CHAPTER III

CHRONOLOGICAL HISTORY OF LAND-USE CHANGES

3.1 INTRODUCTION

A review of the changes of land-use pattern in Kurseong Sub-Division over the years, since the discovery of the Darjeeling area for its suitability as a hill station, reveals the various environmental factors that influence the degradation of an otherwise once a densely forest covered area in an ecologically fragile region.

The study unfolds a plethora of man's heedless actions to nature, which have ultimately lead towards man's own destruction. The changes that have taken place and all that that have resulted through man's activities provide us with very important lessons which perhaps should not be ignored while planning any sort of developmental changes in the area.

3.2 LAND-USE IN THE PRE-BRITISH ERA

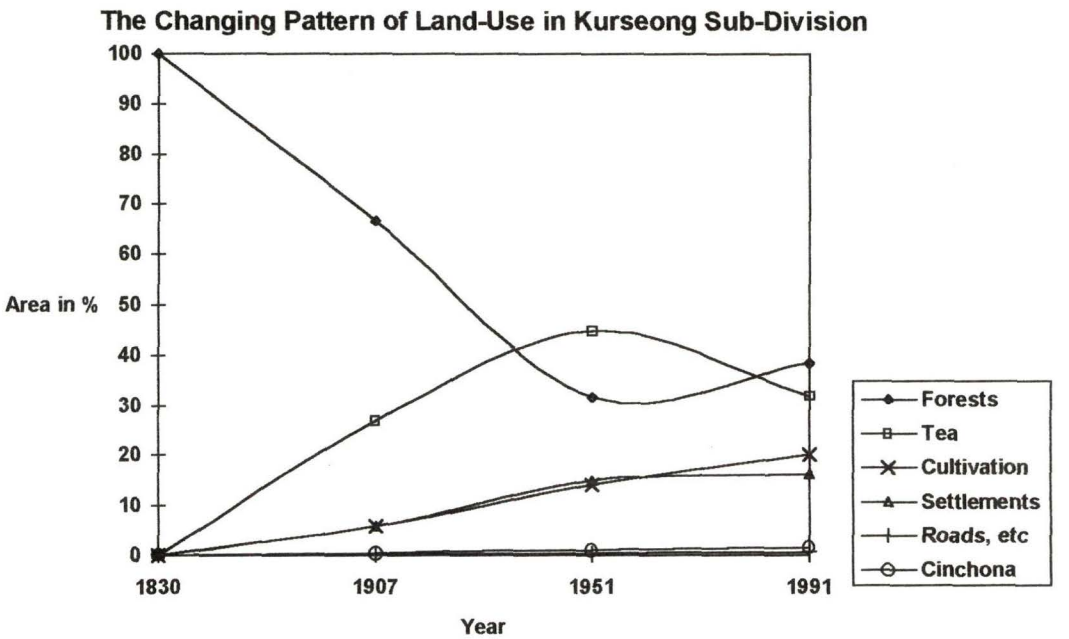
The area, which belonged to the Raja of Sikkim till 1835, was practically covered by dense forest inhabited perhaps by a few migratory Lepchas in the hills and the Meches in the foothills. There is a consensus among the reports of the early travellers in the region that the area was entirely covered by dense forests (Hooker, 1843). Captain Herbert, then Deputy Surveyor General described the area in 1830 as "completely clothed with forest from the very top to the bottom". The only other land-use, though negligible, is worth mentioning, as it was the most crude and primitive form of cultivation known as shifting cultivation. The trees were not felled but stripped of their main branches and debarked until they died. The dead trees were felled only when required for building purposes or for fuel. Cultivation was done in between the dead trees by scratching the humus and sowing seeds. Maize, wheat,

millet and rice were grown till the soil was exhausted, when they moved to another fresh area (F.Pinn, 1986).

3.3 LAND-USE CHANGES

The land-use changes in the study area have been discussed chronologically under the following sub-sections: Figure 3.1 depicts the changes over the years graphically and Figure 3.2 depicts spatial distribution of such changes since the last hundred years:

Figure 3.1



3.3.1 THE BEGINNING OF BRITISH ERA 1835 – 1871

The Acquisition of the Tract

The Raja of Sikkim formally handed over the deed of Grant of the Darjeeling tract to the British Government in 1835 (Dozey, 1989: Roy, 1972). In 1839, the British Government

decided to go ahead with the plans of building a road connecting the hill station to the plains. It was from then onwards that the actual process of man induced environmental degradation started with patches of forests to large tracts of forest areas being cleared for building plots, roads, tea gardens railway lines and settlements.

The Old Military Road

The most significant and perhaps the forerunner of environment degradation during this initial period was the building of the road from the plains to Darjeeling through Kurseong. There appears to be complete neglect of the principles laid down in scientific men for making roads in mountainous areas, as the lines marked for the construction of the road ran through steep gradient from Pankhabari to Kurseong and then to Mahaldiram. During this initial phase, a few places of halt, the bungalows, were built up at Punkhabari, Kurseong, Mahildaram and Sonada by clearing the forests. By 1840, the road popularly known as the Old Military Road, a few huts/sheds as resting-places for the travellers, staging bungalows at Punkhabari, Kurseong, Mahaldiram and Sonada and a hotel at Kurseong (Photo. 3.1) had been completed. The population then could have been 50.

The Introduction of Tea

Experimental planting of tea had been started from 1841 in the region and Dr. Campbell, Superintendent of Darjeeling, campaigned strongly for cultivating tea in the hills. Prospects of tea cultivation within the area grew large, with the success of experimental plantations and between 1860 to 1864, the Ambutia, Makaibari, Singel, Sourini and Phuguri Tea Gardens were opened by companies like The Darjeeling and Kurseong Tea Company. By the end of 1866, gardens were also opened in the foothills with the Government offering land to investors on favourable terms. By 1871, there were no less than 20 tea gardens with about 890 hectares forested area leased out for tea cultivation.

