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Spatio-Temporal Dynamics of Urban Landuse in Kurseong Municipality, Darjeeling District, West Bengal

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Abstract

Land use is a spatial aspect of the types of human activities on a parcel of land to serve the human needs. The land use patterns of an area express the interactions between the availability and quality of land on the one hand and its regional relationship and utilization on the other. Land, being one of the basic and finite resources of human existence, is open to deterioration and exploitation due to increased demand and rapid population growth in Kurseong town. The study of existing land use patterns of Kurseong town, therefore, is an urgent need for planning as it gives the analytical account of various uses and conceptions upon which the future planning and prospects of the town is based. The present paper attempts to study the changes in urban land-use pattern of Kurseong Municipality over a period of 13 years with the help of GIS techniques. Arc GIS 10.3.1 with different geo-processing tools is used for linking spatial and attributes data for querying of information and for portraying them in maps. The study reveals a significant increase in the municipal area during 2003-2016. The noticeable impact of land use change observed is decrease in vacant land and significant increase in developed area of the municipality.

Keywords: Land use, land use pattern, land use change, urbanisation, level of urban development, population growth

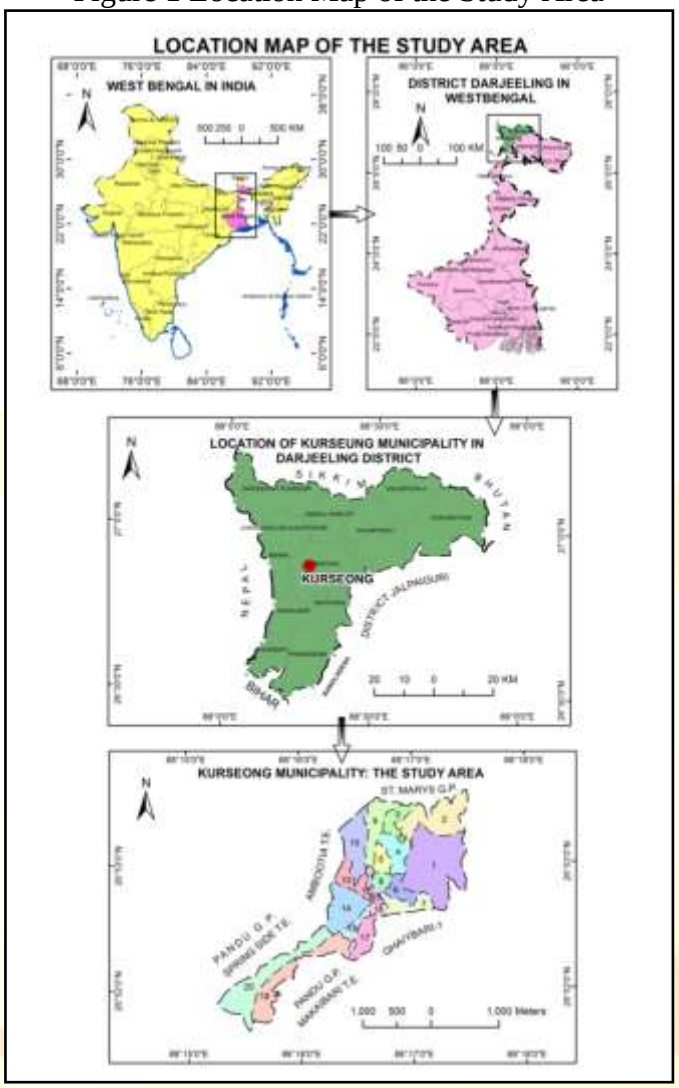
1. Introduction: Land use is the surface utilization of all developed and under-developed land on a specific point, at a given time and area (Mandal, 1982). Proper planning, considering the knowledge of broad characteristics of urban pattern and quantitative analysis of the space devoted to each type of land use, is crucial for ensuring the quality of urban life that can assist in regulating the urban activities and optimizing the use of existing infrastructural facilities and their expansion to meet the future needs of the town. There is no uniformity in the classification of urban land uses as adopted by different organizations or individuals in different parts of the world. This is primarily due to differences in the land use in different cities and it is also attributable to the difficulties in mapping various uses as well as to the purposes for which they are mapped. The types of land use in Indian cities and those in the Western cities are not spatially distributed in the same manner. Breese (1966) noticed the highly mixed land use in Indian urban centres differing markedly from the usual segregation of land uses in Anglo-American cities (Singh, 1980). Brush (1962) while studying morphology of Indian cities observed that the Indian cities with distinct structural arrangements cannot be experimented on the theories developed for the Western cities (Brush, 1962). Kar and Mukherji (1972) found that the different phases of historical evolution along with the site, topography and accessibility have guided and produced the present land use pattern in Darjeeling (Singh, 1980).

