The Indian Geographical Journal
Volume 99 (2) December - 2024, pp 120-145
ISSN 0019-4824

EXPLORING THE QUALITY OF LIFE OF THE SELECTED INDIGENOUS TRIBES IN THE HILLY TERRAIN OF SUB-HIMALAYAN NORTH BENGAL

Manabindra Barman*, Indrajit Roy Chowdhury

Department of Geography & Applied Geography, University of North Bengal, West Bengal, India

*Corresponding author email: rs_manabindra@nbu.ac.in

Abstract

The quality of life of the hilly tribes of India is crucial to understand. For this, the study attempted to analyse the socio-demographics, habitation, livelihood conditions, and quality of life of the tribal communities, namely the Tamang, Lepcha, and Sherpa tribes, in the hilly areas of Darjeeling and Kalimpong districts of West Bengal. To meet this objective, 471 tribal household surveys were conducted using a questionnaire schedule, structured interviews, and field surveys. The research considers both the socioeconomic and demographic well-being of individual tribes or tribal communities with their physical capacity, psychological, level of independence, financial resources, social relationships, living environment and surroundings, spirituality, religion, and personal belief systems. The study finds that these tribal communities underwent many socio-demographic, habitat, and economic challenges even in the twenty-first century. Moreover, they required an improvement in their quality of living. The prevalence of inadequate higher education, diminished social participation, marital disorders, health issues, substandard housing, unmet household needs, primary employment, reduced income, financial obligations towards dependents, limited livestock, and recurrent financial crises was notable. Addressing these issues requires targeted policies, education and skill development, and community-driven initiatives to improve their livelihoods. These measures will enhance the quality of life among the tribes and promote inclusive regional growth.

Keywords: Demographic, Livelihood Conditions, Quality of life, Scheduled Tribe, Darjeeling Himalayan Region

1. Introduction

Socio-demographic and economic aspects, such as satisfaction of needs, well-being, working conditions, and other indicators, are often broadly discussed. Still, it is crucial to understand the contemporary status of the indigenous peoples, especially the tribal people. According to Article 366 (25) of the Indian Constitution, Scheduled Tribes are the tribal communities that are designated under Article 342 of the Constitution to the people who suffer from significant social and educational opportunities and financial constraints due to

primitive practices in agriculture, insufficient facilities for infrastructure, and geographic remoteness (*National Commission for Scheduled Tribes, n.d)*. In the Indian context, tribes are called 'scheduled tribes,' an institutional and legal word to classify ethnic communities based on their socioeconomic condition and cultural and religious customs to offer preferential consideration as specified by the Constitution (Lama & Bhui, 2018). The expansion of globalisation and modernity has brought about numerous developments, including technical advancements and improved healthcare facilities. However, most indigenous or tribal people live in the primitive era with few improvements in their lifestyles concerning education, culture, tradition, and other social organisations (Keshlata et al., 2023). In general, scheduled tribes in India are the nation's aboriginal population. They are the oldest ethnological groupings among India's national population, known as Adivasis or original dwellers. They symbolise their native culture, habitat, and customs. India possesses one of the most populous tribal communities in the world, second only after Africa (Govindharaj, 2016). Throughout India, ethnic groups are placed at the margins of mainstream society as they are considered to be backward, underprivileged, and at a lower livelihood (Deb, 2022). This livelihood stability is described as having adequate and sustained means of income and other wealth that allow the household to meet its basic needs. This includes enough access to food supplies, fresh water, healthcare services, opportunities for education, housing, community involvement, and social life (Frankenberger, 1996).

According to the 2011 Indian census, India has about 104 million tribal people divided into 705 tribes, accounting for 8.6% of the total population. Darjeeling and Kalimpong districts have a combined population of 18,46,823; the hill population was 8,75,703, while the plain population was 9,71,14. At the same time, 28.65% of ST was found in the hills and 15.07% in the plains (Subba & Rai, 2017). Darjeeling and Kalimpong districts are the two administrative areas in the Himalayan region. Some portions of the Darjeeling district are in the foothill zone, while the Kalimpong district has mountainous topography (Raha & Tripathy, 2022). Darjeeling Himalaya is a setting with numerous challenges and exceptions that studies on postcolonialism have attempted to comprehend via research in other South Asian regions; therefore, exploring these through Darjeeling would offer new views and guide new ideas. Before knowing Darjeeling, one needs to look at its past, or rather, the fantasies built about the region (Tamang, 2022). In the early nineteenth century, Grant and Llyod found Darjeeling was practically desolate, with a population of one hundred, mostly Lepchas and Limbus, the ridge, which eventually evolved into the core of urban growth rather than rural districts. According to the 1901 census, the population of the Darjeeling Hills had risen to 2,49,117 over a century later (Dozey, 1922; Tamang, 2022). The three mountainous subdivisions of the district (Darjeeling, Kalimpong, and Kurseong) were later administered by the Autonomous Hilly Council of Darjeeling Gorkha, which went into operation on August 22, 1988 (Cajee, 2018). According to historical and legendary accounts, the Tamangs originated in Tibet. The Tamang community is divided into many sub-castes designated as 'thar.' Each one 'thar' has a name, such as Sangden, Bomjan, Yonjan, and Pakhrin. Tamangs are a significant

Tibeto-Burmese-speaking community in Nepal (Tamang, 2003). The Sherpas, an ethnic group of Tibetan ancestry, are frequently categorised as a Scheduled Tribe in the Bhotia. Sherpas are native to Nepal's Himalayas, but in India, they primarily inhabit the Darjeeling and Kalimpong districts of West Bengal, Sikkim, and the northeastern states. Previously, they migrated to India from Nepal. They belong to the Mongoloid race (Coomar & Ganguly, 2022). Tamangs and Limbu were recognised as ST in 2003, bringing the total number of declared Scheduled Tribes in West Bengal up to forty. The prominent tribes in the Darjeeling Himalayan region include Lepcha, Limbu (Subba), Tamang, Sherpa, Bhutia, and Yalmo (Roy, 2016). Even in the twenty-first century, scheduled tribe (ST) inhabitants in the hilly region continue to be concerned about their quality of life (QOL) and socio-demographic circumstances (Barman & Roy Chowdhury, 2023). Roy (2016), Datta (2006), and other studies on the major scheduled tribes (i.e., Tamang, Lepcha, and Sherpa) of the Darjeeling region explore the social, cultural, and economic aspects; thus, there is an absence of viewpoints on the quality of life among these tribal populations.

However, it is important to know and briefly discuss problem identifications about these tribal communities' socio-demography, livelihood, and contemporary quality of life. This will not only serve their well-being, but it is also necessary for the total growth of any nation, especially the developing nation of Asia, state, or district; the concurrent and even development of all societal communities is fundamental. For this, the government and decision-makers must carefully monitor social and economic situations. Identifying the problems and challenges encountered by the diverse parts of society is required to make this possible (Subba & Rai, 2017). Demographers, anthropologists, geographers, and other social scientists throughout India look to tribal sociodemographic research, but no such study has been found discussing contemporary issues among these tribes. Thus, the current study focuses primarily on the social and environmental well-being of the Scheduled Tribe community in West Bengal's Himalayan districts of Darjeeling and Kalimpong. Furthermore, information on integrating their natural surroundings, demographics, social and cultural status, financial status, community institutions, understanding, attitude, and experience with ecological and development efforts has been gathered to understand better current patterns in their quality-of-life development among tribal people in the extremities of the Eastern State, such as West Bengal's Darjeeling Himalayan region.

The study was conducted to emphasise the current socio-demographics, residences, and livelihood conditions of the Tamang, Lepcha, and Sherpa Tribes in the Darjeeling Himalayan region of the hilly blocks of Darjeeling and the entire Kalimpong District of West Bengal. The study also aims to determine the Quality of life (QoL) spatially of the selected tribal communities in the study area.

2. Geography of the hilly region of Darjeeling and Kalimpong districts

Darjeeling is West Bengal's northernmost district, bordering Sikkim to the north, Bhutan to the east, and Nepal to the west. On February 14th, 2017, the Kalimpong subdivision was separated from West Bengal's Darjeeling district and formed as a new

district. The district's scheduled tribe population was 29.79%. In the Kalimpong district, Gorkhas comprise most of the population, with a sizeable minority of tribal residents (*District Environment Plan* 2021). However, at present, the Darjeeling district is physically divided into two different regions: the hills, which hold the five Community Development Blocks, namely Kurseong, Rangli Rangliot, Darjeeling Pulbazar, Jorebunglow Sukiapokhri, and Mirik, and the plain regions, which include the remaining blocks. The Kalimpong district has been subdivided into the Gorubathan, Kalimpong-I, and Kalimpong-II Community Development Blocks. Under the jurisdiction of the West Bengal state government, the Gorkhaland Territorial Administration constitutes a semi-autonomous administrative entity that holds authority over the district's entire hilly landscape. Many Ethnicities reside in the Darjeeling District, an ethnic group that includes the Lepcha, Tamang, Sherpa, Bhutia, Limbu and others. Since the 1950s, many Tibetan immigrants from Tibet have also settled there (District Environment Plan for Darjeeling, 2023).

