Relief Fund.

Table. 5. 22

Statement of gratuitous relief by Police for the two weeks ending 15<sup>th</sup> April 1897 in Rajshahi

| Name of circle and Heads of gratuitous relief. | Number of persons receiving gratuitous relief                                                                                      |       |           |       | Money expended |    |   |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------|-----------|-------|----------------|----|---|
|                                                | Men                                                                                                                                | Women | Children. | Total | Rs.            | A. | P |
| Relief by Police under section 12 Godagari     | ....                                                                                                                               | 3     | ....      | 3     | 0              | 3  | 6 |
| Tanor                                          | 1                                                                                                                                  | 2     | 3         | 6     | 0              | 8  | 6 |
| Rajapur                                        | 1                                                                                                                                  | 6     | .....     | 7     | 0              | 13 | 6 |
| Lalpur                                         | Particulars of men, women, &c., not given. Gratuitous relief administered by the Charitable Relief Committees were not shown here. |       |           |       | 2              | 0  | 6 |
| Total                                          | 2                                                                                                                                  | 11    | 3         | 16    | 3              | 10 | 0 |

Source: From N. K. Bose., EsQ., Collector of Rajshahi, to the Commissioner of the Rajshahi Division. – (No. 228G., dated Rampur Boalia, the 19<sup>th</sup> April 1897), WBSA.

From the above table it is evident that from among the recipients of gratuitous relief of the district of Rajshahi women formed the overwhelming portion viz. almost 69%. This shows the relatively increased crisis prevailed among them and their sheer dependency on the government relief. This has also reflected that the drought had peeped into the domestic order which was shaken vigorously by the scarcity and wanting of food. Gendered social hierarchies became more intense during the crisis time viz. famine and scarcities when women did not get even for their bare subsistence and their male counterpart captured the whole subsistence. In November 1896, it had been informed that in Hatia and other affected areas of Noakhali-Chittagong rice obtained from the relief actions were consumed by the ‘pater familias, at the cost of the female, minor, old and infirm members of the family.’<sup>185</sup> As ‘for many of the poorer households survival was a balancing act requiring the strategic operation of all economic and cultural resources’,<sup>186</sup> thus the household itself became a site of competition and contestation instead of showing cooperation in a time of crisis. Bina Agarwal argues that ‘there is a systematic anti-female bias in the allocation within rural households of subsistence resources controlled by men, including resources used for food, health care’ etc.<sup>187</sup> Moreover, since the women had mostly relied on the ‘specialized’ job, so they had to go through within a severe crisis of employment during the time of drought or scarcities when the occupational opportunities gradually contracted and ultimately stopped. Arup Maharatna argues that ‘the age-sex composition of mortality effects of famine is usually an outcome of two factors, namely, physiological vulnerability and social protection.’<sup>188</sup>

There were also certain peculiar characteristics which prevailed in the district of Pabna. The Commissioner of Pabna had remarked that the lower class of Muslim women in Pabna did care very little for the *purda*, which was used for hiding themselves behind a curtain, but it did not follow that they had no objection to earthwork – on the contrary it was observed in Rajshahi by their abstention from doing the work despite of prevailing the same condition in that district.<sup>189</sup> The Collector pointed out that the women had no prejudice against husking rice – a task assigned to them in the ordinary course of village industry. Employment of this class, however, was afforded from charitable funds – not by the Government. C. A. Radice, the Officiating Collector of Pabna in a letter to the Commissioner of the Rajshahi Division (18th July 1897) had remarked that he was informed by native gentlemen of Pabna that Muslim women did not care much for the *purda* in this district, this idea, as argued by him, had been attested fully by his personal observation.<sup>190</sup> It was found that at the relief circles the paddy huskers were almost all Muslims, mostly widows, many with several children and

when they came for their paddy from villages even 5 or 6 miles distant many appeared to be endowed with very little modesty. The incident had shaped the Governmental apathy of the fact that the number of women recipients were gradually increasing and also guided them to be 'greatly disinclined to attach importance to the fact that women still [came] to the test-works and they [had] taken to carrying earth as well as turf on the Rajapur-Dasuria road work.'<sup>191</sup> It was further noted that despite of the considerable presence of women workers it was reported that 'their number [had] moreover, remained on the whole comparatively constant,' and the numbers of males was increased by the junior males of less indigent families who were attracted by the lightness of the tasks set.<sup>192</sup> There was a 'rumour', according to the administration, of several deaths in Sara jurisdiction and the 'rumour' of these several deaths from famine had resolved itself on enquiry into one death only, that of a child about 7 years old, the son of a chaukidar who was of the opinion that the death was due to fever. But further enquiries which were conducted amongst some women of the same village showed that the boy had had nothing to eat for two days and had taken a long drink of water for which he began to vomit and died.<sup>193</sup> In the tribal societies where social restrictions were not powerful to restrict them, the tribal women had shared their duty in the initial years of famine – women were engaged in collecting jungle products and men went to the relief works, whereas during the critical famine years men were first to respond to the outward migration leaving their families behind in the famine areas but ultimately the women too had to migrate for the tea gardens of Duars and Assam and for the coal mines of Bihar and Bengal.<sup>194</sup> There existed forms of social prejudices and bindings which were predominant among the poor people even in the days of acquiring famine relief and test-works. Though women were not much familiar with the works that they had to perform for obtaining the reliefs but sometime they still went out from their houses to do such works. This propensity became so widespread that even the Muslim women did join and perform the test-works for which they had to go beyond their *purda* restrictions. Apart from the central and eastern Bengal, these kinds of practises were prevailed in north Bengal. The higher and lower class women of Hindu and Muslim families came to join the test-works during the relief periods when they had to do rice-husking, jute twisting etc. and other women were engaged in cleaning Burma rice.<sup>195</sup> The women's participation in the test-works had disclosed the severity of famine-condition which had critically impoverished the household of the poor and dragged the women from their *antapur*. The acute scarcity in the district of Pabna had brought the Muslim women into the test-works where they could care very little for their *purda*.<sup>196</sup>

In the district of Pabna there were no crops of importance on the fields except the *boro dhan*. The sowing of the *aus* had been delayed by the want of rain. There was no rain during the middle of April in Pabna and this had prevented *aus* sowing and kept the price of rice even higher than it would probably otherwise had been. The normal for the Sadar Subdivision for the whole month of April was 3.12 inches.<sup>197</sup> The retail prices of common rice and paddy was returned as follows from the different police stations. The figures were standard seers of 80 *tolahs*. (80 *tolahs* = 1 *seers*)

Table. 5. 23

Retail prices of common rice and paddy of different police stations in Pabna

| Thanas      | Rice | Paddy        |
|-------------|------|--------------|
| Pabna       | 9    | 13           |
| Sara        | 8¼   | 13           |
| Chatmohar   | 10½  | 25           |
| Faridpur    | 10   | Not returned |
| Dulai       | 8    | Ditto        |
| Mothura     | 8    | 15           |
| Ullapara    | 9    | 14           |
| Khamarkhand | 8    | 13           |
| Shazadpur   | 8¼   | 13½          |
| Sirajganj   | 8    | 13½          |
| Subgacha    | 8¼   | 13           |
| Raiganj     | 9    | 14           |
| Taras       | 10   | 20           |
| Chohali     | 9¼   | 13           |

Source: From W. Maude, EsQ., the Collector of Pabna to the Commissioner of the Rajshahi Division, dated Pabna, the 19<sup>th</sup> April 1897), WBSA.

The above table has shown the great variations in the prices of rice and paddy at different places due to the state of local supplies and the peculiar fact that, although owing to rain holding off the price of paddy had been steadily increasing up whereas the price of rice has remained stationary. The rise in the price of paddy and the great increase in the numbers

attending the one test work which was open during by that time indicated that the position was one of considerable deterioration which had been attributed chiefly to the rain having kept off altogether. On the other hand, the Subdivisional Officer of Sirajganj had further reported that distress in his subdivision was confined to the very poorest people.<sup>198</sup> The imports and exports of food grains registered during that time was as follows: -

|         | Standard maunds |
|---------|-----------------|
| Imports | 28,682          |
| Exports | 2,123           |

The remarkable feature of the relief works during the 1896-97 famine was that this time Government had acknowledged the necessity of both import and export from the districts affected by the famine whereas in the previous famines import and export had both become a matter of dissension among the Government officials. The policy of restrictions on export and increasing quantity of import became widespread in many affected district of the Presidency. The Collector of Darbhanga observed that

“The local feeling, as is invariably the case on such occasions, was very strongly in favour of measures being taken to check the export of food grains from the district, and of Government taking measures to import food grains; Measures to check exports have never been adopted by Government as a part of their famine policy, but in 1897 Government was obliged to import largely.”<sup>199</sup>

The total numbers of task-works, persons who had been relieved by the gratuitous relief and the cost of the same at the circles of Pabna and Dasuria were as follows:

Table. 5. 24

Total numbers of task-work, relieved persons and their cost in Pabna and Dasuria

| Circle  | Task Work | Gratuitous | Cost (Rs.) |
|---------|-----------|------------|------------|
| Dasuria | 1,172     | Nil        | 1,997      |
| Pabna   | 343       | 223        | 269        |

Source: From W. Maude, EsQ., the Collector of Pabna to the Commissioner of the Rajshahi Division, dated Pabna, the 19<sup>th</sup> April 1897), progs. no. 393-94, WBSA.

The condition of the tracts threatened with distress in the districts of Rajshahi and Pabna, during the first half of the April had been demonstrated from the Secretary of the Government in the following manner:

“It appears to the Lieutenant Governor that the Collector of Rajshahi [was] inclined to take an unduly gloomy view of the state of things in his district and I am to request that you [would] take steps to check this tendency on the part of Mr. Bose. His Honor [did] not think that there can be any severe pressure at present in this or any other district in the Rajshahi Division.”<sup>200</sup>

N. K. Bose was of the opinion that the price of rice at the relief works varied between 8 and 9 seers, and as a result of this he had therefore raised the maximum wage from 8 pice to 9 pice.<sup>201</sup> As the operations in the district of Rajshahi were still at the test-work stage, the Lieutenant Governor was of opinion that two *annas* a day should be sufficient as a maximum wage on test works, and that the tasks were to be strictly enforced with an objective to ascertain whether the people were under the necessity of working on a mere subsistence wage.<sup>202</sup> But on a sharp contrast with the Government, A. M. Bose., President of the Indian Association wrote in a telegram about the severe famine condition of the Rajshahi district in following terms:

“Funds for charitable relief in Rajshahi completely exhausted. Rice selling 8 seers, even less, and at places no adequate quantity procurable for money. Scarcity and starvation prevailing. Advance of seed grains to cultivators necessary. Unless Government or Central Relief Committee comes to rescue immediately, many will die.”<sup>203</sup>

The telegram had disclosed an extent of distress which required the immediate attention of the Government. Rai Raj Kumar Sarvadhikary, Bahadur, Secretary, British Indian Association had also acknowledge the ‘prevalence of severe distress in the Rajshahi district’ to the Secretary of the Government of Bengal.<sup>204</sup>

The Collector of the district of Pabna had anticipated a good *aus* crop by the middle of May which was generally coming up well and was already six inches high in many parts. The crop had been ‘benefited by the break without rain for the last week’ for which ‘good occasional showers were needed to bring it along well.’ Therefore, it was expected that there was ‘a good deal to make up during the next fortnight, but constant heavy showers may now be confidently expected.’<sup>205</sup> But there had been a steady rise in price all over the district. This had been attributed to the uncertainty of the probable fate of the *aus* crop owing to the long drought that had prevailed up to the middle of April. There had been a large import of Burma rice, both in Pabna and Sirajganj. The Sub-divisional Officer of Sirajganj wrote most miserably in his reports about ‘the very high prices and on general rumours’ –

“... in the Sadar, at any rate, things are much in the same condition as before, and, if anything, slightly ameliorated by the recent rains and the promising condition of the aus paddy crop. I am satisfied that the distress is much exaggerated.”<sup>206</sup>

The Naib of Shazadpur reported on the first week of May that there was great distress in some of his villages which required serious attention on the part of the Government. Although Government wanted to tackle the problem through the introduction of test-works for the victims but the Naib ‘replied with equal promptness that they would not.’ On the other hand the Naib had insisted the Collector to compel the mahajans to lend money at a small rate of interest. The proposal did not get any approval from the Government which instead of extension of any further loans to the peasants had suggested that the estate (the Tagore’s) should lend money to their tenants at a reasonable rate and as a result the ‘old idea that Government [would] give innumerable loans [was] still hanging on.’<sup>207</sup> There had been importation of 18,141 maunds of food grains whereas 1,207 maunds were exported from the district. Though cholera had again overwhelming presence in the district of Pabna too but gradually cholera was receding from there. The amount which had been allotted for the districts of north Bengal for relief works was as follows:

Table. 5.25

Amount of distribution of relief funds among the districts of North Bengal

| District   | Amount (Rs.) |
|------------|--------------|
| Rajshahi   | 3000         |
| Dinajpur   | 1000         |
| Jalpaiguri | 1000         |
| Darjeeling | Nil.         |
| Rangpur    | 1000         |
| Bogra      | 2000         |
| Pabna      | 2000         |
| Reserve    | 8000         |

Source: Memorandum by P. Nolan, EsQ., Commissioner of the Rajshahi Division – Circular No. 21M., dated Jalpaiguri, the 5<sup>th</sup> April, 1897, progs no. 401-402, WBSA.

It was decided in a meeting of the Bengal Provincial Executive Committee that a sum of Rs. 25,000 (inclusive of sums already remitted to Rajshahi and Pabna) would have been disposed to the Commissioner of the Rajshahi Division for the expenditure in charitable relief in the Division. The Executive Committee had instructed that the money would be distributed from time to time in accordance with circumstances, among the Local Committees which had been formed in all the districts of the Rajshahi Division at the Commissioner's discretion, in response to their respective needs. It seemed to be axiomatic to the Committee that no districts other than Rajshahi and Pabna were likely to require money for charitable relief. The above table (5.22) has shown the amount of distribution of this money which was in total 18,000 and the rest of 7000 had already been remitted to the Rajshahi Division.<sup>208</sup> The table below shows the number of persons on the relief list on the 31<sup>st</sup> March: -

Table. 5. 26

Number of persons on the relief list on the 31<sup>st</sup> March, Rajshahi Division

| Category of people                                                            | Number of people |
|-------------------------------------------------------------------------------|------------------|
| Number of paupers gratuitously relieved                                       | 5,103            |
| Number of huskers, spinners, &c.                                              | 1,649            |
| Number of persons to whom rice is sold at a cheaper rate than the market rate | 597              |
| Total                                                                         | 7,349            |

From E. N. Baker, EsQ., C.S., Honorary Secretary, Bengal Branch, Indian Famine Charitable Relief Fund, to the Commissioner of the Rajshahi Division. – (No. 314, dated Calcutta, the 31<sup>st</sup> March 1897), WBSA.

The centres which were opened up to 31<sup>st</sup> March in Rajshahi were - in Sadar Subdivision relief centres were opened in Boalia, Nowhatta, Bagmara, Muchmal, Tanore, Charghat, Rajapur, Putia, Durgapur and in the Nator Subdivision relief centres were opened at Nator, Lalpur and Bagatipara.

In addition to the miseries of the people caused by the shortage of rainfall and failure of crops, there had been two disastrous fires, one at Boalia, and the other at Putia, besides small fires here and there.<sup>209</sup> The fire at Boalia occurred on Good Friday at the poorest part of the

town. Although the wind was very high but the open space afforded by the Rajshahi College compound and for the untiring exertions of some people to cut off connections by breaking down huts, the conflagration had been tamed at last but otherwise it would have been much more disastrous than it actually was. A tiled hut belonged to the college and another, in the Boalia Hospital were burnt down. In Boalia, it had been roughly ascertained that 50 poor families turned out homeless and in Putia more than 40 families. These poor persons deserved to get some assistance to build up some sort of shelter along with the arrangements for famine-relief. The fires had triggered the sale of food-grain by the mahajans of Murshidabad and other places. In April 1897, the Rani Mena Kumari of Jeagunj and Babu Narpat Singh of Azimganj had sold rice for 10 seers a rupee which was excessively high during the famine periods.<sup>210</sup> In areas of Rajshahi where there was no such systematic grain trade, rich peasants had acted as the mahajans like former and had 'controlled a large part of the surplus engaged in petty retail trade.'<sup>211</sup>

The Rules for the Charitable Relief in Rajshahi were as follows:

“To advance half a maund of paddy (*kachi*) to each indigent female who can husk it, but cannot procure it for want of capital, on her undertaking to return 12 seers (*kachi*) of clean rice. By this arrangement a margin of above one seer of rice with bran and husk is left to the husker as her remuneration. To *pardanishin* ladies, unaccustomed to husking, may be insisted on a return of 10 seers of rice for half a maund of paddy.

To register all lame, blind, decrepit, and infirm persons, and give them a dole of rice at two seers (*kachi*) a week (say on Sunday) and their dependent children below 10 at 1 seer each.

To make house to house search and pick out cases of starvation with a view to supply each one with so much of rice *gratis* as the committee consider necessary. The doles should be given weekly on a fixed day.

