WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Shifting Landscapes: Socio-Economic and Environmental Challenges among the Galo Tribes of Lower Siang, Arunachal Pradesh

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ABSTRACT :

The present era is witnessing the transition of natural landscape to cultural landscape with the large scale developmental activities of man. Understanding of these changes gives ideas on the socio-economic condition of the land and the challenges faced by the nature. When this transformation happens to an environmentally sensitive area, especially in a backward region, there are high chance of adverse effect to the local population, especially the deprived communities. The present study deals with the Lower Siang district, where the natural landscape is slowly converting to unnatural landscape. The district is dominated with Galo tribal population, and are suffering from multiple challenges raised by the nature as well as the socio-economic condition. The study adopted the method of identifying the landscape changes in the district, that occurred between 2002 and 2022. Relating to this change a survey which covers 200 households of the Galo tribes has also been made to get the information regarding the socio-economic aspects of the population, along with understanding the challenges faced by them. The study identified that the district has poor performance in the transportation system, communication system, agricultural support, water management, electrification and related functions, ration system, banking system, education system and the health care system. On the other side landslide, soil erosion, flooding and soil degradation are the major environmental challenges. The poor government support along with the above issues is retarding the growth of the district as a whole, which has to be addressed immediately for the better livelihood of the Galo Population here.

Keywords: Socio-economic, Environmental Challenges, Galo tribe, Lower Siang, Landscape

Introduction

A landscape can be understood as an extensive perception of a region , one that is not rigidly defined, but rather shaped by the viewpoints through which it is seen (Li et al., 2022). This perception emerges from the continuous interaction of the lithosphere, atmosphere, hydrosphere, and biosphere. In essence, a landscape is a three-dimensional entity formed through the interplay of geography, ecology, and culture, or through the dominance of one of these elements (Bonfanti et al., 1997).

When a landscape is organized as an ecosystem driven primarily by diverse species and organisms, it is referred to as a natural landscape. By contrast, when human activities dominate and intentionally shape the land, it is called a cultural landscape (World Heritage Papers 7; Cultural Landscapes: The Challenges of Conservation, 2002, n.d.). Such cultural landscapes often reflect political, social, and economic expansion , growth that frequently comes at an environmental cost (Domosh, 2001). Yet, there are regions where this expansion is slowed or challenged by nature itself. Factors such as rugged topography, untamed wilderness, specific soil characteristics, hydrological conditions, and climatic extremes can all act as natural barriers to the spread of cultural landscapes (Souza-Alonso et al., 2022).

The socio-economic and environmental characteristics of any region are in constant interaction, shaping and influencing one another. Where the environment supports a robust ecosystem, with minimal impacts from natural hazards and climate stress, cultural and socio-economic development tends to flourish (Weiskopf et al., 2020). Conversely, harsh environmental conditions often place a direct burden on cultural activities. This explains why fertile plains, particularly riverbank regions, have historically been centers of settlement and growth, the great plains of India serving as a prominent example. In contrast, the Himalayan regions illustrate the opposite scenario, where environmental challenges contribute to sparse population distribution.

Arunachal Pradesh, India's easternmost state, poetically described as the "land of dawn-lit mountains" , embodies many of the hardships typical of Himalayan terrain. For much of history, the region remained isolated from the outside world, with the mighty Brahmaputra River acting as both a physical and symbolic divider, preserving its sacred remoteness. The indigenous communities here were deeply reliant on nature, adapting their ways of life to the wilderness around them. Even today, geographical constraints are evident. Although the state's capital lies just 20 kilometers from the plains of Assam, reaching it from interior regions can take one to two days of travel. This is largely due to the Himalayan topography and the dense forest cover, which spans nearly 79% of the state's total geographical area. Arunachal Pradesh also records the lowest population density in the country, with just 17 persons per square kilometer and a total population of 1,383,727.

The state has a distinguished cultural tradition when compared to the other states of India. Majority of the population comes under the scheduled tribe category. The state act as a melting pot of traditions with 26 major tribe (Sharma, 2020), with unique culture, language and belief. There is specific regional concentration of tribes within the state. Most of the elder populations are very much close to the nature and lives in the interior villages with their traditional attires and living styles. The people in the urban area are mostly well educated and working in different government sectors. With the increased connectivity in the southern extension of the state, the region is slowly growing as urban centers. A dynamic interplay is happening between the tradition and the modernity of the people and places of Arunachal Pradesh (Ramya (Tarh), 2014). This confluence of geographical features and developing geographical culture has established a new bridge between the past, present and future of the state, with a next stage of cultural evolution as in the form of cultural landscape and conflict in the form of disturbed natural landscape.

