



Impacts On Livelihood In Tribal Villages Of Sikkim

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Abstract: The framework of agricultural systems helps to strengthen the socio-economic status of the region. It is essential for sustainable livelihood. All policies and infrastructure are also imperative, which will affect the livelihood. Sikkim is a hilly state of India having arable land for agriculture and more than 70% of the people are agriculturally dependents. Thus, this study is undertaken to understand socio-economic impacts in tribal villages of Sikkim. Nonetheless the agriculturists of Sikkim were supported by the community forest area, which was called Gaucharan. It was the legal right of community for the use of community forest produces paying certain charges, which was granted by the Councils of Sikkim. However, the State Government of Sikkim imposed ban on grazing in the forest areas in 1998. The present communication deals with the documentation of factors affecting the socio-economic development in the tribal villages of Sikkim.

Keywords: Agricultural system, Grazing, Livestock, Sikkim, Socio-economic.

Introduction

Sikkim is strategically located sharing geopolitical borders with China at North, Bhutan at East and Nepal at West. It is inhabited by several distinctive communities across its hills providing many ecological services (Pradhan *et al.*, 2022). Nonetheless, the difficult terrain of Sikkim faces several constraints to maintain sustainability. Carney (1998) defined sustainable livelihoods comprised of the capabilities, assets (including both material and social resources) and activities required for a means of living, which can cope up with and recover from stresses and shocks and maintain or enhance its capacities, assets both now and in the future, while not undermining the natural resource base. In line to this, Sikkim witnessed several changes after the implementation of ban on grazing policy. When the enforcement of ban on grazing

initiated in Sikkim, all machineries involved were in evacuating all animal herders from the forests areas that bound them to sell animals to the nearest market (Pradhan, 2014). Those animals included sheep (Ban pala), buffalo, cow, yak etc. These animals were local breed of Sikkim, which are nowadays rare in existence. Each Herder of those days used to cater 70-80 sheep, buffalo up to 10-12, cow up to 10-12, and yak upto 100 or above. Those herders as well as households were resettled elsewhere from the affected areas. In turn, it resulted socio-economic downturn in rural economy of Sikkim. Consequently, the communities left the forest fringed villages who were doing farming at the forest fringed villages for yielding cardamom and fodder plants. Gradually, those communities, living near to forest fringed



villages, withdrew the cultivation practices due to the wild animal's menace, lack of manpower for managing the farmland etc. Thus, this paper deals to reflect the recent trends of study areas of Lepcha and Tamang tribes of Sikkim especially focusing on the land use pattern and livestock.

Materials and Methods

Reconnaissance of data from the several qualitative sources performed and compared the information with the available data. The field visit and interaction among stakes performed for qualitative and quantitative analysis in the Sikkim. The survey I undertook for the study of Integrated Watershed Management Programme was funded by Ministry of Land and Revenue, Government of India. The programme was implemented by the Forest and Environment Department, Government of Sikkim. During the study, the baseline information was obtained from the villages of Dzongu, Sikkim. The study area of Dzongu located at $27^{\circ}.28' -27^{\circ}.38'N$ and $88^{\circ}. 23' -88^{\circ}.38' E$ having the altitudinal gradients of 700 to 6000 m . Secondly, the oral interaction with the Tamang tribal households of Melli-Paiyong , GPU conducted to understand the agricultural land use pattern and livestock in the tribal region of Southern region of Sikkim. Here, it is designated as survey II. The GPS coordinates of Melli Paiyong is $27^{\circ}06' N$ and $88^{\circ} 26' E$.

Results and Discussion

Based on the Developmental policies policies of Sikkim, the land use patterns and impacts of tribal inhabiting areas of Dzongu and Melli-Paiyong was studied (Table 1, 4). Noteworthy point is that there is a substantial decrease in the land use trends and livestock in the tribal communities (Table 2,3,5). Further, it was observed that the communities left the traditional agricultural practices due to less production, lack of manpower etc. However, this

study did not discourse any correlation between the productivity rate and the traditional agricultural practices which requires further researches.