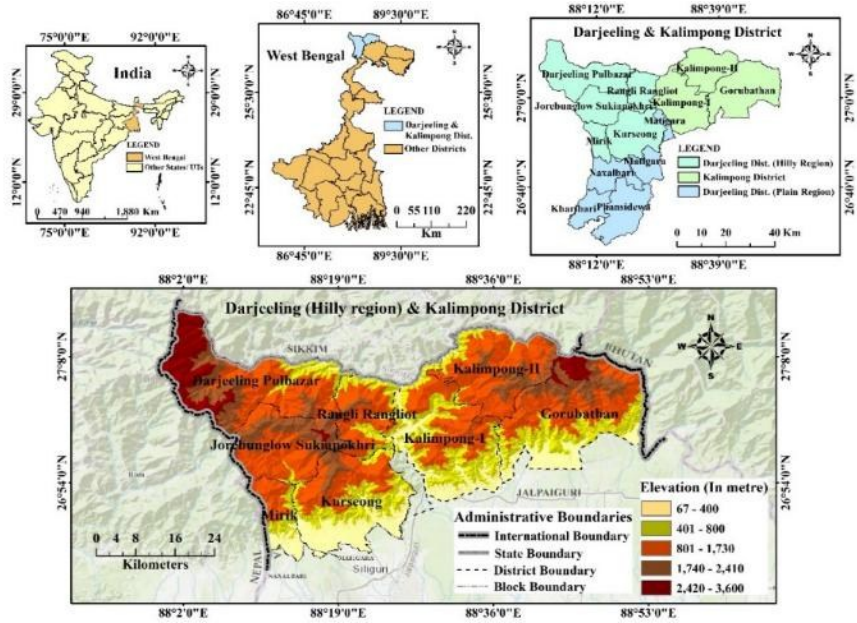

Figure 1: Location Map of the study region of Darjeeling & Kalimpong District, West Bengal, India

The terrain is quite complex, with numerous minor and significant relief formations. The hills rise abruptly from the lowlands, around 150 meters high, and continue northwest towards Sandakphu (3636 meters). The two primary rivers are the Teesta and the Rangeet. These glacier-fed rivers come from Sikkim. The Teesta flows from the Zemu glacier of northern Sikkim, while the Rangeet comes from the Rothong glacier of western Sikkim. It has an average monsoon climate, with rainy summers and dry winters. It has a refreshing climate and unrivalled visual splendour, reinforced by the magnificent perspective of Kanchendzonga, which has led to its emergence as the "Queen of All Hill Stations" (Cajee, 2018). According to the research concentration, the study area (Figure 1)

is limited and subject to consideration for the hilly portion of the Darjeeling and Kalimpong districts. It has international borders with Nepal towards the west and Bhutan in the east, a state boundary with Sikkim in the north, a district boundary with Jalpaiguri, and a block boundary with Naxalbari, Matigara in the South and southeast. With a total size of 2176.5 sq. km, this district's geographic boundaries are 26°45' and 27°13' N latitudes to 87°59' and 88°53' E longitudes. Darjeeling Himalaya remains entangled in a vicious cycle of growth. With a growing population, there has been a steady growth in the geographical region under cultivation for subsistence, followed by increased reliance on livestock farming. Tourism, along with tea plantations that garnered prominence for Darjeeling Himalaya, are primarily consequences of the climate (Khawas, 2002).

3. Methodology

The socio-demographic, housing, and livelihood of all tribal households have been assessed using primary-level household survey data collected from July to December 2022. Darjeeling Pulbazar, Jorebunglow Sukiapokhri, Rangli Rangliot, Mirik, and Kurseong blocks of the Darjeeling district, with the three C.D. blocks (Kalimpong-I, Kalimpong-II, and Gorubathan block) in the Kalimpong district, constitute the study region that has been addressed regionally and communally. According to research studies on tribal communities, this household-level study comprises three ethnic groups: Tamang, Lepcha, and Sherpa.

3.1 Sampling Framework

As per the studied literatures, selected socioeconomic, housing, and livelihood variables (Figure 2) were considered for this study to evaluatethe current development status among the selected tribes in the hilly region of Darjeeling and Kalimpong district of West Bengal. The head of the household was generally interviewed. In the unavailability of the family head, other elderly members were interviewed. Considering the heterogeneous distributional pattern of the different tribal populations throughout the Darjeeling and Kalimpong hilly regions, the multi-stage stratified random sampling method was used to

$$n = \frac{N}{1 + N(e)^2}$$

$$n = 398.72$$

select the sample.

Yamane's (1973) formula is used to determine the sample size.

Where,

n = Sample size
N= Population (total tribal population, i.e., 124787)
e= Level of significance (0.05)

The inclusion of 399 household surveys is necessary to achieve a 95% confidence level. In accordance with this criterion, the study encompassed 471 tribal households as a

sample, which is 1.18 times higher than the calculated figure. From eight blocks, 471 households were selected based on the proportional allocation of the total planned tribes. Of that total, around 67.1% households are Tamang, 16.8% Sherpa, and 16.1% are Lepcha. In the entire population of the sampled tribal residences, out of 1933 individuals, Tamang comprise around 71%, Sherpa 15%, and Lepcha 14%.

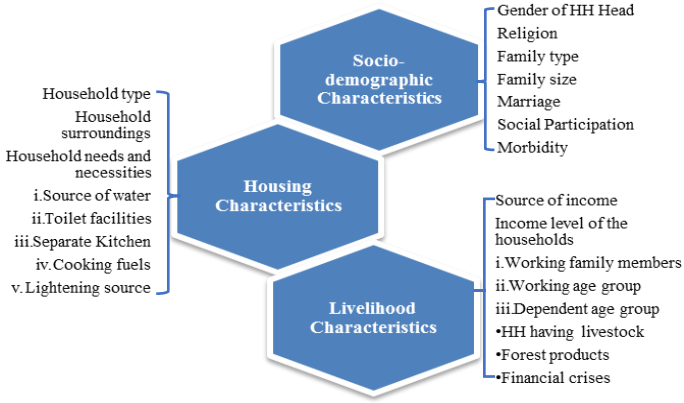

Figure 2: Different variables of the Socio-demographic, housing and livelihood characteristics

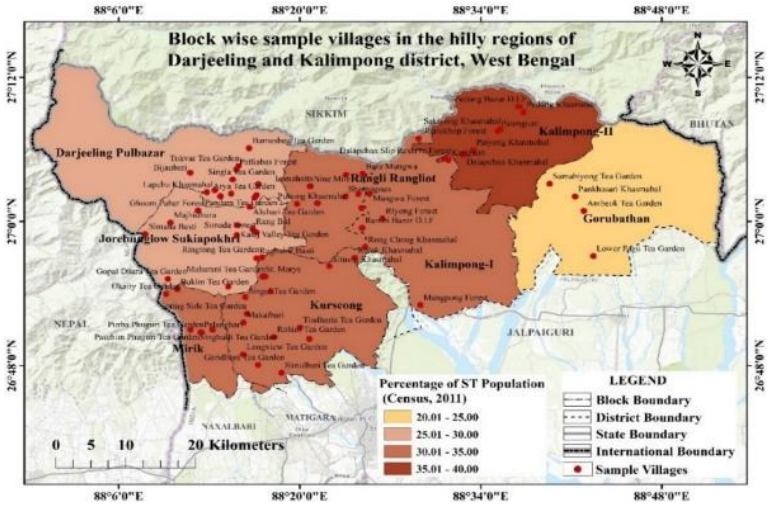

Figure 3: Block-wise sample villages of the tribal households in the study area

This cross-sectional community-based (Scheduled Tribe) study was conducted in a hilly rural region. This research plan is based on data from a primary survey of Scheduled Tribe household populations that was conducted in the eight hilly blocks of the Darjeeling (i.e., Darjeeling Pulbazar, Rangli Rangliot, Jorebunglow Sukiapokhri, Kurseong and Mirik) and Kalimpong (i.e. Gorubathan, Kalimpong-I and Kalimpong-II) districts of West Bengal. Based on the multistage stratified random sample approach, 40 villages were selected throughout the region (Figure 3).

3.2 Analytical Framework

The data have been tabulated and analysed with the help of IBM SPSS Statistics version 26. The study results were represented using descriptive statistics, which included frequencies, percentages, averages, and standard deviations (SD). The primary analysis entailed computing the frequencies and proportions of the selected sociodemographic and livelihood variables for the selected tribal populations. Also, block-wise socio-demographics, households, and livelihood characteristics among tribes were shown by thematic maps in the different C.D. blocks of the hilly region of Darjeeling and Kalimpong districts of West Bengal. For the geospatial mapping, ArcGIS version 10.8 was used. The ground control shows the sample villages of the study area's points data (latitude and longitude), which was taken through the mobile camera with the current GPS location enabled during the household survey in a particular village. Moreover, the spatial map was also created for the quality-of-life domains among the selected tribes in the study area.

3.3 WHOQOL-100 Scoring

The WHOQOL-100 measures a person's quality of life. Six domain scores, 24 specialised aspect scores, and one general facet score used to assess the overall quality of life and health. The scores for each of the six domains- physical, psychological, level of independence, social relationships, environment, spirituality, religion, and personal beliefs reflect a person's view of their quality of life in that area. Higher scores suggest a higher quality of life, while domain and facet scores are graded positively. Higher scores are not always associated with a higher quality of life based on some characteristics (pain and discomfort, negative feelings, medicine dependence, etc.) because some scales do not change positively (World Health Organization, 2012).