2. Review of Literature: The review of related literature has been done relevant to the present study. Studies exist on the urban land use patterns at different levels. Singh (1980) studies the existing land use pattern of Shillong agglomeration efficiently highlighting the

functional structure of markets, various categories of land uses, their problems and the possibilities for improving the land use in such areas; Sharma (1985) examines the morphological and functional analysis of Rohtak city in Haryana on the basis of empirical findings. The author reveals his bold proposal, practice and operation of perspectives, parameters and principles avoiding the western models in explaining the urban growth and ecological processes as he opines that the Indian cities do not yet possess the social mobility and economic vitality of western cities. Upadhyay (1992) brings out the salient features of Jaipur's urban landscape laying emphasis on its evolution and land use pattern and after carefully analysing and interpreting all the pertinent social and economic facts, recommends a proposal for a comprehensive urban land use planning. Pal (2000) in his doctoral thesis explains the problems and prospects of Kurseong town. Detail investigation on the urban morphology of large and medium towns and urban land use pattern and changes is also found in the works of scholars like Katakey and Sharma (2002) - Jorhat in Assam, Malik et al. (2007) - Bolpur town, Swamy and Mahesh, 2010 - Gulbarga city, Tiwary et al. (2010) - Mirzapur city, Jangra and Kaushik (2014) - Kaithal Town, Haryana etc. to name a few.

3. Study Area: The study area is the administrative headquarter of Kurseong subdivision which is situated at
26° 51'42" N to 26° 53'36" N latitude and 88° 15'12" E to 88° 17'32" E longitude in Darjeeling district of West Bengal. It lies at a distance of about 48 km from Siliguri and 30 km from Darjeeling. Kurseong is situated on the southern slope of the Senchal-Mahaldiram range which radiates from the Ghoom ridge in the north in the Darjeeling Himalayas and gradually descends further down to the plains of the Terai. It has an elevation of 4864 feet (1482m) above sea level. The region is composed of resistant Darjeeling gneissic rocks with northerly dips. The average slope of the town is 22° 55.' The town is bounded by two perennial streams namely Hussain Khola in the north and Dhobi Khola in the east. Further the thick Dowhill Reserve Forest bounds it in the east and it is bounded by the tea gardens in the west, north-west and south. The Dowhill ridge, a part of the Jalapahar Ridge shuts it out in the east from the Tista valley. Barring the above mentioned perennial streams, the numerous streams that drain the municipality area are non-perennial in nature. The town has a moderate and favourable climate for human habitation as it neither suffers from severe winter like that of Darjeeling nor from scorching heat like that of the plains. The maximum temperature in summer ranges between 17° c and 25°c and the lowest temperature in winter ranges between 5 ° c and 10 °c. Kurseong being situated in the southern slope of the range receives higher rainfall compared to other urban centres of Darjeeling hills. The average annual rainfall is 400 cm. The soil found in the region is red brown colour derived from the weathering of gneissic rocks.

Figure 1 Location Map of the Study Area



4. Objectives: The major objectives of the study are as follows:

i. To analyze the temporal change in land use pattern of Kurseong Municipality.
ii. To analyze the wardwise land use pattern.
iii. To analyze the impact of land use change during 2003-2016.

5. Data base and methodology: The present study is based on multi-source database. For the preparation of land use map of Kurseong Municipality, open source data available on internet was used. Few senior citizens were also interviewed in order to collect the land use information. The present and past land use maps of Kurseong Municipality have been prepared from Google Earth, 2003 and 2016 with 0.61 metre resolution. The ward boundary has been prepared from the municipality map collected from the Municipality Office. The available satellite data has been visually interpreted and integrated with intensive field checks and the maps were digitized and attributed with the help of GIS software ArcGIS 10.3.1. based on the attribute tables for respective years. Statistical analysis of land use changes has been analysed in MS Excel package.

6. Result and Discussion: Kurseong town has witnessed its urban growth both in terms of time and space. Various land use patterns have evolved through history and their creation and modification reflect the changes in the functional character of the town and the ways

of living of its people with the passage of time. Based on U.S.G.S. classification system (Anderson, 1971) and depending upon the existing features of land use in Kurseong Municipality, the two broad land use categories are discussed for the present study *viz* Developed Area and Under-developed Area which are further classified into residential, commercial, industrial, transport and communication, mixed (commercial cum residential), open space, forest, agriculture and vacant land. As time goes by, the use of land in both natural and man-made environments is influenced by the pressures associated with development and increasing population (Rongmei and Singh, 2013). The need for the study of land use in different time lines, monitoring its change and the factors associated with it, therefore, is essential which can aid, to a great extent, in balancing the present requirements of land considering the future needs.

6.1 Land use pattern in 2003

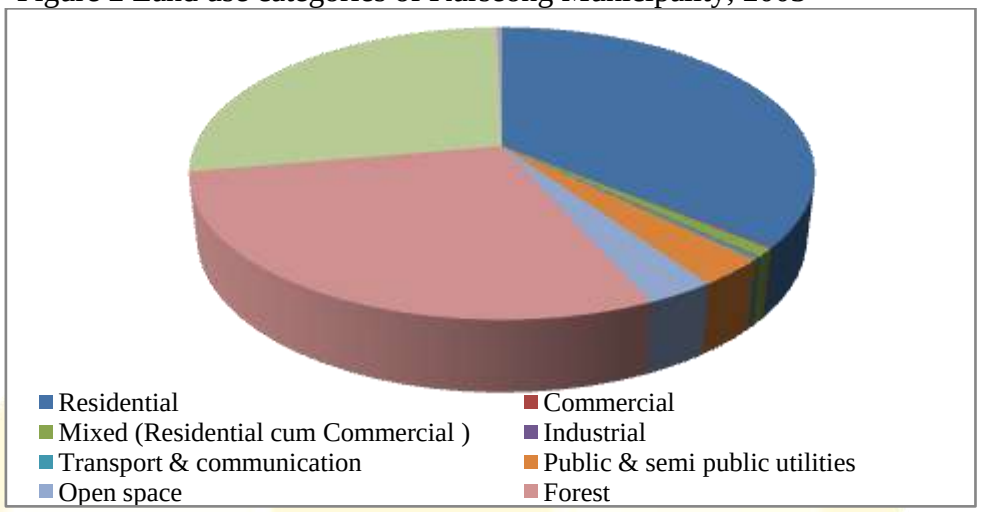
The developed and under-developed area comprised of 43.41% and 56.59% the total area (5.05 km^2) of Kurseong Municipality respectively in 2003. The under-developed area is higher due to the presence of reserved forest and tea gardens which together accounted for 56.27% and vacant land owned by the government that accounted for 00.32% of the total area of the town. Under the category of developed area, residential is the dominant land use accounting for 35.95% of the total municipal area followed by land under public and semi-public (3.05%).

