

Hill Villages of Darjeeling: Aspects of Economy Ecology and Agricultural Modernization

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KEY WORDS Economy. Ecology. Modernization. Agriculture. Technology and Development Schemes.

ABSTRACT The paper attempts to understand the nature of the agricultural economy of some of the hill villages of Darjeeling district with special reference to their ecological characteristics. The cause and extent of agricultural modernization have also been analysed to arrive at a suggestive conclusion which could also be applied to other hill villages of the district as they share certain common ecological and economic characteristics.

This paper partly reports the findings of a general study of the socio-economic condition of the hill villages of the Darjeeling district initiated by North Bengal University a few years ago under an inter-disciplinary action research programme entitled "Eco-development of Mirik-Sukna region in Balason-Mahananda catchment of Darjeeling district." The survey was conducted in 10 villages located at different altitudes in the Kurseong and Sadar sub-divisions of the Darjeeling district. We shall mainly present here the nature of the agricultural economy of these villages with special reference to their ecological characteristics and would also assess the extent of

agricultural modernization that has taken place in these villages. Our special effort would be to find out the causes of inadequate progress made in the agricultural modernization programmes. The conclusions drawn from the study may be aptly applied to other hill villages of the district as they share certain common characteristics in the nature of terrain, crops produced and the extent of adoption of agricultural modernisation programmes.

The Villages : Ecology and Demography

The 10 surveyed villages differ in their altitude, location, area and population. For

Table 1: List of villages surveyed for the present study

<i>Name of the villages</i>	<i>Area (acres)</i>	<i>Population</i>	<i>Altitude (In feet)</i>	<i>Aspect</i>
(A) Saurení Village Cluster				
1. Bungkulung	84.42	321	1800-2200	East faced
2. Sadhu Gaon	38.42	127	3000-3500	East faced
3. Dhar Gaon	26.39	86	3000-4000	East faced
4. Khaptawali	115.48	488	3500-4500	East faced
(B) Plungdung Village Cluster				
1. Lepcha Gaon	430.37	193	2000-3000	South faced
2. Bhutia Gaon	199.44	399	3000-6000	East faced
3. Gairi Gaon	81.82	177	3000-6000	East faced
4. Reying Gaon	52.62	122	3000-6000	South faced
5. Bijua Gaon	152.41	288	4000-6000	West faced
6. Balason Gaon	87.73	249	4000-6000	West faced

analytical purposes we have divided these villages into two clusters - low altitude and middle altitude village clusters. The particulars of these villages are given in the table 1.

Except Lepcha Gaon all the villages in the Plungdung cluster are located at middle altitude. But administratively Lepcha Gaon is included in the Plungdung Village Panchayat. Every village settlement is highly dispersed on the hill slopes and often the altitudinal variation among the houses in the same village ranges from 125 to 900 metres (400 feet to 3000 feet). It may also be observed that the villages are mostly east and south facing obviously to receive more sunshine.

These two village clusters seem to be ecologically different from each other. In the Plungdung area large scale deforestation has probably caused an ecological imbalance which has affected the subsistence activity of the people. In the other group heavy landslides locally known as '*Pahro*' coupled with deforestation has also changed the basic economy of the villages. Besides, the villages in the Saureni cluster are better communicated with main roads leading to the plains and a tea garden is located near it which provides occasional employment to the people.

Increase in population causes a pressure on the environment unless the resource base is developed. The 10 villages occupy 1269.10 acres of land area with a population of 2450. The average density comes to about two persons per acre. But, as expected, the density of population in middle altitude villages is con-

siderably lower, almost half, than that in the lower altitude villages. Though in general in all the villages the density of population in relation to fixed land area of the village is fairly high, the problem is more acute in the lower villages. The ever increasing demand for new house plots, roads and agricultural land has compelled the people to unauthorisedly occupy forest and tea garden lands.