The Lower Siang district is one of the southern district of Arunachal Pradesh where the urban character is slowly penetrating into the natural space. The district has a discernible reduction in the natural landscape. The rugged Himalayan nature when combines with the anthropogenic intervenes makes the region highly unstable. Nature shows its objections to many developmental activities. This in turn affect the socio-economic conditions of the local population of the state which is dominated by the Galo tribes.

Galo is an indigenous tribe of Arunachal Pradesh who are directly associated with forest and natural resource for their livelihoods (Sharma, 2020). They are considered as Tibeto-Mongoloid group of people and are mostly settled in West Siang, East Siang and Upper Subansiri districts of Arunachal Pradesh (Doye, 2015). As the name indicates they are people migrated from Tibetan regions even though there is no written documents regarding the same (Riba, 2021). The Galo population was recognized as Scheduled Tribe on 1952 by India Government. Usually Galos stay in villages with 30 to 100 houses together (Doye, 2015). The economy of the Galo tribe is very much dependent to agricultural and other primary activities. They have adopted shifting cultivation from the olden days itself (Lombi, 2016). In a single statement it can be stated that the Galo population for their belief, for their settlement, for their economy, is mostly depending on the nature. So any disturbance to nature, even in the name of development may affect the socio-economic condition of the Galo tribes.

Significance of the study

The present study of Lower Siang district throws lights on the unexplored landscape of rural settlements in Arunachal Pradesh, evolution in terms of transformation, migration and changing features. The study area has lack of adequate measures like housing, quality of settlement, basic infrastructure etc. The area has inadequate water supply in many villages. The Villages of Sibe, Koyu and Kangku are still not well connected with electricity and road. The lower Siang District is facing lack of health facilities. The only District hospital is functioning without any modern medical equipment. The number of Primary Health Center (PHC) is also limited in the district. The Primary Health Center are at Gensi, Dipa, Koyu, and Kangku. A very poor road condition exists in Gensi Circle, Sibe Circle, Kangku Circle and Koyu Circle. The Villages in Sibe Circle are not connected with proper communication network and most of the villages in Koyu Circle and Gensi Circle are partially connected with telecommunication. Considering the education sector, Lower Siang has only 5 higher secondary schools and 5 secondary schools. For higher studies the local people has to depend on other District. The shifting cultivation is mainly practice in lower Siang. The practice of shifting cultivation along with old method of agricultural practices affected the overall productivity of the land.

The concern area is witnessing socio-economic changing owning to the multiple government initiatives and changing life style of the people. However, an evaluation of the outcomes of these changes and its environmental impacts is very much needed to be addressed. The present work is an analysis on changing landscape of the area along with its impact on the socio-economic and environmental conditions of the indigenous population of the area 'the Galo tribe'.

Materials and methods

Study Area

The study area under consideration is the Lower Siang District of Arunachal Pradesh, where the largest number of Galo tribes settled in Arunachal Pradesh (Sharma, 2020). The district covers 1721sq.km of area (Figure 1). The location of the district is 28°04'20"N latitude and l 95°00'54"E longitude. This is the 22nd district of Arunachal Pradesh formed on 2017. Siji is the permanent capital of Lower Siang District. Lower Siang is bordered to the east by East Siang, to the west by Kamle District, and to the north by Leppa Rada. It also shares a border with Assam, whose districts of Dhemaji and North-Lakhimpur lie to the east and south, respectively.

The district is divided into seven administrative Circles namely Sibe, Gensi, Likabali, Kangku, Nari, New-Serene, and Koyu. There are 28,286 people living in the Lower Siang District of Arunachal Pradesh (Projected population based on the census 2011), with 14,442 men (about 51.1%) and 13,844 women (around 48.9%). Out of the total population 76.9% of the population lives in the rural area. The Lower Siang District of Arunachal Pradesh has a population density of about 16.43 people per square kilometer and a sex ratio of 933 females for every 1,000 males. The overall literacy rate is 61.38%.

Regarding the physical settings, the district is dominated by the Siwalik topography of Himalaya, which shows the dominance of sedimentary rocks. The district has 13.23% of its area coved with very steep slopes and forest of highlands, 34.93% with moderate and gently rolling hills of midlands and the reaming area of lowland. Lower Siang's soils fall into one of four general categories: lateritic, red and yellow, alluvial, and forest soils. Lower Siang has a subtropical, humid climate with noticeable seasonal fluctuations. Maximum summer temperatures can reach as high as 37.1°C in July, while lowest winter temperatures are much lower, with January's low recorded at 8.1°C. The Siang, Siyom, Simang, Siji, Siyadhol, and Sigen rivers are the main rivers that form the Lower Siang district's dynamic drainage system. Lower Siang District has a sizable amount of forest cover with 122.61 square kilometers of reserved forest, 500.31 square kilometers of protected forest, and 647.77 square kilometers of unclassified state forest.