Table 1 Land use categories of Kurseong Municipality, 2003

Land use category	**Land use category**	**Area (in km^2)**	**% to total developed area**	**% to total area**	**% to total area**
Developed Area	Residential	1.6971	81.84	33.61	41.07
	Commercial	0.0063	0.30	0.12	
	Mixed (Residential cum Commercial)	0.0469	2.26	0.93	
	Industrial	0.0048	0.23	0.10	
	Transport & communication	0.0131	0.63	0.26	
	Public & semi public utilities	0.1526	7.36	3.02	
	Open space	0.1530	7.38	3.03	
Under-developed Area	**Land use category**	**Area (in km^2)**	**% to total under-developed area**	**% to total area**	**% to total area**
	Forest	1.4535	48.84	28.78	58.93
	Agriculture	1.3880	46.64	27.49	
	Vacant	0.1347	4.53	2.67	

Source: Google Earth, 2003

Figure 2 Land use categories of Kurseong Municipality, 2003



6.2 Land use pattern in 2016

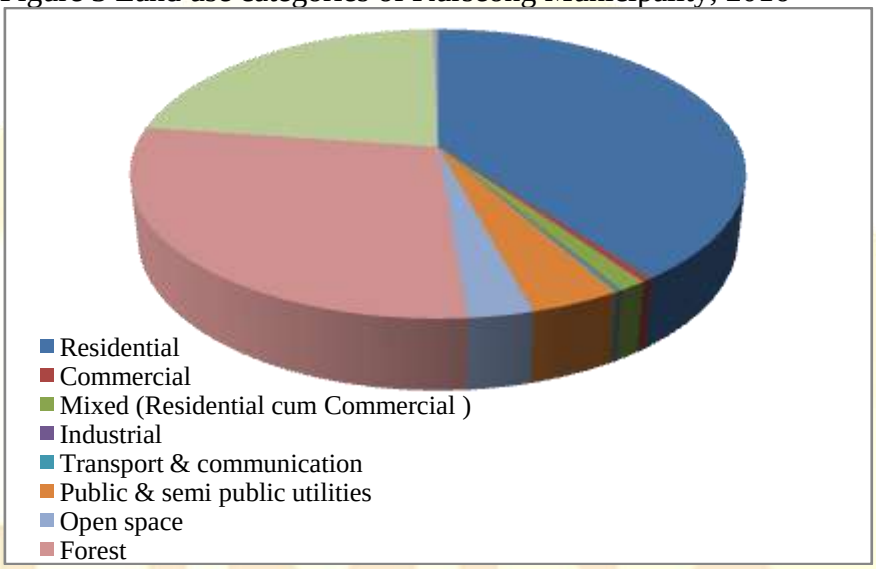
The past and contemporary developments operating in the town have given rise to distinct picture of land use in Kurseong town. The town started with an area of 4.29 km^2. With the realignment of old wards and addition of new wards, the present Kurseong town covers an area of 7.85 km^2. The developed land, which is currently in use for facilitating different urban functions comprised of diverse land uses like residential, commercial, transport and communication etc., comprises of 48.70% and the under-developed land which is occupied by non-urban uses primarily dominated by forest, tea gardens and vacant lands comprised of 51.30% of the total town area. With the passing years of much rapid process of urbanization the percentage of land under urban use is increasing at a faster rate.

Table 2 Land use categories of Kurseong Municipality, 2016

Land use category	**Land use category**	**Area (in km^2)**	**% to total developed area**	**% to total area**	**% to total area**
Developed Area	Residential	3.1229	81.69	39.78	48.70
	Commercial	0.0382	1.00	0.49	
	Mixed (Residential cum Commercial)	0.0989	2.59	1.26	
	Industrial	0.0076	0.20	0.10	
	Transport & communication	0.0154	0.40	0.20	
	Public & semi public utilities	0.3157	8.26	4.02	
	Open space	0.2244	5.87	2.86	
Under-developed Area	**Land use category**	**Area (in km^2)**	**% to total under-developed area**	**% to total area**	**% to total area**
	Forest	2.2409	55.65	28.55	51.30
	Agriculture	1.7619	43.75	22.44	
	Vacant	0.0241	0.60	0.31	