In the population structure of these villages it was noted that the proportion of work force (men and women above 12 years) was very high, about 69 per cent of the total population. In the sex ratio also the men out-numbered the women by 100:92. Migration is a recurrent phenomenon in the villages of this district. At the time of this survey in 1984-85 it was noted 15 per cent of the population were born outside the villages of which five per cent were born in Nepal.

The literacy rate is also fairly high in these villages - 55.5 per cent in the Saureni village cluster and 48.5 per cent in the Plungdung village cluster. Of the literates more than 60 per cent have read above class V, though the number of highly educated persons - graduate and above, is very small. This fact has some relevance with the awareness of the various developmental schemes operating in the area.

The Villages : Economic Profile

Mounting population pressure, growing unemployment and extreme poverty characterize the economy of the two village clusters. With an area of just 1269.10 acres in the hilly terrain

Table 2: Land-use pattern in the two village clusters

Type of land-use	Saureni cluster	Plungdung cluster	Total area (in acres)
	Population: 1022 Area: 264.71 (in acres)	Population: 1428 Area: 1004.39 (in acres)	
Homestead land	14.77	12.67	27.44
Cultivable dry-land (<i>Sukha Kheti</i>)	151.50	752.86	904.36
Cultivable wet-land (<i>Pani Kheti</i>)	46.58	nil	46.58
Land under share cropping	11.22	7.00	18.22
Orchard	22.61	nil	22.61
Uncultivable waste land	18.03	231.86	249.39
Total	264.71	1004.39	1269.10

Table 3: Classification of households according to the size of the land-holding

Villages	No. of households	0.5 to 1 acre	Above 1 to 3 acres	Above 3 to 10 acres	Above 10 to 25 acres
<i>Saureni Cluster</i>					
1. Bungkulung	62	36	21	5	—
2. Sadhu Gaon	22	10	8	4	—
3. Dhar Gaon	14	4	8	2	—
4. Khaptawali	83	46	24	13	—
Total	181	96 (53%)	61 (34%)	24 (13%)	—
<i>Plungdung Cluster</i>					
1. Lepcha Gaon	36	—	1	16	19
2. Bhutia Gaon	74	18	33	22	1
3. Gairi Gaon	26	11	5	10	—
4. Reying Gaon	20	5	6	8	1
5. Bijua Gaon	46	9	16	20	1
6. Balason Gaon	39	18	15	4	2
Total	241	61 (25.3%)	76 (31.6%)	80 (33.2%)	24 (10%)

the villages are saddled with a population of 2450. The density of population per acre stands at 1.93 which is quite high considering the nature of the poor agricultural development.

The villages do not have any industry, 68.44 per cent of the population in these villages depend wholly on agriculture. Only a small portion of the population are engaged in service, trade and commerce. As will be seen the use of fertilizer is minimal and irrigation facilities are poor. The cultivators depend on natural springs and rainfall to irrigate their fields.

The cultivation is carried out on terraces built on slopes, some of which are very narrow (2 to 3 metres feet wide) particularly in the middle altitude villages. An approximate idea of land-use and land-tenure pattern in the two village clusters is given in tables 2 and 3.

It can be seen from table 2 that the proportion of dry-land is very high in all the villages. This is particularly so in the middle altitude villages; whatever wet-land is available is exclusively located in the lower villages. The uncultivable waste-land is also significantly high in the higher villages.

Though some households own quite sizeable areas of land a large part of this land

is uncultivable, particularly in the higher villages. The per capita holding size of cultivable land in both the lower and upper villages varies from 0.22 acre to 0.41 acre except at Lepcha Gaon in the Plungdung cluster where it is 1.91 acres per person. In general classification of farmers most of the cultivators are marginal and small farmers; only a few of them may be called medium farmers.

As noted above the main occupation of the people is agriculture, but the percentage of the population engaged in this work varies from village to village. Taking the two village clusters as reference points, the nature of the primary occupation of the adult population appears as in table 4.