If no paddy is available, *khesari* or *musari* pulses may also be issued. Half a maund (*kachi*) may be issued to each female, who is required to return 13¼ seers (*kachi*) of clean dal.

It has been decided to give relief to indigent weavers. The police has been instructed to prepare a list of those indigent weavers who are ready to supply us with clothes and *gamchas*, with advances made from the fund. These lists will be forwarded to the Branch Committees, and they may, after due enquiry, make advances. The Committees may also on their own knowledge make advances. Not more than Rs. 10 should be advanced at one time to any person.

Each weaver taking advance shall have to execute an agreement on a stamped paper (of 8 annas value) in the form enclosed. It should be executed in favour of

the Magistrate and President of the Relief Committee. The cost of the stamp should be paid from the fund.

Two or more weavers may execute a joint agreement, but the total advance made on subjoint agreement should not exceed Rs. 50.

When the weaver brings in the clothes, their market price should be appraised and paid in cash. The cloths received from the weavers should be distributed *gratis* to the poor and needy.”<sup>212</sup>

Regarding the offering of the advances to weavers there were, however, certain pre-conditions which were set by the Government. In the matter of giving advances to the weavers, no steps were taken until the Committee were satisfied that necessity had arisen to aid them in their industry. While reports were received from the Police, as well as from the Branch Committees, that several indigent weavers were in great distress at the same time objection had been taken to the police preparing a list of indigent weavers.<sup>213</sup> As a matter of fact, the lists were in the first instance submitted by the panchayats, which were as far as possible checked by the police, and then they were sent to the Branch Committee. The members of the Committees were required to make due enquiries personally before any advances were made. The Committee was always in a state of receiving any better plan for preparing the list. Despite of all the above evidences and instances, famine had not been officially declared in the district of Rajshahi till the mid-April of 1897, and the rules laid down were strictly applicable to tracts in which famine prevailed. Therefore, considerable confusion prevailed centering on the question that although the affected persons were entitled to State relief; but as famine had not been officially declared in this district; then they either might be left to die of starvation or be given some relief from the Charitable Fund. In these circumstances, it was decided that supports would be given to the distress people through the weekly distribution of dole of two *seers kachi*, or 1½ *seers paki*, which implied that they were to be provided with ‘only two days’ subsistence allowance, leaving them to pick the other five days’ diet from private charity.<sup>214</sup> It was resolved finally that this form of relief would be discontinued as soon as famine would be declared to prevail in this district. P Nolan was of the opinion that in the adjoining districts of Pabna and Rajshahi there were almost identical conditions in regard to the degree of deficiency in rainfall and of failure in crops. In Pabna, the number employed on the 30th April was 407 and the only difference between them was that charitable relief had been much more freely distributed in Rajshahi.<sup>215</sup> From 16th April to 30th April 1897 the total rainfall in Pabna was 1.99 inches and in Sirajganj was 2.37

inches.<sup>216</sup> W. Maude, the Collector of Pabna wrote to the Commissioner of the Rajshahi Division that the only standing crops in Pabna were *boro dhan*, *jali dhan* and sugarcane. *Jali* paddy was a later kind of *boro dhan* coming between that variety and the aus crop. It was more extensively cultivated in the Sadar subdivision than the regular *boro dhan* which was rare, except in some low *bil* lands whereas *jali* paddy was cultivated on char lands. There had been a good deal of cholera prevalent, especially in Pabna town and the Pabna, Dulai and Mathura *thanas*. There was also an unusual prevalence of fever and dysentery, and general sickness around Dasuria for which a compounder was sent out with medicines.<sup>217</sup>

The Collector of Rajshahi argued that till the half-month of the May there had been good rainfall throughout the district and the table below shows the rainfall recorded in the several rain-registering stations in the district:

Table. 5.27

Rainfall at different places in Rajshahi till the month May, 1897

| Stations   | Rainfall (inches) |
|------------|-------------------|
| Boalia     | 2.35              |
| Naugaon    | 2.69              |
| Nator      | 1.77              |
| Manda      | 2.02              |
| Lalpur     | 1.16              |
| Mahadebpur | 1.32              |

Source: From N. K. Bose, EsQ., Collector of Rajshahi, to the Commissioner of the Rajshahi Division. – (No. 400G., dated Rampur Boalia, the 3rd May 1897), progs. no. 405-406, WBSA.

The Collector continued to state that on the 1st May there was a very smart shower at Boalia which had contributed to the improvement of the agricultural prospects considerably. *Boro* paddy for which some anxiety was being felt had been reported to be safe and the sowing of *aus* and *aman* paddy and jute was about to start.<sup>218</sup> Despite of these changing conditions the prevailing high price of rice had become however, a source of great anxiety. In several hats

the prices had varied from 7½ to 8 seers per rupee and paddy was still being imported in the affected tracts from Panchupur side though in very small quantities.<sup>219</sup> The stocks had fallen low, and the import trade was turning gradually dull which inspired the grain dealers to begin importing Burma rice from Calcutta. This was equally known to the Government who believed that ‘no doubt that they [grain dealers] [would] do so if the present high prices continue.’<sup>220</sup> The prices of labour had largely fluctuated in several places – prices were high in Naugaon and Nator, but low in all other parts of the districts. A large number of landless labourers were searching for work in the fields, as well as in the excavation of tanks; but owing to the high price of food grains, their earnings were insufficient to maintain them and their family. Though the condition of ‘public health fortunately continues fairly good’ but still ‘incomplete’ mortuary returns had been received for the month of April from certain *thanas*, which showed that the rate of mortality was higher than in the previous month. Cholera broke out in the Boalia town, and 50 deaths were reported.<sup>221</sup> Although as a result of the vigorous measures taken by the Municipality at the instance of the Civil Surgeon and the Magistrate, the disease had been stamped out but in the Baraigram *thana* cholera was said to be rather bad, and a necessity for Civil Hospital Assistant for this *thana* was strongly felt by the administration. It was reported that there was no immigration of famished people, but on the other hand the District Superintendent of Police reported that some people left Bagmara, Charghat and Puthia to obtain employment elsewhere beyond the district. The demand for coolies on the Bogra-Sultanpur Railway was widely circulated throughout the district, but it was not known that to what extent it helped the labourers since it was not informed that how many of the labourers had availed themselves of the opportunity.

The last return of May had showed 881 male units on the test-works and the number for the three weeks were 646, 503, and 566 respectively. Though there was no objection in allowing the full famine wage from the Collector but the fact was that the charitable relief at the cost of Government was almost nothing.<sup>222</sup> The death-rate was 3.47, against an average of 4.11 for the month of April. The *boro* crop estimate had been raised from 7 *annas* to 13 by the Collector, which was to be rose to 16 *annas* but the specific estimate after the personal enquiry conducted by the Deputy Collector, as it was anticipated would be 20 *annas*. The area sown this year was 116,600 acres among which more *aus* had been sown in 1897 than usual. Since the prospect of this crop was excellent, therefore the Commissioner ‘s view was that ‘under the favourable circumstances of the season, not a seer of seed-grain or an acre of land would be left unutilized for want of advances.’<sup>223</sup> Bengal Government had tried to

generalise the sufferings of the people of Bengal in relation with the other parts of India regarding the long prevalence of high prices and surprisingly commented that Rajshahi was 'in the position of those districts which shared the common misfortune of the country at large, but where the prescribed test show[ed] that there [was] at present no famine.'<sup>224</sup> Raiyats had been left upon the mercy of the mahajans for lending money during the famine-time which frequently turned out as perilous problem for the raiyats. Although the raiyats of Bogra and Jalpaiguri had tried to obtain loans from the mahajan for the *aus dhan* and jute, but the mahajan had declined to lend money to the raiyats till the prospects of the crops could be settled.<sup>225</sup>

Report of the middle of the May had disappointedly demonstrated no material change in the generally bad condition of the affected tracts, excepting that rain had fallen and had slightly improved agricultural prospects. The recent rainfall had saved the *boro* paddy. Aus paddy had been very extensively sown, and everywhere it had germinated well. At the end of the last April and in the beginning of this half-month of May crowds of raiyats came into Boalia and informed that they had no seed-grain and no money, and they would not be able to get through the next two months unless grain was advanced to them.<sup>226</sup> It was noticed by the Collector that 'most of these applicants appeared to be well-to-do, wearing good cloths, carrying umbrellas, and presenting none of the appearances of want or privation [whose] object was apparently to make a profit for themselves.'<sup>227</sup> Prices have remained high throughout the month of May, in some places as high as 7 seers 4 *chitaks* per rupee. Babu Sasi Bhusan Dutt, Deputy Collector, reported some importations from the eastern *thanas* of this district and Dinajpur, and the Subdivisional Officer of Nator stated that Messrs. Watson and Company had imported about 6,000 maunds of paddy, yet there had been no importation of Burma rice in the district.<sup>228</sup> There was little doubt that the high price of rice was caused by the almost total cessation of importation. Although the Collector had observed improved agricultural prospects caused by the recent rainfall but there was undeniably a good deal of distress. The majority of the people were now living on only one full meal a day, and as far as the poor and destitute, this even was not always procurable by them. Though death-rate was reduced to some extent but it did not stop. The death rate per mile during the month of the April was 3.47 against 4.11 which was the average death-rate in April for five years (1892-96). The average daily numbers of labourers at work at different relief works were 385 at the Narad Khal, and 239 at the Bagha tank. The average daily number of labourers in the Mohunpur tank and Rahimpur tank was about 30.

Government seemed to be anxious not about the deaths caused by famine but about the reports which were sent by its servants. It was argued that ‘the readiness with which the false report of three deaths from starvation was at first accepted is instructive.’<sup>229</sup> Being confident and assured by the enquiries of Mr. Bose who had ‘properly caused a full enquiry’ it was stated that ‘

“Rajshahi may now be classed with the rest of this Division as distinctly outside the famine line (it was never within it, but doubts existed), although the people do and must suffer greatly from the prevalence of famine prices at a time when their means have been diminished by a partial failure of crops. This causes general and searching distress which in many cases reaches the point at which charitable relief is requested.”<sup>230</sup>

For the district of Pabna P. Nolan, had remarked that the agricultural prospect seemed to be excellent, but there prevailed the marked rise in prices in some places to six seers a rupee, the appearances of women on the test works and the increased imports indicated that there was a great pressure. On the other hand the works attracted but a limited number of labourers, the highest figure was the attendance of 414 on the first day of the month of May and the lowest 172, on the 26th, after which it again rose to 262 on the last day of the month.<sup>231</sup>

For the districts of Rajshahi and Pabna the grants allotted from Government fund for the month of April were Rs. 10,000 and Rs. 1,000 respectively, for Pubna which had been paid as advances for village works under the modified rules of the Agriculturists’ Land Improvement Loan Act.<sup>232</sup> The estimate for the district of Rajshahi under the head of relief works and gratuitous relief for the month of May was as follows:

|                                           | Estimated daily number | Estimated cost (Rs.) |
|-------------------------------------------|------------------------|----------------------|
| 1. Relief works -                         | 2,000                  | 8,125                |
| 2. Gratuitous relief -                    | 500                    | 1, 440               |
| 3. Establishments, tools and plant, &c. - | ---                    | 1, 000               |
| Total                                     | -----                  | (Rs.) 10, 565        |

The estimates under (1) and (2) demonstrated a grant of ‘over Rs. 4 per head for the month for relief works, and nearly Rs. 3 per head for gratuitous relief’ which the Lieutenant Governor regarded as ‘very high’ rates for men, women and children.<sup>233</sup> Mr. M. Finucane, the Secretary to the Government of Bengal had ordered an investigation to find ‘an explanation

showing why the estimate [was] so high, and why no part of the estimated expenditure [was] to be borne by the District Board.<sup>234</sup>

In the meantime the report of the Collector of Rajshahi on 2<sup>nd</sup> June had informed that there had been good showers of rain throughout the district. But he was equally aware of the fact that the general condition of the district, however, was still bad owing to the continued high prices of food-grain. The head-constable of Godagari police-station reported three cases of deaths from starvation.<sup>235</sup> Babu Upendra Chandra Mukerjee, Sub-Deputy Collector, was directed by the Collector to make a full enquiry which subsequently confirmed the police report as true incident. But still it was believed that the 'report was very meagre, and the enquiry was most perfunctory.' Babu Atul Chandra Ker, Deputy Collector was therefore deputed to make a searching enquiry on the spot and his report demonstrated that 'one of the deaths was due to chronic fever, the second case reported was the result of a boy aged about 7 years, the son of the man who was 30 *bighas* of land, 2 ploughs, 4 plough bullocks, 3 cows, 4 calves, 3 fowls, 12 or 14 brass bell-metal utensils.'<sup>236</sup> Thus it was conceived by the Deputy Collector that it was 'absurd to think such a man will allow his son to die of starvation.' According to Babu Atul Chandra Ker, the boy probably died of cholera after eating some raw mangoes with chillies. The third case was that of a baby of 18 months old. The family consists of father and mother and three other children who all looked healthy and well fed. The report, however, did not unfolded the 'truth' behind the deaths and there still prevailed a doubt that despite of their well-to-do conditions why these people had died. It was reported that there were no immigration and emigration of famished people worth noticing, but it was, however, stated that many persons in Charghat *thana* have left their homes to seek employment elsewhere.

The Collector of Pabna had stated that from 16<sup>th</sup> May to 31<sup>st</sup> May in Pabna total rainfall was 2.56 and in Sirajganj was 6.60 inches and for the whole month of May the rainfall in Pabna was 7.08 inches and in Sirajganj 10.59 inches, against a normal fall of 6.95 and 7.27 respectively.<sup>237</sup> Though this statistics have shown an increase rainfall than the normal rate, but this did not contribute to the lessening of the prices of rice in the district. The price of common rice was reported as follows:

Table. 5. 28

Price of common rice in Pabna in May, 1897

| Places     | Prices<br>( <i>pucka Seers</i> ) |
|------------|----------------------------------|
| Pabna      | 8½                               |
| Dulai      | 7                                |
| Chatmohar  | 8                                |
| Mathura    | 7½                               |
| Sara       | 7                                |
| Faridpur   | 8                                |
| Ullapara   | 8                                |
| Kamarkhand | 6½                               |
| Shahzadpur | 6                                |
| Subgacha   | 6                                |
| Chohali    | 6¾                               |
| Taras      | 7½                               |
| Raiganj    | 9                                |
| Sirajganj  | 6½                               |

Source: From W. Maude, EsQ., Collector of Pabna, to the Commissioner of the Rajshahi Division. –( No. 424G., dated Pabna, the 3<sup>rd</sup> June 1897), WBSA.

Therefore, it can be seen from the above table that prices were very high in all parts of the district of Pabna and only few seers of rice could be obtained for a rupee which dragged the poor people in the crisis of their livelihood. Instead of acknowledging the high prices, the Government was of the opinion that there had been ‘a slight but general rise in the Sirajganj subdivision, while in the Sadar subdivision prices of common rice [were] stationary.’<sup>238</sup> The total amount of import in the district was 31,009 maunds and on the other hand the quantity of export from the district was 1,822 maunds. The death-rate returns from February to April 1897 for Pabna were as follows as compared with the average:

Table 5.29  
The death-rate returns from February to April 1897 for Pabna

| Month    | 1897 | Average |
|----------|------|---------|
| February | 3.37 | 1.87    |
| March    | 4.00 | 2.05    |
| April    | 4.69 | 3.07    |

Source: From W. Maude, EsQ., Collector of Pabna, to the Commissioner of the Rajshahi Division. –( No. 424G., dated Pabna, the 3<sup>rd</sup> June 1897), WBSA.

The above table has shown a considerable increase in the death-rates during the months mentioned above from the average rates. Despite of that it was stated that the state of public health showed ‘a marked improvement if one may judge by the police reports.’ In addition to this there had been many returns of cholera and small-pox which shows a severe deterioration of public health conditions triggered by the drought and governmental callousness.