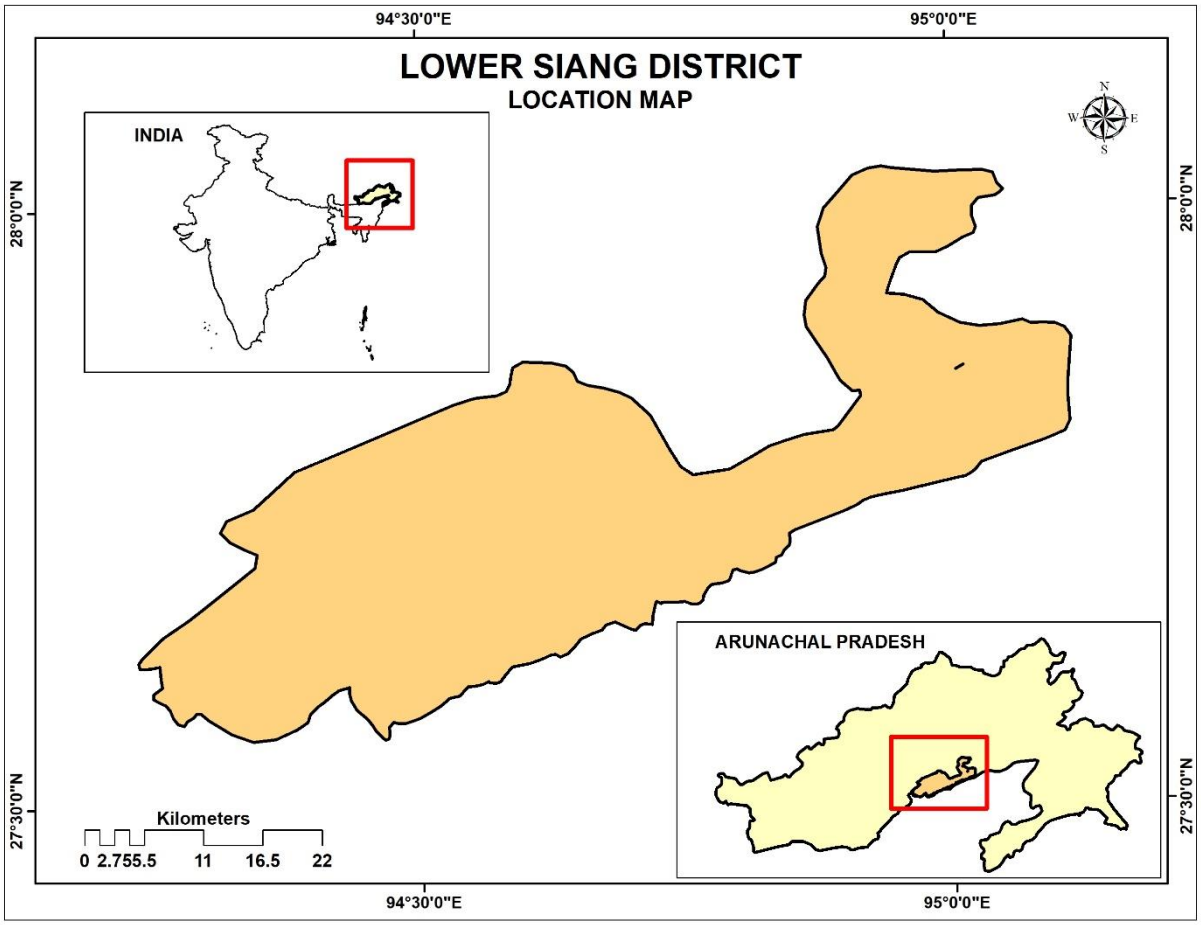


Figure 1. The location Map of the study area

Methodology

The methodology of the study has two main part. The first portion deals with the landscape changes of the district. The second portion deals with the socio-economic survey and its analysis. The landscape of the study area has been divided into four main classifications as followed the study pattern of (Akhil & Jayapal, 2020). The classification includes Natural, Sub-Natural, Semi Natural and Unnatural categories of landscape (Table 1).

Table 1.The landscape classification for the study

Name	Description
Natural	Absence of anthropogenic influence
Sub-Natural	Natural component having slight modification either by nature or human
Semi Natural	Land modified for agricultural activities and other Open areas
Unnatural	highly modified by humans, changing the naturalness of the area

This has been mapped with the support of ArcGIS software. The seven administrative Circles of Lower Siang district have been compared on its landscape modification between 2002 and 2022. The area of modification and its spatial distribution were compared with the relief of the area to understand the environmental consequence.