There is quite a difference in the occupational pattern in the two clusters. Because of the shortage of land the working population in the lower villages are forced to depend less on agriculture; the number of agricultural labourers is also higher here and so also the number of persons (mostly women) who are engaged in housework exclusively. But this table should be read along with table 5 which shows the nature of supplementary occupation of the villages in these two clusters who have some kind of secondary occupation.

Higher villages mean villages at middle altitude

Table 4: Primary occupation of the working population

Occupation	Soureni Cluster		Plungdung Cluster	
	Num-ber	Per-centage	Num-ber	Per-centage
Cultivation	241	34.58	653	66.64
Service	54	7.75	80	8.16
Trade and Commerce	8	1.14	10	1.02
Agricultural Labourer	54	7.75	29	2.95
Student	100	14.34	174	17.76
Housework	188	26.98	13	1.32
Others	27	3.88	5	0.52
Non-workers	25	3.58	16	1.63
Total	697	100.00	980	100.00

It is evident from table 5 that a little more than half of the working population has some kind of secondary occupation in which agriculture, pursued either partly and as or agricultural labour, takes the prominent part. This part support from agriculture on the one hand reflects the poor economic plight of the villagers and on the other hand discourages them from going for any development programme to improve the output from the field.

Table 5: Supplementary occupation of the working population

Occupation	Soureni Cluster		Plungdung Cluster	
	Num-ber	Per-centage	Num-ber	Per-centage
Cultivation	247	71.80	18	3.48
Service	1	0.29	2	0.38
Agricultural Labourers	78	22.68	374	72.06
Housework	5	1.46	108	20.80
Others	13	3.77	17	3.28
Total	344	100.00	519	100.00

Any programme of agricultural modernization is directly linked with the nature of the crops produced in an area. Maize, millet and paddy are the subsistence crops of the area, but paddy is not grown in the middle altitude villages obviously owing to the lack of irrigation facilities. At these altitudes maize and potato form the principal crops. In the low altitude villages maize, millet, ginger, squash and orange are grown. Cardamom is grown in both the types of the villages. Maize

is the basic subsistence food occasionally supplemented by rice whenever available. Potato, orange, squash, ginger and cardamom are primarily grown for export to the plains. Millet is used as food as well as for making beer.

For these marginal and small farmers family is the basic production unit. Only a small number of cultivators can afford to hire labourers, that too partially, to augment the family labour. However, a system of mutual exchange of labour exists among the people. As expected the Plungdung group of villages being more dependent on agriculture, the employment of hired labourers and exchanged labour is more widespread than that in the Saureni group. Table 6 gives the actual picture of the labour utilization pattern.

On a very rough estimate it was found that in the agricultural year 1984-85 about 16 per cent of the total man days in the Saureni cluster of villages came from hired labour; in the Plungdung cluster it was 21.5 per cent. This shows that the major part of the agricultural operations was done by family and exchange labour; the chances of getting employment as hired labour were very little in these villages, though the scope was marginally better in the Plungdung cluster of villages.

Table 6: Labour utilization (percentage of households)

Village cluster	Family labour	Partially hired labour	Exchange labour
Saureni Cluster	73.29	15.94	10.78
Plungdung Cluster	58.46	21.37	20.19
Total	62.32	19.36	17.44

It is quite but natural that in such a bleak economic situation people would try to secure other means to maximize their income. One of these has been to keep cattle. Almost every household has one or more cows or buffalos the milk of which is sold either to milk co-operatives or to outside milk traders. This provides the family with some much needed cash income. A census of the cattle in the villages

was accordingly taken at the time of the survey, which is given in table 7.

It is obvious that with so little of waste land available it is not possible to support such a large cattle population. The pressure is more acute in the Saureni group of villages where, theoretically 63 heads of cattle must be supported on one acre of wasteland. The people are therefore compelled to go to the nearby forest to collect grass and leaves or send their cattle for grazing to the forest. This over grazing or over exploitation of forest resources is causing unbridled destruction of this natural wealth on the one hand and increasing the misery of the people on the other hand as the villagers are to cover more and more distance to collect grass, leaves and timber with the shrinking of the forest line. Leaving other ecological depredations apart this itself is a matter of great concern.