Test-works were, however, still continuing on at the Manikair tank, the Dasuria tank, and the Pokuria tank. A test-work was tried at Gunaigacha, but did not draw due to unknown reasons. The chief feature of the test-work of this time was the appearance from the commencement of it of women workers on the Manikair tank. These women generally carried out baling work which was very muddy and nasty work. Their appearance showed that how deep the distress was in this particular quarter. The Collector was ‘confidently assured by many babus some months since that no pinch would ever induce the women of this district to come to a Government relief work.’<sup>239</sup> But the acute crisis had driven the women from their home and compelled them to do such works with which they were not accustomed neither they were suitable. On the other hand, this also demonstrated that how meagre was the knowledge of babus that they could not even sense the gravity of the condition prevailing in their areas and who lived in a state of oblivion about their surrounding world. On the other hand, it was revealed that the Collector had sent an incorrect report regarding the average death-rate which was subsequently corrected by P Nolan, Commissioner of the Rajshahi Division. Showing the ‘correct’ information Nolan stated that ‘The statement in Mr. Maude’s fortnightly report was incorrect, and the mortality in Pabna, during the months referred to, really indicated the necessity for watchfulness.’<sup>240</sup>

The Lieutenant Governor had sanctioned a grant of Rs. 5,000 to meet the expenditure under the above mentioned three heads and in addition to that he also approved a grant of Rs. 9,000 for advances for village works in the districts of Rajshahi and Pabna during the month of May. For the district of Rajshahi an expenditure of 3,139 Rs. 9 annas 6 paise had been incurred for relief works and gratuitous relief, including Rs. 382 -12-3, the cost of establishment, and that the entire cost had been met from the grants of Rs. 14,000 made by the District Board. At the end of May it was found that there was still a balance of Rs. 10,860 available from this grant for expenditure in May, the estimate for which is Rs. 10,565, and the Lieutenant Governor anticipated that the grant of Rs. 5,000 sanctioned from provincial revenues (in paragraph 2 of Government order No. 138 T.R./Fam., dated the 4th May 1897) would not be required.<sup>241</sup> It was also reported that from the amount placed under the Agriculturists' Land Improvement Loan Act for the district of Rajshahi and Pabna only Rs. 1,850 had been advanced in the former district and nothing in the latter.<sup>242</sup> The estimates for June 1897 for the Rajshahi District were as follows:

|                                       | Rs.    |
|---------------------------------------|--------|
| Relief works -----                    | 4, 062 |
| Gratuitous Relief -----               | 719    |
| Establishment, tools, plant, &c. ---- | 500    |
| Total -----                           | 5,281  |

It was directed that out of this amount Rs. 281 only would be provided from District Funds, and that the balance of Rs. 5,000 should be paid from Provincial revenues. Along with a grant of Rs. 3,000 for Rashahi for June under the head of advances for villages, the Lieutenant Governor had sanctioned a grant of Rs. 5,000 from the Government Funds on the pre-condition that the amount could not be met by contributions from the District Fund. On the other hand, the local banias were still continuing to hoard rice in their private stores which had led to the abnormal rise in prices in Rajshahi and paved the way for grain riots in Rampur-Boalia in June-July.<sup>243</sup>

For Pabna the estimates for June was as follows:

|                         | Rs.    |
|-------------------------|--------|
| Relief works -----      | 4, 500 |
| Gratuitous Relief ----- | Nil.   |

|                                       |       |
|---------------------------------------|-------|
| Establishment, tools, plant, &c. ---- | 200   |
| Total -----                           | 4,700 |

The above amount which had been sanctioned by the Lieutenant Governor was to be made from the District Funds.<sup>244</sup> However, the estimates which had been forwarded by Mr. E.M. Konstam, Under-Secretary to the Government of Bengal, Revenue Department to the Commissioner of the Rajshahi Division had included the expenditure on famine relief during August 1897 along with the statements of actual for the month of June where it was shown that the cost of giving doles to 500 persons daily was amounted to Rs. 1,500 and the cost for establishment, tools, and plant was Rs. 500.<sup>245</sup> The grant applied for from Government was Rs. 2,000 for the district of Rajshahi under the heads of gratuitous relief and establishments. tools, and plant etc. The weekly telegraphic reports for the first three weeks of the month of July regarding the test-works and gratuitous relief for Rajshahi were as follows:

Table. 5. 30

Weekly report for the Rajshahi district for July, 1897

| Weeks                 | Test-workers | Gratuitous relief              |
|-----------------------|--------------|--------------------------------|
| 3 <sup>rd</sup> July  | 405          | -----                          |
| 10 <sup>th</sup> July | Works closed | 6,901 from the charitable fund |
| 17 <sup>th</sup> July | -----        | 6,674 from the charitable fund |

Source: From E.M. Konstam, EsQ., Under-Secretary to the Government of Bengal, Revenue Department, to the Commissioner of the Rajshahi Division. – (No. 1452 (Fam.), dated Calcutta, the 24<sup>th</sup> July 1897), WBSA.

It is to be noted here that the Government wanted to initiate an enquiry against the estimate for establishment and other expenditure for the district of Rajshahi which was Rs. 500 whereas ‘the estimate under this head for the district of Pabna [was] only Rs. 250, against Rs. 4,700, the estimated cost of test-workers and gratuitous relief.’<sup>246</sup> But the fact was that the circumstances in terms of intensity of scarcity and number of population were not identical for the two districts. The rainfall had been insufficient in the Pabna subdivision to allow

transplantation of the *aman* to begin which had added a new difficulty in the existing state of crisis.<sup>247</sup> It was said to believe that since the residents of the Gangetic tract of Rajshahi were well-off than the average of Bengal in terms of wealth, therefore, the local workers of this tract and also the workers of Bogra and Pabna did not incline to work at the famine rate on 2 *annas* a day.<sup>248</sup> This tendency of 'sacrifice' was much prominent in Pabna, and at Sirajganj in Pabna, the workers and coolies were demanding for more wages despite of the fact that they had been paid at the 'high rate of four to five rupees per thousand cubic feet.'<sup>249</sup>

To meet the famine situation and to prevent such condition in coming days the Government of Bengal had placed a scheme of advances to the Land Revenue Department. It was stated that 'the proposed advances should be given freely in tracts declared by the District Officer, with the sanction of the Commissioner, to be affected by scarcity or famine, care being taken to see that the works for which the advances [were] given [we]re really executed, and that the money advanced [was] not spent on purposes other than those for which it is advanced.'<sup>250</sup> For the maintenance and proper functioning of the scheme it was decided that the advances should be made in instalments, no further instalments would be made till the Government officers were satisfied that the sums already advanced had been properly spent. The works on which these advances were to spent should be directed towards relieving distress through the relief works, and for the increase supply of water for drinking and irrigation purposes for the needy people which would consist of tanks, wells, village reservoirs for the storage of water, and irrigation channels (pynes); and this work would have to be 'approved by local officers of Government.'<sup>251</sup> Another provision which was inflicted was that the labourers who were to be employed upon these works should not receive more than the maximum and never less than the minimum wage calculated according to the provisions of the Bengal Famine Code under the supervision of Circle Officer who would be 'able to regulate the wages paid on it and to see by periodical inspections that the condition as regards giving the minimum wage [was] fulfilled.'<sup>252</sup> The Government of India had sanctioned not only the grant of these advances free of interest, but also the remission of a portion of the advance, representing the difference between the cost of executing the work in ordinary years and the increased cost entailed by the employment of famine labour. Since it was difficult to estimate the exact amount of this difference in each case, the Lieutenant Governor was of the opinion that 'if the work [was] completed to the satisfaction of the collector, one-third of the total amount advanced [would] be remitted.'<sup>253</sup> Citing the instance of a notification of 1873-74 Famine dated the 20th November 1873 which was published for relaxing temporarily some of the

rules under the Land Improvement Act then in force (XXVI of 1871), the Lieutenant Governor had suggested that a similar notification should now be issued in order to modify the existing rules under the Land Improvement Loans Act. In addition to the above mentioned clauses the chief modifications of the Act were as follows:

“.... (Rule 4.) – The Lieutenant Governor thinks that the limits upto which Collectors and Commissioners may sanction individual loans may, under the special circumstances of the case, be raised from Rs. 1,000 and Rs. 5,000 to Rs. 5,000 and Rs. 10,000, respectively....

(Rules 9 and 10). - The Lieutenant Governor does not think it desirable that in the present case the maximum period for repayment of the advance should be ten years. It is sufficient to provide that the first instalment shall be paid by the end of February 1898, subsequent payments being made in equal half yearly instalments till the debt is discharged in five years from January 1898.”<sup>254</sup>

The modified rules of the Land Improvement Loans Act, XIX of 1883, had issued the following provisions regarding the relief works for tracts affected by scarcity or famine which had come into existence from the 5th January 1897. –

“....It will be in the power of the Commissioners to divide the sum so allotted among the Districts of their Divisions at their jurisdiction, and to transfer assignments from one district to another, but expenditure in the Division must be kept within the amount assigned.

....Subject to the provisions of these rules, the Collector may sanction loans not exceeding Rs. 5,000, provided the district allotment is not exceeded without the sanction of the Commissioner of the Division. Loans exceeding Rs. 5,000 require the sanction of the commissioner, and exceeding Rs. 10,000, the sanction of the Board.”<sup>255</sup>

Table. 5.31

Statement showing the net imports and exports (tons) of food-grains from January to September 1897 in Rajshahi Division [Net Import +] [Net Export -]

| Districts  | January to<br>March | April to June | July to<br>September | Total   |
|------------|---------------------|---------------|----------------------|---------|
| Rajshahi   | + 5, 573            | +5,084        | +1,260               | +11,917 |
| Dinajpur   | -7,920              | -4,930        | +23                  | -12,827 |
| Jalpaiguri | + 3,018             | +5,148        | +4,523               | +12,699 |
| Darjeeling | +1,793              | +2,171        | +1,965               | +5,929  |
| Rangpur    | -408                | +433          | -889                 | -864    |
| Bogra      | -5,631              | -4,632        | +1,712               | -8,551  |
| Pabna      | +3,894              | +4,864        | +702                 | +9,460  |

Source: T. W. Holderness, *Narrative of the Famine in India in 1896-97, Appdx. VII.*

The figures for the districts have included the quantity of import and export done by only the rail borne traffic. The figures mentioned above have indicated the net figures, i.e., the imports have been deducted from the exports, or vice-versa. Since the imports of one district were the exports of another, therefore, no inference as to the gross volume of trade could be made by taking the aggregate totals. As the above table have included the figures of the districts which were engaged in the rail-born traffic of grains, so it can be said that by the end of the nineteenth century the districts of northern Bengal had already been connected with the railway networks that helped to import to and export from the districts of this part of Bengal. So far the import was concerned, the districts of Rajshahi, Jalpaiguri and Pabna had the largest amount of import, and on the hand the districts of Dinajpur and Bogra had witnessed

largest export from the districts. This revealed that the famine condition was more intense and critical in the former districts and relief operations were largely carried out through the export of grains from the later districts to meet the necessity of former districts. It is to be noted here that despite of having a greater degree of import the district of Jalpaiguri did not receive much attention in the relief administration or official correspondence. In some of the codes viz. Bengal and others District Boards were deemed to form an integral part of the administration and to be the primary agency for coping with famine, to which object they might subordinate the ordinary objects and methods of their expenditure.<sup>256</sup> The position assigned to the chief revenue authority in regard to famine relief administration did vary greatly in the different provinces. In Bengal and the North- Western Provinces the Board of Revenue finds no place. Regarding the detailed management of relief works, the prescriptions of the Bengal famine code were found as imperfect as those of the code of the North-Western Provinces. The code in recommending the grouping of the relief workers into gangs did not specify the size or composition of the gang, and its schedule of tasks proved to be unworkable.<sup>257</sup> But in a later development, the Indian Famine Commission of 1901 agreed with the 1898 Commission that 'a considerably low wage should be given on village works, because 'experience [showed] that people [could] live on less at home than elsewhere.'<sup>258</sup>

The famine of 1896-97 had been also attended by numerous cases of cholera in different parts of northern Bengal. Cholera usually became frequent when there was a scarcity of water. During the time of drought as a result of the absence ample source of water people were compelled to consume dirty and polluted water which caused severe cholera. Many parts of the districts of Rajshahi and Pabna were affected by serious cases of cholera which aggravated the overall condition of public health. Despite of prevalence of many cases of cholera, most surprisingly the year of 1897 had been declared as one of the comparatively 'healthy' year 'owing perhaps to short rainfall, which caused many of the shallower *bils* to dry up.'<sup>259</sup> The people of the district was generally depended on *bils*, ponds etc. for their regular water supply. Due to the shortage of rainfall when the regular source of water had been dried up then the people had to take any other source of water which was not properly maintained or got polluted. Moreover, during the hot weather tanks were either dried up or became very low and the water was polluted by the indiscriminate washing of cloths, house linen, and kitchen utensils and by the bathing of cattle as human being who frequently had to drink the same water. This tendency turned into practices during the prolonged season of drought which triggered the appearances of severe cases of cholera. The district of Pabna as a whole became unhealthy due to the long absence of inundation since 1871 when in a report

‘the beneficial results of flushing by the rivers and the deterioration caused by their failure [had] long being recognized in this district.’ Mr. W. V. G. Tyler, the Collector of Pabna in a report had argued that:

“Within the districts [were] tracts, at places miles in extent, almost without a ryot, and there [had] been a time when they were as highly cultivated as the best tracts are now. These results were generally due to the simple cause that the rivers’ inundations [had] ceased to extend so far.... When the river ceased to keep open the jolas and water courses, they became gradually choked up and all the hollows of the plain became an unhealthy plain. This breeds fever. The prosperity and energy of the ryots die[d] away, they allowed their own drinking water to become foul...sickness increase[d], cultivation decrease[d], and the small remnant [were] driven away by the wild beasts. This was happening...within a few miles of the Sadar station, as it had happened over and over again in the interior.”<sup>260</sup>

The environmental transformations in terms of drying of river channels of the district had contributed in intensifying ecological vulnerability which was also responsible for the heightening of tensions of famine. Apart from the relief administration the Government hardly look into this sort of problem. Supplying of clean water in the drought affected areas was not a part of governmental concern which only blamed the habits of the people of having polluted water. What appears more interesting in this situation was the Governmental refusal of acknowledging the actual conditions caused by cholera in the affected parts. For several occasions the Government had declared the public health condition as ‘fairly good’, without taking into consideration the prevalence of cholera in the district or it was observed that in a widespread attack of cholera only minimum initiatives had been under taken by the administration. Government was indifferent towards securing the supply of clean and hygienic source of drinking water, and as a result cholera made its repeated visits in a single famine year which proved disastrous for the health of the poor and distressed who were already suffering from starvation, malnutrition and absence of any proper medical care or treatment. The death-rate in the 1896-97 famine was quite high in comparison with the previous 1873-74 famine. Deaths were caused by starvation and disease viz. cholera, influenza etc. But Government in no occasion had admitted the fact that death were caused by the starvation or failure of obtaining food either from the market or through the relief operations. It was projected either as health problem or any other causes. This showed that relief administration was not successful in rescuing the people from starvation and death. Till the end of the nineteenth century communication and transport remained a major problem which acted as serious impediment in the organization and circulation of relief operations.

The interior areas were still going on without any relief or assistance that could resist the poor people from deaths. Moreover, the reports collected and sent by the district officials were in many cases not only incomplete or contradictory but even generated much confusion in the official circles which misguided the relief operations in the affected areas. In several occasions, the estimates and account of food-movement, crop failure, and death-rates sent by the Collector or Deputy Collector proved to be unreliable by the Commissioners or Secretaries who had to but rely on the reports of the formers. Police reports could not even provide the actual truth regarding the famine conditions prevailed in different *thanas* or police stations. Thus the whole set of ground level administrative machinery sometime became a source of misconception which ultimately misguided the famine administration.

### III

#### The Scarcity of 1908-09

The district of Dinajpur was again visited by a scarcity during the autumn of 1908-09. Although the rainfall in 1908-09 was normal in May, and both the jute and *bhadoi* crops were good, but it did not continue for long because a prolonged draught persisted in June, July and August.<sup>261</sup> As a result the *bhadoi* was spoiled and jute did not turn well due to the lack of steeping water. The continuous drought severely affected the main crop of Dinajpur – winter rice. The almost total absent of rain made it impossible for transplanting of paddy seeds for most parts of the district. The rain in September was too late to save the crop and the result was a total loss of winter rice in the *thanas* of Pirganj, Hemtabad, Raiganj, Itahar, and Ghoraghat, and there was widespread loss in all over the Balurghat subdivision and also in parts of Thakurgaon and Birganj.<sup>262</sup> The rabi crops which were to be followed later was also in a state of total failure except in Kaliyaganj and Gangarampur, where a small crop of chillies was obtained. In the district of Rangpur the scarcity of 1908-09 was like what was in 1873-74. The scarcity of 1908-09 was felt in the *khiyar* tract of the district of Rangpur and its adjacent parts. This was caused by the partial failure of rain in 1907 and 1908. The hard *khiyar* soil which was found chiefly in the *thanas* of Govindganj, Pirganj, and Mithapukur, was capable of producing only one good crop namely, the winter rice but as there were no system of irrigation in these tracts so people had to solely rely on the rainfall.<sup>263</sup> Although there was a dire necessity of heavy rain in July and August for the betterment of rice crop but this was in total absence in both 1907 and 1908. The outturn of the winter *aman* rice was

much below the normal in the rest of Rangpur and in other parts of the province the price of rice rose in February 1908 to 7¼ seers per rupee which remained same till the July when, at cost of the failure of the monsoon rain, it started to rise again and in September the price reached its maximum limit - 5¾ seers.<sup>264</sup> This situation had continued till December 1908, when the price fell to 7 seers per rupee and remained stagnant at that figure throughout 1909, till a good crop of *aman* had contributed to the lessening of prices to 11 seers in January 1910. The *barind* tract of the district of Rajshahi had been also suffered by scarcity in 1908-09 caused by the deficient rainfall which led to a partial failure of the *aman* crop.<sup>265</sup>

