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Existing livestock production and socioeconomic condition in selected hilly areas of Bangladesh

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Abstract

This survey was carried out to know the existing livestock farming system along with socioeconomic conditions in livestock communities in two different selected hilly areas under Bandarban and Cox's Bazar District. Data were collected based on the farmer's personal information, livestock and poultry production system, problems and prospects of livestock production and socio-economic status of commodity through a pre-structured questionnaire. There was no significant ($P>0.05$) different in family size, age of the farmers but have significant ($P<0.05$) different in illiteracy and occupation in study areas. According to the land distribution pattern, land size and land ownership was not significantly ($P>0.05$) differed but cultivable and fellow land was significantly ($P<0.05$) differed in selected areas. The majority of the farmers have indigenous (native) type livestock whereas cattle population was significantly ($P<0.05$) higher in Tulatuli (plain area) than in Adarshogram (hilly area). Most of the farmers (79.71%) had separate housing facilities for their livestock species and they sold their livestock and poultry species in their local market. About 85.90% of farmers depended on natural sources as feed and only 14.10% purchased feed for their animals. About 71.50% of farmers faced animal feed crisis during the summer season. Most of the farmers (89.45%) depended on natural mating for breeding purposes and only 10.55% practiced artificial insemination. Majority of the farmers faced warm infestation in cattle (73%), PPR disease in goats (15.50%) and ND in poultry (56.50%). Most of the farmers (87%) disposed of their dead birds/animals in the pit. The average non-farm income (Tk.136929.44) was higher than farm income (Tk.50632.15) and average gross income per farmer per year was higher (Tk. 204739.37) in Tulatuli than Adarshogram (Tk.170383.74). The skill-ness about animal and poultry rearing, concentrate feed availability, vaccination facility and lack of pasture land had the main problems of the farmers in selected areas. Most of the farmers are interested in rearing cattle farming, followed by poultry, sheep, goats and pigeons farming. It may be concluded that raising awareness, providing vaccination, making sustainable technology available, providing technical support for current stock to increase livestock production, and enhancing the livelihoods of local hill peoples.

Key words: Baseline survey, live farming system, socioeconomic condition, hilly areas, Bangladesh

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Introduction

The range of viable livelihoods in rural areas is generally declining, with this trend being especially pronounced in environmentally vulnerable places like drought-prone desert regions, hilly terrain, and other less developed/backward areas. The territory of the Hill Tracts is primarily inhabited by various tribal people.

The majority of the tribal people have a primitive lifestyle and inhabit hilly forests. They engage in traditional agriculture, which mostly consists of an integrated farming system that includes crop production under shifting cultivation along with domestic gardens, livestock, horticulture, and forest trees (Alam, 1993). Livestock sector plays an integral part of agricultural economy of Bangladesh performing multidimensional functions such as provision of food, nutrition, income, savings, draft power, manure, transport, social and cultural functions (Tareque and Chowdhury, 2010). The hilly region possess slightly different type of genetic resources of livestock and poultry rather than the common indigenous. The hilly goats are available at hilly districts and they are small size goats and known to be famous for its high adaptability, fertility, prolificacy (Talukder *et al.*, 2016). The Hill Tracts area is also home to naked neck and hilly chickens, which are raised for local consumption. Rural farmers like the distinct flavor of their eggs and meat (Rahman *et al.*, 2013). The Government gives priority to increasing milk, meat and egg production from the available genetic resources of livestock through better management, feeding animal health and genetics. Hilly topography is relatively low population density, and availability of large forest and grazing areas with adequate production of

natural bio-mass forages, grasses, weeds and legumes, there exists a prospect for improving livestock and poultry production in this region. However there is no documentation about livestock and poultry population and the farming system condition in that areas. Increasing livestock and poultry production of these region awareness buildup of the farmers and developed technologies and packages should be implemented. Livestock research has been compartmentalized based on little knowledge of the farming systems, mostly unrelated to the smallholder animal production and health problems and of little recognition to the involvement of farmers. Location specific problems in livestock production have not been well defined and solutions have not been tested at farm level. Before starting the farming system research activities, a base line survey was carried out to understand existing livestock and poultry production system, socioeconomic and agro-climatic situation. In this regard, the study was under taken to know the existing livestock farming system along with socioeconomic condition on livestock community.