The Hill Cart Road

In the meantime, the steep gradient of the Old Military Road which was unsuitable for bigger carts, had compelled the Government to start an alternate road in 1860. Thus the Hill Cart Road connecting Darjeeling to the plains was built from 1861 to 1869. The gradient of the road was gentle and as such, ran by a long round about route obviously through forest clearings, hill and rock cuttings. With the increase in tea gardens and more settlements, the population within the area multiplied and by 1871, the population as recorded, was 26937.

3.3.2 THE EARLY DEVELOPMENTAL PHASE 1871 – 1899

The Railway Line

By 1878 a railway had been completed from Calcutta to Siliguri making the communication easier. However, the hill portion of the journey by Tonga proved to be tedious and an unsatisfactory means of transit to the general public with the cultivation of tea having developed remarkably and the industry firmly established. The maintenance of the road, which had become a costly affair as landslips were frequently disrupting the road, led to the construction of a steam tramway along the Hill Cart Road. The construction of the tramway commenced in 1879 and by the end of 1880, completed up-to Kurseong from Siliguri. By the year 1881 the Darjeeling-Himalayan Railway Company opened it for traffic to Darjeeling. The construction of this rail line, again, did involve further clearing of forested areas, hill and rock cuttings besides the clearing of areas for stopping places at Sukna, Rangtong, Chunabhati, Tindharia, Gayabari, Mahanadi and Tung.

The Educational Set-Up

With the development having taken so far, the need for primary education for the people of the hills was felt, as there was apparently no organised school worthy of mention in the area. The Missionaries having made inroads in the region were the pioneers in meeting the

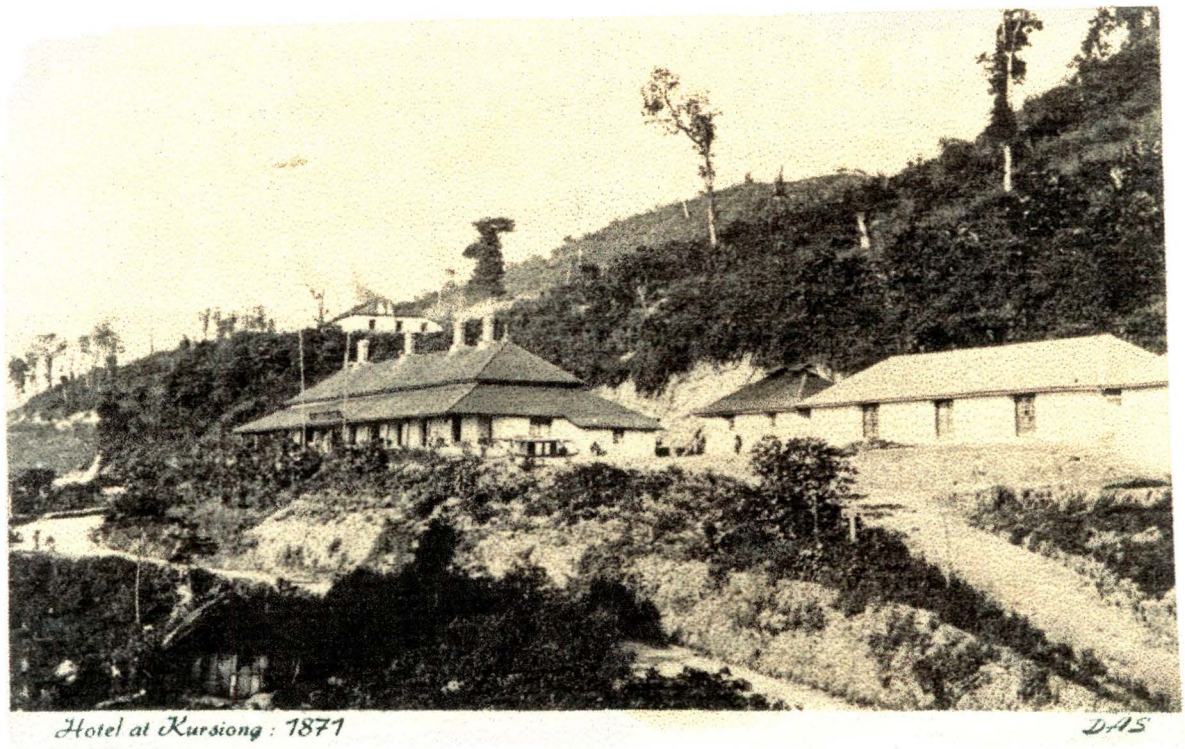


Photo. 3.1 Kurseong in 1871

Photo. 3.2 Settlement around Tea Gardens

primary educational needs of the people of the hills. Therefore, many plots of land were leased out for the construction of school infrastructure within the forest areas like the Victoria Boy's School founded in 1879 by Sir Ashley Eden followed by others like the Dow Hill School for girls, St. Helens' College, Goethal's Memorial School and the St. Mary's Theological College.

The Introduction of Terrace Cultivation

Following settlements and increase in population, agriculture in its traditional and introduced form was widely practised wherever feasible. Rice formed the staple agricultural product in the foothills with the Nepali settlers selecting level sites near the banks of rivers or water courses and laying out successive terraces. This system was definitely superior to the shifting cultivation practised by the Meches. In the hills, maize, millet, wheat, potato and cardamom were grown wherever feasible and even there the slopes were terraced to raise these hill crops. The introduction of terrace farming was, therefore, far more scientific and eco-friendly than the traditional methods practised by the Lepchas and the Meches and was perhaps the best alternative to shifting cultivation, specially at a time when forest conservancy was gaining importance and forest areas were being reserved.

The Cinchona Plantations

Another significant, though localised change in the land use was the introduction of cinchona within the area. With the success of cinchona plantations in the Nilgiris, it was Dr. Anderson, the Superintendent of Calcutta Botanic Garden who suggested growing cinchona in the nursery in Darjeeling in 1861. This was followed by plantations in the Rangjo valley at Rangli, which was subsequently extended to Sittong on the southern slope of Rayeng valley within the study area. By 1881, about 300 acres of cinchona plantation had been established in the area.