Another point is that there is higher rate of animal mortality (Table 2,3,5) as well as low agriculture productivity rate (Table 1,4) in the study areas. The plant and animal diseases are the primordial factors for the discouragement of farming though there are some facilities from the Government sectors. Such other important factors are Monkey Menace, Bear Menace, Lack of Manpower, No community forest, Industrial workers, Less agricultural production etc. In addition to this, the farmers are also not aware of the policies upgradation, process and impact. So, there is a huge gap in between agricultural practices and technology. Unless this gap reduces, the agricultural diversity of Sikkim shall face dire consequences in next future.

The reasons indicated that it was due to the disease, lack of manpower, animal menace etc. But in the recent time, it was noted that the farmlands are uncultivated due to lack of farming knowledge also, besides diseases, lack of manpower etc. It depicts that the farmers are losing hope in the agriculture, which was earlier primary source of income of Sikkim. Ultimately, such action resulted decrease in the primary income source. The younger generation is moving towards the tertiary income creating a shift in economic paradigm of Sikkim. In the light of this, the agriculturally based primary income of Sikkim requires a special mechanism to restore for sustainable development as the communities started depending on the tertiary income, which are industrial based. However, this study did not cover the aspect of carrying capacity of industries and the manpower in view of sustainability.



Table 1: Cultivated and Uncultivated Land of Dzongu

Dzongu (Villages)	Uncultivated land (Ha)	Land under cultivation (Ha)	Total Land (Ha)	Uncultivated land % (Ha)	Cultivated Land % (Ha)	Reason for not cultivating
Sudur Bringbong	32.635	27.015	59.65	54.71	45.29	1,2,3, 9, 11
Lingko	32.4	12.45	44.85	72.24	27.76	1,2,3,4, 9, 11
Upper Lingdong	39.2	16.3	55.5	70.63	29.37	1, , 9, 11
	36.05	19.65	55.7	64.72	35.28	1,2,3, 9, 11
Taryang	53.75	86.8	140.55	38.24	61.76	1,2,3,5,6, 9, 11
Shayoung	32.635	27.015	59.65	54.71	45.29	1,2,3, 9, 11
Tingvong and Payal	51.35	29.2	80.55	63.75	36.25	1,2,3, 9, 11
Mangtang	105.2	43.15	148.35	70.91	29.09	1,2,3, 9, 11
Lingthem	169.3	90.65	259.95	65.13	34.87	1,2,3, 9, 11
Namprick	101.1	17.2	118.3	85.46	14.54	1,2,3, 9, 11
Ghon	20.9	8.15	29.05	71.94	28.06	1,2,3, 9, 11
Ghor			0			1,2,3,6, 9, 11
Gyathang	36.95	13.15	50.1	73.75	26.25	1,2,3,6, 9, 11
Kasal Mangzing	88.9	22.35	111.25	79.91	20.09	1,2,3, 9, 11
Kusung	29.75	45.4	75.15	39.59	60.41	1,2,3,6, 9, 11
Leven	24	7	31	77.42	22.58	1,2,3,6, 9, 11
Lingdem	40.98	80.75	121.73	33.66	66.34	1,2,3,6, 9, 11
Lower Lingdong	39.75	24.45	64.2	61.92	38.08	1,2,3,6, 9, 11
Lum	154.25	65.65	219.9	70.15	29.85	1,2,3,6, 9, 11
Nun	20.2	31.05	51.25	39.41	60.59	1,2,3,6, 9, 11
Ravong Bringkatam	87.3	19.1	106.4	82.05	17.95	1,2,3, 6, 9, 11
Rakluk Kayem	58.6	18.61	77.21	75.90	24.10	1,2,3,6, 9, 11
Sangdong	66.15	47.35	113.5	58.28	41.72	1,2,3, 9, 11
Sangkalang Mantam	20.91	12.65	33.56	62.31	37.69	1,2,3, 6, 9, 11
Sangtok	79.97	94.95	174.92	45.72	54.28	1,2,3,6, 9, 11
Upper Barfok	15.8	23.8	39.6	39.90	60.10	1,2,3, 6, 9, 11

Source: Field Survey

(Note: 1. Cardamom disease 2. Monkey Menace 3. Bear/ animal Menace 4. Pest 5. Landslide 6. Lack of Manpower 7. Drought 8. Government service 9. No community forest 10. Industrial workers; 11. Less agricultural production 12. Unaware of policies 13. Business 14. NREGA Scheme)



Further, there is an increase in the percentage of uncultivated farmland in different areas in Sikkim.