Source: Google Earth, 2016

Figure 3 Land use categories of Kurseong Municipality, 2016



6.3 Changes in Land Use Pattern (2003-2016)

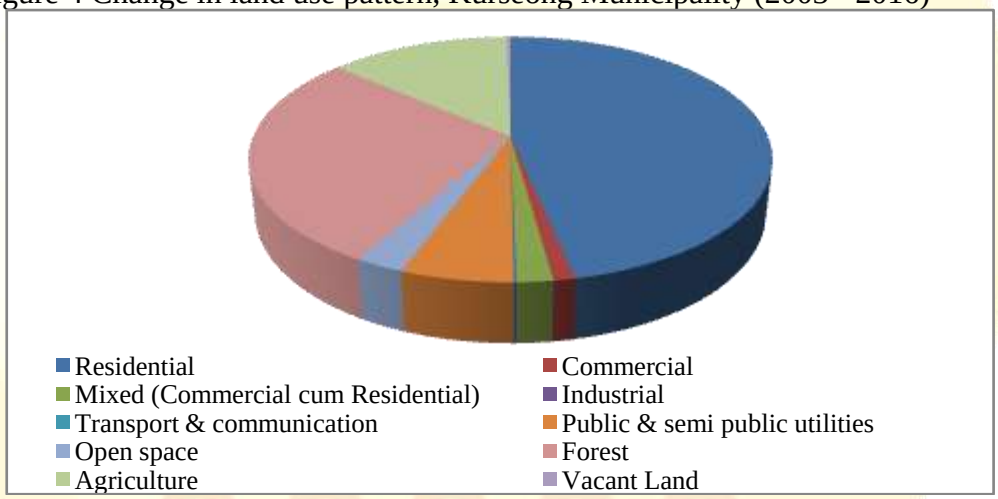
Land use change is a complex and dynamic process which is closely associated with human activities involving nature. Any change in human activities results in change in land use. When the population decreases the urban functions begin to shrink and when it increases the functions begin to expand and decentralize (Singh, J. P., 1980). Land use change, fundamentally a spatial and dynamic process is essential for the management, monitoring, planning and sustainable development of any urban area. In Kurseong town settlement and public and semi-public area has increased due to growing urbanization and area under forest and agriculture has been precariously diminishing. The areal expansion of Kurseong town in different directions is affected because of physiographic limitations and anthropogenic interventions. The changing urban land use has been studied during the period 2003 – 2016. The town under study has been experiencing growth of the built-up area within and outside the municipal limits. The total area of the town also has increased from 5.05 sq. km. in 2003 to 7.85 sq km in 2016.

Table 3 Change in land use pattern in Kurseong Municipality, (2003 - 2016)

Land use category	Area in km^2		Change in land use (in km^2)
	2003	2016	2003 – 2016
Residential	1.6971	3.1229	1.4258
Commercial	0.0063	0.0382	0.0319
Mixed (Commercial cum Residential)	0.0469	0.0989	0.052
Industrial	0.0048	0.0076	0.0028
Transport & communication	0.0131	0.0154	0.0023
Public & semi public utilities	0.1526	0.3157	0.1631
Open space	0.1530	0.2244	0.0714
Total	***2.0738***	***3.8231***	***1.7493***
Forest	1.4535	2.2409	0.7874
Agriculture	1.3880	1.7619	0.3739
Vacant Land	0.1347	0.0241	-0.1106
Total	***2.9762***	***4.0269***	***1.0507***
Total	**5.05**	**7.85**	**2.8**

Source: Google Earth, 2003 and 2016

Figure 4 Change in land use pattern, Kurseong Municipality (2003 - 2016)



The population of the town increased rapidly after independence. The town population increased from 11719 in 1951 to 42446 in 2011with the highest decadal growth rate of 49.56% recorded during 1991 – 2001. Consequently land under different functions increased to fulfill the increasing requirements of the people. This resulted into growth and expansion of Kurseong town as a whole as well as various land uses. The town increased from 5.05 km^2 in 2003 to 7.85 km^2 in 2016. Therefore, there was an addition of 2.80 km^2 of land in 2016. The growth pattern of various land uses and its change has been dominated by residential land use. The highest quantity of land has increased in residential land use (1.4258 km^2) while very little growth is observed in land under transport and communication. In order to provide better understanding of land use changes, the land use

data have been compared for 2003 and 2016 (Table 3). It is clear from this table that the urban land use has increased at the expense of agricultural and vacant lands.