3.3.3 THE DEVELOPMENTAL PHASE 1900 – 1951

The first half of the century saw the tea gardens reaching their watershed as most of the areas suitable for tea cultivation had already been taken over by the tea gardens while most of the forest areas of the forest department were under reservation or in process of being reserved. The forests were being worked under various management plans. Another cause of the slowing down the extensions of tea plantations within the area was the severe depression following over production of tea by reckless extensions in India, Ceylon (Srilanka) and Java, and the depreciation in the value of rupee and the duty on tea imposed by Great Britain. By 1905, 46 tea gardens, with an area of 6840 hectares under tea cultivation, had been established in the hilly areas of the Sub-Division. The following years saw very little forest areas giving way to other land uses except the 286 hectares of forests that were allotted at Latpanchar and Sittong for the extension of cinchona plantations and for the metalled State Highway through Garidhura to Mirik from Siliguri. The road from Mirik led to Sukhia Pokhri, which was ultimately connected to Darjeeling.

By 1951, the pattern of land-use in the Kurseong Sub-Division was more or less stabilised. The land-use and the extent of area under each are shown in Table 3.1.

Table 3.1

Land-Use	*Area in Ha.*	*% of area*
Forests	13710	31.70
Tea Gardens	19379	44.80
Cultivated Area*	6116	14.14
Settlements	6500	15.00
Roads, etc.	150	0.3 5
Cinchona	486	1.12

*includes cultivated areas in tea gardens and settlements

3.3.4 CONSOLIDATION PHASE 1952 – 1990

Land Resumption

With only about thirty two percent of the land under forest area and about forty five percent under tea gardens, there was hardly any scope for any substantial increase in area of other land use. Whatever increase there had been in agriculture resulted from the extension of cultivable lands within the settlement areas like the khasmahals (government estates) and the villages, and within the tea gardens. However an important landmark on the existing land-use was the enactment of the West Bengal Estate Acquisition Act, 1953 which rendered the earlier rules and regulations of the Bengal Wastelands Manual of 1936 void. The West Bengal Land Reforms Act followed this and the date of vesting of tea estates was notified to be 15th April 1955. Consequently, the tea gardens were allowed to retain only the necessary quantum of land, which, according to the opinion of the State Government, was required for the purpose, and the surplus land was resumed to the State. Provisions were therefore, laid for restricting the use and utilisation of the forests within tea gardens. This led to the resumption of the surplus lands in the tea gardens, which was to the advantage of the Government as 11979 acres of forests were resumed to the State.

Population Boom

The growth of population during the period appears to be quite significant as it has resulted in the increase of the number of households in all the settled areas. Table 3.2 and Figure 3.3a & 3.3b shows the growth of population during the period. The environmental impact of this growth of population was significant in bringing about quantitative and more so qualitative changes particularly to the forests as the demand for fuel and timber shot up and the local people living around the forests entered the forest areas to fulfil their daily requirements of fuelwood.