In the district of Dinajpur, the real distress was not due to so much of a shortage of stocks in the market, which were 'ample', nor to high prices, but rather to the inability of the people to buy food owing to lack of money and the contraction of credit. Because, as it was reported by the Collector of the District, the total loss of one season's crop could not ordinarily cause a famine or even a serious distress in the district for the fact that people had 'become thriftless and extravagant.'<sup>266</sup> The shortage of money was caused by the fact that in the previous year when the price of paddy suddenly rose up with remarkable rapidity to the unprecedented figure of Rs. 3-12-0 per maund, the cultivators had hurriedly sold their entire stocks and in some cases, even seed grain. The shortage was remarkably present in the *pali* areas which was nearer to the railway exposition and where recurrent crops being possible the raiyats had larger stocks.<sup>267</sup> It was not, however, stated that since the raiyats had received extra money for selling their crops then why in the next year they did not have any money to spend for buying food. When the scarcity was apprehended in the *khiyar* tracts a famine programme had been commenced there, but the greatest distress was prominent in the *pali* area. Although in comparison with the 1873-74 famine, the scarcity of 1908-09 had been regarded as less severe but it should be noted here that the smallness of the affect was due to the shortness of the duration of the scarcity. It was argued that the scarcity was met by the governmental relief and by the 'general increase in prosperity among the agricultural classes resulting from the high prices for produce obtained in recent years,' and by the 'improved communications and better organization of trade which enabled rice to be exported from Burdwan, Buckergunj, and Burma into the district.'<sup>268</sup> The famine of 1908-09 in the district of Dinajpur had been declared by the administration as 'a money famine.'<sup>269</sup>

In Rangpur, in order to meet the distress, large quantities were imported by merchants through the nearest railway stations, viz. Mohimganj and Panchbibi and a great part of the imported rice was imported from Burma.<sup>270</sup> People were, however, did not show much

inclination in accepting this imported rice due to its coarse quality. Although the distress had extended to many places but relief measures were confined to an area of about 40 square miles around the village of Kamdia and Govindganj *thana*. Rangpur District Board had spent Rs. 12,000 on repairing the roads in this area and Rs. 15,000 on the excavation 15 tanks which eventually provided works to the able-bodied men and women.<sup>271</sup> A considerable amount of money had been collected through public subscription for the distribution of gratuitous relief to the old and infirm, and to women and children with a definite belief that starvation did not cause any loss of life, yet it triggered the process of migration of people into the other parts of the district.<sup>272</sup> Apart from this, loans of about Rs. 1,20,000 were distributed under the Agriculturists Loan's Act of 1884 which coupled with the 'improved state of district, inter-district and railway-communications' had contributed in the rapid recovery of the district from the scarcity.<sup>273</sup> In the districts of Rajshahi, test works were opened and agricultural loans were also distributed. But no other relief measures were carried out in the affected tracts of the district.<sup>274</sup>

## Conclusion

The above analysis which shows serious inconvenience caused by the natural disorders and its subsequent impact that had reached to the extent of famine due to the considerable shortage of food grains in the districts of north Bengal during the period from 1866 to 1909, asserts a justification of human dependence upon nature and simultaneously the human reciprocity towards the response against the nature for its survival in the earth. This study of man-nature relationship places itself in the broad contour of ecological and environmental structure that has some historical implications on it. Bengal famine of 1770 took a heavy toll of life and nearly a third of the population was perished in this famine. During the period of 1870-1910, as Mike Davis has argued, more than thirty million famines related deaths occurred in British India and this phenomenon has been considered by him as the "Late Victorian Holocaust".<sup>275</sup> It is in this context that the famines of 1873-74 and 1896-97 deserve a closer look of the historians in order to understand the changed relation between environment, production and demographic pattern of certain less highlighted regions in a broad spectrum under a colonial authority which dominated almost every part of the material world till the end of the first half of the twentieth century. In particular, the devaluation of currency that began in 1873 and continued over the next twenty years increased not only the

burden of Home Charges but also heightened the demand for compensation from the British officers in India. The principal sources of revenue, at the time, were land revenue, excise, salt tax, stamps and opium. Leaving aside the opium revenue, the burden of all these taxes fell on the rural classes in general and the poorer classes in particular.<sup>276</sup> Since the establishment of colonial rule in Bengal and the great famine of 1770, as Sugata Bose has remarked, to the post-colonial conditions of widespread endemic malnutrition and hunger poses all the conceptual problems of an agrarian society depending on a subsistence base which in course of time increasingly got connected to wider economic systems including a capitalist world market.<sup>277</sup> Hence, natural or ecological dislocations and their subsequent impact on the economy or production system during the colonial period were not confined only to the concerned regions but demonstrated an eclectic characteristic formed by their ultimate link with the broader world economic structure, dominated by the British. It is evident from the analysis of the above famine that the colonized people had never been recognized beyond their minimum subsistence level and even though, during the time of scarcities the administration's concern was only to restore that but public health and over-all well-being of the people was never a concern for them. Although the causation of famine had been chiefly and regularly attributed to the shortage of rainfall, but the problem of irrigation or its virtual absence was neither a part of relief operations nor public-works for the administration. Moreover, the contradicted official reports sometime hindered the pace of policy formation. On the other hand, despite of prevalence of widespread distress the official pronouncement of 'famine' came too late to propose any long term development plan which could protect the famine affected areas from such future disasters.

## Notes and References:

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- <sup>3</sup> G. W. Forrest, *The Famine in India*, Horace Cox, London, 1897, p. 16.
- <sup>4</sup> C. W. McMinn, *Famines: Truths, Half-Truths, Untruths*, Calcutta, 1902, p. 39.
- <sup>5</sup> Tirthankar Roy, *The Economic History of India, 1857- 1947*, Oxford University Press, New Delhi, Second Edition, 2009, p. 362.
- <sup>6</sup> Michelle Burge McAlpin, 'Dearth, Famine and Risk: The Changing Impact of Crop Failures in Western India, 1870 – 1920', *Journal of Economic History*, vol. 39, no. 1, March, 1979, p. 145.
- <sup>7</sup> David Arnold, *Famine: Social Crisis and Historical Change*, Oxford, 1988, p. 31.
- <sup>8</sup> Tirthankar Roy, *op. cit.*, p. 361.
- <sup>9</sup> Amartya Sen, *Poverty and Famines: An Essay on Entitlement and Deprivation*, Oxford University Press, New Delhi, Eleventh Impression, 2007, p. 2.
- <sup>10</sup> *Ibid.*, p. 3.
- <sup>11</sup> Vinita Damodaran, 'Famine in Bengal: A Comparison of the 1770 Famine in Bengal and the 1897 Famine in Chhotanagpur,' in Christof Mauch and Christian Pfister (eds.), *Natural Disasters, Cultural Responses: Case Studies toward a Global Environmental History*, Lexington Books, UK, 2009, p. 206.
- <sup>12</sup> Sugata Bose, *The New Cambridge History of India III: 2; Peasant Labour and Colonial Capital: Rural Bengal since 1770*, Cambridge University Press, Cambridge, 1993, p. 4.
- <sup>13</sup> Romesh Dutt, *Indian Famines: Their Causes and Prevention*, P. S. King & Son, London, 1901, p. 5.
- <sup>14</sup> Georgina Brewis, 'Fill Full the Mouth of Famine': Voluntary Action in Famine Relief in India 1896— 1901,' *Modern Asian Studies*, Vol. 44, No. 4 (JULY 2010), p. 888.
- <sup>15</sup> *Ibid.*, p. 907.
- <sup>16</sup> Vinita Damodaran, 'Famine in a Forest Tract: Ecological Change and the Causes of the 1897 Famine in Chotanagpur, Northern India,' in Arun Bandopadhyay (ed.), *Nature Knowledge and Development: Critical Essays on the Environmental History of India*, Primus Books, New Delhi, 2016, pp. 109-142; Nirmal Kumar Mahato, 'Environmental Change and Chronic Famine in Manbhum, Bengal District, 1860-1910,' *Global Environment*, 6, 2011, pp. 68-94.

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<sup>17</sup> C. E. Buckland, *Bengal under the Lieutenant Governors: A Narrative of the Principal Events and Public Measures during Their Periods of Office from 1854 to 1898, Vol. I*, S. K. Lahiri & Co., Calcutta, 1901, p. 555.

<sup>18</sup> In his study, in order to calculate the weights, money and prices Hunter has made these according to his own convenience in the following manner respectively – “To convert the weights ..... multiply the seers by 2 to find the pounds, and the maunds by 82 to find the pounds — i.e., 2 lbs. = 1 *seer* ; 82 lbs. =1 *maund*”, “[A] rupee for all practical purposes in small calculations may be taken as two shillings ; and an anna as three-halfpence, or 1-16th of a rupee”, “[T]he rate of rice is expressed either by so many rupees and annas the maund, or more commonly by so many seers per rupee.” W. W. Hunter, *Famine Aspects of Bengal Districts*, Trubner & CO., London, 1874, p. xii.

<sup>19</sup> *Ibid.*, p. 119.

<sup>20</sup> *Ibid.*, p. 122.

<sup>21</sup> Hunter, W. W., *A Statistical Account of Bengal Vol. VII: Districts of Malda, Dinajpur and Rangpur*, Trubner & CO., London, 1876, pp. 92-3.

<sup>22</sup> W. W. Hunter, *Famine Aspects of Bengal Districts*, p. 115.

<sup>23</sup> B. Chaudhury, ‘Eastern India’, in Daharma Kumar (ed.), *The Cambridge Economic History of India, Vol. II: c. 1757-2003* (henceforth *CEHI*), Orient Blackswan, New Delhi, 2008, p. 160 and 309.

<sup>24</sup> F. W. Strong, *Eastern Bengal District Gazetteers, Dinajpur*, Allahabad, Pioneer Press, 1912, p. 65.

<sup>25</sup> W. W. Hunter, *Famine Aspects of Bengal Districts*, p. 97.

<sup>26</sup> *Ibid.*

<sup>27</sup> *Ibid.*, pp. 97-8. Though Hunter has taken into account the number of population, engaged in agriculture and the people worked as labour in the above mentioned districts as highlighted by the Census of 1872, but he did not show any specific implications of these population statistics during the famine year of 1866.

<sup>28</sup> Amiya Kumar Bagchi and Arun Bandopadhyay, (eds.), *Documents on Economic History of British Rule in India, 1858-1947: Eastern India in the Late Nineteenth Century, Part I: 1860s-1870s*, Manohar, New Delhi, 2009, p. 283.

<sup>29</sup> *Document 10. Annual Report 1873-74: Land Settlements, production and distribution, weather and crops, land revenues of Bengal in Ibid.*, p. 156.

<sup>30</sup> C. E. Buckland, *Bengal under the Lieutenant Governors: A Narrative of the Principal Events and Public Measures during Their Periods of Office from 1854 to 1898, Vol. II*, S. K. Lahiri & Co., Calcutta, 1901, p. 577.

<sup>31</sup> ‘First Special Narrative of the Drought to the 14th November 1873,’ *Special Narratives of the Drought in Bengal and Bihar, 1873-74, Papers*. Bengal Famine, Mss Eur F86/127 : 1874.

<sup>32</sup> *Ibid.*

<sup>33</sup> *Ibid.*

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<sup>34</sup> Sir George Campbell, *Memoirs of My Indian Career, Vol. II*, Macmillan & Co., London, 1893, pp. 320-322.

<sup>35</sup> Richard Temple, *Men and Events of My Time in India*, John Murray, London, 1882, p. 394.

<sup>36</sup> *Second Special Narrative of the Drought from the 15th to the 21st November 1873*, Mss Eur F86/127 : 1874.

<sup>37</sup> *Third Special Narrative of the Drought from the 22nd to the 28th November 1873*, Mss Eur F86/127 : 1874.

<sup>38</sup> Amiya Kumar Bagchi and Arun Bandopadhyay (eds.), *op. cit.*, p. 157.

<sup>39</sup> A. P. MacDonnell, *Report on the Food Grain Supply and Statistical Review of the Relief Operations in the Distressed Districts of Behar and Bengal During the famine of 1873-74* Bengal Secretariat Press, Calcutta, 1876, p. 251.

<sup>40</sup> *Ibid.*, p. 252.

<sup>41</sup> G. E. Lambourn, *Bengal District Gazetteers: Malda*, Bengal Secretariat Book Depot, Calcutta, 1918, p. 51.

<sup>42</sup> A. P. MacDonnell, *op. cit.*, p. 224.

<sup>43</sup> *Ibid.*, p. 225.

<sup>44</sup> *Ibid.*

<sup>45</sup> F. W. Strong, *op. cit.*, p. 66.

<sup>46</sup> *Ibid.*

<sup>47</sup> Ratnalekha Ray, *Change in Bengal Agrarian Society c. 1760-1850*, Manohar, New Delhi, 1979, p. 197.

<sup>48</sup> *Ibid.*

<sup>49</sup> B. Chaudhury, *op. cit.*, p. 304.

<sup>50</sup> The condition of the distressed group, who formed 35 per cent of the agricultural labour population, as recorded by Dass, had no land or implement of their own and they survived by the *bhagai* or *batai* (a very negligible part of the produce) i.e. on others' mercy. Gopal Chandra Dass, *Report of the Statistics of Rangpur for the year, 1872-73* (Calcutta, 1874), p. 85.

<sup>51</sup> B. Chaudhury, *op. cit.*, p. 305.

<sup>52</sup> Asoke Sen and Others, *Perspective in Social Science Vol.2: Three Studies on the Agrarian Structure in Bengal, 1850-1947*, Calcutta, 1982, p. 31.

<sup>53</sup> A. P. MacDonnell, *op. cit.*, p. 234.

<sup>54</sup> *Ibid.* p. 237.

<sup>55</sup> *Ibid.*

<sup>56</sup> *Ibid.* p. 238.

<sup>57</sup> *Ibid.* p. 239. The grain import had shattered because of induced rice of prices in Assam and Cooch Behar which resisted export of rice from these areas and on the other hand there was a joint effort of local grain dealers to boost up prices to an extreme point. p. 240.

<sup>58</sup> *Glazier's Further Notes on the Rangpur Records*, p. 48 cited in J. A. Vas, *Eastern Bengal and Assam District Gazetteers ; Rangpur*, Pioneer Press, Allahabad, 1911, p. 71.

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- <sup>59</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VII*, p. 299.
- <sup>60</sup> A. P. MacDonnell, *op. cit.*, p. 241.
- <sup>61</sup> *Ibid.* p. 243.
- <sup>62</sup> George Campbell, *op. cit.*, p. 322.
- <sup>63</sup> *Ibid.*
- <sup>64</sup> *Ibid.*, p. 323.
- <sup>65</sup> Richard Temple, *op. cit.*, p. 402.
- <sup>66</sup> *Document 11. Annual Report 1874-75: weather crops and prices in Bengal, meeting of food deficiency, effect of the rain on crops, floods in the northern districts* in Amiya Kumar Bagchi, and Arun Bandopadhyay (eds.), *op. cit.*, p. 173.
- <sup>67</sup> *Fifth Special Narrative of the Drought from the 6th to the 12th December 1873*, Mss Eur F86/127: 1874.
- <sup>68</sup> *Ibid.*
- <sup>69</sup> *Sixth Special Narrative of the Drought from the 13th to the 18th December 1873*, MSS EUR F86/127: 1874.
- <sup>70</sup> *Ibid.*
- <sup>71</sup> The terms offered were a three year's agreement on wages, of which the minimum was guaranteed to be, for men, Rs. 10 each; for women, Rs. 6; and for children of between 10 and 16 years of age, Rs. 3. A superintendent of State Emigration had been appointed, and instructions had been given to the district officers to make the terms widely known not only to labourers but to influential local men, who were invited to assist in including emigrants to come forward. *Tenth Special Narrative of the Drought from the 23<sup>rd</sup> January to the 4<sup>th</sup> February 1874*, MSS EUR F86/127: 1874.
- <sup>72</sup> Aged, sick, and infirm people would not be sent 'unless their infirmity [was] one temporarily caused by privation, and likely to pass away with proper care.' The experiment would be, as it was hoped, proved advantageous to British Burma, where the demand for labourers and colonists was nearly increasing. *Ibid.*
- <sup>73</sup> The average rainfall of the four years 1871-74 had been 73.89 inches, the rainfall of 1865 was 80.2, and that of 1873, 37. 13 or 47 inches less than the normal fall. J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, Pioneer Press, Allahabad, 1910, p. 75.
- <sup>74</sup> *Ibid.*
- <sup>75</sup> *Ibid.*, p. 76.

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<sup>76</sup> *Ibid.*

<sup>77</sup> W. W. Hunter, *A Statistical Account of Bengal, Vol. VIII: Districts of Rajshahi and Bogra*, Trubner & Co., London, 1876, p. 253.

<sup>78</sup> *Ibid.*

<sup>79</sup> The thanas of Adamdighi, Badalgachhi, and the south-west of Bogra had witnessed a good crops whereas the thanas of Khetlal and Panchbibi had been provided with ‘bad account of the crops’ because ‘in these parts the people had not been able to effect irrigation. *Ibid.*, p. 254.

<sup>80</sup> *Ibid.*

<sup>81</sup> *Ibid.*, p. 256.

<sup>82</sup> J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, p. 77 and 75.

<sup>83</sup> *Seventh Special Narrative of the Drought from the 19th to the 31st December, 1873*, MSS EUR F86/127: 1874.