The internal consistency was examined using Cronbach's alpha (Amirrudin et al., 2020). The World Health Organisation Quality of Life-100 was tested using this method, with the acceptable results criteria greater than 0.70 value. Those six domain variables of the WHOQOL-100 were physical capacity, psychological, level of independence, social relationships, environment, and spirituality, religion, personal beliefs.

4. Results and Discussion

4.1 Socio-demographic characteristics of the selected tribal communities

In every community, socioeconomic and demographic characteristics such as level of education, health condition, income, etc., substantially impact development (Buragohain, 2013). The present study attempts to briefly study the socio-demographic and livelihood features of the sample tribal households. Table 1 represents some of the socio-demographic features of the sample household of the Tamang, Lepcha, and Sherpa communities of the Darjeeling and Kalimpong hilly regions using descriptive statistics results.

4.1.1 Gender

Gender is a social construct that refers to men and women's expected roles in creation, development, and power dynamics in diverse societal contexts. Culture develops and transforms into its present shape. As a result, cultural factors significantly impact tribal gender dynamics (Bhattacharya & Pal, 2022). It's found that 84.50 per cent of the sample households were headed by male members, indicating that most of the socioeconomic activities taken up by the households were male-dominated livelihood activities, where the highest per cent of male household heads found among the Sherpa (87.34%), followed by Lepcha (84.21%) and Tamang (83.86%) tribe (Table 1). In terms of block levels, the men household head depicts (Figure 4a) the highest in Gorubathan (91.67%), then Darjeeling Pulbazar (91.25%), Kurseong (86.57%), Kalimpong-I (86.44%), Kalimpong-II (82.35%), Mirik (81.08%), and 79.35 per cent in Jorebunglow Sukiapokhri. Among these tribes, the highest percentage of male tribal household head members was found among the Sherpa (about 87%) and female Tamang tribes (16.14%), respectively. The role of the head of the tribal household can vary widely depending on the specific cultural, social, and political structures of the tribe.

Table 1: Socio-demographic characteristics of the sample scheduled tribe households

Variables	Characteristics	Level	Tribes (in %)			Total (%)
			Tamang	Lepcha	Sherpa	
Gender	Gender of the ST household head	Male	83.86	84.21	87.34	84.50
		Female	16.14	15.79	12.66	15.50
Religion	The religion of ST household	Hindu	3.16	3.95	5.06	3.61
		Buddhist	92.72	52.63	88.61	85.56
		Christian	4.11	43.42	6.33	10.83
Educational Status	Complete Level of Education	No Education	15.51	15.79	6.33	14.01
		Pre-Primary	4.75	5.26	3.80	4.67
		Primary	37.97	38.16	44.30	39.07
		Secondary	28.80	26.32	35.44	29.51
		Higher Secondary	8.23	9.21	5.06	7.86
		Graduation	4.11	5.26	3.80	4.25
		Post Graduation	0.63	0.00	1.27	0.64
Family Type	Structure of the family	Nuclear Family	51.27	56.58	60.76	53.72
		Joint Family	44.62	42.11	37.97	43.10
		Extended Family	4.11	1.32	1.27	3.18
Family Size	No. of household's members	Less than 3	13.29	13.16	13.92	13.38
		3 - 4	56.65	67.11	58.23	58.60
		5 - 6	24.37	17.11	21.52	22.72
		More than 6	5.70	2.63	6.33	5.31
Marriage	Preferred age of marriage in the community	Below 18	28.16	27.63	30.38	28.45
		18-21	23.42	26.32	16.46	22.72
		Above 21	48.42	46.05	53.16	48.83
	Type of marriage	Arrange marriage	31.65	32.89	32.91	32.06
		Love marriage	68.35	67.11	67.09	67.94
Social Participation	Usual visit and participation in gram Sabha, panchayat, and village programme	No participation	2.22	2.63	7.59	3.18
		Low	17.09	7.89	16.46	15.50
		Moderate	30.70	27.63	27.85	29.72
		High	50.00	61.84	48.10	51.59
Morbidity	Any members suffered from diseases (past year)	No	80.38	77.63	86.08	80.89
		Yes	19.62	22.37	13.92	19.11

Source: Primary field survey of the ST households in the hilly Darjeeling & Kalimpong dist., 2022

4.1.2 Religion

Religion remains an important aspect of the diverse socio-cultural activities in the Darjeeling Himalayas. The populace is primarily Nepali-speaking. They follow Hinduism, Buddhism, and Christianity (Lama and Rai, 2016). Most tribal communities in the research area identified as Buddhists (85%), followed by Christians and Hindus (Table 1). While Hindu tribes worship goddesses like Durga, Kali, Hanuman, and Saraswati, Buddhist tribes visit their Gumba, or monastery, to honor Lord Buddha. Many Hindu tribespeople, primarily Buddhists, have converted to Christianity. As a result, they practice their former religion rarely and adhere rigidly to church regulations. Research on Hinduism and Christianity is severely lacking. Only 10.83% and 3.61% of tribal households follow Christianity and Hinduism, respectively. In the block level, the share of Buddhism was higher, including Darjeeling Pulbazar (93.75%), Gorubathan (91.67%), Jorebunglow Sukiapokhri (91.30%), Kalimpong-I (88.14%) and Mirik (86.49%). In comparison, the percentage of Christians was significantly higher in Rangli Rangliot (24.36%), Kurseong (19.4%), and Kalimpong-II (17.65%). However, most tribes' belief in animism has not faded, and religion is regarded as a social tool that promotes societal solidarity and responsibility (Figure 4b).

4.1.3 Educational status

The literacy rate of every community is an important standard for measuring socioeconomic growth. The educational status of the head of a tribal household can vary widely depending on factors such as location, access to educational opportunities, government policies, and individual circumstances. From the study, it is found that among the different selected tribal communities (Table 1), more than 15 per cent of non-literate household members are from the Lepcha (15.79%) and Tamang (15.51%) as compared to the Sherpa (6.33%). In the case of block-level educational status (Figure 4c), it is found that the non-literate tribes are primarily found in the Jorebunglow Block, Rangli Rangliot, Kurseong, Kalimpong-I and Gorubathan (more than 10%). The difference in literacy level was because of their circumstances; they often face challenges in accessing quality education due to geographic remoteness, socio-economic disparities, and cultural differences. Most tribes reside in rural regions and have limited access to school; the proportion of tribes who discontinue their studies rises when it comes to their higher levels of educational attainment (Dunn, 1993).

4.1.4 Family type and size

Family is a fundamental social institution established on biological and marital ties. Diverse tribes may possess distinct familial structures, which can differ significantly based on cultural practices, rituals, social organization, socioeconomic factors, and historical contexts within a tribal group or community (Deb, 2022). Some common family types found in the study areas were the nuclear family, a small family consisting of a married couple and their children. This is considered the basic family unit in many societies. On the other hand, a joint family is a traditional family structure where several generations live under one roof or

nearby, including grandparents, parents, children, and spouses. An extended tribal family is a family structure within a tribal community beyond the nuclear family unit. It encompasses a broader network of relatives, often spanning multiple generations, who live together or nearby and share responsibilities, resources, and social connections. The nuclear family has a higher share (53.72%) throughout the region than the combined and extended families (Table 1). The Mirik and Rangli Rangliot blocks have a higher percentage of joint families (more than 50%) (figure 4d). At the same time, among the tribal communities, the Tamang people lived in a joint family in higher proportion than the Lepcha and Sherpa.

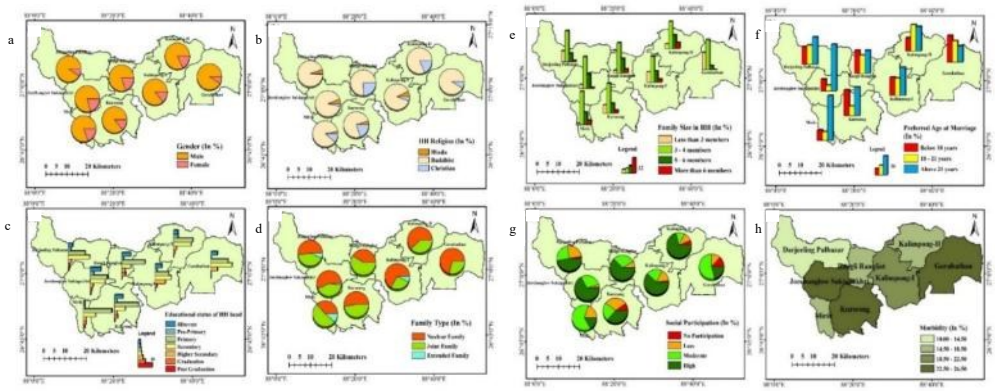

Figure 4: Socio-demographic characteristics of the selected tribal communities

In many tribal communities, family size tends to be influenced by factors unique to their specific cultural and environmental context. Some of the broad findings from the study data are shown in Table 1. According to the total number of family members, four different types of families have been recognised: small (less than three people), mild (3-4 people), moderate (5-6 people), and huge high (more than 6 peoples). The research area has the highest concentration of mild-sized families (58.60 per cent). In Mirik, Jorebunglow Sukiapokhri, and Darjeeling Pulbazar, more than 60% of tribal households belong to mild-sized families. Smaller families comprise more than 20% of tribal houses in the Gorubathan, Darjeeling Pulbazar, and Kalimpong-I blocks (Figure 4e). Only 5.31% of households have large-sized families, whereas 22.72% of moderate-sized and only 13.38% of households have small families. The Lepcha community comprised a significant proportion of households, with mild (67.11%), whereas the highest share of moderate family members is found in the Tamang (24.37%). Among the tribal communities, small and large size families (13.92 and 6.33%, respectively), the Sherpa tribe's share is high. However, nearly 13 per cent of all these tribes' household members were less than 3, and most have 3-4 family members (Table 1).