Figure 5 Land use and land cover map of Kurseong Municipality, 2003

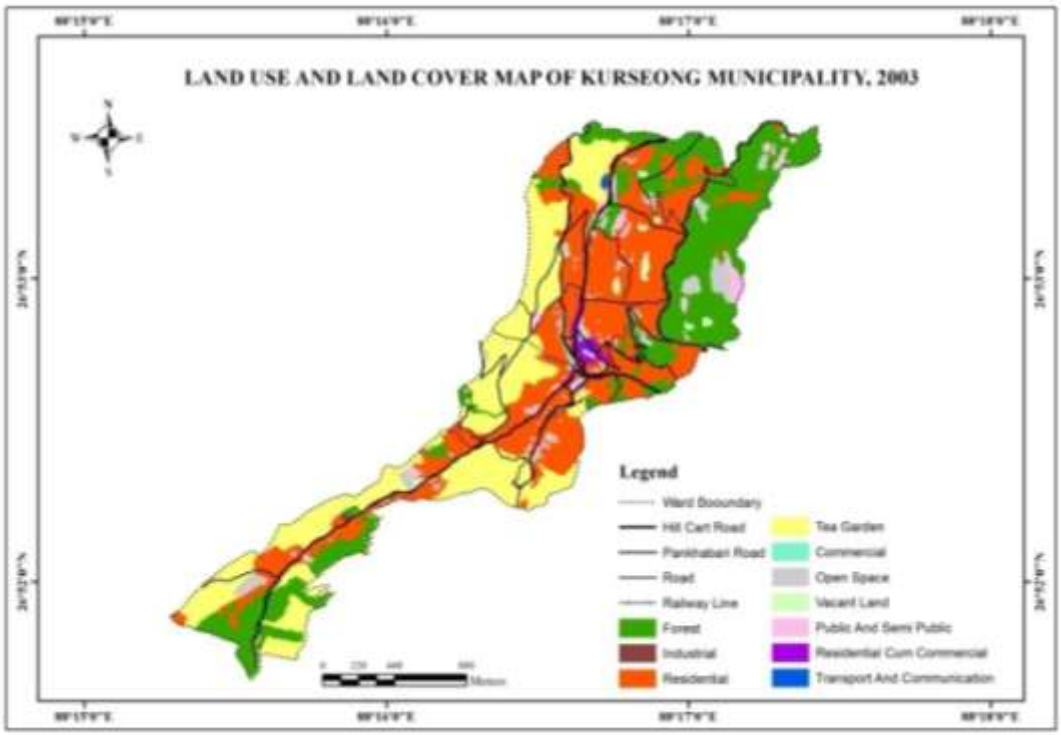


Figure 6 Land use and land cover map of Kurseong Municipality, 2016

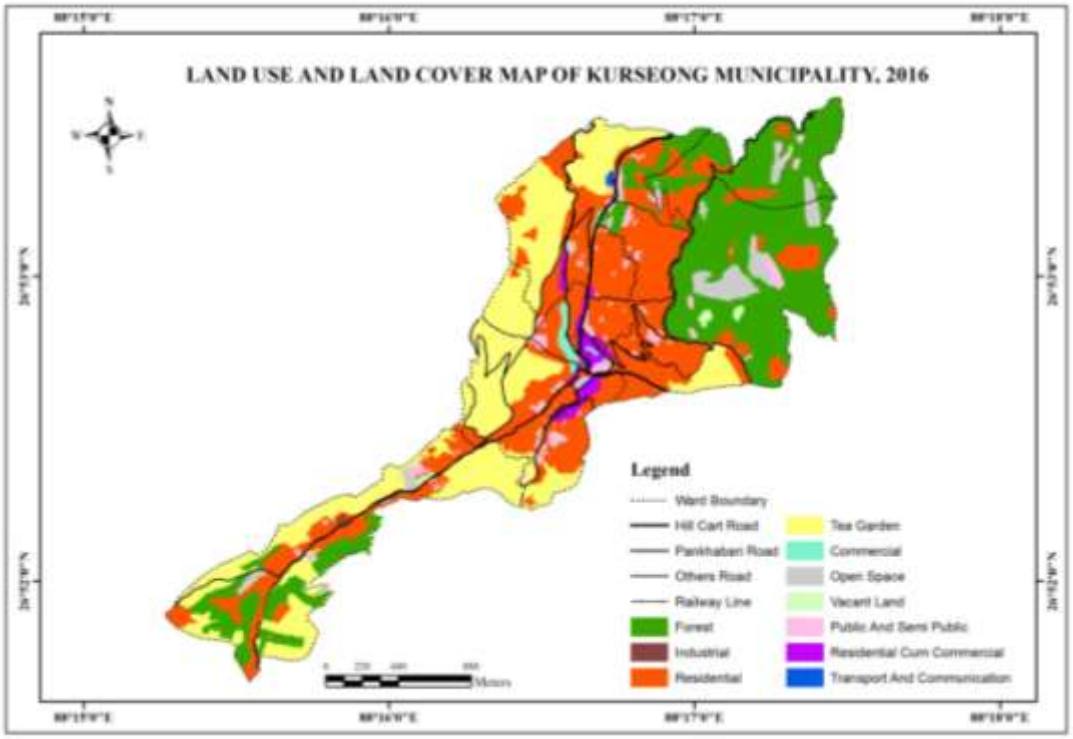


Figure 7 Percentage of land under different categories in Kurseong Municipality, 2003 and 2016

