Earthquake, Vulnerability and State: North Bengal in 1897

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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.[1] 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'.[2]

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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'[3] and this frequently demonstrated by the commonly assigned designation of 'topicality'.[4] 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.[5] 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). [6]

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.[7] 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.[8] 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.[9] 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'.[10]

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.[11] 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.[12] The western assumption 'to depict large parts of the world as dangerous places for *us* and *ours*'[13] 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.[14] 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)[15].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 12th June of 1897, popularly known as Assam Earthquake, had 'three distinct types of wave motion having different rates of propagation';[16] 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.[17] 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.'[18]

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.'[19] 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[20] but there was hardly any intervention on the part of the colonial state through any charitable grant.[21]

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.[22] 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 pleatu 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).[23] 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 exits..... 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.[24]

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 12th 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.[25]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

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.[27] 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.[28] 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.'[29]

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 22nd 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."[30]

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 [31] 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.[32]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.[33] 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.'[34]

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."[35]

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.[36] 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 12th of June 1897. There were three distinct shocks, one succeeding the other, coming from the nort-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."[37]

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."[38]

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."[39] 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."[40]

The banks of river Torsa had been much cut up by fissures on both sides and had in many places caved in.[41] The shock of earthquake did not end on the 12th June; however, several waves of after-shock were felt in later time which had extended even in the month of July.[42]

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.[43]At Raninagar the earth was much fissured and these fissures were three hundred yards long stretched parallel to the railways which were often dislocated.[44] 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..."[45]

In Dinajpur the earthquake caused considerable damage to masonry buildings and created panic among the inhabitants of the town.[46] 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.[47] 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.[48] 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.[49] 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.[50] 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."[51]

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 my 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."[52]The shocks started at 5.15 p. m. on 12th 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."[53]

The earthquake resulted in interruption of all communications and sharp rise in the prices of food-stuffs and necessaries 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*.[54] 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'.[55]

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.[56]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.[57]

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.[58] 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.[59]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.[60] 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."[61]The first geological map was prepared by G. B. Greenough in 1853 without visited the country even once.[62]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.[63] 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.[64] 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.[65]

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.[66] 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.'[67]

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'[68] 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.[69] 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.[70] 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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