4.1.5 Marriage

Despite assertions of primitive tribal identities, caste remains a significant factor in marriage. The preferred age for marriage within a tribal community can vary significantly

based on specific cultural, social, and economic factors. In this study, it was found that overall marriage practices among the selected tribal communities were primarily above the age of 21 years (48.83%), whereas 22.72% of marriages take place at the age of 18-21 years, and the most concerned 28.45% of marriages below the age 18 years. Before 18 years of age, marriages were found mainly among the Sherpa tribes, higher than the Tamang and Lepcha. Moreover, the preferred age of marriage among these tribal communities was nearly 72%, above the age of 18 years (Table 1). Spatially, in terms of the block level, it was found that more than 20% of the marriages below 18 years found among tribes in the blocks of Gorubathan, Kurseong, Rangli Rangliot, Kalimpong-I, Darjeeling Pulbazar, and Kalimpong-II. Whereas above 21 years, tribe marriages were found in more than 40% of Kurseong, Kalimpong-I, and Darjeeling Pulbazar, only Jourbunglow Sukiapokhri and Mirik block found more than 70% in the study area (Figure 4f). It is important to note that there is no one-size-fits-all answer, as different tribal communities have unique customs and traditions. However, some common trends can be observed in certain tribal societies. There were two common marriage practices: arranged and love marriage. Traditionally, arranged marriages were common in many tribal communities. However, at present, love marriages are becoming more prevalent. Based on the study results (Table 1), the contemporary marriage practices among the tribes were mostly love marriages (67.4%) rather than arranged marriages. Among the selected tribal groups, Tamang tribes (68.35%) were found higher in this love marriage preferences and current practices than the Lepcha and sherpa. In the block-level study of the type of marriage practices and preferences, it was found that only Rangli Rangliot and Gorubathan block tribal people practices and prefer arranged marriage more than 50 per cent, While Kalimpong-I, Darjeeling Pulbazar, Kalimpong-II (more than 30%), and rest below 30%.

4.1.6 Social Participation

The level of social participation among tribal communities can vary widely based on cultural traditions, geographical location, access to resources, and exposure to outside influences. High social participation was found to be more concentrated among the tribes of Kalimpong-II, Jorebunglow Sukiapokhri, Rangli Rangliot, Kalimpong-I, and Darjeeling Pulbazar (more than 47%) as compared to other blocks in the region (Figure 4g). In contrast, the number of such social participants was high in the Gorubathan, Kurseong, and Kalimpong-II blocks (more than 6%). However, among these tribes, the social participation rate was comparatively higher among the Tamang (more than 97%) than the Lepcha and Sherpa (Table 1).

4.1.7 Morbidity

Some key considerations regarding morbidity within tribal communities were: Morbidity among the tribal community was more than 20 % in the Jorebunglow Sukiapokhri, Kurseong, Gorbathan, and Kalimpong-I blocks (Figure 4h). Prevalence of morbidity was

found to be higher among the Lepcha (about 22%), followed by the Tamang and Sherpa (Table 1). Indigenous peoples or Scheduled Tribes (STs) have made far slower progress on developmental indices than predicted, particularly in terms of health. They have high mortality and malnutrition rates, the lowest standard of obstetric care, and fall among the country's poorest recipients of healthcare (Raushan & Acharya, 2018).

4.1.8 Household Types and Surroundings

In hilly regions, including tribal areas, households often have different types of constructions based on the availability of resources and the level of infrastructure development. The terms "kuccha," "pucca," and "semi-pucca" refer to the types of construction materials and methods used in building houses. Kuccha houses are made of non-durable and locally available materials like mud, bamboo, thatch, or other natural materials. Meanwhile, semi-pucca houses incorporate elements of both kuccha and pucca construction. They may use a combination of durable and non-durable materials. The pucca houses use durable and permanent materials such as baked bricks, cement, concrete, and metal (Deb, 2022). In the study area's selected tribal population, the kuccha household (HH) found more than 10 per cent in the Gorubathan, Rangli Rangliot, and Kalimpong-II blocks. Furthermore, the pucca tribal household was comparatively high in Kurseong, Kalimpong-I, and Darjeeling Pulbazar (more than 40%) (Figure 5a). It was also found that the majority (more than 50%) of these selected tribal households (Table 2) were semi-pucca in structure compared to pucca and kutcha. This Kucha household was found to be comparatively more common among the Lepcha. It depends on factors such as household income, resources, government policies, and the level of development in the tribal community within that region.

In the tribal areas, the households tend to be deeply intertwined with the local communities' rugged terrain, dense forests, and unique cultural practices. These households were typically built with an understanding of the local environment. They were designed to withstand natural disasters like landslides, heavy rainfall, and other challenges. The structure and layout of houses often carry cultural significance and may be influenced by indigenous beliefs, rituals, and customs. The study results found that, overall, 44.95% of selected tribal households were situated near steep hills, followed by 33.59% near small to moderate landslide-prone areas, 6.77% situated near riverbanks, 4.81% both landslide and steep hills, and 9.88% of them lived in the lower highland or the foothill areas (Figure 5b). Among these tribes (Table 2), the Lepcha people and their households found most of the nearby landslide surroundings, whereas the Tamang were mainly found along the riverbank and steep hills. Sherpa people's houses were found in both landslide and steep hill areas. Due to the risk of landslides, households are often situated in areas less prone to soil erosion and geological instability. Some communities may have relocated to safer locations after experiencing landslides in the past. In some areas, households were situated near riverbanks, which provide a vital water source for various domestic and agricultural needs. However, this proximity can also pose risks during periods of heavy rainfall.

4.1.9 Household facilities

In the hilly tribal regions of the Darjeeling Himalayan region, ensuring basic amenities for households is of utmost importance for their well-being and quality of life. Those households have specific needs and necessities shaped by the rugged terrain, climate, cultural practices, and sometimes limited access to modern amenities. Based on the results of Table 2, specific needs and necessities related to water, toilet facilities, separate kitchens, and light sources in these areas were discussed.

a. *Source of Water:* Most of the selected tribal household's source of water (mainly for drinking, cooking, hygiene, and other usage) was from the nearby stream flow (48.03%), then shared public tap (21.36%), 16.39% from spring water, 13.19% of other sources, including the tank facilities and only 1.04% (Gorubathan) through well or tube well (Figure 5c). Similar studies for the research area highlight the region's poor water management. Most ST homes get their drinking water from untreated sources. However, some ST homes utilise purified tap water. Again, streams, tank/ reservoirs and other water bodies are more commonly used than rivers as drinking water sources (Subba & Rai, 2017).

b. *Toilet Facilities:* Unimproved toilet facilities (i.e., shared toilet, open defecation) were found more among Lepcha (about 18%), followed by Sherpa and Tamang. Toilet facilities in the selected tribal households were found overall, except in the Gorubathan, Rangli Rangliot, Kalimpong-I, and Kurseong blocks, where more than 10 per cent do not have toilet facilities. Even some households in the Gorubathan, Darjeeling Pulbazar, Kurseong, and Rangli Rangliot (more than 2.5%) found open defecation practices (Figure 5d).

c. *Separate Kitchen:* Except for Kalimpong-I and Kalimpong-II, other blocks (Jorebunglow Sukiapokhri, Mirik, Rangli Rangliot, Darjeeling Pulbazar, and Kurseong) in the study area had more than 10 per cent of tribal households without a separate kitchen room (Figure 5e). Separate kitchens were provided in about 88% of these tribes, the highest among Tamang (90%) and less than 80% among Sherpa and Lepcha households (Table 2).

d. *Cooking fuel:* Traditional cooking fuels (e.g., wood, crop residuals, dung cakes) among the tribal households were found in more than 30 per cent of the Gorubathan, Kalimpong-II, and Rangli Rangliot blocks (Figure 5e). It was evident from the study results that these tribes mostly use and prefer to use modern (LPG) fuels for cooking, but still, many of the Tamang tribe prefer to use traditional cooking fuel, which was found to be higher than that of the Sherpa and Lepcha. This is primarily due to affordability and socio-economic issues.

e. *Source of light:* It is important to note that the choice of light source depends on factors such as accessibility, availability of resources, cost, and environmental considerations.