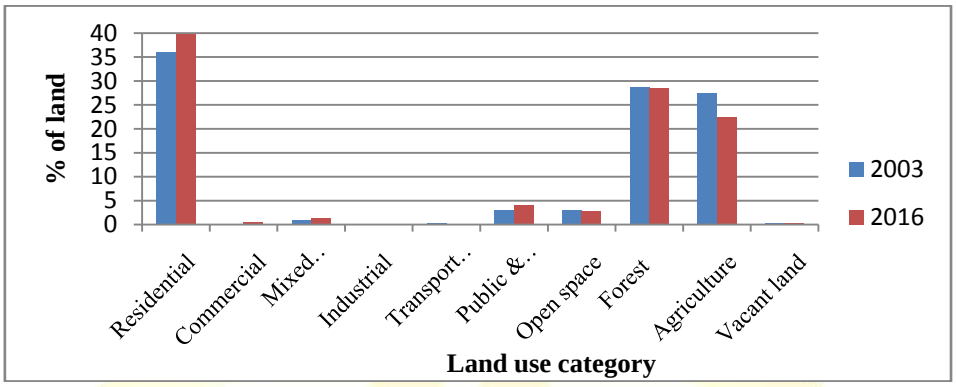
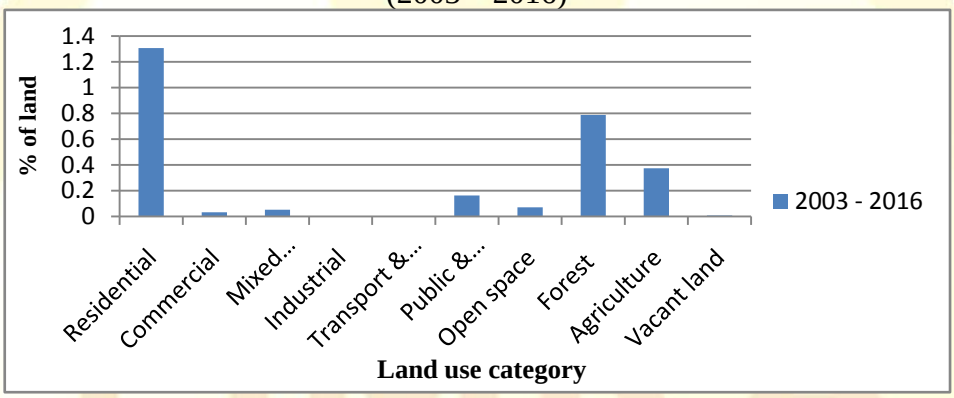


Figure 8 Change in different land use categories, Kurseong Municipality (2003 – 2016)



A. Developed Area

a)Residential

The developed area increased from 2.0738 km^2 in 2003 to 3.8231 km^2 in 2016. The developed area occupied by residential land use has increased by 1.4258 km^2 which is highest among all the land use categories. This was possible due to the availability of a good amount of vacant land in different parts of the town. The encroachment of tea garden areas in the northern, western and southern part of the town has taken place to make way for urbanisation. Owing to scarcity of land and ever-increasing demand for space, old wooden single storey light houses have been replaced by multi-storied buildings to accommodate more population in the CBD area and its surroundings.

b) *Commercial*

The land under commercial use has increased from 0.0063 km^2 in 2003 to 0.0382 km^2 in 2016. The reason is attributed to rapid increase in population and Kurseong town being developed as an educational hub. Transfer of land for commercial use has taken place mostly from residential land use. In addition to CBD, retail shops are generally scattered all over the town and are found invariably along the streets of the residential areas of different wards. However, the land use under purely commercial use has been replaced by residential cum commercial use in recent years.

c) *Mixed (Residential cum Commercial)*

There was a significant increase of land under this category as this category has replaced the land under commercial use and to some extent residential use. This category increased from 0.0469 km^2 in 2003 to 0.0989 km^2 in 2016. Most of the commercial and residential land use in the CBD area comprising of Wards 12 and 15 has been replaced by mixed land use because of urbanization and the associated intensive use of land.

d)Industrial

No significant increase and change has taken place in industrial land use. The Cutlery Servicing Station set up during the Second Plan Period associated with the manufacture of agricultural and tea garden implements have become non-operational and later converted into a training centre for weaving. Similar weaving centres have developed in the Municipality Boys' Primary School. No other new industry has emerged in Kurseong town. The increase in industrial land use is only 0.0028 km^2 during 2003 – 2016.

e)Transport and communication

The lowest amount of change in land use has been observed in transport and communication. This land use category increased from 0.0131 km^2 in 2003 to 0.0154 km^2 in 2016, thus with an increase of only 0.0023 km^2 during 2003 - 2016. In the process of upgrading transport system, a metalled road has been constructed in Wards 4 and 17. A new motorable road under construction at Tekbir Busty in Ward 2 is yet to be completed. There is a very little scope for the widening of roads within the municipal area.

f) *Public and semi-public utilities*

The land under this category shows an increase of 0.1631 km^2 during 2003 – 2016. With increase in population and expansion of town, this category of land has a significant increase as the demand for public utility facilities such as government offices, educational institutions, public halls, libraries etc. increase with the increase in population.

g)Open space

The land under open space increased from 0.1530 km^2 in 2003 to 0.2244 km^2 in 2016. This significant increase is attributed to the fact that a significant amount of new areas have been incorporated in 2011 in Wards 1 and 2 to the north and north-eastern part of the town and some amount of new areas have been incorporated in Wards 9, 10, 19 and 20 to the western and southern part of the town.