<sup>84</sup> A very small amount of rice was exported to Bihar by this route and the figures of this upward trade past Sahebganj were, for the period between the 1st November and the 23rd December, pulses 1,05,000 maunds, and rice 88,000 maunds. *Ibid.*

<sup>85</sup> *Ibid.*

<sup>86</sup> *Ibid.*

<sup>87</sup> Grain was sent by the Eastern Bengal Railway to Koosthea, from there it was taken by Government steamer and flat and dropped at Dhaparee, Rampur Boalia, and Godagaree. From Godagaree it was carried by boat to Malda and Raiganj; from Malda and other parts on the Mahanadi it moved by cart to Gazole; and from Raiganj the Khurba depot was supplied. *Ibid.*

<sup>88</sup> *Ibid.*

<sup>89</sup> The average rainfall in the Nator subdivision was 61 inches annually, but in 1873 only 43 inches had fell; and in Sadar subdivision there was a deficiency of 27 inches in a normal fall of 59 inches. Out of the normal fall of 18 inches in September and October in Nator, only 6 inches fell in 1873; while in Sadar subdivision the normal fall during those months, had fell short by 13 inches. L. S. S. O’Malley, *Bengal District Gazetteers: Rajshahi*, Bengal Secretariat Book Depot, Calcutta, 1916, pp. 89-90.

<sup>90</sup> In general throughout the district the *aus* or autumn crop was one-half or 8 *annas*, and the *aman* or winter crop was 6 *annas* or three eights of an average crop. *Ibid.*, p. 90.

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<sup>91</sup> Though there was no report for any deaths caused by starvation, the Collector argued, as it was believed, that ‘had it not been for the relief afforded, there would have been many deaths from starvation.’ *Ibid.*

<sup>92</sup> *Ibid.*

<sup>93</sup> L. S. S. O’Malley, *Bengal District Gazetteers: Pabna*, The Bengal Secretariat Book Depot, Calcutta, 1923, p. 45.

<sup>94</sup> Hunter had, however, praised the transformation and he was of the opinion that ‘the jute might succeed when the rice failed, and the rayat would then have something wherewith to purchase food.’ W. W. Hunter, *A Statistical Account of Bengal, Vol. IX: Murshidabad and Pabna*, Trubner & Co., London, p. 328.

<sup>95</sup> The total cost of the charitable relief in 1874 was Rs. 83,000; and the amount spent on roads and relief works was Rs. 28, 000. Apart from these Rs. 76, 000 was spent on money and grain as advance to the cultivators through their landlords, ‘from whom security was taken for the repayment of the loans.’ L. S. S. O’Malley, *Bengal District Gazetteers: Pabna*, p. 45.

<sup>96</sup> *Eighth Special Narrative of the Draught from the 1<sup>st</sup> to the 15<sup>th</sup> January 1874*, MSS EUR F86/127: 1874.

<sup>97</sup> *Tenth Special Narrative of the Drought from the 23<sup>rd</sup> January to the 4<sup>th</sup> February 1874*, MSS EUR F86/127: 1874.

<sup>98</sup> *Ibid.*

<sup>99</sup> *Ibid.*

<sup>100</sup> *Eleventh Special Narrative of the Drought from the 5<sup>th</sup> to the 19<sup>th</sup> February 1874*, MSS EUR F86/127: 1874.

<sup>101</sup> *Twelfth Special Narrative of the Drought from the 20th February to the 15th March 1874*, MSS EUR F86/127: 1874.

<sup>102</sup> *Ibid.*

<sup>103</sup> *Ibid.*

<sup>104</sup> *Thirteenth Special Narrative of the Drought from the 6th to the 19th March 1874*, MSS EUR F86/127: 1874.

<sup>105</sup> *Ibid.*

<sup>106</sup> *Ibid.*

<sup>107</sup> The Engineer-in-Chief was very anxious to complete the railway bank from Jalpaiguri down to the Ganges this season, and he had arranged to import labourers from other

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distressed districts. The Magistrate of Bogra also had also been instructed to send over for work-upon the railway any distressed people of his district who might be willing to take work away from their homes. *Fourteenth Special Narrative of the Drought from the 20th March to the 2nd April 1874*, MSS EUR F86/127: 1874.

<sup>108</sup> *Ibid.*

<sup>109</sup> *Fifteenth Special Narrative of the Drought from the 3rd to the 16th April, 1874*, MSS EUR F86/127: 1874.

<sup>110</sup> *Twentieth Special Narrative of the Drought from the 12th to the 25th June 1874*, MSS EUR F86/127: 1874.

<sup>111</sup> *Ibid.*

<sup>112</sup> Cited in C. E. Buckland, *op. cit.*, Vol. I, pp. 556-557.

<sup>113</sup> “The famine area was estimated at 40,000 sq: miles, and the population affected at 17 millions. Of these 735,000 were employed on works for 9 months, 450,000 received gratuitous relief daily for 6 months, and 3,200,000 bought grain at low rates enough to support them for 7 months, or received advances of grain or cash, large part of which was repaid to the Government.” *Ibid.*, p. 557.

<sup>114</sup> George Campbell, *op. cit.*, p. 328.

<sup>115</sup> Richard Temple, *op. cit.*, p. 396.

<sup>116</sup> This system was mostly prevailed in Bihar where indigo was not managed on usual mercantile principles, rather they had received estates from zamindars who leased out lands to the planters. The planters through this process enjoyed some feudal power which had been exercised to get the carts and bullocks of the ryots at the planters’ disposal for the carriage of indigo and other purposes. Now these carts and bullocks were exercised for carrying the grains to the distressed districts upon terms very advantageous to themselves. There was no doubt that the terms of their contracts had provided them with the increased rates from the Government rates which was enormously in excess of those which they paid the ryots. George Campbell, *op. cit.*, Vol. I, p. 329.

<sup>117</sup> It was argued that in dealing with the Parliamentary returns called for and since the funds were supplied by a Native State, therefore, the returns should be drawn up for the whole district as a whole, by treating the Cooch Behar expenditure as a contribution to the Government treasury. Finally it was concluded that the work was wholly done by Government officers or under their orders. From Sir W. J. Herschel, Bart., Commissioner of the Cooch Behar Division, to the Officiating Secretary to the Government of Bengal, Scarcity and Relief Department. – (No. 420 – S.R., dated Julpigoree, the 14th November 1874), prog no. 34, *Proceedings of the Lieutenant-Governor of Bengal. Scarcity and Relief department, Calcutta, January 1875*, West Bengal State Archives (Henceforth WBSA).

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<sup>118</sup> *Ibid.*

<sup>119</sup> John F. Gruning, *Eastern Bengal and Assam District Gazetteers: Jalpaiguri*, Pioneer Press, Allahabad, 1911, p. 79.

<sup>120</sup> He further stated that 'in case, where advances have been made direct, and where the zemindars have not stood security for repayment, it may be best to realise through such zemindars as may tender their services, and may be trusted not to realise more than is due.' From the Officiating Secretary to the Government of Bengal, Scarcity and Relief Department, to the Relief Commissioner of Dinagepore. – (No. 6860 – S.R., dated Calcutta, the 30th November 1874), progs. no. 21, *Proceedings of the Lieutenant-Governor of Bengal. Scarcity and Relief department, Calcutta, January 1875*, WBSA.

<sup>121</sup> *Ibid.*

<sup>122</sup> The realization of advances was declared to be collected as soon as possible and the instalments were also to be collected during this first six months. *Ibid.*

<sup>123</sup> From A.C. Brett, EsQ., Joint-Magistrate, in charge of the Dinagepore Magistracy, to the Officiating Secretary Government of Bengal, Scarcity and Relief Department. – (No. 2109 – S.R., dated Dinagepore, the 14th December 1874), progs. no. 116, *Proceedings of the Lieutenant-Governor of Bengal. Scarcity and Relief department, Calcutta, January 1875*, WBSA.

<sup>124</sup> From W. LeF. Robinson, EsQ., Relief Commissioner of the Rajshahye Division, to the Officiating Secretary to the Government of Bengal, Scarcity and Relief Department. – (No. 2411, dated Dinagepore, the 21st December 1874), progs. no. 22, *Proceedings of the Lieutenant-Governor of Bengal. Scarcity and Relief department, Calcutta, January 1875*, WBSA.

<sup>125</sup> From F. Wyer, EsQ., Magistrate-Collector of Maldah, to the Officiating Secretary Government of Bengal, Scarcity and Relief Department. – (No. 694, dated Maldah, the 14<sup>th</sup> December 1874), progs. no. 117, *Proceedings of the Lieutenant-Governor of Bengal. Scarcity and Relief department, Calcutta, January 1875*, WBSA.

<sup>126</sup> *Ibid.*

<sup>127</sup> From W. LeF. Robinson, EsQ., Relief Commissioner of the Rajshahye Division, to the Officiating Secretary to the Government of Bengal, Scarcity and Relief Department. – (No. 2411, dated Dinagepore, the 21st December 1874), progs. no. 22, WBSA.

<sup>128</sup> Moreover, he was of the opinion that though in some parts of the country there was in fact no other harvest, but in some portions where there were cold-weather crops a second instalment, be fairly asked for in April, after what was called here the *chitali* harvest, i.e., all cold-weather crops had been gathered. *Ibid.*

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<sup>129</sup> From R. Knight, the Assistant Secretary to the Government of Bengal to the Relief Commissioner of the Rajshahye. - (No. 7286, dated Calcutta, the 30th December 1874), progs. no. 23, *Proceedings of the Lieutenant-Governor of Bengal. Scarcity and Relief department, Calcutta, January 1875*, WBSA.

<sup>130</sup> C. E. Buckland, *op. cit.*, vol. II. p. 577.

<sup>131</sup> *Ibid.* p. 582.

<sup>132</sup> Malavika Chakrabarty, *Famine of 1896-97 in Bengal: The Availability or Entitlement Crisis*, Orient Blackswan, New Delhi, 2004, p. 232.

<sup>133</sup> For example, mention can be made of Jalpaiguri, where prices of rice would never have reached to 8 or 6 seers for the rupee by May 1874, but for the exceptional rate of exports by traders coming in from Purnea, Rangpur, Dinajpur and Darjeeling. *Ibid.* p. 234.

<sup>134</sup> *Report of the Indian Famine Commission*, Calcutta, 1901, p. 2.

<sup>135</sup> C. E. Buckland, *op. cit.* Vol. I, p. 566.

<sup>136</sup> Richard Temple, *op. cit.*, p. 405.

<sup>137</sup> *Ibid.*, p. 393.

<sup>138</sup> Romesh Dutt, *op. cit.*, p. 1.

<sup>139</sup> 'Census of Bengal, 1881', *Journal of the Statistical Society of London*, vol. 46, No. 4 (Dec., 1883), p. 682.

<sup>140</sup> *Document 12. Annual Report 1875-76: Weather, crops, and Prices of Bengal* in Amiya Kumar Bagchi, and Arun Bandopadhyay, *op. cit.*, p. 177 and 180.

<sup>141</sup> *Ibid.*, p.180.

<sup>142</sup> *Ibid.* p. 181

<sup>143</sup> *Report of the Indian Famine Commission, 1898*, Government Central Printing Office, Simla, 1898, p. 9

<sup>144</sup> *Ibid.*

<sup>145</sup> *Ibid.*, p. 11.

<sup>146</sup> F. W. Strong, *op. cit.*, p. 67.

<sup>147</sup> *Report of the Indian Famine Commission, 1898*, p. 27.

<sup>148</sup> *Ibid.*, pp. 27-28.

<sup>149</sup> *Ibid.*, p. 28.

<sup>150</sup> F. W. Strong, *op. cit.*, p. 67 and *Report of the Indian Famine Commission, 1898*, p. 28.

<sup>151</sup> Labourers in class 'a' received the full ration wage of the code on performing a given quantity of work, and a corresponding smaller wage if they failed to complete it. They were

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not permitted to earn more than the full ration wage, nor was any minimum wage secured to them. Labourers in class 'b' were required to do a fair task for people of their calibre for a  $\frac{3}{4}$ th wage. If they did less they were fined, but never received less than the minimum wage. Persons in class 'c' were encouraged to do what they could, but their work was not measured, and they received the minimum wage. Ibid., p. 29.

<sup>152</sup> T. W. Holderness, *Narrative of the Famine in India in 1896-97*, Government Central Printing Office, Simla, 1897, p. 1.

<sup>153</sup> Malavika Chakrabarty, *op. cit.*, p. 296.

<sup>154</sup> C. E. Buckland, *op. cit.*, vol. II, p. 988.

<sup>155</sup> *Ibid.*

<sup>156</sup> Malavika Chakrabarty, *op. cit.*, p. 304 and 305.

<sup>157</sup> For details see Lance Brennan, Les Heathcote, and Anton Lucas, 'The Causation of Famine: A Comparative Analyses of Lombok and Bengal, 1891-1974,' *South Asia*, Vol. 7, no. 1 (1984): 1-26.

<sup>158</sup> C. E. Buckland, *op. cit.*, vol. II, p. 990.

<sup>159</sup> *Report of the Indian Famine Commission, 1898*, p. 65.

<sup>160</sup> Vinita Damodaran, 'Famine in a Forest Tract,' p. 129.

<sup>161</sup> *Ibid.*, p. 131.

<sup>162</sup> Almost 250,000 tribals were recruited in the tea gardens of Assam from Chhotanagpur. For details see Sanjukta Das Gupta, Accessing Nature: Agrarian Change, Forest Laws and their Impact on an Adivasi Economy in Colonial India, in Arun Bandopadhyay (ed.), *Nature Knowledge and Development: Critical Essays on the Environmental History of India*, Primus Books, New Delhi, 2016, pp. 98-99.

<sup>163</sup> Michael Mann, 'Forestry and Famine in the Chambal-Jamna Doab, 1879-1919,' in Mahesh Rangarajan and K. Sivaramakrishnan (eds.), *India's Environmental History, Vol. 2: Colonialism, Modernity, and the Nation*, Permanent Black, Ranikhet, 2014, p. 445.

<sup>164</sup> 'One hundred and forty-two applications for loans under the Agriculturists' Loans Act were received, and Rs. 1,991 were lent to the applicants in 27 cases.' J. N. Gupta, *District Gazetteers of Eastern Bengal and Assam: Bogra*, p. 78.

<sup>165</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Murshidabad*, Bengal Secretariat Book Depot, Calcutta, 1914, p. 112.

<sup>166</sup> . In 1896 there was an early cessation of the rains, and due to prevalence of low rivers a small portion of the Kalantar was flooded which was resulted in an almost complete failure of the rice crop over a portion of the Kalantar and a partial failure in the Barh. Due to this rain,

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the outturn of winter rice in the Karh was about 9 *annas*, but the average outturn for the district did not exceed 7 *annas*. *Ibid*.

<sup>167</sup> *Ibid.*, p. 113.

<sup>168</sup> . The closing of several of the silk filatures in the Barwa and Bharatpur thanas also deprived numbers of labourers of employment at a time when it was most needed. *Ibid*.

<sup>169</sup> During the end of July when the prospects of the *aus* crop seemed good the relief operations were gradually relaxed and by the end of August when the new *aus* came into the market, prices began to fall, and the Government found it necessary to discontinue the relief works. *Ibid*.

<sup>170</sup> *Ibid.*, p. 114.

<sup>171</sup> The average rainfall for the district was only 4 *annas*. L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 91.

<sup>172</sup> *Ibid*.

<sup>173</sup> The Collector of the district had estimated the outturn of the *aus* paddy as 8 *annas* and for *aman* paddy as  $6\frac{2}{3}$  *annas* – viz., 2 to 4 *annas* in the Gangetic tract, 6 to 8 *annas* in the Barind, and 8 to 12 *annas* in the Barind area. The Commissioner had provided a different account of the outturn – 4 *annas* for the Gangetic tract, 8 *annas* for the Barind, and 12 *annas* for the Bils. *Ibid*.

<sup>174</sup> Malabika Chakrabarti, *op. cit.*, p. 387.

<sup>175</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Rajshahi*, p. 91.

<sup>176</sup> *Ibid.*, p. 92.

<sup>177</sup> *Ibid*.

<sup>178</sup> (No. 125Met., dated Darjeeling, the 16<sup>th</sup> April 1897), progs. no. 26-27, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part I), WBSA.

<sup>179</sup> Resolution on the Rajshahi Report, under the section 13 of the Famine Code, for the half-month ending on the 17th April 1897. Memorandum by P. Nolan, EsQ., Commissioner of the Rajshahi Division. – (No. 88Met., dated Darjeeling, the 22nd April 1897), progs no. 391-392, File No. 2-S/11 – 13, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>180</sup> *Ibid*.

<sup>181</sup> *Ibid*.

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<sup>182</sup> From N. K. Bose., EsQ., Collector of Rajshahi, to the Commissioner of the Rajshahi Division. – (No. 228G., dated Rampur Boalia, the 19<sup>th</sup> April 1897), *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>183</sup> *Ibid.*

<sup>184</sup> *Ibid.*

<sup>185</sup> Malabika Chakrabarti, *op. cit.*, pp. 314-315.

<sup>186</sup> Vinita Damodaran, 'Gender, Forests and Famine in 19<sup>th</sup>-Century Chotanagpur, India,' *Indian Journal of Gender Studies*, 9:2, 2002, p. 139.