Table 7: Cattle census in relation to uncultivable wasteland

Village cluster	No. of households	No. of cattle	Uncultivable wasteland (acres)	Cattle per acre
Saureni	181	1141	18.03	63.28
Plungdung	241	1792	231.86	7.73

Table 8: Index of dependent population to working population

Villages	Working population	Dependent population	Depending index
<i>Saureni Cluster</i>			
1. Bungkulung	127	194	1.52
2. Sadhu Gaon	46	81	1.76
3. Dhar Gaon	39	47	1.20
4. Khaptawali	176	312	1.77
<i>Plungdung Cluster</i>			
1. Lepcha Gaon	108	85	0.78
2. Bhutia Gaon	245	154	0.62
3. Gairi Gaon	108	69	0.63
4. Reying Gaon	71	51	0.71
5. Rijua Gaon	154	134	0.87
6. Balason Gaon	132	177	0.88
Total	1206	1244	1.03

To get in overall picture of the economic situation of the village an attempt was made to find

Table 9: Loan utilization pattern

Villages	Mode of utilization				
	Milch cattle	Bull-ock	Goat/ Pigs	Culti- vation	Other purpose
<i>Saureni Cluster</i>					
1. Bungkulung	9	—	3	2	3
2. Sadhu Gaon	6	—	1	4	4
3. Dhar Gaon	6	—	—	1	—
4. Khaptawali	21	1	1	28	4
<i>Plungdung Cluster</i>					
1. Lepcha Gaon	20	—	—	1	2
2. Bhutia Gaon	30	—	4	5	—
3. Gairi Gaon	12	—	—	—	—
4. Raying Gaon	6	—	—	9	1
5. Bijua Gaon	23	—	1	3	—
6. Balason Gaon	10	—	—	1	—
Total	143	1	10	54	14

out the ratio of dependent population to working population. This is represented in table 9.

Though on an average one earner in the family has to support one dependent, in the Saureni cluster of villages he/she has to support more than one person. In individual cases it may be as high as 3 to 4 persons. When dependence ratio is unfavourable and the income is meagre the scope for saving is very much restricted. Very few can afford to save after meeting the basic needs.

AGRICULTURAL MODERNIZATION

In the rural economy of the hill villages agriculture plays a dominant role. It is therefore expected that sufficient attention has been given to modernize the technique of production by providing the necessary inputs. In reality, however, this has been quite contrary to expectations. To understand this phenomenon of modernization we shall examine the nature of irrigation facilities available, input of seeds and chemical fertilizer, application of new techniques and use of institutional financing.

(a) Irrigation

It has been noted that there is a substantial difference in the cropping pattern in the two

groups of villages. Maize is the common crop in all the villages but paddy is now grown in upper villages obviously due to lack of irrigation facilities. Potato is the major cash crop in the upper villages which is substituted by other cash crops like ginger, squash and orange in the lower altitude villages. Upper villages do not have any wet-land and the lower villages have only about 27 per cent of cultivable land as wet-land. This predominance of dry-land has seriously hindered the adoption of multi-cropping in these regions.

The traditional source of water in these villages is the innumerable hill streams known as *Khola* in the local language. Plots near the streams are irrigated with the help of polythene or rubber pipes. But due to depletion of forests, heavy soil erosion and landslides the course of these streams are constantly changing and supply of water to fields is becoming erratic and uncertain. In the upper villages though there are some important perennial streams the water is very deep and it requires special engineering effort to draw water for the higher villages. There is no Minor Surface Irrigation Scheme or River Lift Irrigation Scheme operating in any of these villages. As such the fields can only produce maize and potato which require less water. Usually these crops are sown in March-April for maize and September-November for potato and harvested a few months later.