B. Under-developed Area

a)Forest

There was a significant increase of 0.7874 km^2 under this land use during 2003 – 2016, which was highest of the under-developed area. This is mainly because of the incorporation of new areas in Ward 1 to the north-eastern part of the town and in the southern part of the town comprising of Wards 19 and 20. In Ward 1, the land under forest increased from 0.6856 km^2 in 2003 to 1.1803 km^2 in 2016.

b)Agriculture

The land under tea gardens increased from 1.388 km^2 in 2003 to 1.7619 km^2 in 2016, which is attributed to the fact that the incorporation of new areas to the north-

western, western, southern and eastern part of the town caused some land under tea gardens to be included in the municipal area. In Ward 7 to the eastern part of the town there was an increase of 0.0607 km^2 of land under tea garden. In Wards 9 and 10 it increased from 0.1378 km^2 and 0.2293 km^2 in 2003 to 0.2315 km^2 and 0.3391 km^2 in 2016 respectively. Similarly, there was an increase of 0.0402 km^2, 0.0225 km^2 and 0.0753 km^2 in Wards 13, 14 and 19 respectively which are located in the western and southern part of the town during 2003 – 2016.

c) Vacant land

A negative growth has been observed in vacant land as the land under this category decreased from 0.1347 km^2 in 2003 to 0.0241 km^2 in 2016. This is due to the fact that the vacant land available in the form of land as a portion of already closed tea garden later came up with many new settlements especially in Wards 3, 4 and 5.

6.2 Land use problem

The problems of allocating urban land uses for various functions are fundamentally similar to those of allocating food, clothes and shelter (Hallett, 1979). As Pacione (2001) has stated that further reduction in availability of land for human use due to rapid population growth in urban areas results into re-distribution, intensification and overlapping of various land uses as well as its expansion on surrounding agricultural land (Sharma and Mishra, 2011). Discrepancy can be clearly noticed from comparative figures of distribution of extent of land uses under different categories. “The misuses of land today are a product of the past” (Singh, J. P., 1980). Various existing land use patterns of Kurseong town have evolved through history, the creation and modification of which reflect the outcome of human demands and needs, developmental activities, decisions taken, intensive and extensive utilisation as well as natural and cultural phenomena in the past. With variations in relief the growth has not been uniform in Kurseong town in different directions, mainly due to physical constraints. Moreover, the land uses have been influenced by the pressures associated with increasing population and the consequent developmental activities. At the time of the initiation of the town, attempts were made by the local authorities for its organised development which, with the passage of time, gradually became a far difficult dream in view of its rapid and high population growth in recent decades. This ultimately has resulted into disorganised development of land uses characterised by emerging haphazard mixed land uses.

The multifarious activities that operate in the town centre are not in compatible relationship with the commercial and residential land uses of the area. NH-55 and the railway line connecting Siliguri with Darjeeling pass through this central commercial area along which shops selling variety of goods are aligned. The parking of numerous vehicles along this highway and the practice of loading and unloading goods make the situation worse. As the shops are found scattered in a haphazard and unplanned manner, scarcity of footpath and lack of parking space is intensely noticed due to encroachment. Some educational institutions are located in a very crowded town centre. The relocation of some of the scattered government offices in an administrative functional area in Wards 18 and 20 in recent years is a significant move by the municipality towards a planned development. But there are many government offices still scattered in different wards of the town. The location of LPG shop on the Hill Cart Road is a misuse in the present context. The loading and unloading of the cylinders creates traffic jam on the already narrow road. It has not been possible to use Chandmari ground in Ward 20 as a public ground owing to reluctance on the part of the Ministry of Defence, Government of India to handover the right of land to the civil authorities and therefore, no further necessary development has taken place here.

6.2.1 Identification of gap between the existing land uses and the recommended standards

The identification of gaps between the existing land use of the town under study and the recommended standards for an efficient land use planning becomes important for curving the unplanned development of the past and for new development, it is essential to ensure the utilisation of the available land in urban areas in most judicious manner. Here an attempt has been made to identify the gap between the quantum of present land use and the recommended quantum of land use that will assist in optimizing the use of land for further extension of infrastructural facilities to meet the future needs. The percentages of land uses under various categories in Kurseong town have not been in sync with the recommended percentage of URDPFI guidelines. The residential area (81.69%) has already far exceeded the standard recommended (50-55%) and this will continue in future. The intensive utilisation of land in the CBD area has led to congestion and overcrowding. Physical constraints such as steep slopes on the eastern and south- eastern part and difficult terrain on the north and north-eastern part restrict the growth of the town. The western edge with gentle slope, the only possibility of future expansion is limited by extension of tea gardens. Hence a clear picture of cramped and congested hill town carrying a burden far beyond the town can sustain is observable. Many houses have been constructed without any regard to building regulations.

Table 4 Gap between the existing land uses and the recommended standards, Kurseong Municipality

Land use category	Percentage of developed area	
Land use category	Recommended land use structure (in %) *	Existing land use structure of Kurseong town (in %) **
Residential	50-55	81.69
Commercial	2-3	1.00
Industrial	3-4	0.20
Public and semi-public	8-10	8.26
Transport and communication	5-6	0.40
Ecological/Forest	8-10	8

Source: * URDPFI Guidelines
** Google Earth, 2016

Table 5 Occurrences of landslides in Kurseong Municipality

Year of occurrence	Affected wards	No. of casualties
2011-12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 16, 17, 18, 19, 20	4
2012-13	1, 2, 3, 5, 6, 7, 8, 9, 14, 16, 17, 18, 19, 20	-
2013-14	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 16, 17, 18, 19	-
2014-15	1, 2, 3, 4, 6, 7, 8, 9, 10, 14, 16, 17, 18, 19, 20	-
2015-16	1, 2, 3, 4, 6, 7, 8, 9, 13, 16, 17, 18, 19	-