The second portion which deals with the socio-economic survey that has been used to understand the challenges facing by the Galo community in the Lower Siang district. Around 200 household of Galo community which covers 10% of the total Galo households of the district has been surveyed using stratified sampling method, which classified the samples based on the Circles and economic status of the sample population. Due to the isolated nature of the Galo villages and the restrictions by topography made the survey a hectic process.

Result and Discussion

Even though the landscape is dominated by naturalness in all the Circle, the landscape of the seven Circles shows a varying character in the landscape modification. There is an overall increase in the unnatural area of Lower Siang district in 2022 when compared to 2002 (Table 2), there are expansion of Sub-Natural and Semi-Natural areas as well. This shows the increasing activities of man that creates external stress to the nature.

Table 2. Landscape change 2002 and 2022

Circle	Landscape Type	Area in m² (2022)	Area in m² (2002)
SIBE	Natural	10,34,04,669.85	10,37,85,972.65
	Sub-Natural	10,02,896.25	13,73,631.35
	Semi Natural	11,27,182.25	4,12,556.45
	Unnatural	2,26,066.25	1,88,654.15
	Grand Total	**10,57,60,814.60**	**10,57,60,814.60**
NEW SEREN	Natural	9,72,02,048.90	9,99,11,489.90
	Sub-Natural	80,21,586.53	97,30,835.25
	Semi Natural	41,53,099.52	78,464.20
	Unnatural	22,94,292.55	19,50,238.15
	Grand Total	**11,16,71,027.50**	**11,16,71,027.50**
NARI	Natural	8,72,59,267.84	8,89,55,611.84
	Sub-Natural	11,87,158.70	1,96,708.77
	Semi Natural	68,15,742.54	63,75,350.04
	Unnatural	9,39,756.91	6,74,255.34
	Grand Total	**9,62,01,925.99**	**9,62,01,925.99**
LIKABALI	Natural	30,57,80,113.25	30,68,85,360.95
	Sub-Natural	23,89,405.08	14,75,362.63
	Semi Natural	30,52,966.38	38,99,699.11
	Unnatural	53,74,311.09	43,36,373.11
	Grand Total	**31,65,96,795.80**	**31,65,96,795.80**
KOYU	Natural	26,16,94,259.92	26,22,78,988.39
	Sub-Natural	40,00,748.03	25,11,055.98
	Semi Natural	10,56,774.14	20,53,693.68
	Unnatural	8,08,912.71	7,16,956.75
	Grand Total	**26,75,60,694.80**	**26,75,60,694.80**
KANG KU	Natural	44,11,67,308.46	44,21,21,547.73
	Sub-Natural	13,73,589.26	3,56,611.07
	Semi Natural	36,98,410.14	38,48,211.18
	Unnatural	10,24,020.14	9,36,958.02
	Grand Total	**44,72,63,328.00**	**44,72,63,328.00**
GENSI	Natural	37,24,51,526.54	37,29,09,361.51
	Sub-Natural	28,676.45	13,43,665.31
	Semi Natural	16,53,352.65	3,682.64
	Unnatural	18,11,857.76	16,88,703.94
	Grand Total	**37,59,45,413.40**	**37,59,45,413.40**

Decrease in Natural Areas: There is a visible pattern of modest drops in Natural areas in almost all the Circles. This pattern points to a progressive disappearance of unaltered or barely changed landscapes, maybe as the result of growing environmental stresses or human activity.