Tamang households found more electricity for their source of light than the Sherpa and Lepcha tribes. Almost all the blocks have more than 85 per cent of the tribal households electrified, except Gorubathan (75%) and Kalimpong-I (76.27%). Overall, 87% of tribal households have electricity. However, some tribal households (8%) were found to use solar light and biogas for their household light, and only 6% of them use traditional (kerosene) light (Figure 5f).

Table 2: Housing characteristics of the sample scheduled tribe households

Variable	Characteristics	Level	Tribes (in %)			Total (%)
			Tamang	Lepcha	Sherpa	
Household type	Structure of the household	Pucca	37.97	35.53	39.24	37.79
		Semi Pucca	53.16	52.63	54.43	53.29
		Kuccha	8.86	11.84	6.33	8.92
Household's surroundings	Household's locational geographies	Landslide area	33.55	44.59	44.30	37.15
		Riverbank	8.39	6.76	1.27	6.91
		Steep hill	49.03	40.54	26.58	43.84
		Both a landslide and a steep hill	3.23	4.05	7.59	4.10
		Others	5.81	4.05	20.25	7.99
Household needs and necessities	Main source of drinking Water	Protected/Unprotected Spring	18.04	13.16	7.59	15.50
		Stream/Canal	52.53	44.74	32.91	47.98
		Own/Public/Shared tap	21.52	13.16	40.51	23.35
		Well-covered/uncovered	0.32	1.32	0.00	0.42
		Other	7.59	27.63	18.99	12.74
	Type of toilet Facilities	Own flush/pit toilet	89.24	81.58	82.28	86.84
		Shared toilet	7.91	15.79	17.72	10.83
		Open defecation	2.85	2.63	0.00	2.34
	Provision of a separate kitchen	No	9.87	11.84	22.78	12.37
		Yes	90.13	88.16	77.22	87.63
	Type of fuels used for cooking	Wood/Crop Residue/Dung cakes	23.42	18.42	7.59	19.96
		Liquid Petroleum Gas (LPG)	73.10	78.95	88.61	76.65
		Others	3.48	2.63	3.80	3.40
	Source of lightning in the household	Electricity	88.61	84.21	86.08	87.47
		Kerosene	5.70	2.63	5.06	5.10
		Others	5.70	13.16	8.86	7.43

4.2 Livelihood patterns of the selected tribal communities

In the hilly regions of Darjeeling and Kalimpong districts, the Lepcha, Tamang, and Sherpa communities have distinct livelihood patterns influenced by the area's unique terrain, climate, and cultural heritage. Some common livelihood patterns of these tribal communities are shown in Table 3. These communities often practice subsistence agriculture, cultivating crops and horticulture in terraced fields. It is important to note that while tea garden labour provides an important source of income for many tribal households, it may also come with challenges such as seasonal employment, exposure to weather conditions, and sometimes issues related to labour rights and fair wages, for these averse reasons, some households engage in multiple and other livelihood activities. Individual households may engage in a combination of these activities to diversify their sources of income and enhance their resilience to economic challenges. However, their inadequate level of educational attainment, existence within isolated areas, and lack of access to knowledge about the outside world were still among the obstacles to their effective economic growth (Deb, 2002).

These livelihood patterns were indicative of the diverse and adaptive strategies employed by these communities to thrive in the challenging terrain of the Darjeeling and Kalimpong districts.

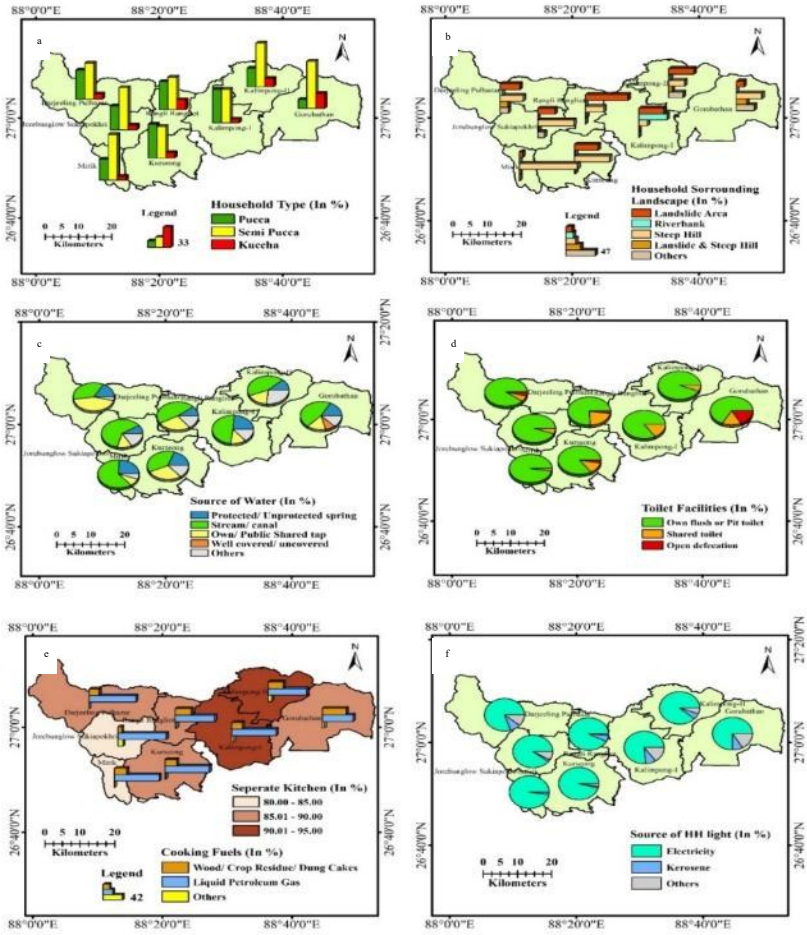

Figure 5: Household characteristics of the selected tribal communities

4.2.1 Occupational status

The Lepcha, Tamang, and Sherpa communities engage in various occupational activities influenced by the local environment, cultural practices, and economic opportunities. The share of daily labourers (mostly tea garden, then construction) was high in all the blocks (Figure 6a). Apart from the labourers, other sectors were also found, such as cultivation, agricultural workers, small or medium shops, service members, and other occupations like drivers and homestay businesses. Overall, 54% selected tribals' main occupation (Table 3) as a daily labourer, followed by service sectors (16.14%), Cultivators (12.39%), shop runners (4.39%), and others (13.19%). A similar study by Subba & Rai (2017) also found that the occupations with the most significant percentages were tea garden labour, farming-

owned land, self-employed professionals, small-scale businesses, and agricultural land. Non-agricultural labour, livestock rearing, trade activity, and driving account for a small proportion of the ST population.

Table 3: Livelihood characteristics of the sample scheduled tribe households

Variable	Characteristics	Level	Tribes (in %)			Total (%)
			Tamang	Lepcha	Sherpa	
Occupational Status	Main source of income	Cultivation	5.06	27.63	18.99	11.04
		Daily Labour	60.13	55.26	37.97	55.63
		Small / Medium Shop	6.01	0.00	3.80	4.67
		Servicemen	17.72	7.89	13.92	15.50
		Others	11.08	9.21	25.32	13.16
Income Level	Family member's monthly income	Less Than 3000	2.53	7.89	5.06	3.82
		3000-5000	24.68	19.74	17.72	22.72
		5000-7000	17.09	21.05	25.32	19.11
		7000-10000	19.30	15.79	25.32	19.75
		Above 10000	36.39	35.53	26.58	34.61
Workforce	Number of working family members in the household	1 Member	56.65	59.21	65.82	58.60
		2 Members	28.48	23.68	22.78	26.75
		3 Members	10.76	15.79	7.59	11.04
		More than 3 Members	4.11	1.32	3.80	3.61
	Working age group pop. Dependent age group population	Age group of 15-64 years	80.62	75.96	79.47	79.77
		Age group of under 15 years.	11.50	16.03	11.41	12.16
		Age group of above 64 years.	7.88	8.01	9.13	8.07
		Total dependent	19.38	24.04	20.53	20.23
Livestock	Households, any livestock, herds, farm animals/ poultry	No	36.62	19.74	29.49	32.69
		Yes	63.38	80.26	70.51	67.31
Forest products	Using different forest products	No	64.56	82.89	75.95	69.43
		Yes	35.44	17.11	24.05	30.57
Financial Crises	The frequency of financial crises that households faced	Always/most of the time	36.39	59.21	45.57	41.61
		Occasionally	49.68	34.21	37.97	45.22
		Never	13.92	6.58	16.46	13.16

4.2.2 Income level

Many tribal households rely on tea gardens and other labourer work and subsistence agriculture, which provide a basic income and also, those engaged in agriculture or animal husbandry have a moderate income, while individuals involved in trade, commerce, or tourism-related activities have higher earning potential. Over the study area (Figure 6b), more than 64.6 per cent of tribal households' income levels were below ten thousand rupees, whereas only 35.4 per cent were above ten thousand. Moreover, 3.5 per cent of those with an income level of less than three thousand rupees were found among them over the region. Most of the Sherpa tribe's household income (65%) was below ten thousand compared to the other two tribal households (i.e., Tamang and Lepcha). This was because of their low wages, insufficient work participation rate, and problems in their current employment situations. A similar study indicated that a significant proportion of households belonging to Scheduled Tribes earn less than ten thousand rupees per month. However, the other social caste found a higher monthly income of ten thousand rupees than ST households (Subba & Rai, 2017).