THE CHANGING PATTERNS OF LAND-USE IN KURSEONG SUB-DIVISION

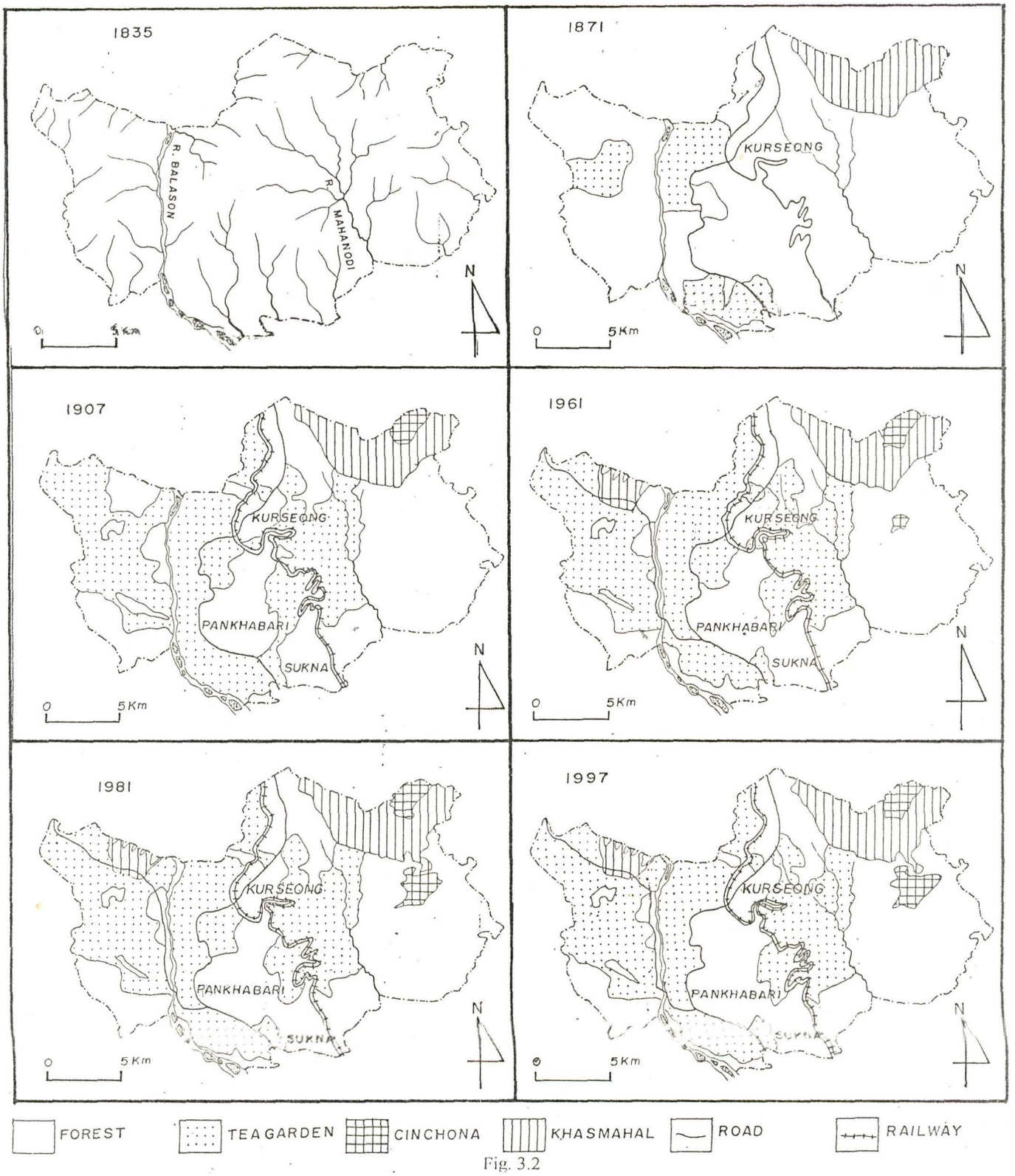
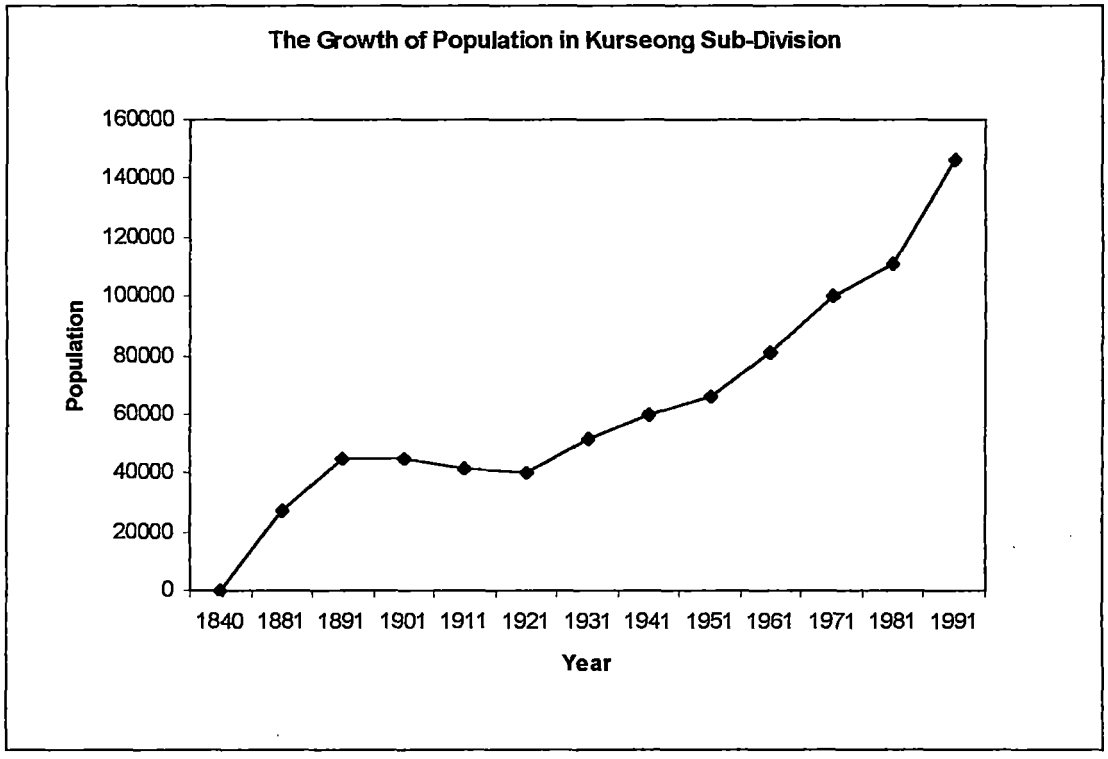


Fig. 3.2

Table 3.2

Year	1840	1881	1891	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
Population	50	26937	44645	45187	41207	40357	51996	59986	65713	80743	100233	111302	146640

Figure 3.3a



3.3.5 THE PRESENT 1991 – ONWARDS

The changes in the land-use pattern over the years have therefore, resulted in the situation that we are presently facing with all the maladies of an ever-increasing population that has