<sup>187</sup> Bina Agarwal, 'Gender, Environment, and Poverty Interlinks: Regional Variations and Temporal Shifts in Rural India, 1971-1991,' in Mahesh Rangarajan and K. Sivaramakrishnan (eds.), *India's Environmental History, Vol. 2: Colonialism, Modernity, and the Nation*, Permanent Black, Ranikhet, 2014, pp. 460-461.

<sup>188</sup> Women health was also an important issue in analysing the issues on infant mortality which was chiefly relied on 'prenatal exposure' and 'postnatal exposure', when the former depends on 'maternal nutritional stress and associated material infections' whereas the later is related with the 'infants' own nutritional deficiency, poor care etc.' For details see Arup Maharatna, 'Infant and Child Mortality during Famines in Late 19th and Early 20th Century India,' *Economic and Political Weekly*, Vol. 31, No. 27 (Jul. 6, 1996), pp. 1774-1775.

<sup>189</sup> [Proceedings No. 431-432.] Commissioner's remark on the Pabna Famine Report under section 13 of the Code for the fortnight ending on the 15th July 1897, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part III), WBSA.

<sup>190</sup> From C. A. Radice, EsQ., Officiating Collector of Pabna, to the Commissioner of the Rajshahi Division. (No. 730G., dated Pabna, the 18th July 1897), *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part III), WBSA.

<sup>191</sup> *Ibid.*

<sup>192</sup> *Ibid.*

<sup>193</sup> *Ibid.*

<sup>194</sup> Vinita Damodaran, *Gender, Forest and Famine...*, pp. 154-155.

<sup>195</sup> Malabika Chakrabarti, *op. cit.*, pp. 389-390.

<sup>196</sup> *Ibid.*, p. 390.

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<sup>197</sup> From W. Maude, EsQ., the Collector of Pabna to the Commissioner of the Rajshahi Division, dated Pabna, the 19<sup>th</sup> April 1897), progs. no. 393-94, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>198</sup> *Ibid.*

<sup>199</sup> R. W. Carlyle, 'Famine Administration in a Bengal District in 1896-7,' *The Economic Journal*, Vol. 10, No. 39 (Sep., 1900), p. 425.

<sup>200</sup> [Proceedings No. 395] From M. Finucane, EsQ., Secretary to the Government of Bengal, Revenue Department, to the Commissioner of the Rajshahi Division. – (No. 75T.R. – Fam., dated Darjeeling, the 29<sup>th</sup> April 1897), progs. no. 395, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>201</sup> *Ibid.*

<sup>202</sup> *Ibid.*

<sup>203</sup> From the Hon'ble A. M. Bose., President of the Indian Association, to the Secretary of the Government of Bengal, Revenue Department. – (No. 28., dated Calcutta, the 24<sup>th</sup> April 1897), progs. no. 396, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>204</sup> From Rai Raj Kumar Sarvadhikary, Bahadur, Secretary, British Indian Association, to the Secretary of the Government of Bengal, Revenue Department. – (No. 251, dated Calcutta, the 14<sup>th</sup> May 1897), progs. no. 397-98, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>205</sup> From W. Maude, EsQ., I.C.S., Collector of Pabna, to the Commissioner of the Rajshahi Division. – (No. 334G., dated Pabna, the 18th May 1897), progs. no. 399-400, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>206</sup> *Ibid.*

<sup>207</sup> *Ibid.*

<sup>208</sup> From E. N. Baker, EsQ., C.S., Honorary Secretary, Bengal Branch, Indian Famine Charitable Relief Fund, to the Commissioner of the Rajshahi Division. – (No. 314, dated Calcutta, the 31<sup>st</sup> March 1897), *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>209</sup> *Ibid.*

<sup>210</sup> In November 1896, the mahajans had increased prices through the exportation of large stocks in Pabna, Bogra, the Santal Parganas, Hazaribagh and Singhbhum, but on the other

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hand in Cuttack, Puri and north Bihar majajans had retain their stocks ‘in the hope of a further price rice.’ Malabika Chakrabarti, *op. cit.*, p. 359.

<sup>211</sup> *Ibid.*

<sup>212</sup> From E. N. Baker, EsQ., C.S., Honorary Secretary, Bengal Branch, Indian Famine Charitable Relief Fund, to the Commissioner of the Rajshahi Division. – (No. 314, dated Calcutta, the 31<sup>st</sup> March 1897).

<sup>213</sup> From N. K. Bose, EsQ., Magistrate of Rajshahi, to the Commissioner of the Rajshahi Division. – (No. 190J., dated Boalia, the 30th April 1897), *Proceedings of the Hon’ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>214</sup> *Ibid.*

<sup>215</sup> Commissioner’s resolution on the Pabna report under section 13 of the Famine Code for the fortnight ending 30th April 1897, progs. no. 403-404, *Proceedings of the Hon’ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>216</sup> From W. Maude, EsQ., Collector of Pabna, to the Commissioner of the Rajshahi Division. (No. 245G., dated Pabna, the 3rd May 1897), *Proceedings of the Hon’ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>217</sup> *Ibid.*

<sup>218</sup> From N. K. Bose, EsQ., Collector of Rajshahi, to the Commissioner of the Rajshahi Division. – (No. 400G., dated Rampur Boalia, the 3rd May 1897), progs. no. 405-406, *Proceedings of the Hon’ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>219</sup> *Ibid.*

<sup>220</sup> *Ibid.*

<sup>221</sup> *Ibid.*

<sup>222</sup> Commissioner’s remarks on the Rajshahi Report under section 13 of the Famine Code, for the fortnight ending the 15th May 1897, progs no. 407-408, *Proceedings of the Hon’ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>223</sup> *Ibid.*

<sup>224</sup> *Ibid.*

<sup>225</sup> Malavika Chakrabarty, *op. cit.*, p. 350.

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<sup>226</sup> From N. K. Bose, EsQ., Collector of Rajshahi, to the Commissioner of the Rajshahi Division. – (No. 586G., dated Rampur Boalia, the 17th May 1897), *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>227</sup> *Ibid.*

<sup>228</sup> *Ibid.*

<sup>229</sup> Commissioner's resolution on the Rajshahi Report under section 13 of the Famine Code, for the fortnight ending the 31st May 1897, progs no. 412-413, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>230</sup> *Ibid.*

<sup>231</sup> Commissioner's remark on the report under section 13 of the Famine Code from the Collector of Pabna District for the fortnight ending the 31st May 1897, progs. no. 414-415, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>232</sup> From M. Finucane, EsQ., the Secretary to the Government of Bengal, to the Commissioner of the Rajshahi Division. – (Agriculture. – No. 138 T.R/(Fam), dated Darjeeling, the 4<sup>th</sup> May 1897) [File No. 3-B/6.3.], progs. no. 29, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part I), WBSA.

<sup>233</sup> *Ibid.*

<sup>234</sup> *Ibid.*

<sup>235</sup> From N. K. Bose, EsQ., Collector of Rajshahi to the Commissioner of the Rajshahi Division. – (No. 754G., dated Rampur Boalia, the 2nd June 1897), *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>236</sup> *Ibid.*

<sup>237</sup> From W. Maude, EsQ., Collector of Pabna, to the Commissioner of the Rajshahi Division. – ( No. 424G., dated Pabna, the 3<sup>rd</sup> June 1897.), *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>238</sup> *Ibid.*

<sup>239</sup> *Ibid.*

<sup>240</sup> The 'correct' figures for column 3 of the statement regarding the average death-rate, as started by Nolan, would be February - 1.98, March – 2.35, April, 3.65, May, 2.70. From P.

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Nolan, EsQ., Commissioner of the Rajshahi Division, to the Secretary to the Government of Bengal, Revenue Department . (No. 574Met., dated Darjeeling, the 30<sup>th</sup> June 1897), progs. no. 417-418, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part II), WBSA.

<sup>241</sup> From M. Finucane, EsQ., Secretary to the Government of Bengal, to the Commissioner of the Rajshahi Division. – (Agriculture – No. 461 T. R. /Fam., dated Darjeeling, the 31st May 1897), progs. no. 34, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part I), WBSA.

<sup>242</sup> *Ibid.*

<sup>243</sup> Malavik Chakrabarti, *op. cit.*, p. 433.

<sup>244</sup> Since 'the estimated average cost of relieving each individual appear[ed] to be high, being in the case of relief workers equal to the maximum wage laid down in the Famine Code [therefore] in future the estimates should be framed on the basis of the numbers of individuals, men, women, and children, to be relieved, as [was] done in other Divisions.' From M. Finucane, EsQ., Secretary to the Government of Bengal, to the Commissioner of the Rajshahi Division. – (Agriculture – No. 461 T. R. /Fam., dated Darjeeling, the 31st May 1897), progs. no. 34, WBSA.

<sup>245</sup> (No. 1452 (Fam.), dated Calcutta, the 24th July 1897, progs. no. 40, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part I), WBSA.

<sup>246</sup> *Ibid.*

<sup>247</sup> From C. A. Radice, EsQ., Officiating Collector of Pabna, to the Commissioner of the Rajshahi Division. (No. 730G., dated Pabna, the 18th July 1897), WBSA.

<sup>248</sup> Malavika Chakrabarty, *op. cit.*, p. 381.

<sup>249</sup> *Ibid.*

<sup>250</sup> From M. Finucane, EsQ., Secretary to the Government of Bengal, to the Secretary to the Board of Revenue, Land Revenue Department. – (Agriculture – No. 5610 Agri., dated Calcutta, the 31st December 1896), progs. no. 42-43, *Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897* – Revenue Department. (Part I), WBSA.

<sup>251</sup> In Bihar for digging tanks acre should be taken especially from the areas which were selected and approved by the officers of Government with due regard to level, so that it might be possible to connect those tanks with rivers by pynes or channels, and thus to open them flushed with water when required, and so made permanently useful for purposes of irrigation and consequent prevention or mitigation of future scarcities from drought. *Ibid.*

<sup>252</sup> *Ibid.*

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<sup>253</sup> In order to solve this problem, the Lieutenant Governor had followed the precedent of 1873-74, when Government agreed to defray up to one-third of the cost of village relief works (paragraph 70, page 131, Part III of the Report of the Indian Famine Commission). *Ibid.*

<sup>254</sup> *Ibid.*

<sup>255</sup> Notification No. 69, *Modified Rules under the Land Improvement Loans Act, XIX of 1883, for tracts affected by scarcity or famine*, progs no. 46, File No. 3A/9-5, Proceedings of the Hon'ble the Lieutenant Governor of Bengal during August 1897 – Revenue Department. (Part I), WBSA.

<sup>256</sup> *Report of the Indian Famine Commission, 1898*, p. 47.

<sup>257</sup> *Ibid.*, p. 67.

<sup>258</sup> *Report of the India Famine Commission 1901*, Office of the Superintendent of Government Printing, 1901, p. 44.

<sup>259</sup> L. S. S. O'Malley, *Bengal District Gazetteer: Rajshahi*, p. 67.

<sup>260</sup> L. S. S. O'Malley, *Bengal District Gazetteers: Pabna*, pp. 39-40.

<sup>261</sup> F. W. Strong, *op. cit.*, p. 67.

<sup>262</sup> *Ibid.*

<sup>263</sup> J. A. Vas, *op. cit.*, p. 72.

<sup>264</sup> *Ibid.*

<sup>265</sup> L. S. S. O'Malley, *Bengal District Gazetteer: Rajshahi*, p. 92

<sup>266</sup> F. W. Strong, *op. cit.*, p. 67.

<sup>267</sup> In the *khia*r tracts where the raiyats had practically only one crop (winter rice) to depend on, the sales were not so extensive, and even where stocks had been sold the money was not wasted. However, the circumstances were different in the *pali* area where, the raiyats with their extreme seriousness invested all their money and as a result the subsequent coming failure of successive crops left them without food-grain or money. *Ibid.*

<sup>268</sup> *Ibid.*, p. 68.

<sup>269</sup> *Ibid.*

<sup>270</sup> J. A. Vas, *op. cit.*, p. 72.

<sup>271</sup> *Ibid.*, pp. 72-73.

<sup>272</sup> *Ibid.*, p. 73.

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<sup>273</sup> Since 1871 the increasing necessity of the improvement of the communication system was surfaced on the official circle in order to efficiently meet the agricultural distress. The improvement in the roads and railway communication, it was anticipated, would 'facilitate both import of food supplies and migration.' People were, however, criticized on account of not having the 'habits of thrift and Postal Savings Bank and Co-operative Credit Societies. *Ibid.*

<sup>274</sup> L. S. S. O'Malley, *Bengal District Gazeetter: Rajshahi*, p. 92.

<sup>275</sup> Mike Davis, *Late Victorian Holocausts: El Nino Famines and the Making of the Third World*, Verso, London, 2001.

<sup>276</sup> B. M. Bhatia, *Famines in India: A Study in Some Aspects of the Economic History of India, 1860-1945*, Asia Publishing House, Bombay, 1968, p. 22.

<sup>277</sup> Sugata Bose, *op. cit.*, p. 4.

## Conclusion

The study has portrayed a chequered history of natural disasters in colonial north Bengal with an aim to provide a social dimension of the disasters when human vulnerability had been intensified to such an extent that governmental and private charity also fell short. The day to day survival of the victims of the disasters had demonstrated a complex continuation of mutual cooperation and conflict between the distressed, market and administration where 'entitlement' and survival had been redefined in accordance with the ability of the distressed to cope with the calamities and duration of recovery which was further depended on the deteriorating condition of public health and altered market system. During and after the time of disasters when reliefs were administered by the Government, which introduced a method of test-work as a means to distribute relief was hardly concerned about the physical conditions of the 'workers' who had been already famished and weakened by the prolonged starvation and homelessness. Thus recovery from the distress and restoration of pre-disaster order amounted to a long and complex chain of events which sought for not only the material mitigation of the distressed through the allocation of limited 'relief' and 'charity' but to establish and consolidate the 'morale' of the victims. This would have been possible only through the demonstration of sympathetic attitude and fellow feelings. The colonial endeavours of relief had lacked the both, rather displayed an attitude of superiority and 'governance' while proposing and executing any remedial measure.

Sometimes the contradictory official reports had prevented the administration in collection of accurate information, which obstructed the formation of any comprehensive policy to mitigate the disasters. The victims of cyclones and earthquakes had received little support from the Government in the name of 'relief', which had been justified by the administration by blaming the 'nature' itself which had destroyed and impaired the governmental machinery to undertake any effort to rescue the victims. On the other hand the official pronouncement of famine resulting from drought had come very late untill there was any death or severe crisis of retaining life. The government did not feel the necessity to declare famine which was caused by the floods.

Although floods had carried away many lives and caused serious damage to the property but there was hardly any initiative taken by the administration to elevate the condition of people. During the severe floods large scale destruction of crops had been taken place when the food-prices had raised upto the famine prices and in many places famine condition were prevailing. But there was neither any official pronouncement regarding famine nor any initiatives had been undertaken by the government to regulate market or trade during the period of floods.

It is evident from the above chapters that rivers of northern Bengal had gone through considerable changes since the eighteenth century. The riverine transformation in terms of change of course and opening of new *char* lands had not only introduced changes in the ecological system but had also brought out significant changes in the agrarian and demographic profile of the region. The natural diversion of the rivers induced by the quantity of rainfall had been substantiated (or more appropriately) distorted by the human interference in form of railways and embankments. The consequent rise and fall of water in the rivers had made themselves vulnerable for the poor's who resided on the banks of the rivers for their day to day survival. It has already been shown that the moribund rivers or deltas had contributed to the deterioration of public health and agriculture. By the end of the first half of the twentieth century the majority of the rivers of northern Bengal had lost their earlier flow and velocity. The floods and change of river course had complemented to each other in this direction, because sometimes floods induced the change of river courses due to sudden increase of water resulting from unprecedented quantity of rainfall and sometimes this increased amount of water found a new way to move further towards a more open spaces. But increasing numbers of population over the centuries and successive civilizational hazards were also instrumental in causing a river to die or reappear with full fury, none of which was favourable for human settlement. The dying force of rivers had appeared as a great obstacle for navigating the relief-boats which were carrying food grains for the famine victims. It had been admitted several times by the colonial administration that swallowing of river beds and decreasing quantity of water had acted as a chief hindrance to the movement of relief -boats in the interior of the villages. Although the famines caused by prolonged drought did exhibit a saga of human negligence of restoring rain waters for the dry season, but it simultaneously demonstrated the meagre expansion of necessary primary communication system which even at the turn of the nineteenth century overwhelmingly

depended on the bullock cart's, whereas the trading centres, ports were already connected by the railway networks. But the furflung interiors of villages in northern Bengal did not witness any comprehensive development of transport and communication. Improvement of communication in terms of railways expansion was only aimed at the extraction of natural resources and fulfillment of commercial and imperial interests. Natural disasters such as earthquakes, cyclones and floods had serious affected the railway networks by damaging the railway lines and stations in northern Bengal. Therefore, relief operations during the earthquakes and floods did not receive any support from the railway networks, rather during the time of floods railway embankments and rail-lines were destroyed. But despite of expansion of railways in different parts of northern Bengal till the end of the nineteenth century, the colonial endeavour to conduct the famine-relief through the railway networks was not successful enough because the interior areas of northern Bengal had not been connected with the railways which on the contrary had only connected the areas of high commercial value in terms of commodity extraction and revenue generation.