Some irrigation facilities are, however, available for the low altitude villages. But these are restricted only to those plots which are near a water source and it is the owners of these plots who avail of the opportunity with the help of polythene pipes. Hardly do they allow others whose terraces may be located at a distance to draw water from the source through pipes drawn across their fields. It has been seen that usually more affluent farmers have their fields located near a water source with the result that the poor and small farmers are often deprived of even this meagre irrigation facility. What is needed is a sound irrigation scheme attuned to the topographical features of the area and its proper implementation.

(b) Technology and Inputs

Except for potato no use of chemical fertilizer is made in any of the villages. Only in one village—Sadhu Gaon in lower altitude, some fertilizer (about 5 kg.) was used in 1984-85 to grow maize. For other crops like paddy, millet, cardamom, squash, ginger only the manure cow-dung is used as a fertilizer. Seeds and the technology of production are also traditional. No application of high yielding variety of seeds or improved method of cultivation was noticed in any of villages.

In the case of potato cultivation, however, all the six villages in the higher altitudes were seen using substantial quantity of chemical fertilizer. All the potato growers used about 50,000 kg. of potato seeds and 9,000 kg. of chemical fertilizer in one season. Potato being an important cash crop the farmers do not hesitate to invest in this crop. It requires less water and seems to be suitable for the upland soil.

The selective use of fertilizer goes to prove that the farmers are quite aware of the new inputs and technology but probably due to poor condition of the soil, poverty and lack of irrigation facilities do not consider it worthwhile to apply these inputs in other crops.

(c) Institutional Financing

One yardstick of rural development is the amount of investment made in various productive enterprises. Records of the various institutional agencies and personal interview of the householders reveal that more than 50 per cent of households have taken loans from various sources mostly for the purpose of purchasing milch cattle and investment in cultivation of cash crops. Table 9 gives some idea about the nature and source of these loans.

Of the 222 cases of loans reported almost in two-thirds instances the loans have been secured to purchase milch cattle. The number of cases of agricultural loan is relatively small and that also mostly for potato, ginger and squash cultivation.

From 1979 onwards institutional financing has been the main source of loans. All these loans have been taken during the period 1980 to 1985. The State Bank of India, The Farmers' Co-operative Cattle Society and The Gramin Bank have given small loans for the purchase of cattle. In four instances relatives and friends have given loans for house building, medical and family expenses. The amount of loan from institutions ranged from Rs. 1500/- to Rs. 4000/- for cattle and cultivation and Rs. 1000/- for raising pigs and goats. In almost all cases these loans were advanced against land mortgage. The loans from *mahajans* (Money lenders) and relatives rated much less than those secured from the institutions. Three cases of loans under DRDA¹ and SFDA² schemes were reported but that too was obtained for purchase of cow.

SUMMARY AND CONCLUSION

The above description of the economic life of the people in the 10 villages studied brings to light certain features, which we believe, are shared by the hill regions of this part of the country as a whole. In adopting a strategy for overall rural development of this region these features should be taken into consideration. But in practice this has not been so as our experience shows. Let us now examine these facets in some detail.

The first and foremost point that should be mentioned is that this region bears some special ecological characteristics. The whole area was once heavily wooded and during the last one hundred years or so human settlements have come up in the hill-slopes and valleys causing gradual depletion of the forest resources. As the population pressure increased, migration being one of the causes, more and more forests were cut down and village established. With 'hard' labour people built terraces on the slopes and undulating valleys. But even then very

little of land could be made cultivable, which automatically restricted the size of the villages. So we find that the villages on an average contain 40-42 households. The pressure of population has been so great that the people have been forced to occupy government land. In one such instance we noted that in the Saureni village cluster in the Valley a stretch of government land measuring about 2000 metre by 100 metre has been unauthorizedly occupied by people from middle altitude villages. Above 10 cattle-sheds have been built and the area is used for grazing. Such land is known as *Veshme* or *Baisey* land. Altitudinal differences in the villages have caused variation in the cropping pattern. Middle altitude villages are conspicuous by the absence of paddy cultivation. But potato has become the major cash crop here. In the low altitude villages paddy, though grown, the other crops like maize, ginger, squash and oranges have taken precedence. On the whole it appears that the people have, without any new input, maximized the productive capability of the land. Had there been irrigation facilities and new inputs they could have further diversified the cropping pattern. Absence of Rabi crop in the lower regions is specially noteworthy in the context.