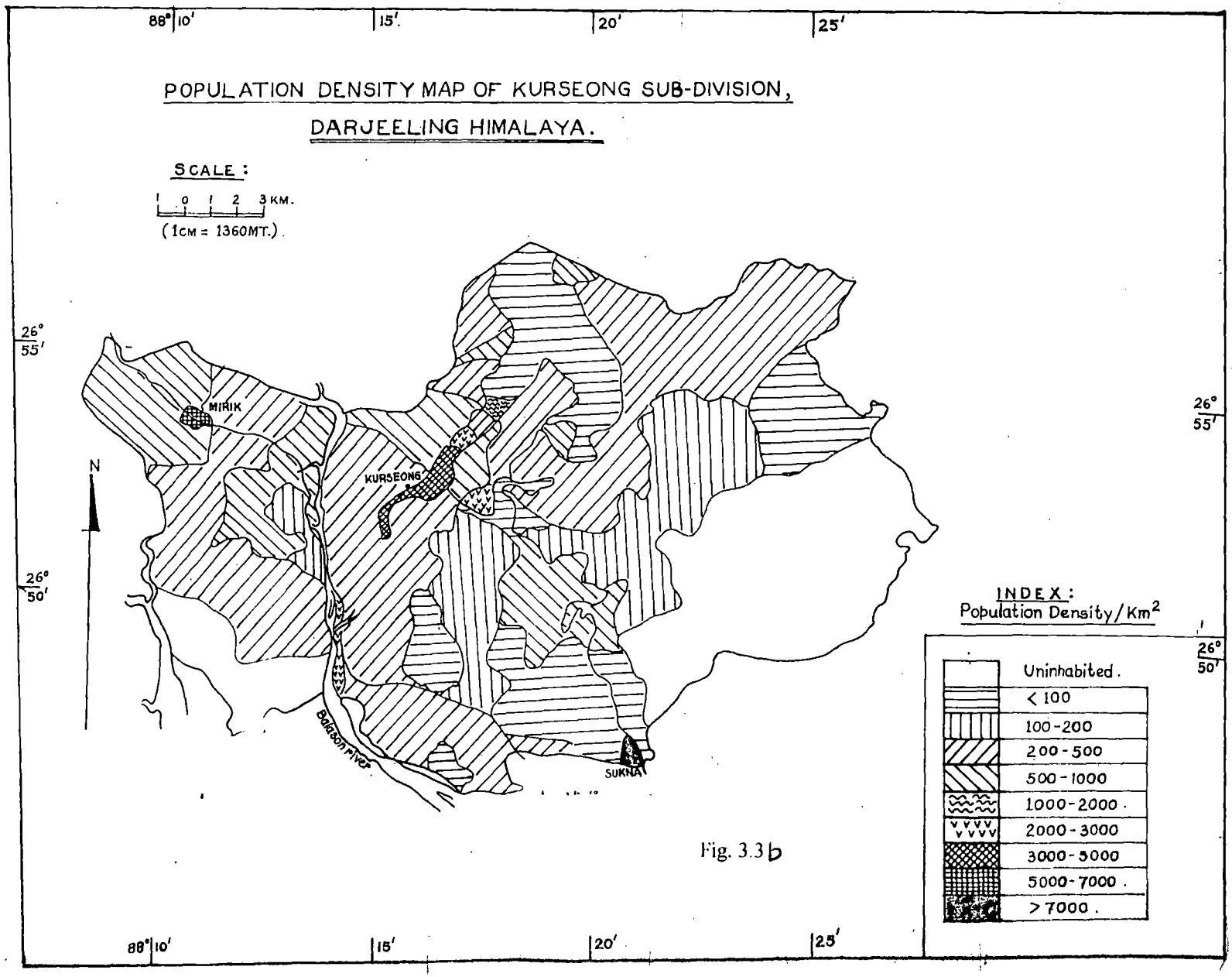

POPULATION DENSITY MAP OF KURSEONG SUB-DIVISION,
DARJEELING HIMALAYA.
SCALE :
1 0 1 2 3 KM.
(1CM = 1360MT.)
88° 10'
15'
20'
25'
26° 55'
26° 50'
N
MIRIK
KURSEONG
SUKNA
Balasun River
INDEX:
Population Density/Km²
Uninhabited.
< 100
100-200
200-500
500-1000
1000-2000.
2000-3000
3000-5000
5000-7000.
> 7000.

Fig. 3.3 b

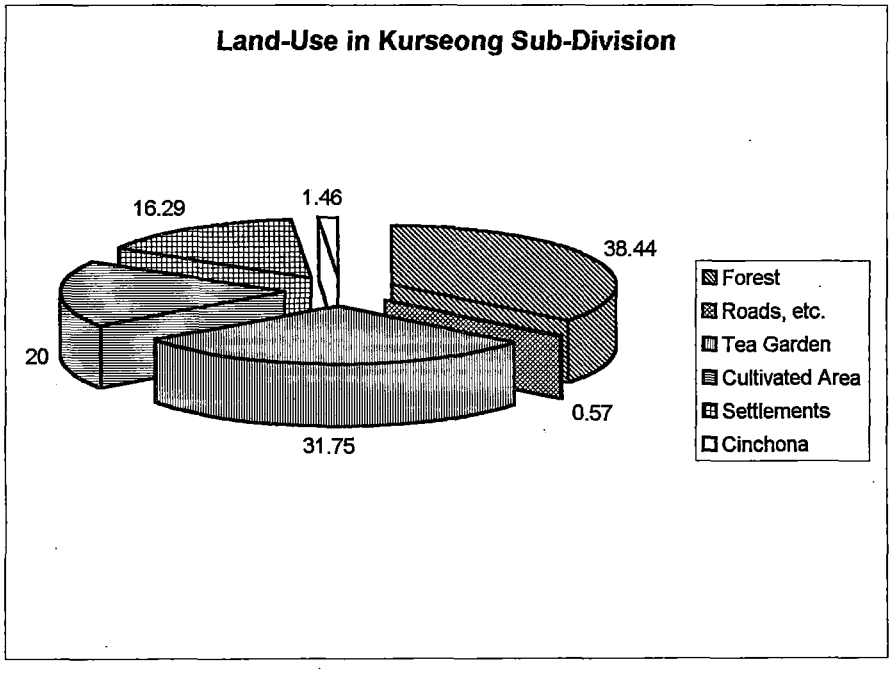
put a tremendous pressure on the environment. Table 3.3 & Fig. 3.4 indicates the land-use and the extent of area under each land-use for the present.

Table 3.3

Land-Use	*Area in Ha.*	*% of area*
Forests	16621	38.44
Tea Gardens	13730	31.75
Cultivated Area*	8650	20.00
Settlements	7045	16.29
Roads, etc.	245	0.57
Cinchona	630	1.46

* includes cultivated areas of tea gardens and settlement areas

Figure 3.4



The Forests

The forests in the Sub-Division are presently under the jurisdiction of Kurseong Forest Division, Wild Life Division I, and Darjeeling Gorkha Hill Council. There are some forests within a few tea gardens. However, an interesting development that has taken place over the years is the growing of trees around household localities in the villages and other settlement areas. The overall extent of forest area is about 40 % percent of the geographical area of the Sub-Division. Out of this 23 % is under plantations and the rest still under natural and semi natural forests.

The Tea Gardens

There are 42 tea gardens within the Sub-Division occupying about 31% of total area. A few have become defunct. More than 50% of the population of the Sub-Division are within the tea gardens and therefore there is a build-up of a tremendous population pressure from the tea gardens on the environment (Photo. 3.2).

The Cultivated Areas

There has been an increasing trend in the cultivation of various crops in the Sub-Division although there is little scope of increasing agricultural area. The extent of area under cultivation is about 20 % of the total area. This could possibly have happened due to the gradual extension of cultivation within the households of settled areas and tea gardens (Photo. 3.3).