The natural calamities had thus brought to fore an uncharted history of social and economic transformations which were not exclusively created by the natural disasters, rather the disasters had aggravated, intensified, and deepened the contradictions and conflicts which were prevailing even during the pre-disaster periods. To cope with the disasters through the temporary amelioration of systems or conditions did not provide any sustainable relief to the people of this region. The programme of rural reconstruction in the aftermath of the disasters (especially during the earthquakes and cyclones) was entirely different from those of urban reconstruction. The primary concern for the administration was to rebuild the seat of the Government located in the urban centres, and to repair the government buildings and offices which were the sites of control and power and from where the policies would be enumerated. The European population largely concentrated in the urban areas did suffer very little from the disasters except few instances. But the majority population comprised of the rural poor had to face the worst in terms of loss of property and lives than the Europeans and Indian elites and riches, and the subsequent story of rehabilitation and normalization had been reflected in a widely varied norm which was constructed amidst of the hostile markets, starvation and homelessness. The marginal nutritional balance of the poor rural people had received a severe setback during the time of floods and droughts which had made the distress so intense that obtaining even a bare subsistence became a

struggle between the poor and the mighty market which sometime went out of control of the State. Although the natural disasters have been regarded as 'class-neutral' phenomena but they were not 'class-neutral' in terms of sufferings and recovery, rather the disasters had introduced more uneven dialectics between the sufferer and the savior, who were both hit by the disasters yet not in same manner and when the communication between them was guided and dictated by certain unequal terms and conditions. Relief operations conducted by the notable rich families, zamindars, and landlords of the particular affected areas had shown the varied influence of the disasters upon different sections of the society.

Apart from the seasonal migrations, natural calamities had generated sometime large scale migration or displacement of population from the affected areas to the non-affected areas that had altered not only the existed demographic scenario of the affected region but to a great extent change the population profile of the neighbouring or distant regions. This process resulted in the creation of new lands of habitation one the one hand, and the desertion of old settlements on the other, and had greatly influenced the agricultural production and livelihood pattern as a whole. Displacement of the sufferers had affected their rights on property and belongings which had been left on the mercy and mutual arbitration between the nature and human on the one hand that how could one restore from the nature's force, and the market-State and society one the other hand that to what extend the victims could withstand the complex and critical bargaining systems emerged in the post-disaster period. The continuous occurrences of disasters were attended by selective or occasional relief measures and charity on behalf of the government but any comprehensive planning was still lacking any official support. Due to this reason, the severe disasters every time were met with serious costs on the part of the government as well as governed. The dislocation of ecological order caused by the disasters had affected the overall existing conditions of biosphere when trees were uprooted and boats were drowned in the storms, when buildings and houses were destroyed in earthquakes, when crops and plants were submerged and communication was disrupted and cattle were want of fodder in floods, when crops were fell short, prices had been raised and acute starvation had prevailed in famines. Disaster studies have mostly focused on the human aspects of the disasters, whereas the disasters had remarkable natural or environmental dimension which has shaped and altered the pattern of social ecology where natural occurrences had been observed, experienced and shared by the

human population in relation with the natural changes of environment. These natural changes are, however, not detached from the civilizational impact upon the environment which was exploited by the humans according to their ever increasing interests of control and ‘management’.

It can be observed from the above discussion that the study has shown a changing relationship between the environment, political economy and socio-economic pattern of a particular region namely northern Bengal, as a case study, where recurrence of natural disasters had introduced and developed a complex scenario of changing livelihood which was influenced by the changing dialogue between the state, market, production and social agencies during the period of disasters. The multiple frontiers of suffering of people caused by the natural disasters and successive human effort to control the recovery and relief was not only a part of environmental or socio-economic research, rather it formed the basis of the historical transformation of the region, as a whole, which was constructed and transformed by the natural disasters in many ways.

Although the above mentioned chapters have separately dealt with separate disasters like – cyclones, earthquakes, floods, and drought, but they aim at the exploring the multifaceted pattern of human vulnerability which was depended on the control of water, lands and environment. The present study has critically analyzed these crucial issues with their mutual and contradictory relationships which were influenced and disrupted in the pre and post-disaster periods in colonial northern Bengal. The dynamics of agrarian and trading activities had received a major blow from the disasters which transformed the market into a more hostile place where life had been bargained along with the commodities of consumption. Thus disaster history is not just the study of natural occurrences for itself but a study of anguish, sorrow and deprivation emerged from the dislocation and desolation on the one hand, and of recovery, rehabilitation, and management conducted by the Self, society and State on the other.

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## Earthquake, Vulnerability and State: North Bengal in 1897

Tirthankar Ghosh\*

**Abstract:** *The historical dimensions of the natural disasters or calamities such as – flood, earthquake, cyclone, landslide, etc. form one of the important segments of historical reconstruction of human past and these issues are also increasingly coming to be recognized, with their regional and local variations. Natural disorders not only destroyed lives and property but also disturbed the existed norms of the environment by which ecological balance could be restored. The distinctiveness of north Bengal in respect of climate, river-influence, rainfall and natural disasters; the behavior of demographic pattern influenced and shaped by the natural calamities along with ratio of mortality or birth and death rates during these calamities displayed certain peculiarities that assert the necessity of historical analysis of these aspects. Historians have, so far, paid little attention to the historical significance of the natural disasters and to the effects of disasters upon societies. Coping with the natural disasters of a particular society depends on the nature of state and its success of providing shelter to the distress. In this background the present article seeks to draw, from historical standpoint the occurrence and consequences of the Earthquake of 1897 which originated in the region of Shillong plateau and affected lives and property in northern part of Bengal and the subsequent measures taken by the colonial Government during and after the events.*

**Keywords:** Natural disasters, Vulnerability, Earthquake, North Bengal, Colonial Government.

### Disasters and Vulnerability

In the 1990s there was increasing emphasis on natural disaster information and mitigation and the decade was celebrated as the International Decade for Natural Disasters Reduction (IDNDR). The information was technical and initiated the basis for major enterprises in building structures designed for seismic safety, slope stability, severe storm warning systems, and global monitoring and reporting.<sup>1</sup> On the other hand, the historical dimension of natural disasters is no less important in exploring the history and legacies of vulnerability and coping of the societies lived under the colonial domination and in doing so ‘a deeper understanding of the impact of natural disasters upon society needs a graded sense of time’.<sup>2</sup>

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The western inference on disasters like, abnormal natural events or vulnerable population, rests on the postulation of 'a socio-cultural construct reflecting a distinct, institution-centred and ethnocentric view of man and nature'<sup>3</sup> and this frequently demonstrated by the commonly assigned designation of 'topicality'.<sup>4</sup> Along with the geographical heterogeneity there were differences in demographic structures affected by the unequal terms of international trade which made the populations of less developed countries more likely to die from hazard in comparison with the more developed countries.<sup>5</sup> Asian Disaster Reduction Center has compiled the statistics on disaster mortality in the recent past which revealed the probability that death caused by natural disasters in South Asia was double than the rest of the world (excluding China).<sup>6</sup>

Until the advent of the knowledge of 'vulnerability' to illustrate disasters, there was a collection of predominant interpretations which rarely delved into the problem of a particular society that produces the experiences through which people encounter dangers. One approach was blatantly naturalist (often termed as physicalist), where the entire circumstances has been attributed to 'the fierce forces of nature' or 'nature on the rampage', on the other hand, further observations of 'man and nature' confrontation intricate a more delicate environmental determinism, in which the perimeters of human rationality and resultant confusion of nature stretched to catastrophic errors in our interfaces with it.<sup>7</sup> But the notion of a society's vulnerability to natural hazard can be attributed more than to a region's geographic or climatic tendency to hazard though very often the major historical and social dimensions of natural hazards or disasters were overlooked in emphasizing disaster prevention through the improving scientific applications, engineering remedies and the administrative management of hazard. At the same time a group of populations as well as the governments were categorized as liable of lacking of adequate knowledge and awareness, which could initiate measures towards reducing of risk but failed to do so.<sup>8</sup> Vulnerability can be devoted to the errors in planning, location, strategy, and construction of a community's erections and organization. R. Chambers (1989) has argued that vulnerability can be denoted by historical developments which dispossess people from the resources of surviving from hazard without suffering losses that make them physically weak, economically penurious, socially dependent and degraded and psychologically impaired.<sup>9</sup> The historical analysis of the natural disasters, such as – flood, earthquake, cyclone, drought, landslide, etc. form one of the important segments of historical reconstruction of human past and these issues are also increasingly coming to be recognized, with their regional and local variations. Regional environmental history seems to be a vital inclusion in interpreting the natural or ecological issues of a particular region with an in-depth and thorough research since, as has been argued by J. Donald Hughes, 'a region, more aptly than a nation, can be defined in ecological terms'.<sup>10</sup>

Colonialism marked a watershed in environmental history of the globe. After the fifteenth century the evolving global structure of trade and travel provided the backgrounds for a process by which indigenous European ideas about nature were gradually transformed and developed through the exhaustive inclusion of 'information, impressions and inspiration from the wider world'. In this way the commercial and utilitarian purposes of European expansion generated a situation, as argued by Richard Grove, in which the tropical environment was increasingly utilized as the symbolic location for the idealized landscapes and aspirations of the western imagination.<sup>11</sup> Similarly, for India, as the world ecology has been profoundly changed during the eighteenth and nineteenth centuries by the growth of western capitalism, first through trade and later by colonialism, in view of this alteration the ecological transformations in India during the colonial period deserve special interest in regard to the intimate connection that recent research has made between British imperialism and environmental vulnerability in the colonized countries.<sup>12</sup> The western assumption 'to depict large parts of the world as dangerous places for *us* and *ours*'<sup>13</sup> provided a major justification for their 'civilizing mission' and the process of adaptation for themselves in the 'temperate climate' was coupled with 'cultural constraints' and criticism of the oriental society and environment. Moreover, colonial rule became the major stricture in measuring the extent and complexities of the reasons of vulnerabilities and efficiency in conducting relief operations. Recovery from the natural disasters could not only be a matter of accumulation of resource or execution of relief but it was more based on the society's knowledge and understanding of cultural distinctiveness for themselves and the space provided by the colonial state to recover the colonized from the given 'marginality' of their material and spiritual conditions.

According to the *International Perspectives on Natural Disasters* earthquake is the result of the continuous cycle of stress accretion and pressure release along faults and seismogenic structures in the earth's layer. All parts of the earth's crust are subject to compressive (pushing together), tensile (tearing apart), and shearing stresses, which cause strain to accumulate gradually over time. Walter Hays argues that when the stress exceeds the strength of the rocks, sharp failure occurs, causing in slide or rupture and permanent twist along a fault zone and as a result rupture front spreads out from the focus of the earthquake (sometimes called the hypocenter) as elastic seismic waves.<sup>14</sup> In disaster research though scholars have focused much on the geologic, seismological and engineering aspects of the earthquakes, one cannot eschew the utter significance of historical developments and sociological magnitudes of a society prone to the earthquake. Vulnerability can also be estimated in terms of failure or availability of earthquake knowledge and the degree of prevention, mitigation, and preparedness measures that are adopted as public policy by the state and prescribed by the community assuming their

traditional existence on a particular geographical region shaped and transformed by politics, business and 'subjugation'. The livelihood and survival of the people of India in the nineteenth century, however, was in provenance and reaction of the changing pattern of colonial domination and regulations derived from the administrative rules and laws imposed upon them time to time. Thus the present paper seeks to highlight a region's vulnerability, society and administration comparatively rarely-focused by the scholars in their research on 1897 great earthquake of Assam, the most fatal earthquake in the history of nineteenth century colonial India.

### **Earthquake of 1897: A Brief Outline**

Himalayan belt is considered as vulnerable to great earthquakes of magnitude exceeding 8.0 and during the closing years of the nineteenth century and first half of the twentieth century in a short span of about 50 years, four such earthquakes have occurred: 1897 Assam (M8.7), 1905 Kangra (M8.6), 1934 Bihar-Nepal (M8.4), and 1950 Assam-Tibet (M8.7)<sup>15</sup>. One natural calamity, very often, succeeds by other calamities that aggravated the human suffering during these calamitous days. An earthquake which is instrumental to the causing of landslips or vice-versa (abrupt reducing of rock or soil-pressure sometime created the condition of earthquake in a local level), or flood, accelerated by excessive rainfall, that exposed the occurrence of serious landslips in the hilly region, emphasizes the necessity of investigating their influence in the social and material life of the inhabitants of the region concerned. The earthquake of 12<sup>th</sup> June of 1897, popularly known as Assam Earthquake, had 'three distinct types of wave motion having different rates of propagation';<sup>16</sup> one succeeding the other and the total duration was just more than three minutes. Shillong, the summer capital of Bengal until 1874 and the capital of Assam thereafter, had to suffer a major setback in its idealistic image of pleasant hill-town that provided adequate space for British leisure and amusements was shaken by the earthquake beyond repair.<sup>17</sup> R.D. Oldham, the head of the *Geological Survey of India* (GSI) had described:

'At about quarter past five in the afternoon of the 12th June 1897, there burst on the western portion of Assam an earthquake which, for violence and extent, has not been surpassed by any of which we have historic record. Lasting about two and a half minutes, it had not ceased at Shillong before an area of 150,000 square miles had been laid in ruins, all means of communication interrupted, the hills rent and cast down in landslips, and the plains fissured and riddled with vents, from which sand and water poured out in most astounding quantities; and ten minutes had not elapsed from the time when Shillong was laid in ruins before about one and three quarter millions

of square miles had felt a shock which was everywhere recognized as one quite out of the common.’<sup>18</sup>

The *Imperial Gazetteer of India* highlighted the damage in the following words: ‘Nearly all masonry buildings in Gauhati and Sylhet were completely wrecked, and much damage was done in Goalpara, Nowgong, and Darrang. Two Europeans and 1,540 natives lost their lives, the majority of the latter being killed by landslips in the hills and by the falling in of river banks in Sylhet. Roads and bridges were destroyed, and the drainage of the country was seriously affected by the silting-up of streams and watercourses.’<sup>19</sup> Calcutta witnessed the earthquake on a minor scale but more constructions were ruined there. Though the incident had acquired a great place in the newspapers of Assam and Calcutta<sup>20</sup> but there was hardly any intervention on the part of the colonial state through any charitable grant.<sup>21</sup>

Several historical and scientific researches on 1897 earthquake have been carried out by the historians and social scientists that delve into the aftermath of the disaster in the north-eastern part of India, particularly the Assam and Shillong regions; however, little importance has been given to the affected areas of north Bengal. So far the available documents and information on 1897 earthquake are concerned they overwhelmingly concentrate on the Shillong plateau region and statistics or information for northern districts of Bengal are not only scarce but could only be obtained in a more scattered manner. Perhaps for this reason hardly any attempt has been made by the social scientists to find out the extent of destruction and suffering or recuperating of the society of north Bengal during and after the earthquake.<sup>22</sup> In this background the present article seeks to draw from historical standpoint, the occurrence and consequences of the Earthquake of 1897 which originated in the region of Shillong plateau and affected lives and property in northern part of Bengal and the subsequent measures taken by the colonial Government during and after the events.