The size of operational holdings of cultivable land being very small, most of the farmers are small or marginal and it has put a severe constraint to agricultural development, for such a category of farmers, further investment to modernize agriculture does not seem to be economically viable. What is needed is a different strategy for agricultural development with new crops adapted to the hill conditions to be followed up by intensive extension service. This could in the form of agricultural co-operatives and stress on cash crops with proper marketing facilities.

Though schemes like DRDA, SFDA and later IRDP³ programmes have been initiated in these villages since 1970 very few farmers

1. DRDA - District Rural Development Agency

2. SFDA - Small Farmers' Development Agency

3. IRDP - Integrated Rural Development Programme

have taken advantage of these schemes for cultivation purpose. Whatever few cases (54 in number) have been reported in these villages the loans were taken for growing ginger, squash and potato and none for any food crop. Absence of use of high yielding variety of seeds for paddy is noteworthy. It is not that the farmers are ignorant of these programmes, most of them being literate and knowledgeable, but they do not consider it worthwhile to go through the process of bureaucratic machinery and visit the block office repeatedly for an uneconomic cause. That is why to increase the family income they have gone more for cattle, goat or pig loan from the Banks and Co-operative Societies than for agricultural loans. Under the prevailing circumstances that has been perhaps a wiser choice though the presence of a large number of cattle, in the long run, will affect the ecology of the area.

Use of new agricultural technology and inputs like chemical fertilizer though restricted to the growing of cash crops like potato and also ginger and squash to some extent, go to prove that the farmers are not ignorant of them, but have used them only wherever they found their use economically profitable. This again goes to show their wisdom in selecting such alternatives which would prove more beneficial and attuned to the environment and reject the others which would not give them any significant relief. Success of rural development programmes to a large measure depends upon promoting the choice of alternatives expressed by the recipient group.

While concluding this paper we would like to mention that special agricultural modernization plan suited to the felt needs of the people and the ecology of the region should have been adopted in all these years. In such a plan irrigation for the dry lands must take a prominent place. This will help diversification of the cropping pattern. New crops, especially suited to the middle altitude villages, need to be introduced. The seed farms should be entrusted with the responsibility

of experimenting with and developing new crops. There is also scope for developing further the present cash crops, potato, ginger, squash and orange. Economic return from cash crops seems to be much more than investment in food crops. People are quite aware of this fact. What they need is the proper encouragement and regular extension service. In substance what we are suggesting is a micro-region comprehensive planning and its proper execution for the region.

But even with scientific management of agriculture and substantial increase in production we feel that agriculture alone cannot solve the economic problems of the region. Limitation of land and the nature of the terrain cannot possibly cope with increasing population pressure and unemployment. It is therefore necessary to expand the employment base by setting up small scale industries, encouraging such schemes as could provide self employment, such as piggery, poultry-farming and bee-keeping on a co-operative basis. Floriculture has also considerable scope in this region. However a full discussion of this strategy of development is beyond the scope of this paper. But whatever schemes are adopted must be suited to the needs and economic capability of small and marginal farmers.

ACKNOWLEDGMENTS

The original research scheme "Study of the Socio-economic Condition of the Hill Villages of the Darjeeling District" was conducted jointly by Prof. N.C. Choudhury and Prof. S.K. Chaube, ex-Director of the Centre for Himalayan Studies. The team of Research Assistants include Shri Khemraj Sarma, Shri Thaneswar Bir, Shri Alok Biswas and Shri Kanchan Sarker. Shri Sarma and Shri Bir have since left the team. We acknowledge with thanks the help received from Shri Sarma, Shri Bir and Shri Biswas of the team in the collection and compilation of the data. However we are only responsible for the views expressed in the paper.