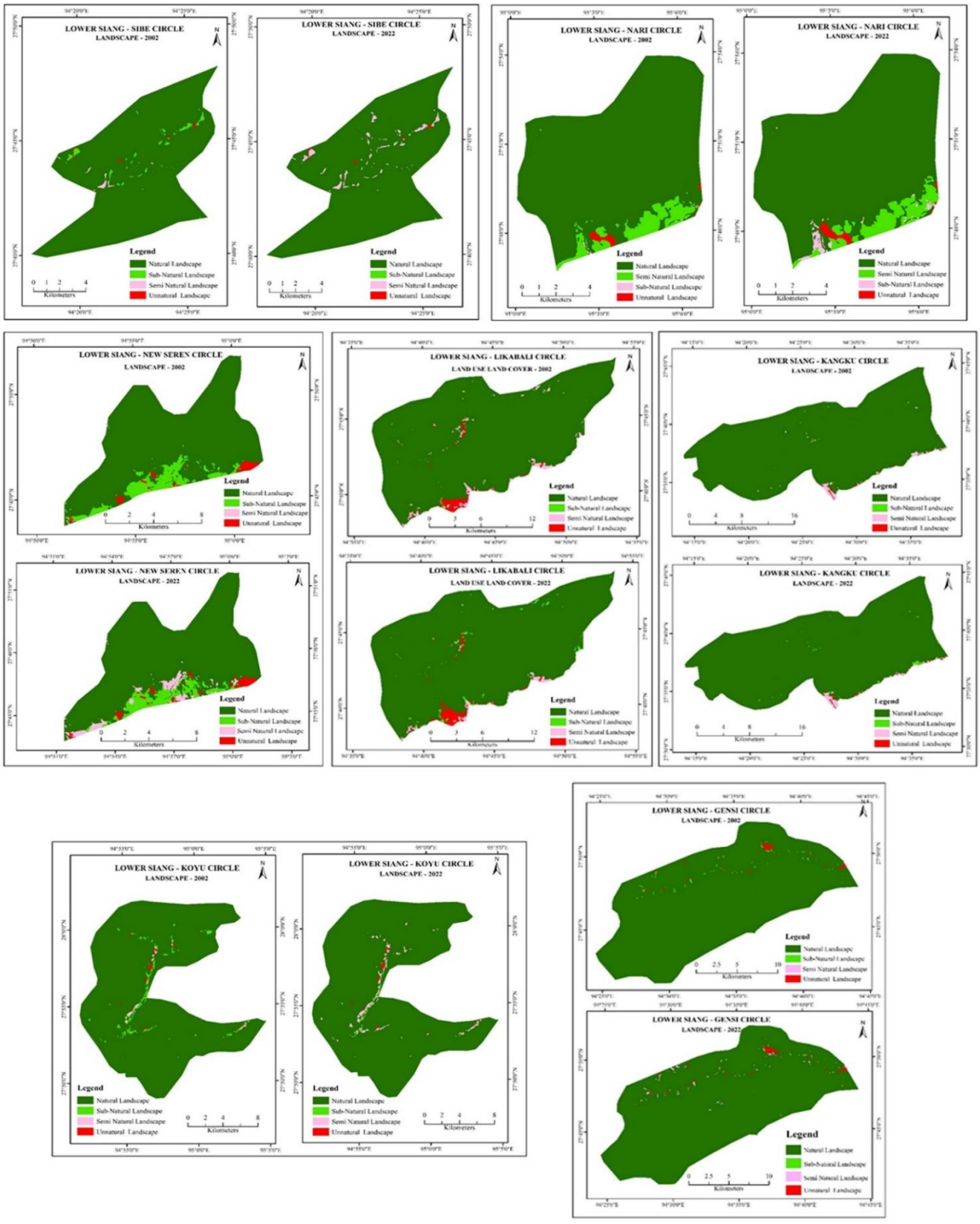
Sub-Natural Area Expansion: The distinguished rises in Sub-Natural areas in Circles may be a hint that these environments are shifting from their original, completely natural states to more modified ones. This increase in Sub-Natural areas is also may be the consequence of poorly managed restoration initiatives or continued deterioration, leaving behind landscapes that are not entirely manmade but yet fall short of real biological restoration. This pattern implies that, even in the face of some improvement, there can be fundamental problems with land management plans or conservation techniques that need to be fixed to minimize or stop additional degradation.

The Sibe, New Seren, Nari, and Gensi Circles in the Sub-Natural regions also exhibit a declining trend in addition to the loss in Natural landscapes. Indicating that areas that were formerly shifting from natural to semi-natural states are now losing their ecological integrity, this pattern is especially worrisome. The decline in Sub-Natural regions may be a sign of increasing deterioration or of a move toward more developed or managed areas. The Koyu, Likabali, and Kang Ku Circles, on the other hand, show a minor increase in Sub-Natural zones. The observed rise in natural landscapes in these

Circles can be explained by the ongoing deterioration of natural regions. The growth of Sub-Natural areas in these locations can indicate a stage of transition where ecosystems shaped by human activity are gradually replacing natural landscapes.

Variability in Semi-Natural Areas: There are contradictory patterns in the semi-natural areas. There have been drops in certain Circles and increases in others. A complicated interaction between human activity and natural processes is highlighted by the possibility that particular regional land and agricultural management techniques, as well as ecological changes, have an impact on this variability.

Figure 2. Landscape Change : 2002 and 2022



Increase in Unnatural Areas: A growing tendency of land development, urbanization, and other human-induced modifications is highlighted by the increase in Unnatural areas observed in most Circles. The trend towards more altered or artificially constructed landscapes is reflected in this expansion (Figure 2). The Siang District's ecologically delicate areas could be severely disrupted by such widespread intervention. Increases in non-natural areas put local ecosystems at danger, possibly resulting in habitat loss, decreased biodiversity, and changes to ecological processes. Solving these problems will be essential to reducing the negative effects of growth and guaranteeing the protection of environmentally fragile places.