### **Earthquake Society and Hazard: North Bengal in 1897**

The northern part of Bengal during the nineteenth century was comprised of, as has been shown by W. W. Hunter in his *Statistical Account* of several districts of Bengal, Koch Behar Division (comprised of the princely state of Koch Behar and the districts of Jalpaiguri and Darjeeling) and Rajshahi Division (including the districts of Rangpur, Dinajpur, Malda, Rajshahi, Pabna, Bogra and Murshidabad).<sup>23</sup> Along with Assam or its neighbouring north eastern states, the districts of northern Bengal viz. Districts of Darjeeling, Rangpur, Pabna, Dinajpur and the Princely State of Cooch Behar had also become the victims of the earthquake. Although the earthquake is called as Assam

Earthquake but large parts of Bengal had also felt the vibrations of the earthquake. C. E. Buckland has summed up the devastations caused by the earthquake in Bengal in the following manner:

“.....an earthquake shock, varying in severity, was felt throughout the province of Bengal.....The shock was far more severe over a larger area than that of any previous earthquake in Bengal of which any authentic record exists..... It was strongest in the districts of Rajshahi Division, the Kuch Bihar State, and the districts of Dacca and Mymensingh. The damage done to buildings, roads, and bridges was greatest in Rangpur, which lies on the western side of the Brahmaputra, opposite to the Garo Hills, in Kuch Bihar, in Mymensingh, south of the Garo Hills, in Bogra, in Dacca, and in Dinajpur. Many houses were damaged, and some destroyed, in Darjeeling. A remarkable feature of the earthquake was the opening of fissures in the ground through which water and sand were ejected..... In the towns of Rangpur, Bogra, Pabna, Dinajpur, Murshidabad, Berhampur, Dacca, Mymensingh, and Kuch Bihar nearly, all the masonry houses suffered; while .... in Malda a considerable proportion of the larger buildings were damaged. .... Heavy damage was done to the permanent-way, bridges and buildings on the Eastern Bengal State Railway, the Assam-Bengal Railway and the Kuch Bihar State Railway. The head-quarters of Government, which at the time were at Darjeeling, were for 3 days cut off from postal communication, and regular passenger traffic was suspended on the northern section of Eastern Bengal State Railway for a fortnight..... In Kuch Bihar the earthquake was very severely felt, and caused most serious damage to the Maharaja's palace, the state buildings generally, the State Railway and roads and bridges, the total loss being estimated at over 15 lakhs.<sup>24</sup>

Though the District of Darjeeling did not have to witness of becoming an epicenter of any major seismic activity but the district had felt the presence of earthquake, originated in north-east India, since 1842 and several shocks were felt between March and October in the year 1863. The District was affected by a major earthquake which occurred in the north-east on 12<sup>th</sup> June, 1897. Geologically the District of Darjeeling was comprised of unaltered sedimentary rocks, rested to the hills on the south, and various forms of metamorphic rocks over the rest of the area. The hilly parts of the district were consisted of soft rocks such as schists, shales, and clays or thick layers of soil and weathered rocks on steep slopes.<sup>25</sup> Darjeeling had to face ‘a good deal of destruction’ of the buildings ‘which being heavy, stone-built structures,.....oscillated out of their centres and flattened out like a pack of cards; while the lighter, wooden structures

suffered little or no damage.’<sup>26</sup> The worst affected parts of the district were the Darjeeling town and the railway station at Tindharia. In many buildings cracks appeared or walls fell out and bungalows were damaged by the fall of stone-built chimneys rolling through roofs. Due to the loose nature of soil landslips were started near Tindharia station soon after the earthquake and in Siliguri ground fissures appeared at several places in the submontane tract to the north, near Sukna and beyond and the Cart road was cut up.<sup>27</sup> The head-quarters of Government, which at the time were at Darjeeling, were for 3 days cut off from postal communication, and regular passenger traffic was suspended on the northern section of the Eastern Bengal State Railway for a fortnight.<sup>28</sup> E. C. Dozey has described this event in following manner:

‘Assuming that the focus of disturbance to have been near Cherapunji in Assam, the shock appears to have travelled thence to the western extremity of Bengal and Behar in 6 minutes or less. Its duration varied greatly, according to the reports of local officers, the lowest being **5** seconds, the highest 5 minutes.’<sup>29</sup>

The news about the destruction caused by the earthquake of 1897 spread out to a larger populace far too quickly. The newspaper, *The Mercury* reported in Thursday morning on 22<sup>nd</sup> June, 1897 under the headlines - “*Indian Earthquake – Darjeeling Railway Destroyed – 6, 000 Lives Lost in Assam – Queen’s Massage of Sympathy*” - :

“The Darjeeling railway for fifty miles has been completely destroyed, cutting of all communication between the termini. Her Majesty Queen Victoria has forwarded to the Viceroy of India (Earl of Elgin) a message, sympathising with her Indian subjects in their great tribulation.”<sup>30</sup>

In the hilly regions of Darjeeling district the earthquake produced landslides. The types of landslides that were occurred in Darjeeling were classified, according to the Swiss terminology, as *Schuttsturze*, i. e. soil sidles or soil slips<sup>31</sup> and this *Schuttrutschungen* was caused by slow movements of soil or unconsolidated material along the hill slopes and these movements of soil were common at the lands stretched between Mahanadi and Rangtong rivers.<sup>32</sup> The deduction of soil from the surface by the automated action of running water, and the concurrent accumulation of decomposed products below the sub-soil by chemical activity of infiltrating water are not simultaneously compensatory in slopes covered with vegetation and on the other hand the creation of soil-cap, obviously, does not in itself help to an increase in the surface slope but its erosion from the foot of a slope by watercourses increases the average slope of the hillside. This kind of destabilization or subsidence of the foot of a hill was recorded in the

faulted area between the two branches of the Kagjhora in Darjeeling.<sup>33</sup> In recent time, a large amount of landslides have occurred due to the over exercise on nature by human being and thus, 'there has been a rapid acceleration of landslide phenomena over this region due to anthropogenic abuse like unscientific settlement construction, severe deforestation, overloaded cargo (more than 80 ton trucks etc.) induced tremor, poor maintenance of tea garden areas, dumping of garbage behind the settled buildings, poor or non-maintenance of community drains etc.'<sup>34</sup>

H. H. Hayden, the Assistant Superintendent of Geological Survey of India has reported the damages in north Bengal caused by the earthquake of which Darjeeling occupied an overwhelming section, in comparison with the other districts of north Bengal. His account recorded the damages occurred at Tindharia railway station and its surrounding parts, at the Darjeeling town and its other adjoining areas. He noted – "Here the most striking effects of the earthquakes [were] seen in the large number of chimneys which have fallen. Many houses,.....[had] been badly damaged by the falling in of the great heavy chimney stacks which crashed through the roof, breaking everything before them.....In the old Bhutia Cemetery,.....several old tombs were partially thrown down."<sup>35</sup>

The Princely State of Cooch Behar had to suffer loss in its property in Darjeeling and the cost of which was amounted to Rs. 2½ lakhs, while for Cooch Behar zamindaries in the State, it was Rs. 18, 000 and in Calcutta it was Rs. 7, 000.<sup>36</sup> The *Annual Administration Report* (1897-98) has summed up the severity of the earthquake in following manner:

"The state was visited by a terrible earth-quake on the 12<sup>th</sup> of June 1897. There were three distinct shocks, one succeeding the other, coming from the north-east, the whole lasting for a little over three minutes....The earth was fissured, sand and water spouting out from the fissures. The earth sank in places, while beds of rivers...were upheaved. Your Highness' Palace, other state buildings, roads, bridges...suffered very serious damage. The damage in the State alone has been estimated to be about Rs. 17, 93, 847....There were also some petty losses in cattle, crops and cutcha houses....[and] small loss of life (8 only having been killed) is a noteworthy fact."<sup>37</sup>

However, the cost of damage varied widely as estimated from different accounts. Calica Doss Dutt, the then Dewan of the State of Kuch Bihar has recorded that:

"There was not much loss of human life, the victims having been eight in number only, and that being confined to the town of Cooch Behar.... But

loss to property was enormous. All the pucca buildings were more or less severely injured, roads were badly fissured, bridges damaged, and drain and wells choked and filled up. The damages done to the palace and the public buildings in the town amounted to about ten lacs of rupees, and that to private buildings, about seventy five thousand..... Successive shocks were felt throughout the night and even afterwards, all through the year at intervals. Springs of hot water with sands issued from many of the fissures; and at places ashes and cinders were thrown out. The beds of marshes and beels were upheaved, and many fisheries became dry.”<sup>38</sup>

T. D. LaTauche, Superintendent, Geological Survey of India, has recorded that “Several high bunds which ran due north from the bazar to the road connecting Dhubri with Kuch Bihar have been fissured transversely at intervals of a few feet, and settled down considerably.”<sup>39</sup> Considerable damage and destruction of bridges were observed in the different parts of Princely State of Cooch Behar and adjacent regions.

“Near Shampur,... the hexagonal brick piers of one of the bridges have been broken through horizontally and the upper portion has shifted slightly..... The same effect is seen in numerous places between Rangpur and Kuch Bihar, where bridges of small span cross canals or swamps.... In the neighborhood of Dewan Hat, however, the line has suffered severely, and the bridges, particularly that over the Manshai River, have been broken..... At about seven miles south of Kuch Bihar, a small bridge passing over a water channel in swampy land has been damaged by the thrusting-up of the central pier.”<sup>40</sup>

The banks of river Torsa had been much cut up by fissures on both sides and had in many places caved in.<sup>41</sup> The shock of earthquake did not end on the 12<sup>th</sup> June; however, several waves of after-shock were felt in later time which had extended even in the month of July.<sup>42</sup>

The district of Jalpaiguri was also suffered from this earthquake. In Jalpaiguri much damage was done to the roads by collapsing and by the opening of deep fissures, and many bridges were destroyed.<sup>43</sup> At Raninagar the earth was much fissured and these fissures were three hundred yards long stretched parallel to the railways which were often dislocated.<sup>44</sup> H. H. Hayden has further recorded that -

“At Haldibari railway station the permanent way and platform were cut up by fissures running north and south and a large portion of platform was subsided....there [were]..... circular holes from which,... sand and

water were ejected during the earthquake. In some cases the displacing force has been sufficient to break the solid steel rails, but, more frequently, fracture has taken place at the junction of the rails, the fish-plates being broken and bolts turn out. At about half way between Haldibari and Mandalghat four telegraph posts have fallen....At Jalpaiguri..... a two storied brick building, was ...badly cracked.....At *Belakoba* railway station house [was] cracked at its north-east corner...”<sup>45</sup>

In Dinajpur the earthquake caused considerable damage to masonry buildings and created panic among the inhabitants of the town.<sup>46</sup> The Rajbari of Dinajpur suffered most of all and parts of it had to be rebuilt. The *pukka* houses in the town belonged to several zamindars were also seriously injured and the walls of the Judge’s and Collector’s houses were cracked.<sup>47</sup> In Rajshahi district the shock was severe, especially on the eastern side, but the loss of life was comparatively small, though four deaths were reported from Nator, two from Naogaon, and nine from Rampur Boalia.<sup>48</sup> In the district town of Rajshahi Government buildings, the Judge’s Court house, the Collectorate, the record-room, the Circuit house, the police barracks and subsidiary buildings, the post office, the educational buildings and the Para Kothi at Rampur Boalia were all more or less damaged.<sup>49</sup> The zamindars suffered seriously and the greatest loss fell upon the leading families resided at Nator, Dighapatia, and Puthia. Earth fissures occurred throughout the district, and the roads were badly cracked in places and moreover, large railway bridges over Atrai and Baral were much damaged, and many of the small bridges and culverts had to suffer loss.<sup>50</sup> H. H. Hayden, Assistant Superintendent, Geological Survey of India has reported that “...the *Atrai* river fissures were seen for the first time; here they run almost due east and west, parallel to the banks of the river, and continue for several hundred yards with a breadth of (on an average) 6 to 8 inches.”<sup>51</sup>

Among the earthquake affected districts of north Bengal, Rangpur was one of such districts which had fallen under severe destruction. H. H. Hayden has asserted that “Of all the places visited by me, Rangpur was undoubtedly that which had suffered the most damage....almost every brick building was irretrievably damaged, while several were almost completely overthrown....the Raja of Dimla’s house,...was almost completely surrounded by tanks and consequently suffered very badly....In the cemetery at Rangpur two similar monuments were partially overthrown.”<sup>52</sup> The shocks started at 5.15 p. m. on 12<sup>th</sup> June and lasted for about five minutes.

“The crust of the earth was rent into great yawing fissures, east to west in direction, from which torrents of sand and water poured over the surrounding country. The same phenomenon was observed in rivers, tanks and wells. In many places there were explosions leaving cavities in the

ground 4 or 5 feet in diameter, from which there was a similar discharge of sand and water. A great shrinkage of water and an accession of sand in khals, canals, streams, tanks, and wells was observed immediately after the earthquake. Large tracts of cultivated land were covered with a thick layer of sand, causing much damage to standing crops and rendering many lands unculturable.”<sup>53</sup>

The earthquake resulted in interruption of all communications and sharp rise in the prices of food-stuffs and necessities in the District of Rangpur. The cost of damage amounted to over 30 lakhs of rupees. The earthquake produced great changes in the drainage of the country caused simultaneously by the upheaval in many streams and river beds and contraction by the slipping of their banks. In the process of upheaval in the rivers the district in many places appeared to have been a cup-shaped formation and as a result there did not remain any considerable outlet for accumulated rainfall which contributed to the conversion of large areas of cultivable land into *bhils*.<sup>54</sup> The loss of life, confined chiefly to Rangpur town, was rather small due to the fact that almost entire population of the district lived in thatched bamboo houses. Oldham has argued that though in Ranpur a number of small aftershocks were felt but those were ‘not recorded at the neighbouring stations from which regular returns were beings received’.<sup>55</sup>

The District of Pabna was also seriously visited by the earthquake. At Sirajganj the upper storey of the sub-divisional office, the jail and the post-office were exhausted and almost every other masonry buildings were severely shaken or damaged.<sup>56</sup> The court houses and other brick buildings were damaged in Pabna and in the interior of the district fissures opened in the earth and many wells were clogged with sand and silt.<sup>57</sup>

### **Earthquake and Colonial Policy in 1897 and after: Some Observations**

The earthquake of 1897, once again, contributed to the generation and collection of information and knowledge on the part of the Government. The Geological Survey of India was at the crucial stage of its performance as the situation sought for a greater undertaking of knowledge and its implications. This was a time when the science of seismology was passing from a pre-instrumental period to seismograph but a standard universal scale of earthquake measurement was still awaited. The colonial government not only lacked resources and experiences to deal with such a devastating earthquake but the idea of state intervention to rescue affected population from disaster was yet to be part of the narrative of governance.<sup>58</sup> Moreover, ‘compatibility’ between private and social aims had been considered as the defining factor for the effectiveness of the state intervention that absolutely was depended on the very question of ‘state’s legitimacy’, as

the modern researches have prescribed.<sup>59</sup> The disputed property rights had often become a matter of great complexities to run the relief operation by the state since the victims did not agree, as it is argued, on the plans taken up for the amelioration of the prevailing conditions.<sup>60</sup> The contested terrain of economic and social interests of the victims, both Indian and European, had no doubt, derived from the discourse of 'rights' and 'power' which was manifold and controlled and manipulated in a colonial atmosphere. Relief operation was not, however, always entirely a matter of charity or to dispense humanitarian responsibility but, very often, was unfolded with an overt agenda for rescuing '*ourselves*' amidst from the disasters which not only serve, for several times, the justification of governance for the Indians but set a trend of British 'efficiency', not common in pre-British period, to deal with such unpredictable natural disaster, though failed in many respect in several occasions, sometimes even offered hardly any scope to provide recovery settlements.

Deepak Kumar has put emphasis on the 'economic compulsions' behind the establishment of Geological Survey of India and comments that "[Thomas Oldham, father of R. D. Oldham] himself recognised that the original reason for his appointment was the study of the coal resources of India."<sup>61</sup> The first geological map was prepared by G. B. Greenough in 1853 without visited the country even once.<sup>62</sup> However, Richard. D. Oldham (1858-1936), wrote accounts of four major Indian earthquakes – 1819, 1869, 1881 and 1897; and these accounts established a template for the study of earthquakes that occurred in Indian subcontinent subsequently.<sup>63</sup> Oldham clearly recognized the value of surface deformation as a quantitative measure of what happens in an earthquake, but the analytical tools to interpret these data were not to emerge for a further half century.<sup>64</sup> The *Report of Oldham* recorded the damage caused to the cemetery made for the Europeans. This evidently reflected the British concerns for their even very minor belongings in India which was no less important than the death toll resulted in the disasters. Since the disasters did not show any mercy to the 'racially superior' British, so they had to confront the 'equal fate' along with their Indian counterpart. The disruption in communication caused by the fissures appeared in road and broken railway tracks hindered the colonial endeavours of relief strategies made for the affected areas. The large scale deforestation of land and changing pattern of dwelling areas during the colonial period aggravated the intensity of the disasters. Preparedness for the disasters and state capacity to deal with this unusual responses of nature was attributed to the knowledge patterns acquired 'in the past on how events were explained, how social cooperation formed or fell apart, and how states were constituted' which undoubtedly disclosed the fact 'that the state engaged in this activity late, and with variable success.'<sup>65</sup>

Earthquake engineering progresses commenced relatively early in India. Development of the first seismic zone map and of the earthquake resistant features for masonry buildings took place in 1930's, and formal teaching and research in earthquake engineering started in late 1950's.<sup>66</sup> However, the recent researches have modified the earlier versions which considered the earthquake of 1897 as the Himalayan earthquake. Seismologists have argued that the 1897 earthquake was a 'shield earthquake like that of the 1819 great Kutch earthquake.....or the 2001 Bhuj earthquake....in Western India.....The 1897 event [was] also a shield earthquake, the present broadband seismic data and the GPS data do not support it to be a Himalayan earthquake as was proposed earlier.'<sup>67</sup>

While the hill stations (like Darjeeling and Shillong) of British India were regarded by the western observers as 'an island of Victorian values and symbols without a clientele'<sup>68</sup> but the imperial design behind the construction of sanatoriums or health-places in colonial India invites the scope for historical scrutiny of the colonial objective on the discourses of imperial practices which reinforced the distinction of this British enclave not only as a suitable place for colonial administrators, but also on the basis of a racial and spatial categorization that represented the sense of British superiority and difference spawned up from the fear of being degenerated.<sup>69</sup> Apart from this, the disasters provided a major psychological setback to the British perception of colonial amenities which were derived from the 'sites of colonial leisure and recreation; temperate places that represented socially, culturally and architecturally, derivations of metropolitan and imperial symbols of leisure' and in addition with an aim of its incorporation into the colonial economy.<sup>70</sup> Thus, natural disasters in the colonies occupied special consideration by the colonial administrators in respect to the exceptional characteristics of the disasters in their eyes because Europeans had also inhabited the same places where the Indians lived. It is most striking that the absence of any relief measure in the earthquake of 1897, not only in Bengal but in all the regions affected by the earthquake. However, colonial initiatives during the later earthquakes appeared to have been more crucial, though unknown in previous cases, because of their influence in society and if more broadly speaking for the ideologies that the enterprises revealed the colonial supremacy, in a different manner.

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