The Settlements

Photo. 3.3 Horticultural activities- gaining popularity

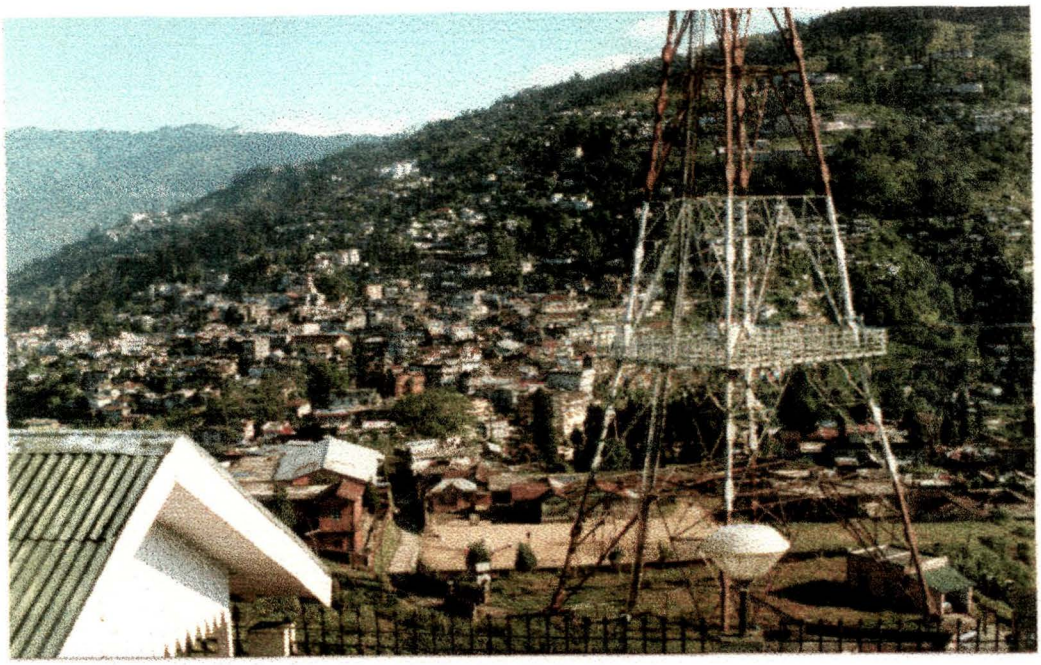


Photo. 3.4 Kurseong Town

Settlement areas occupy about 16 % of the geographical areas. The number of households has increased substantially in the settled areas, particularly in Kurseong Municipality (Photo. 3.4), the T.N. Road, and the villages and some of the Khasmahal areas.

Roads and Communications

The roads, surfaced and unsurfaced, are maintained by the Public Works Department and other local bodies and run along 244 kilometres within the Sub-Division. Some like the by pass road from Giddapahar to Tindharia, have been recently built over very steep and dangerous gradient. The T.N. Road remains disrupted continuously every year by landslides at several places. An important feature of the roads, particularly the T.N. Road is that quite a substantial number of households exist along these roads.

The Cinchona Plantations

There has been no further extension in the cinchona plantations in the Sub-Division mainly because of the non-availability of suitable land for cinchona plantations. Whatever plantations had been carried out in the latter years were in the forest areas of Sittong and Latpanchar. These plantations occupy about 1.46 % of the total area.

Study of the Population Density

A study of the spread of population throughout the Sub-Division (Fig.3.3) reveals high population density per square kilometre in Sukna (more than 7000), Jamadar Bhita (more than 2000), Kurseong Municipality (more than 5000) and adjoining areas like Giddapahar, St.Mary's Hill (more than 2000) and Mirik (more than 3000). About 35 % of the population of the study area reside in tea garden areas, which on an average have a population density of 378 per square kilometre. Many of the forest areas and defunct tea garden have a density less than 50 while the south eastern parts of the study area comprising dense forests and portions in the south western parts are still practically uninhabited.

3.4 FOREST MANAGEMENT

While all the changes in the land-use occurred in passage of time, the forests that formed one of the most important entity of the environment in the area, were treated in various ways to suit the needs of the time, and the policies of the Government started with indifference, as revealed from terminology of the virgin forests in the hilly tracts as "waste lands" for leasehold grants, to gradual concern for conservation. The salient features, as given under, of the various management practices that have been followed in managing the forest resources, illustrates the reasons for condition of the forests as they now are.

Reservation

Until 1863, the forests were being exploited with very low priority being given to conservancy in most parts of Bengal, and it was only after the first Inspector General of Forests, Sir Deitrich Brandis' proposal for conservancy of forest in Bengal, did the Government think of restricting exploitation of the forests. With the promulgation of the Government Forest Act VII of 1865, and the provisions laid therein, forest demarcation and reservation followed rapidly, the tract of Cooch Behar and Darjeeling being the first forest areas to be declared as forest under the act. Subsequently, more tracts were added, and a better description against each reserve given with the supercession of the act by the Indian Forest Act VII of 1878, and later on, in the year 1927, the Indian Forest Act XVI.

Systems of Management

With the reservation of forest areas, restrictions on exploitation were initiated by preparing annual/working schemes to fix the number of trees (particularly sal in the plain and terai areas) and introduce regular methods of treatments, as the forests, till then, were being worked under the permit system, which led to the removal of the best trees particularly in the accessible areas. Drawing up of working plans over the years followed this.

Bamanpokhri Working Plan and Scheme 1887 – 1902: The Working Plan of the Bamanpokhri Forests, prepared by Messers Chester and French in 1887, followed by working schemes prepared during 1895-98 which was carried out upto 1902 when regular working plans came into operation, put certain restrictions on the removal of sal while still allowing continuous removal of `kukats' (trees of less valuable species). Silviculture was less considered and exploitation yet given priority. Continued fire protection and opening out of canopy in mixed sal forests led to the suppression of sal regeneration by miscellaneous species and dense undergrowth.