Source: Kurseong Municipality Office

Certain parts of the town such as Sherpa Busty, Dhobi Khola area, Cutlery, Rajbari-Ranicoop, Sudhapatole, Ghandhigram and Buddhagram with moderate to steep slope, witnessing frequent incidents of landslides during the monsoons which are not very suitable for residential purposes, have dense and compact houses. Though the commercial area of Kurseong town (1%) is below the recommended standard (2-3%), this category of land has been replaced by mixed land use comprising of residential cum commercial land use especially in the CBD area resulting in congestion and unhealthy living conditions. Haat bazar set up during the British period have become very narrow and congested today with increased number of inhabitants as no fore-thought was given at the time of its establishment. The CBD area has been experiencing continuous vertical growth in recent years due to dearth of land and very little scope for horizontal expansion. As the shops are found scattered in a haphazard and unplanned manner, scarcity of footpath and lack of parking space is intensely noticed due to encroachment. Heavy concentration of shops (60%) as well as location of wholesale godowns in the CBD makes the situation worse. Further, some of the inefficient land uses under commercial category are exemplified by the location of godown of FCI near Supermarket, a municipality shopping complex in the CBD and taxi stand near Railway Station, all of which have occupied huge space. The INA Bus Terminus located at nearly a kilometre away from the heart of the town, remains isolated with a very little utilisation. The Sub-divisional Hospital being located in the heart of the town at Burdwan Road suffers from tremendous noise pollution. In the absence of any large industries, Kurseong town is far from industrial development. The tea industry, the sole industry is plagued by labour unrest, competition in the international market and frequent closures in recent years. The cottage industries which have come up in recent years suffer from sufficient incentives from the government and a very limited market. The percentage of land under forest (28.55%) to total area though fulfils the recommended standard, is apparently open to exploitation in near future. There is a much more possibility of the problem of already limited parks and playgrounds to get aggravated in the near future due to increase in population.

7. Conclusion and suggestions: In 2003, out of a total municipal area of 5.05 km^2 43.41% was under developed area. Residential land use covered the highest percentage of developed area followed by open space and public and semi-public land use. Highest and lowest percentage of developed area was found in the centrally located wards and the wards located in the periphery respectively. Forest covered the highest percentage of under-developed area. The percentage of under-developed area was higher than the developed area. Out of a total municipal area of 7.85 km^2 in 2016, 48.70% was under developed area. Thus, with the rapid process of urbanization the percentage of land under developed area has increased. However, the percentage of under-developed area is still dominant in 2016. Residential land use covered the highest percentage of the developed area followed by public and semi-public land use. 45% of the total wards have more than 80% of their ward area under developed area. Paucity of land has caused the emergence of residential cum commercial land use which has dominated the centrally located wards and along the Hill Cart Road and Pankhabari Road where all kinds of wholesale and retail businesses are performed. The industrially backward status of the district has left its imprint also upon Kurseong town as is reflected from its insignificant industrial development. Land under public and semi-public utilities is scattered all over the town. There was an increase of 1.0507 km^2 of under-developed area during 2003 – 2016. Owing to rapid population growth, land under different functions increased to fulfil the increasing requirements of the people. This resulted into growth and expansion of various land uses. The growth pattern of various land uses has been dominated by residential land use. A

significant increase in the land under forest and tea garden is attributed to the incorporation of some new areas in the north-eastern, western, eastern and southern part of the town.

The land use planning of the study area requires a dynamic approach taking into account the diverse socio-economic needs of the people in and around the town in order to make the urban utility facilities accessible. There is a need to check further construction and physical verification of the site before construction in the high density areas of Wards 12, 15 and 11 in the town centre and the steep slope areas of Wards 3, 6, 7, 16 and 17 as these are landslide prone areas. In order to disperse the commercial activities from the central mixed area and also to provide uniform marketing facilities for the people of Kurseong, a community commercial sub-centre in three places namely Victoriagram/Dowhill area, Dumaram Busty and Fatakdara/Campsite is needed for fulfilling the daily requirements of the residents. To develop Kurseong as a major tourist centre in the district, it is proposed to have a shopping mall in the INA Bus terminus with all the facilities and upgrade the existing supermarket in Park Location by beautification programme. The open space in Park location created by dismantling the Sweepers' quarters should be utilized for commercial purposes with parking facilities. As there is sufficient vacant land in the administrative premises in Ward 20, the shifting of other remaining government offices scattered over the town to the said location can facilitate a better coordination among the different government departments. The considerable vast areas of Kurseong College should be protected from encroachments. The large vacant area under the jurisdiction of the Sanatorium can be planned for setting up of a nursing institute and a subsidiary hospital. There should be sufficient number of health sub-centres, at least one for two wards with sufficient staff and infrastructure. Two recreational parks – one near INA Bus Terminus and another in Chandmari can be planned with artificial water bodies, open space and greeneries which can serve as a place for physical and mental refreshment of the urban dwellers. An indoor stadium with parking modern facilities can be planned on the government vacant land in Ward 9. The following proposals put forward should be taken into consideration for an orderly future growth of Kurseong town and to bring about a balanced urban development taking the increasing demands of the town dwellers as well as the requirements of the people of the entire subdivision.

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