Table 2: Baseline Information of Villages under Dzongu.

Village under Dzongu	Livestock				Mortality			
	Cow+ ox	Pig	Goat	Chicken	Cows	Pig	Goat	Chicken
Sudur Bringbong	80	50	75	1380	3	-	-	7
Lingko	45	17	54	180	4	2	4	12
Upper Lingdong	33	29	51	178	2	1	7	19
	34	18	32	93	-	-	3	-
Taryang	63	27	92	197	4	6	9	4
Shayoung	80	50	75	1380	3	-	-	7
Tingvong and Payal	104	21	102	208	5	3	9	13
Mangtyang – Tingkyong	70	38	70	830	4	-	3	15
Lingthem	104	40	87	459	13	1	13	64
Namprick	22	8	40	90	3	3	2	2
Ghon	42	7	63	159	-	-	6	7
Ghor	98 +13	39	13	158	7	3	22	35
Gyathang	49 +2	19	61	231	3	1	2	15
Kasal Mangzing	60	20	110	162	-	-	15	-
Kusung	41+2	3	85	300	3	-	8	15
Lingdem	29 +4	24	67	164	1	2	3	9
Lower Lingdong	42	332	58	201	3	-	-	17
Lum	52 +12	29	113	193	3	-	6	3
Nun	24 +3	16	45	161	-	4	-	-
Ravong Bringkatam	103	13	177	251	1	1	7	3
Rakluk Kayem	34	16	45	104	2	1	-	7
Sangdong	77	31	88	349	6	3	4	7
Sangkalang Mantam	25	17	35	97	1	-	-	14
Sangtok	62+12	33	73	256	-	1	-	-
Upper Barfok	29	12	41	134	3	-	-	4

Source: Field Survey

Table 3: Mortality percentage and Livestock percentage (Dzongu)

Dzongu	Ox	Cow	Pig	Goat	Chicken
Mortality percentage	-	5.27	3.52	7.02	3.52
Livestock percentage	0.399135	11.65	7.55	14.56	65.81

Source: Field Survey



Table 4: Cultivated and Uncultivated Land of Tribal Tamang community of Melli-Paiyoung, South Sikkim

Melli Paiyoung (Villages)	Uncultivated land Ha.	Land under cultivation (Ha)	Total Land (Ha)	Uncultivated land % (Ha)	Cultivated Land % (Ha)	Reason for not cultivating
Upper Paiyoung	26.6	11.4	38	70	30	6, 7,8,9,10, 13, 14
Lower Paiyoung	1.5	0.4	2	80	20	6, 8,9, 10, 12, 14

Source: Field Survey

(Note: 1.Cardamom disease 2. Monkey Menace 3. Bear/ animal Menace 4. Pest 5. Landslide 6. Lack of Manpower 7. Drought 8. Government service 9. No community forest 10. Industrial workers; 11. Less agricultural production 12. Unaware of policies 13. Business 14. NREGA Scheme)

Table 5: Baseline Information of Tribal Tamang community under Melli Paiyoung

Villages under Melli Paiyoung	Livestock				Mortality			
	Cow	Pig	Goat	Chicken	Cows	Pig	Goat	Chicken
Upper Paiyoung	150	60	30	48000	3	4	2	2400
Lower Paiyoung	10	Nil	20	2400	1	-	-	20

Source: Field Survey

Furthermore, it was found that one of the general reasons for undoing of agriculture is also related with community forest land. In earlier days, there was less population whereby the communities were allowed to fetch wood and fodder from the forest levying certain fees of forest produces with certain exception of free use of basic resources. The Sikkim implemented some rules such as ban on grazing, ban on medicinal plants etc which debarred the use the Goucharan land (community land) for the public purposes. This resulted the adaptation of other activities for their livelihood. Primarily, in past, those forest fringed farming areas were good sources of milk products such as dried cheese, butter etc and other farm as well as non-farm products (Sharma *et al.*, 2017; Kumar and Raioi, 2021). In consequence of implementation of such policies, the rearing yak, sheep, buffalo, etc., affected in the community forest of Sikkim (Pradhan, 2014). In case of sheep, there were two kinds of sheep rearing in Sikkim: one is called Gharpala (Home Breed). This sheep stays in one place all round the year. The other kind of sheep called Banpala (Wild- Breed) that does