4.2.3 Workforce

The workforce and its participation indicate the percentage of people involved in economic occupations in the entire population (Deb, 2022). Combating poverty remains one of the most significant challenges in the progress of our nation's process since it is closely related to their vocations and labour participation, improving their living standards. Most tribes were still engaged in low-productive farming and other lower-paid jobs, which was also seen in their high poverty rate, and many times higher than that of the other communities (Mehta & Singh, 2021). Their participation in different sectors of the economy reflects their skills, cultural practices, and adaptability to the region's unique terrain. An overview of the workforce participation of these tribal communities was discussed and portrayed in Figure 6c, d, e and Table 5.

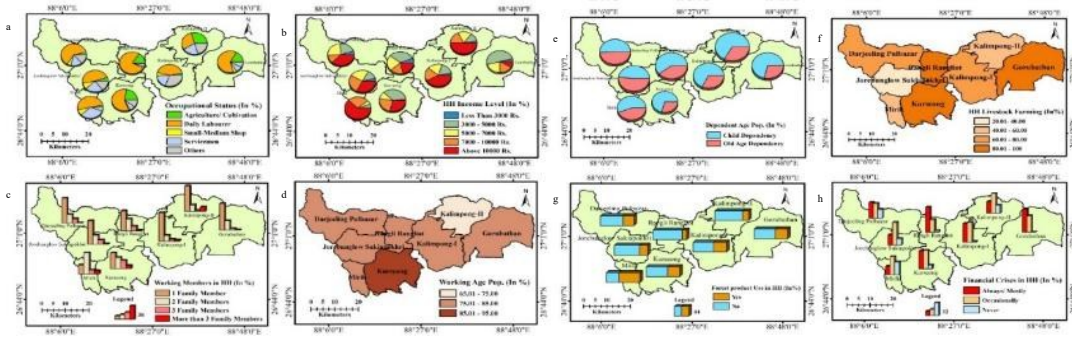

Figure 6: Socio-economic and livelihood characteristics of the selected tribal communities

a. *Working Family Members in the HH:* The number of working family members in tribal households varies widely based on family size, age distribution, and economic opportunities available in their respective areas. Some families have multiple members actively engaged in various economic activities, while others have fewer members contributing directly to the workforce. In the study area (Figure 6c), the majority (58%) of the tribal households have only one working family member, followed by 27.8 per cent of 2 members, 10.1 per cent of 3 members, and only 4.2 per cent of households have more than three working family members.

b. *Working age population:* The working-age population typically refers to individuals between the ages of 15 and 64. In tribal households of the Tamang, Lepcha, and Sherpa communities of Darjeeling and Kalimpong districts, the proportion of working-age individuals varies based on family size, age distribution, and local economic opportunities. Overall, 79.7 per cent of the working-age group tribal population was found in the study area. The working age group was more proportionate in the Kurseong and Mirik blocks (more than 80%) than in the others (Figure 6d). The number of three working family members in the tribal households was high among the Lepcha tribe. On the other hand, comparatively fewer working family members were found in the Tamang and Sherpa households.

c. *Dependency:* Individuals aged below 15 and older than 65 are often considered part of the dependent population. Nevertheless, there are also some individuals with disabilities and non-working adults who are reliant on working members for their livelihood, such as students and unemployed family members, sometimes due to illness or other circumstances. The proportion of the dependent tribal population in the study area (Figure 6e) was about 21.3 per cent. The children's population was 12.5 per cent, and 7.9 per cent were adults. This dependent age group population was highest in Kalimpong-II, Rangli Rangliot, Gorubathan, and Jorebunglow Sukiapokhri (more than 21%) blocks. The dependent age group population was the highest among the Lepcha tribe compared to the other two tribes (Tamang and Sherpa).

4.2.4 Livestock

Livestock plays a crucial role in the livelihoods of tribal households in the Darjeeling and Kalimpong districts, including those belonging to the Tamang, Lepcha, and Sherpa communities. The general overview of the types of livestock commonly raised by these communities: where the households often keep cattle for dairy, which provides a source of milk and other dairy products for the family's consumption and potential sale. Goats are commonly raised for their meat, and hens and ducks are raised for eggs and meat. It was important to note that the choice of livestock differs based on factors such as altitude, climate, available resources, and cultural practices specific to each community. From the results, it was found that a total of 68.5 per cent of sample households of the selected tribes have livestock (raised by the selected tribal communities). All blocks except Mirik, Kalimpong-II, and Sukhiapokhri have more than 60 per cent of the tribal households' rear livestock farming (Figure 6f). Livestock farming was found to be highly prevalent among the Lepcha tribe, followed by the Sherpa and Tamang (Table 3). However, in all these circumstances, environmental factors substantially impact the livelihoods and economies of the inhabitants of Darjeeling Himalaya. Subsistence agriculture, cattle, forestry, and related activities substantially impact their livelihood (Khawas, 2002).

4.2.5 Forest Products

Forests are of the utmost importance to the tribal economy and have traditionally served as a means of subsistence and livelihood. The indigenous people's economy was mainly forest-based and comprised various economic activities such as hunting, food collecting, shifting cultivation, cultivating land, and handicrafts. Forests and tribes are economically intertwined (Lama & Bhui, 2018). These communities know their natural environment and rely on forest resources for subsistence and economic activities. Communities frequently utilize various forest products, particularly local medicinal plants and herbs sourced from the forests. These plants were utilized in traditional healthcare practices. Wild fruits, mushrooms, ferns, and other edible items were collected from forests for consumption. Timber and bamboo serve as significant forest products utilized in construction, including residential structures and the production of household items such as baskets and containers, as well as in animal husbandry. The use of forest products among

the tribes within these blocks (Figure 6g) was about 32.8 per cent. Mirik, Kalimpong-I, Gorubathan, Kurseong, and Darjeeling Pulbazar blocks have more than 30 per cent of tribes directly or indirectly using forest products. The use of forest products was higher among the Tamang tribes than the Sherpa and Lepcha tribes (Table 3).

4.2.6 Financial Crises

Financial vulnerability, particularly in lower-income and socioeconomically deprived communities like tribes, derives from their constant reliance on informal funding sources (Kumar, 2017). The occurrence of financial crises among the selected tribal communities' households (Figure 6h) was primarily found occasionally (45.24%), 41.47% faced always or mostly, and only 13.29% have never faced financial crises. In the case of always or mostly faced financial crises, the Rangli Rangliot, Gorubathan, and Kalimpong-I tribes consist of more than 45 per cent. The most frequent financial crises faced by Lepcha people are compared to those faced by the Sherpa and Tamang. Financial crises affect the tribal communities. The factors that trigger these crises include economic downturns, natural disasters, health emergencies, or other unforeseen events like crop failure, livestock loss, and limited access to credit.

4.3 Quality of life of the Tamang, Lepcha and Sherpa tribes

The results of Table 4 show that the independence domain exhibits the highest mean score (57.62) in comparison to the physical, psychological, social relationships, spirituality, religion, and personal beliefs domains, while the environment domain has a comparatively lower mean score of 46.0. This study found that the highest mean score among the six WHOQOL-100 domains was found in the level of independence. reflecting a significant degree of freedom and contentment with the meaning of life. The lowest mean score is observed in the environment, indicating that economic resources, availability and accessibility of information and educational institutions, and, importantly, access to healthcare services and transportation options in the hills area are suboptimal.

Table 5 lists the mean values for the various aspects of the hilly tribal people's quality of life. The scores for the aspect were very poor (0 to 1), poor (1 to 2), neither poor nor good (2 to 3), good (3 to 4), and very good (4 to 5). Most of the facets' mean values fall between 2 and 3, which is neither good nor poor. Work capacity gets the highest mean score (2.99), whereas pain and discomfort frequently receive the lowest mean score (1.01). The maximum mean score for energy and fatigue in the physical capability area was 2.26; a low mean score was reported for pain and discomfort. Self-esteem has been identified to have a maximum mean of 2.97, followed by thinking, learning, memory, and concentration (2.40), positive feelings (2.36), bodily image and appearance (1.70), and negative feelings (1.51) in the psychological area. Whereas the working capacity (2.99), activities of daily living (2.48), and mobility (2.25) facet scores for the level of independence domain were neither good nor bad, and dependence on medication or treatment (1.79) was found to be poor in the tribal population. Social relationships were important for human beings, and it

was found that social support (2.80), personal relationships (2.63), and sexual activity (2.37) were neither good nor bad among the tribes. One of the most crucial variables was the environment, particularly in the predominantly hilly tribal areas, which influences people's quality of life and level of subsistence. The mean score was high in the home environment (2.80), and the minimum mean score was 1.55 in health and social care: accessibility and quality. Moreover, the last domain, spirituality, religion and personal beliefs, was found to have a moderate mean score of 2.73, while overall, it consists of a 2.71 mean score.