Working Plan of Kurseong Division - Hatt's Plan 1902 – 1918: This working plan for the Kurseong Division prescribed Selection and Improvement Fellings with greater emphasis on sal. However, the high demands for firewood and box planking led to violation of the prescriptions and sal regeneration suffered due to sudden exposure and invasion of inferior spp. and climbers. Since 1919, Coppice Working Circle (CWC) was formed in mixed forests, Coppice with Standards (CWS) system being prescribed with rotation of 20 years. This plan led to the concentration of work in only one Range while the other was excluded in the first half of the felling cycle.

Working Plan of the Upper Hill Forests - 1892 – 1919: The forest of the upper hills were worked under the Working Plan of Mansion, 1892 to 1900-01, followed by Osmaston's Revision of the Plan in 1902 and Grieve's Plan from 1912-1919. Mansion's Plan prescribed a rotation of 160 years in 5 Periodic Blocks under the Shelterwood System and Improvement Felling. Osmaston revised the Plan, prescribing 8 coupes for Mahildaram in 10 years with removal in final felling all shelterwood in succession, but no new regeneration was prescribed or undertaken. The drawbacks of Mansion's Plan of regeneration under shelterwood was the retention of 2/3 of original crop including all the biggest stem and wolf trees. Overhead shade, as well as physical damage at the time of final felling hampered regeneration. More consideration was given to adequate seed dispersal from mother trees and felling coupes were prescribed in long and narrow strips across the contours, rendering

the area liable to erosion. The interval between two successive felling was too long and a whole area was partially planted instead of a smaller area thoroughly.

Grieve's Plan 1912 – 1919: The Plan avoided the second felling which was in most cases responsible for the destruction of regeneration established after the first felling. Areas previously regenerated were put under a separate WC and the remainder divided into Coppice WC and High Forests. 30 years rotation was prescribed for CWC to supply firewood to the Tea Gardens. For High Forests, selection system on a rotation of 150 years with 25 years Felling Cycle was prescribed. During felling cycle, one half of Class I trees were to be removed in groups, utilising advance growth in the main, supplemented by planting wherever necessary. This method, was however, unsuitable and led to clear felling in patches and since mature regeneration had not appeared, it was decided to prescribe the method of clear felling and planting in conjunction with taungya cultivation. The CWC, since 1918, was also put under the taungya system, as these areas required extensive restocking.

Gent's Working Scheme 1919 – 1926: A period of experimentation to find out the best method of regeneration of sal and other species started with Gent's Working Scheme from 1919-1926 particularly for the lower hills and the terai and plains. A shift from Selection to Uniform Systems by artificial and natural regeneration was aimed at.
The whole of sal forests was put in one WC subdividing it in 3 FC viz. Hill, Sukna and Balason. A CWC was opened with felling cycle of 20 years to meet firewood demand of the Tea Gardens. All non-sal bearing areas excluding CWC were put in Miscellaneous WC. This resulted in successful restocking of clear felled areas, improvement in the condition of sal and introduction of valuable species, in the coppice coupes. However, regeneration of miscellaneous species was still neglected.

The successful experiments of clear felling followed by artificial regeneration of sal and other species led to the adoption of this Scheme, with main objective of converting irregular forests into a regular normal forests and improving species composition.

Datta's Plan: Datta's Plan of 1929-30 divided the forests (excluding the upper hills) in Plains Sal, Hill Sall, Misc., Riverain, Afforestation, Protection and Undeveloped WC, for different treatments of the forests. Clear felling followed by artificial regeneration was prescribed for Plain Sal WC with rotation of 80 years and provision of selection thinning and climber. For Hill WC, selection and improvement felling for sal and different species was prescribed. Clear felling with artificial regeneration was prescribed for Bamanpokhri forests.

For Miscellaneous WC, clear felling followed by artificial regeneration and for riverain and Afforestation WCs, selection felling were prescribed. Removal of dry and fallen trees was allowed in Protected WC and no felling was prescribed in undeveloped areas. The result was observed in the Plain WC with sal regeneration coming up successfully.

Baker's Working Plan for the Upper Hills 1920 – 1937: The upper hill forests were then being worked following Baker's Plan, dividing the forests of Mahaldiram, Upper Babukhola and Dhobijhora into 2WC for firewood and timber and charcoal respectively. Clear felling and planting in conjunction with taungya cultivation was prescribed. However, taungya cultivation was observed to be unsatisfactory, as it led to soil erosion and loss of nutrients.

The Third Working Plan 1941 – 1960: The Third WP divided the forest into 9 WCs with the objective of converting irregular forests into normal forests and to improve stocking both in quality and quantity. Soil erosion, water supply and demand for forest produce were also of concern. Clear felling followed by artificial regeneration was prescribed in 6WC, while selection felling to selection with improvement felling to discretionary felling in Protected and Undeveloped WC. There was improvement in the condition of sal pole crops, and the tendency to over-exploit sal was checked by prescription of volume control in Conversion WC II, however, much of the sal and good miscellaneous trees were felled in unallotted PB of different WCs to meet the war demand. The practice of regeneration by taungya was on the whole successful inspite of the drawbacks. However, plantation in the Hill Forest WC were patchy as seedlings got suppressed by vigorous coppice shoots of undesired species.

Due to lack of demand, the suggestion of a systematic removal of dhupi by clear felling and replanting the areas with suitable hill spp. could not be implemented. Clear felling was also carried out to give way to cinchona plantations. This plan was revised after 13 years.

The Fourth Working Plan 1954 – 1963: The objectives of this Working Plan were to convert irregular mixed forests into regular, normal even aged forest in order to improve the future yield both in quantity and quality on the principles of sustained yield for meeting the demand of forest produce, minimise soil erosion and landslips, regulate war supply, permit cinchona plantation in forest lands and create a better environment for wildlife. There were 10 WCs. Prescriptions were also made for bamboo, cane and khair. Complete fire protection was advocated in the forests.