Materials and Methods

Study area:

Selection of the study area is an important step and largely depends upon objectives or purpose of the study. The selected areas and farmers were considered on the basis of their traditional crop production combined with livestock and small-scale poultry production system. Two villages namely Adarshogram of Naikhongchari Upazilla under Bandarban district and Tulatuli of Ramu Upazilla under Cox's Bazar district were selected for this study.

Data collection: The study accounting data of 100 household were collected from each village for base line survey of "Livelihood improvement of rural farmers through suitable livestock and poultry technology dissemination in selected hilly areas of Bangladesh" research project by using the Random Sampling Technique method during September, 2015 to February, 2016. At first, a list of all farms from the two represented villages was prepared and then 50 farmers of the village were selected using random sampling technique. Data was gathered through face-to-face interviewing considering every family head with a fill up a pre-structured questionnaires on farmer's knowledge regarding livestock and poultry rearing and their socioeconomic condition. The following information's that was taken during baseline survey;

- Farmers personal information Asset and Cultivation patterns
- Population and Production of livestock and poultry
- Rearing system of livestock and poultry
- Feed and feeding of livestock and poultry
- Disease & health Management
- Marketing System
- Socio-Economic status of commodity
- Problems and Prospects of Livestock Production

Processing and analysis of Data:

After collection of data, each interview schedule was verified for the sake of consistency and completeness. Editing was done before putting the data in the computer. Summarization, careful scrutiny and necessary summary tables have been made from the data. For analyzing the data, descriptive statistics such as sum, average and percentages were used to achieve the objectives and to get the meaningful results.

The t-statistics was applied to test the significance of relevant parameters in between two surveyed areas.

Result and Discussion

Farmer's personal information

Family size

The results of survey showed that the average family size was found higher in Adarshogram (6.23) and lower in Tulatuli (5.21) villages. According to HIES, (2016), the national average of Bangladesh was 4.06 which was higher than the present findings (Table 1).

Age

The ages of the households in the two farmer's areas were not significantly ($P>0.05$) differed. Table 1 showed that most of farmers were of middle (46%) aged (35-50) followed by young and old. According to Mundi, (2019), the age structure (25-54 years) of the population of Bangladesh was 40.07 % which was slightly lower than the present findings.

Education

The average percentage of illiterate farmers differed significantly ($P>0.05$) between Adarshogram (52.48%) and Tulatuli (41.41%) villages. According to the Bangladesh Bureau of Statistics (BBS, 2017), the literate and illiterate people of Bangladesh were 72.3 and 27.7%, respectively, which was higher than the present findings because of remote area and less communication facility.

Occupation

About 48.0% and 32.0% farmers working in different agricultural fields which was found in main occupation in Adarshogram and

Table 1. Farmer's personal information of the study areas

Parameters	Location		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
Personal Information (%)					
Family size (no./f)	6.23±0.26	5.21±0.27	5.72	0.31	NS
Age (Year)					
Young <30	35±5.72	38±3.81	36.5	0.61	NS
Middle 31-50	49±9.01	43±2.17	46.0	0.31	NS
Old >50	16±2.11	19±6.03	17.5	0.81	NS
Education (%)					
Illiterate	52.48±4.01	41.41±5.99	46.94	0.03	*
Up to Primary	29.70±6.02	32.32±5.09	31.01	0.71	NS
Up to SSC	11.88±1.99	15.15±2.01	13.515	0.31	NS
Up to HSC	5.94±0.90	11.12±1.11	8.53	0.26	NS
Occupation (%)					
Daily Labor	11.50±1.22	8.50±1.09	10.0	0.65	NS
Agri. worker	48.00±2.32	32.00±2.00	40.0	0.04	*
Farming	12.70±2.44	7.30±1.99	10.0	0.91	NS
Driver	17.58±1.31	22.42±1.34	20.0	0.85	NS
Business man	18.64±2.03	21.36±1.78	20.0	0.77	NS

* Significant at 5% level ($P < 0.05$), NS= Non significant ($P < 0.05$)

Tulatuli village, respectively (Table 1) and it were differed significantly ($P < 0.05$). According to Bangladesh Bureau of Statistics (BBS, 2010), the main income source of the population of Bangladesh was self-employed (agri.) 25.5%, self-employed (non-agri.) 18.9%, service 14.9%, day labour (agri.) 21.0%, day labour (Non-agri.) 15.5% and others 4.2% which was not consistent to the findings because of less industrial and remote areas.