Table 4: Summary of the WHOQOL-100 domains

Domain	Mean	Standard Deviation	Cronbach's Alpha
Physical Health	53.05	10.94	0.68
Psychological	51.40	10.71	0.66
Level of Independence	57.62	9.63	0.70
Social Relationships	52.04	8.51	0.72
Environment	46.00	9.01	0.74
Spirituality, Religion & Personal Beliefs	54.53	19.09	0.65
Overall	54.16	16.08	0.69

Source: Primary field survey of the ST households in the hilly Darjeeling & Kalimpong dist., 2022

The quality-of-life mean score in the hilly Darjeeling and Kalimpong districts of West Bengal is necessary to understand (Table 6 and Figure 7). Regarding the physical health domain, significantly tribal inhabitants of Mirik had the highest QOL score (59.91), followed by Jorebunglow Sukiapokhri with 56.45, Kalimpong-II with 56.19, Darjeeling Pulbazar with 53.46, Kurseong with 52.18, Kalimpong-I with 50.74, Gorubathan with 48.78, and Rangli Rangliot C.D. block with 47.97. Subsequently, it has been found that the tribes in the Kalimpong-I block have a higher psychologically-related QOL (58.64) than the tribes living in the other blocks, including Darjeeling, Pulbazar, Gorubathan, Kurseong, Jorebunglow Sukiapokhri, Kalimpong-II, Rangli Rangliot, and Mirik block. The level of independence is another important domain that signifies autonomy at different levels. It was statistically significant, with the highest score in the Mirik (65.41) block of the Darjeeling district, followed by Kalimpong-I, Darjeeling Pulbazar, Kurseong, Gorubathan, Kalimpong-II, Jorebunglow Sukiapokhri and 50.87 in Rangli Rangliot. For these tribal people, social connections with other people on individual, societal, communal, and other levels are also essential.

Table 5: Mean value of all the facets of WHOQOL-100 among the ST household respondents

Domain	Facets	Mean ± SD
Physical Capacity	Pain and discomfort	1.01±0.98
	Energy and fatigue	2.26±0.74
	Sleep and rest	1.73±0.74
Psychological	Positive feelings	2.36±0.84
	Thinking, learning, memory, and concentration	2.40±0.90
	Self-esteem	2.97±0.75
	Bodily image and appearance	1.70±0.61
	Negative feelings	1.51±0.95
Level of Independence	Mobility	2.25±0.55
	Activities of daily living	2.48±0.64
	Dependence on medication or treatments	1.18±0.93
	Work capacity	2.99±0.90
Social Relationships	Personal relationships	2.37±0.53
	Social support	2.80±0.63
	Sexual activity	2.63±0.57
Environment	Physical safety and security	2.67±0.49
	Home environment	2.80±0.63
	Financial resources	2.32±0.76
	Health and social care: accessibility and quality	1.55±1.03
	Opportunities for acquiring new information and skills	1.57±1.06
	Participation in and opportunities for recreation/ leisure activities	2.54±0.79
	Physical environment (pollution/noise/traffic/climate)	2.65±0.60
	Transport	2.29±0.64
SPIR	Spirituality/Religion/ Personal Beliefs	2.73±0.95
Overall	Overall quality of life and general health perceptions	2.71±0.80

Source: Primary field survey of the ST households in the hilly Darjeeling & Kalimpong dist., 2022

Table 6: Descriptives of the WHOQOL-100's domains within the different C.D. Blocks

C.D. Blocks	n	Physical Health	Psychological	Level of Independence	Social Relationships	Environment	Spirituality, Religion & Personal Beliefs
Kurseong	67	52.18±7.38	51.19±9.82	59.27±11.31	52.60±9.44	45.83±8.04	55.78±14.65
Rangli Rangliot	78	47.97±7.95	46.32±6.74	50.87±9.28	47.84±8.36	47.74±7.71	50.59±14.74
Mirik	37	59.91±2.80	49.44±7.49	65.41±3.85	58.25±3.35	44.13±2.76	51.18±10.81
Jorebunglow Sukiapokhri	92	56.45±11.37	50.58±6.48	52.94±7.09	51.13±7.67	54.84±8.96	58.63±13.36
Gorubathan	24	48.78±9.85	53.02±15.92	58.40±9.53	48.18±11.90	36.30±5.28	50.78±31.13
Kalimpong-I	59	50.74±10.09	58.64±13.17	64.64±8.38	55.33±7.69	41.79±6.82	55.90±24.72
Darjeeling Pulbazar	80	53.46±13.06	54.01±13.58	59.39±8.28	52.37±7.55	42.17±7.62	54.61±25.70
Kalimpong-II	34	56.19±15.80	48.53±7.37	57.49±4.88	52.57±7.68	43.36±6.90	54.23±13.56
F-statistic		7.849	8.557	22.695	8.569	31.325	1.473
P-value		0.000**	0.000**	0.000**	0.000**	0.000**	0.175

Source: Primary field survey of the ST households in the hilly Darjeeling & Kalimpong dist., 2022

Significance level: *P<0.05, **P<0.01

There were six C.D. blocks with QoL scores greater than 50 in the social relationships category, including Mirik, Kalimpong-II, Kalimpong-I, Kurseong, and Darjeeling Pulbazar. In contrast, the two blocks, Rangli Rangliot and Gorubathan, have a QOL score in the social relationship category below 50. The tribal people were known to live close to nature, and the environment played a significant part in their standard of living. According to the study results for this environment domain, all other blocks of the study region's tribal residents have less than a 50 score in their quality of life related to the environment, apart from the Jorebunglow Sukiapokhri block (54.84). However, there was no such statistically significant

difference found for the spirituality, religion, and personal beliefs (SRPB) related QoL, ranging from 50.59 in the Rangli Rangliot to 58.63 in the Jorebunglow sukiapokhri block's tribal inhabitants of the study area.

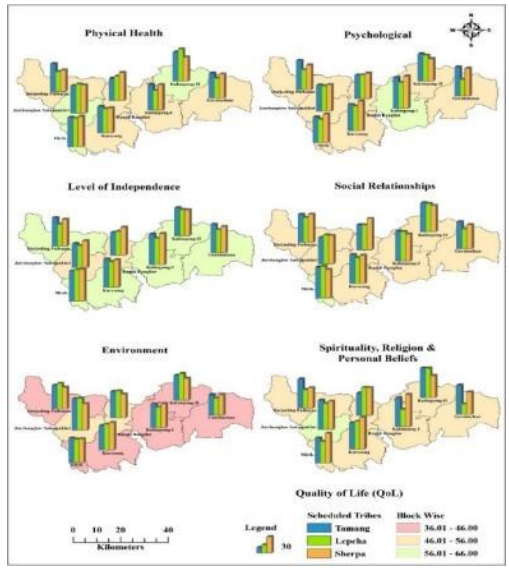

Figure 7: Block-wise Quality of Life (QoL) among the selected Tribes

The quality-of-life mean score among the different tribal communities, especially the predominant tribes (i.e., Tamang, Lepcha, and Sherpa) in the hilly Darjeeling and Kalimpong districts of West Bengal, is necessary to understand.

The selected tribal communities of the Tamang, Lepcha, and Sherpa households QoL were examined in this study region (Table 7 & Figure 7). Where it was found that these selected tribes had significant mean scores, higher than 50 in their physical health domain,

apart from the Lepcha tribes. Similar findings were found for the psychological domain, where the mean QoL score for Tamang and Sherpa tribal communities was significantly higher than 50 and less among the Lepcha (46.55). However, the QoL scores of the tribal communities studied were significantly higher than 50 in the domain connected to the level of independence. It has been found that only the Lepcha (49.34) tribe has QoL mean scores below 50, which were related to social relationships. It is important to know the environment-related QoL among the indigenous tribes, especially among the study region's hilly tribal communities. Regarding the study's findings, the selected tribal communities have average QOL scores in the environment domain below 50. This is noteworthy because it impacts the livelihood and QoL of hilly tribal people. However, it was found that these tribes have higher than 50 mean QOL scores related to the spirituality, religion, and personal beliefs domain.

Table 7: Descriptives of the WHOQOL-100's six domains among the selected tribal communities

Tribes	(n)	Physical Health	Psychological	Level of Independence	Social Relationships	Environment	Spirituality, Religion & Personal Beliefs
Tamang	316	54.02±10.77	52.85±11.26	58.56±10.04	52.50±7.84	46.23±8.92	55.87±18.83
Lepcha	76	49.89±9.36	46.55±7.62	52.96±8.10	49.34±10.53	47.05±9.31	50.49±20.89
Sherpa	79	52.38±12.47	50.51±9.69	58.48±8.04	52.80±8.57	43.93±8.89	53.24±17.79
F-statistic		4.618	11.384	11.159	4.654	2.728	2.684
P-value		0.010*	0.000**	0.000**	0.010*	0.066	0.069

5. Suggestions

Based on the study, the following suggestive measures have been drawn-

a. Efforts to enhance educational opportunities and skills development can increase workforce participation and will improve the economies of these tribal communities.

b. Organizations, NGOs, and government initiatives may play a significant role in implementing water supply, sanitation, and energy access projects in the Darjeeling Himalayan region. These efforts can significantly improve the quality of life for tribal households in the region.

c. It is essential to note that addressing socio-demographic and quality of life problems requires a multi-dimensional approach involving infrastructure development, community engagement, and sustainable practices. Additionally, considering the specific challenges of the hilly terrain, solutions must be adapted to the local context.

d. Due to the hilly terrain, households may implement measures like contour bunding, check dams, and vegetative barriers to prevent soil erosion and landslides.

e. Efforts to mitigate the impact of financial crises on tribal households may involve targeted support, such as emergency relief, access to credit, training in new livelihood skills, and community-based social safety nets.

f. Additionally, policies and programs focused on building economic resilience and sustainable livelihoods can help strengthen the financial well-being of these communities in the long term.

g. Due to the unavailability of water in many parts of hilly regions, households may require storage facilities like tanks or reservoirs to ensure a continuous supply.

h. Depending on the level of connectivity with surrounding societies, tribal communities should interact with government agencies, NGOs, and other external organisations to address specific needs or issues.