not stay long in one place and goes to the high elevations in the summer and to the lower valleys and plains in the winter. The local breed of buffalo, cow and yak were the assets of Sikkim which had very good adaptability qualities in the terrain of Sikkim. Looking into the facts of Tables 1-5, these reveal that the grazing policy affected the livestock populations and land use pattern in study areas of Sikkim. Even in the farm, the numbers of the animals were reduced. The impact of such reduction also resulted less production of organic manures for farmland, which are natural pesticides or insecticides for some diseases. Further, there is a considerable decrease in ox rearing that was reared for manuring field and ploughing. In earlier agricultural system, the oxen were tied at the farm field to manure all farmland, in a rotational basis. Such practice was helpful to manage the farmland easily however, nowadays, it is rarely seen in farmland.

Crop Responses to Climate Change

Globally, the temperature is increasing and its effect is noted in the study areas affecting



humidity, moisture, air matrix etc. These adaptic factors are very important for the osmotic water potential management in plants which affect the vegetation composition. Looking into the crops and vegetation produces of Sikkim, the climate change is playing and affecting their matrices. During the study, it is observed that there is the plant movement from low altitude to higher altitude. This displacement of Plant population occurs from its habitat to higher altitude, which are in some cases reported above 500 ft from its natural habitat. Furthermore, the plant species are displacing due to the anthropogenic climate change as the species require to acclimate, adapt, move, or die. Consequently, such displacement of the population of species is a threat to the biodiversity (Corlet & Westcott, 2013). For instance, the natural habitat of apple is displacing migrating from Timbung, Dzongu to higher elevation and, at present, its earlier habitat does not produce apples anymore.

Land Use and Livestock Productivity

In Table 1, the data depicted the land use of the tribal areas of Dzongu. The primary data obtained during the survey of the Integrated Watershed Development Programme of Dzongu which was funded by Ministry of Land Revenue, Government of India in the tribal regions of Dzongu. The extensive survey made involving local Government, State Government agencies, Panchayat, Non-government organizations, SHGs, income generation group etc to find out the baseline data of the regions (Pradhan, 2010). It indicated that there is a downtrend of land use in the tribal areas of Dzongu.

At the same time, the baseline data of livestock and its mortality unraveled the decrease tendency in livestock rearing in the tribal villages. Notably, this decrease is due to unavailability of fodder and grazing areas. (Table 2, 3, 5). The tribal communities started rearing chicken in higher percentage in compare

to other livestock. The cattle rearing are quite low. This is alarming because these livestock are important for the agricultural activities such as manure production, organic production, economic regeneration etc. , which ought be maintained in the farmland. In addition to this, the population of indigenous plants and animals declined and found several plant species which are susceptible to disease. For instance, the recent reporting of Fall army worm (FAW) *Spodoptera frugiperda* (J E Smith) in Sikkim. In one of the studies of the livelihood of Sikkim, it was found that there is decreasing trend of livestock from 1950 to 2004 (Tambe and Rawat, 2009).

Conclusion

This study concluded that all livestock and agricultural functions were providing ecosystem services to Sikkim Himalaya since time immemorial however these mechanism were disrupted by several factors, one of the key factors observed is unavailability of grazing land or community forest after the implementation of grazing ban policy. It may be due to lack of scientific assessment of the previous data. The retrospect of previous data indicates that it affected the Sikkim agricultural system a lot. All issues and challenges of Himalayan regions ought to evolve with sustainable regulatory mechanism for the stakeholders for economic security.

In fact, the ban on grazing is the policy to render qualitative forest production for environmental safety however at the same time, it was also necessary to evaluate the mechanism for the stakeholders for the stability of economic security. So, it is recommended to revisit the old policies such as grazing, non timber forest produce sale etc to set up the institutional mechanism for revival of agricultural system of Sikkim and its economy .



Inequitable sharing of resources and policies gaps need to be addressed properly which warrant further research.

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