Lower Siang District's physiography (Highland-13.23%, Midland-34.93% and Lowland-51.83%) is greatly wedged by its advantageous location in the Eastern Himalayan foothills, closely adjacent to the vast Brahmaputra Plain (Figure 3). Due to its exceptional geographic location, the district is susceptible to strong environmental factors, such as high rates of erosion and land degradation (Debnath et al., 2023; Dekaraja & Mahanta, 2021). It is also situated within the catchment of the powerful Brahmaputra River. The geography of the district, which is made up of rolling hills and river valleys, makes it especially prone to these processes, which are made worse by the monsoon season, when many regions repeatedly flood.

The district's socioeconomic dynamics are meaningfully shaped by its geographical background. The land's natural complications, which include flooding, land degradation, and soil erosion, have a big impact on infrastructure development, agriculture, and human occupancy. Due to the ongoing brawl against these natural forces, human activity and the environment now interact intricately, with both trying to maintain a unwarranted equilibrium of dominance.

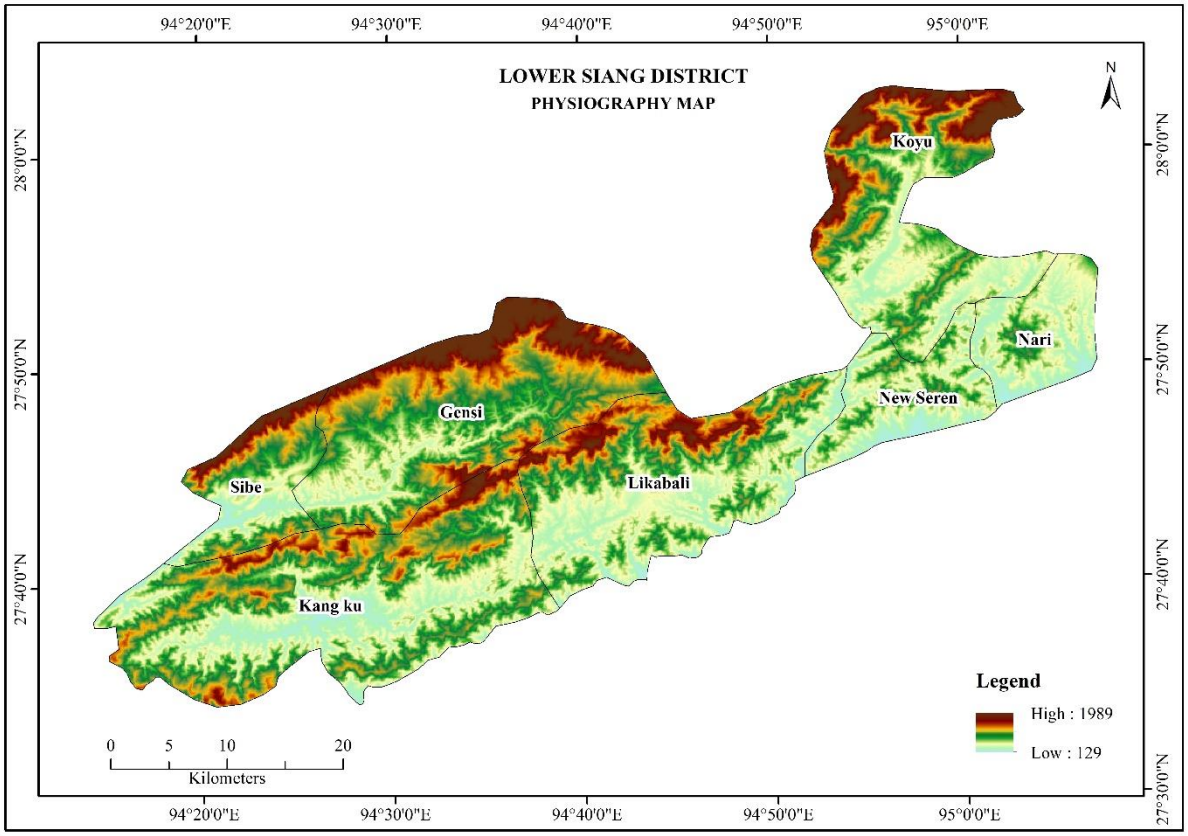


Figure 3. Physiography of Lower Siang District

A ***comprehensive survey*** (Figure 4) straddling a range of important factors categorized under various titles was done in order to thoroughly analyse the complicated difficulties especially the socio-economic and environmental challenges impacting the Lower Siang District. The first category, Demographics, involves collecting specifics on every hamlet, such as its name, the population's caste and religion, and the kinds of family that are most common in Lower Siang

The features of village Settlements, such as their kind and arrangement and the materials used in house building, are the subject of the second category. This data highlights on the habitation conditions, architectural styles, and perhaps even the residents' socioeconomic standing. Another important category is Agriculture, which looks at the different agricultural methods utilized locally, the range of crops farmed, and the sources of irrigation. The availability and state of basic Infrastructure, including marketplaces, ration stores, transit networks, power, drinking water, health facilities, educational institutions, banking services, and roads.