The study's main limitations are that the data utilized was cross-sectional and only encompassed quantitative attributes, whereas future research could benefit from using a qualitative approach for enhanced understanding. Furthermore, research was restricted to a certain geographic area of chosen tribal habitats, and only a limited range

of social, economic, and demographic characteristics was examined regarding quality of life

6. Conclusion

This study underscores the socio-demography and quality-of-life challenges faced by the Tamang, Lepcha, and Sherpa tribes in the Darjeeling and Kalimpong districts of the Sub-Himalayan region of West Bengal. Despite the rich cultural heritage and natural surroundings, these tribal communities face persistent issues such as limited educational opportunities in some areas, inadequate health services, economic vulnerabilities, and environmental risks. The WHOQOL-100 analysis revealed that while certain domains, like independence and social relationships, reflect moderate satisfaction, others, such as the environment and access to resources, highlight critical gaps in quality of life. Livelihood patterns remain rooted in traditional sectors like agriculture and tea plantations, with limited diversification into higher-value economic activities. Furthermore, issues like frequent financial crises, insufficient infrastructure, and dependence on natural resources continue to hinder sustainable development. Addressing these issues requires a multidimensional approach, including targeted policy interventions, enhanced education and skill development programs, and community-driven initiatives to improve socio-economic, demographic, health, sanitation, livelihood, and infrastructure. Such measures will elevate the quality of life of these tribal populations and will contribute to the inclusive growth and sustainability of the region.

Acknowledgements: The authors acknowledge the Indian Council of Social Science Research (ICSSR) for funding and the Department of Geography and Applied Geography, University of North Bengal for providing research settings, respectively. The authors appreciate the hilly tribal individuals and institutions of the study's regions for their meaningful participation. The authors declared no conflicts of interest regarding the research writing or publication of the present study.

Ethical Statement: Before and during the study, every single tribal household was surveyed, and consent was obtained using the structured questionnaire. The information gathered file has none of the details that might be used to identify the survey respondents uniquely and was solely to be used for academic purposes.

References

1. Amirrudin, M., Nasution, K., & Supahar, S. (2020). Effect of Variability on Cronbach Alpha Reliability in Research Practice. *Jurnal Matematika Statistika Dan Komputasi*, *17*(2), 223–230. https://doi.org/10.20956/jmsk.v17i2.11655
2. Barman, M., & Chowdhury, I. R. (2023). Assessing the Quality of Life (QoL) of the Scheduled Tribes in the Darjiling District of West Bengal using World Health Organization Quality of Life (WHOQOL)-100. *Indian Journal of Spatial Science*, *14*(2), 10–21

3. Bhattacharya, S., & Pal, S. (2022). Culture and Gender Dynamics in the Context of Tribes of India. *AGPE The Royal Gondwana Research of History, Science, Economic, Political and Social Science*, *3*(2), 75-83.
4. Buragohain, P. P. (2013). Construction of a community specific Human Development Index with special reference to the Tai-Ahoms of Assam. *Asia Pacific Journal of Marketing & Management Review*, 2(10), 13-18.
5. Cajee, L. (2018). Physical Aspects of the Darjeeling Himalaya: Understanding from a Geographical Perspective. *IOSR Journal of Humanities and Social Science*, *23*(3), 66–79.
6. Datta, K. (2006). Heritage of Tibetan Culture Among the People of Darjeeling Hills. *Social Change*, *36*(2), 160–172. https://doi.org/10.1177/004908570603600210
7. Deb, P. (2022). Housing Condition, Livelihood Pattern and Socio-cultural Life of Oraon, Munda and Santal Tribes in Dooars, Jalpaiguri District, West Bengal: The Migrants from Chota Nagpur Plateau Region. *Contemporary Voice of Dalit*. https://doi.org/10.1177/2455328x211069487
8. *District Environment Plan 2021 | Official Website of Kalimpong District | India*. (2021). Retrieved August 17, 2023, from https://kalimpong.gov.in/district-environment-plan-2021/
9. *District Environment Plan for Darjeeling, West Bengal, 2023-2024*. (2023, February 28). Retrieved August 18, 2023, from https://darjeeling.gov.in/document-category/annual-report/
10. Dozey, E. C. (1922). A concise history of the Darjeeling District since 1835: With a Complete itinerary of tours in Sikkim and the District. Bibliophil edition 2012: Kolkata.
11. Dunn, D. (1993). Gender inequality in education and employment in the scheduled castes and tribes of India. *Population Research and Policy Review*, *12*(1), 53–70. https://doi.org/10.1007/bf01074509
12. Frankenberger, T. (1996, November). Measuring household livelihood security: an approach for reducing absolute poverty. In *Food forum,* Washington, DC: Food Aid Management. 34(2), 1-5.
13. Govindharaj, Y. (2016). Scheduled Tribes in India: An assessment of Ethnographic and Demographic transition. *Review of Research*, *6*(2).
14. Keshlata, Nizami, B., Shakil, M., & Singh Cheema, G. (2023). Transformation in Cultural and Livelihood Aspects Among Gujjar Tribes in Jammu and Kashmir: A Sociological Analysis. *YMER*, *22*(8), 420–430. http://ymerdigital.com
15. Khawas, V. (2002). Environment and rural development in Darjeeling Himalaya: Issues and concerns. *Centre for Environment Planning and Technology, Ahmedabad, India*.
16. Kumar, B.P. (2017). Financial Vulnerability among Tribes in Rural Areas: Certain Observations from a Study. *International Journal of Multidisciplinary Educational Research*, 6, (7), 119-125. https://ideas.repec.org/p/pra/mprapa/82425.html
17. Lama, D. and Bhui, U. (2018). Dynamics in Economic Status of Tribal Women of Forest Villages in Darjeeling and Kalimpong, West Bengal. *South Asian Anthropologist*, 18(1), 97–107. www.cabdirect.org/cabdirect/abstract/20193271928

18. Lama, M. P., & Roshan P. R. (2016). Chokho Pani: An Interface between Religion and Environment in Darjeeling. *HIMALAYA, the Journal of the Association for Nepal and Himalayan Studies*, *36*(2),90-98.
19. Limbu, V. (2019). Limbus of Darjeeling Himalaya: aspects of their economy, society and culture in relation to habitat, *Doctoral dissertation, University of North Bengal*.
20. Mehta, B. S., & Singh, B. (2021). Employment and Livelihoods among Tribal in India. *Journal of the Anthropological Survey of India*, *70*(2), 264–277. https://doi.org/10.1177/2277436x211066517
21. *National Commission for Scheduled Tribes*. https://ncst.nic.in/content/frequently-asked-questions. Accessed 12 Oct. 2024.
22. Coomar, P. C., & Ganguly, D (2022). Study on the Sherpa agrarian economy and management of local resources in a village of Kalimpong district." *NDC E-BIOS*, (2) 56–62. www.ndcebios.in/v2n1/2022020107.pdf
23. Raha, S., & Tripathy, B. (2022). A Descriptive Study on Sex Ratio and Literacy Rate of Tea Garden Workers in Darjeeling and Kalimpong District, West Bengal. *Dogo Rangsang Research Journal*, *12*(3), 2, 142–151.
24. Raushan, R., & Acharya, S. S. (2018). Morbidity and Treatment-seeking Behaviour Among Scheduled Tribe in India: A Cross-sectional Study. *Journal of Social Inclusion Studies*, *4*(2), 325–340. https://doi.org/10.1177/2394481118818594
25. Roy, D. C. (2016). Scheduled Tribe Status and Competition for Public Sector Jobs: A Study in Kalimpong Area in Darjeeling. *Social Trends*, 3(1).
26. Subba, N., & Rai, S. (2017). The socio-economic study: A case of Darjeeling hills. *Splint International Journal Of Professionals*, *4*(3), 7-17.
27. Tamang, G. (2003). An ethnobiological study of the Tamang people. *Our Nature*, *1*(1), 37–41. https://doi.org/10.3126/on.v1i1.303
28. Tamang, P. G. (2022). Decolonizing Darjeeling: History and Identity in the Writings of Indra Bahadur Rai. *HIMALAYA-The Journal of the Association for Nepal and Himalayan Studies*, *41*(1), 12-24. https://doi.org/10.2218/himalaya.2022.7044
29. World Health Organization (2012). "WHOQOL - measuring quality of life| The World Health Organization (Revision)." *World Health Organization*. www.who.int/tools/whoqol
30. Yamane, T. (1973). "Statistics: An introductory analysis", Second (ed), New York: Harper & Row, 886.