The Fifth Working Plan 1969 –1989: The Fourth W.P. was revised to incorporate the increasing industrial demands of forest produce. The cultivable hill forests were allotted to the Miscellaneous W.C. to raise quick growing species. Steep and unstable areas of the hill forests and forests for water supply were allotted to Protection W.C. with no felling of any living tree prescribed. Riverain forest were placed under Riverain W.C. to protect the river beds and unstable river banks while the forest of the foothills and the plains were placed in the Plain W.C. to grow valuable species. The allotment of areas into various PB has not been done except PBI and clear felling followed by artificial regeneration has been prescribed for the Wcs with yield being fixed by area alone.

The Sixth Working Plan 1997-2018: Dictates of the Indian Forest Conservation Act 1980, Forest (Conservation) Amendment Act 1988, Wildlife Protection Act 1972, National Wildlife Action Plan 1983 and the order of the Hon'ble Supreme Court 1996 have called for the objectives of the Working Plan to strike a judicious balance between conservation and development of bio diversity on one hand, and effective utilisation of natural resources on the other hand. Accordingly six Working Circles have been prescribed namely: -

(1) Bio diversity and Wildlife Conservation and Preservation Working Circle.

(2) Eco-development and Eco-tourism development Working Circle.

(3) Applied Forestry Research and Development Working Circle.

(4) Intensive Biomass Development Working Circle.

(5) Conifer and Miscellaneous development Working Circle.

(6) Broad Leaved Endemic Species Development Working Circle.

Restrictions have been put on felling of natural forests and even plantations particularly in hills of Kurseong Division.

The management practice can therefore be traced from the pre-conservation days, when trees were exploited, through a period when restrictions were put on the removal of valuable species (while no substantial control was put to the removal of the miscellaneous species), to the present era of conservation of Bio-diversity. The objective of the Government, all along, was clearly to get maximum returns from the forests, which were already under the pressures created by population increase and development of tea industry. The endeavour of the Forest Department to improve the quality and quantity of the forests led to creation of plantations of only a few identified and useful species, which perhaps had an effect on the species diversity. Moreover the introduction of dhupi and the way in which it was planted as a monocrop proved to be harmful for the natural vegetation, with no under growth coming up. Even the systematic removal of the species and replacement with hill species could not be carried out because of less demand for the species.

3.5 CONCLUSION

The process of land-use change brought about by the development of the area through the passage of time has gradually increased the environmental hazards that we are now exposed to. Man's activities in the area has escalated the pressures of an increasing population on the ecologically fragile environment leading to widespread deforestation, soil erosion, landslips and landslides, and floods in the plains. The various steps that were taken to bring about the changes in the land-use and the direct and indirect results that emanated should be taken as

important lessons and as warnings. Signs of environmental breakdown began to be manifested by the turn of the century itself, when the landslides of 1899, which took the toll of many lives and loss of a lot of property in the area following unprecedented rainfall, came as a warning to planners. The report of the Committee, which was appointed to inspect the condition of buildings, roads and drains to find remedies for preventing the occurrence of such landslides, narrowed down not only to the natural phenomena of the heavy amount of rainfall that was received during the particular period, but also, and more so, to man's own indifference and ignorance. The report revealed 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 and quarrying in unsafe localities. The findings led to the promulgation of an Act, which ensured immediate protection work to be carried out in the District. The fact that an Act could come into force and lead to extensive protection works which were considered necessary as far as preventive measures were concerned stands as one good example of the 'will' which needs to be emulated when we have all the advantages of modern technology today.

REFERENCE

Basnet, L.B. Sikkim A Short Political History, S.Chand and Co.(Pvt) Ltd. New Delhi, 1974

Dash, A.J. Bengal District Gazetteer- Darjeeling, Bengal Government Press, Calcutta, 1947

De, B. The West Bengal District Gazetteer, Darjeeling, West Bengal District Gazetteers, Calcutta, 1981

Dozey, E.C. A Concise History of the Darjeeling District Since 1835, Jhetsum Publishing House, Darjeeling, 1989

Edgar, J.W. Papers Regarding the Tea Industry in Bengal, Bengal Secretariat Press, Calcutta, 1873

Ghose, B. Census 1971- District Census Handbook – Darjeeling District, Government Printing Press, Calcutta

Ghosh, D.K. Sixth Working Plan of Kurseong Division 1998 – 2018, Vol. 1&2, Directorate of Forests, West Bengal

Ghosh, S.N. Census 1981 – West Bengal – District Census Handbook – Darjeeling District, Government Printing Press, Calcutta

Ghosh, T.K. Tea Gardens of West Bengal A Critical Study of Land Management, B.R. Publishing Corporation, Delhi

Hooker, J.D. 1859; Darjeeling Sikkim Himalaya and Passes Leading into Tibet, Himalayan Journal, Bot.2; 11-16

Mitra, A. Census 1961 – West Bengal – District Handbook – Darjeeling, West Bengal Government Press, Calcutta

Mitra, A. Census 1951 – West Bengal – District Handbook – Darjeeling, West Bengal Government Press, Calcutta

0'Malley, L.S.S. Darjeling District Gazetteer, Gyan Publishing House, New Delhi

Pinn, F. The Road to Destiny – Darjeeling Letters 1839, Oxford University Press, Calcutta, 1986

Roy, N.K. The West Bengal Estate Acquisition Act, 1951 and the West Bengal Acquisition Rules, 1954, Eastern Law House, Calcutta, 1972

Sarkar R.L.& Lama M.P. (Ed.) Tea Plantation Workers in the Eastern Himalayas, Atma Ram and Sons, New Delhi, 1986

Darjeeling and its Mountain Railway – A Guide and Souvenir, Darjeeling Himalayan Railway Co. Ltd., 1921, Jhetsum Publishing House, Darjeeling, 1983

District Statistical Handbook – Darjeeling 1995, Bureau of Applied Economics and Statistics, Government of West Bengal

The Assam Directory and Tea Areas Handbook 1991-92, Assam Review Publishing Company, Calcutta

The Assam Review and Tea News, Vol. 84 No.1-12, 1995-96, Assam Review Publishing Company, Calcutta