Figure 4. Household Survey in Lower Siang district

The community's main concerns such as environmental difficulties and the requirement for developmental activities are covered under the title of Challenges and Development. As a grassroots view of the district's developmental needs and goals, the survey also includes recommendations from the community for enhancing the quality of life.

The life style of Galo Tribes in Lower Siang District

In all the circles of Lower Siang district, the population is predominantly composed of Galo tribes, who mostly follow Donyi Polo and Christianity. The circles of Likabali, Nari, Gensi, Kangku, and Sibe have a higher level of education, though there remains a significant older population with no formal literacy. Circles like Gensi and Likabali have a dominant joint family structure, while Koyu and New Seren exhibit both joint and mixed family types. The economy of all the circles is mainly driven by agriculture and other primary activities, although some individuals are now engaged in government services and business. Shifting cultivation, wetland farming, plantation farming, and dryland farming are the primary agricultural methods, with crops like rice, maize, millet, taro root, and potatoes being predominant. Income levels in these circles range from ₹1,20,000 to as high as ₹15,000,000, with Likabali having the highest income and New Seren and Kangku having the lowest.

The Gensi Circle shows serious problems with basic infrastructure facilities and accessibility. The government-sponsored food grain ration shops and markets are non-existent or far away. Communication in the Circle is mostly dependant to mobile phones and the transportation is mostly private owned vehicle. There are few post offices in some places, but there is no telegraph office. Drinking water is often obtained from rivers and provided by the government in dry season. The electrification of the Circle has mostly done, however, electricity is irregular and fluctuates with the seasons. The condition is more complicated with less number of health centres. The presence of Primary Health Centres (PHCs) in some areas makes health amenities somewhat manageable, while availability might vary and health centres may not be present in certain areas.

The road condition of the region is very pathetic, and just a small proportion is getting repaired. Most of the roads are maintained by Public Work Department (PWD). The poor establishment and maintenance of drainage is also affecting the quality of road. Despite some government projects like Pradhan Mantri Gram Sadak Yojana (PMGSY), there is a big vacuum to address the demands of the farming community.

The major environmental problems in the Gensi Circle are deforestation and poor waste management system. Which in turn intensify the soil erosion, landslide and environmental deterioration. The physiography of the Circle is the most complex among all the Circles of Lower Siang district. Inadequate drainage infrastructure and inadequate flood control strategies further aggravate issues like landslides and soil erosion in the area. Water logging and road blocks, Poor road conditions, unpredictable network connectivity, and variable power supplies are usually associated with the terrain and other geographical challenges. This shows how the environment challenge the developmental activities of the Circle and how the human activities challenge the natural landscape.

The road condition of **Kangu Circle** is in poor state, the travel and accessibility are further impacted by issues like erosion and flooding. The infrastructure and communication facilities used also not different from the Gensi Circle. People owns private vehicle and mobile phones for their transportation and communication with limited or no support from the government. Primary health centers (PHCs) and sometimes district hospitals are the only healthcare facilities that provide public services. Financial transactions and credit availability are hampered by the frequent unavailability of banking services.

Despite having a plenty water availability and being in generally decent shape, the region's rivers and streams come with serious environmental problems. Flooding is a persistent issue that causes significant destruction and disruption in the impacted areas. Deforestation increases the effects of flooding by causing habitat loss, soil erosion, and disturbing regional water cycles. The loss of rich topsoil near roads and agricultural fields has a negative impact on agricultural output and causes more sedimentation in water bodies, making soil erosion a serious issue. Water quality and public health are compromised when erosion and water stagnation coexist, leading to water contamination and the creation of habitats for disease-carrying organisms.

Deplorable state of roads, insufficient drainage systems, and restricted access to banking and healthcare facilities are the major socio-economic issue of the Circle. Inadequate water management and unreliable power supplies often disturbs the life of Galos in the Circle. Renovation of schools, including staff quarters and hostels, as well as community halls, with an emphasis on educational and communal amenities is also considered as basic requirement of the Kangu Circle.

Unfortunate to highlight that the infrastructure of **the *Koyu* Circle** including transportation and communication facilities are poor like the early Circles. Agriculture in Koyu Circle is mostly based on customary methods, and neither irrigation nor agricultural development are supported by the government. Peoples struggle with support services in spite of the significant agricultural activity because there is no irrigation support provided by the government. There are handy markets close by, and although ration shops exist, food grains are not subsidized by the government. The natural drainages help the people for irrigating their agriculture land. Power supply is the only area infrastructures is regular.

Geographical and infrastructural difficulties in Koyu Circle are closely linked to serious environmental problems. Because many settlements are situated on steep slopes, landslides are a common issue, especially during the rainy season. Another significant issue that affects agricultural areas and degrades fertile land is soil erosion. Deforestation exacerbates the issue by decreasing the land's capacity to hold water, which raises the risk of soil erosion and landslides. Wet agricultural areas are seriously exposed by river erosion.

The Likabali Circle use conventional letter communication; mobile phones are the primary means of communication nowadays. Cars and motorcycles, are typically used for transportation. Like other Circles the roads are poorly maintained in the Likabali Circle. There is extensive electrification, with most places having year-round access to electricity. Other government amenities are also poor in many areas of the Circle, except the urban area.

The government initiatives like Pradhan Mantri Gram Sadak Yojana (PMGSY), Janani Suraksha Yojana, Sarva Shiksha Abhiyan (SSA), the Rashtriya Madhyamik Shiksha Abhiyan (RMSA), Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) etc. are very much active in this Circle. Even though many government initiatives have been put into place, but problems still exist. Lack of public transportation, and inadequate healthcare services are common problems in villages. The problem is there due to lack of appropriate transportation links, health facilities, and schools. Inadequate road infrastructure, a lack of public transportation, and inadequate railway crossings put communities at risk.

Another major problem is soil erosion, which is mostly begun by the indiscriminate mining of stones and sand from neighboring rivers. This erosion stresses affects agricultural fields. These issues are made worse by the absence of bridges across large rivers and the inadequate road network, which isolates villages and makes it more difficult to get necessary services especially during the flooding or the wet season.

The infrastructure facility in ***the Nari Circle*** is comparatively better with nearby market areas, availability of public and private vehicles for transportation, rivers and government supplied water facilities, the primary education facility and health care system and the electrification. The Nari Circle has other government services for the community, such as PHED (Public Health Engineering Department) offices, post offices, police stations, and forest offices. However, the road conditions are average with little maintenance, furthermore, many places lack effective drainage system, and the majority of road drainage systems are insufficient, which could cause issues during heavy rains or floods. There are environmental challenges caused by deforestation for urban expansion like soil erosion, Regular flooding of Depi river causing risk to wetland farming and people residing the banks of the river.

The basic amenities of ***the New Seren Circle*** are mostly managed by the local population themselves, like private vehicles for transportation and mobiles for communication. River is the major source of drinking water and domestic activities. The entire area is electrified and the education system is comparatively better up to higher secondary level schooling. Government Primary Health Centers (PHCs) offer healthcare services. The New Seren Circle has better road system and is well managed by PWD, even though there are some exception in few areas. Banking and health services are among the issues associated with New Seren Circle's infrastructure.

Regarding environmental challenge, deforestation and water erosion, which lead to land degradation and the loss of productive topsoil, aggravate soil erosion issue in agricultural fields. Another crucial problem is flooding, as the region often experiences flash floods and water stagnation after heavy rainfall.

Except few support in drinking water facility, health care and few ration shops, all other facilities are not sufficient or is absent in ***the Sibe Circle***. Roads and drainage system associated with roads are maintained in poor condition. Electric supply is highly undependable, fewer educational options for the community etc. making the region described as minimal public services area. Sibe Circle is blessed with an ample supply of water from its rivers and streams, but it also has serious infrastructure problems and environmental issues. Deforestation, landslides, soil erosion, and water erosion are the main environmental problems. Inadequate flood control systems and bad road conditions make these issues worse.

Conclusion

The survey in Lower Siang district has provided a deep insight on the socio-economic and environmental condition of the Galo tribes and how the people are challenged by these conditions. In all the seven Circles the nature has created many challenges like landslides, soil erosion, flooding and soil degradation. As the majority of the Galo population in this district depends on agriculture and farming related activities for their economy, the challenges created by the nature is indirectly affecting their economy and livelihood. The poor condition of roads, even though there are laps from the government side, is mainly caused by the terrain and the landslide. Nature has created a natural restriction on the developmental activities of the district.

The district on the other side has developmental issue due to the poor performance by the government. From the survey report, the disappointment of the people regarding the functioning of government agencies are very clear. The district has poor performance in the transportation system, communication system, agricultural support, water management, electrification and related functions, ration system, banking system, education system and the health care system. The deforestation in the name of developmental activities and agricultural activities is worsening the existing issues of land degradation.

The indigenous population, predominantly from the Galo tribe, has long aligned their way of life with the existing environmental conditions. However, the landscape is gradually changing, with the natural landscape slowly being replaced by cultural developments, in this environmentally sensitive area. Such landscape changes have the potential to disrupt the natural rhythm of the environment.

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