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Land Distribution Pattern

Average land size was higher in Tulatuli (170.35dcm) than Adarshogram (125.00 dcm) whereas 100.75dcm and 113.09dcm were their ownership (Table 2). There was little variation between the two locations, with dwelling structures and homestead gardens occupying around 17.15% and 16.50%, respectively. Zannat, (2016)

Table 2. Land distribution Pattern of farmers in selected areas

Parameter	Location		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
Land size (dcm./f)	125.00±15.23	170.35±14.72	147.67	0.53	NS
Ownership (dcm/f)	113.09±6.09	100.75±7.01	106.92	0.52	NS
Borga land(dcm/f)	12.00±0.51	69.60±0.52	40.8	0.01	**
Homestead %	17.80±1.34	16.50±1.51	17.15	0.80	NS
Cultivable land%	22.10±5.81	48.80±6.01	35.45	0.04	*
Pond%	0.48±0.31	2.53±0.41	1.505	1.23	NS
Livestock farm%	0.07±0.22	0.06±0.22	0.065	0.74	NS
Fellow%	59.60±4.75	32.10±5.04	45.85	0.02	*

** Significant at 1% level (P<0.01), * Significant at 5% level (P<0.05), NS= Non significant (P<0.05)

reported that in Khulna City, the land use structure consisted of 46% residential, 18% agriculture, 15% industrial, and 5% commercial which was not similar to the findings because of less population of these areas and required less residential area. The cultivable land and fellow land was differed significantly (P<0.05) but the quantity of borga land of the farmers was highly significant (P<0.01) differed among the locations because farmers of hilly areas did not utilized of land where in this plain areas farmers are mostly involved in agriculture. Mondal (2008) reported that the following land uses were found to be more or less prevalent in Madertala village, Dumuria upazilla, Khulna district: settlement 9.33%, crop agriculture 21.83%, water body 10%, fisheries 5.21%, agri-fisheries 46.26%, road 4.27%, commercial 1.56%, and institutional 1.55%. The use of land for livestock farm was only 0.07% and 0.06% of the two locations, respectively (Table 2).

Existing Livestock and poultry population

There are extremely few different livestock species in each farm household. Table 3 showed that the distribution pattern of the the total livestock population was 6.30%, 1.31%, 4.74%, 87.53% and 12.00%, 0.01%, 4.64%, 83.26% for cattle, sheep, goat and poultry in Adarshogram and Tulatuli village, respectively. Whereas most of them were found in indigenous type. The cattle population was higher in Tulatuli (plain area) than in Adarshogram (hilly area) and it was differed significantly (P<0.05) among the locations. According to Agricultural Census 1996, about 76% of rural household had poultry, 39% had duck, 46% had cattle and 31% had goats in Bangladesh which was more or less similar to the present findings.

Rearing and marketing system of Livestock and poultry

Result showed that 79% and 80.43% of

Table 3. Existing Livestock and poultry population in selected areas

Parameters	Location		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
Existing Livestock and Poultry Population (%)					
Cattle	6.30±0.36	12.00±0.32	9.15	0.05	*
Sheep	1.31±0.05	0.01±0.07	0.66	0.65	NS
Goat	4.74±0.57	4.64±0.49	4.59	1.01	NS
Poultry	87.53±0.31	83.26±0.29	85.40	0.52	NS

* Significant at 5% level (P<0.05), NS= Non significant (P>0.05)

Table 4. Livestock and Poultry rearing system in selected areas

Parameters	Location		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
Housing (%)					
Living house	21.00±1.21	19.57±1.31	20.28	0.56	NS
Separate house	79.00±0.31	80.43±0.29	79.71	0.81	NS
Livestock rearing (%)					
Tethering	49.00±1.22	55.23±1.15	52.11	1.02	NS
Extensive	46.65±1.04	29.34±1.03	37.99	0.01	*
Semi-extensive	4.35±0.25	15.43±0.25	9.89	0.50	NS
Marketing (%)					
Local market	54.00±1.45	62.00±1.41	58	0.61	NS
Padler	50.00±0.29	58.00±0.31	54	0.73	NS

* Significant at 5% level (P<0.05), NS= Non significant (P>0.05)

farmer had separate housing facilities for their livestock species in two villages respectively (Table). It was revealed that rearing system of livestock were found 49.00%, 46.65%, 4.35% and 55.23%, 29.34%, 15.43% for tethering system, extensive, semi-extensive in Adarshogram and Tulatuli villages, respectively, and there was significantly (P>0.05) differ of extensive rearing system among the locations. About 54% in Adarshogram and 62% in Tulatuli of the farmers sold their

livestock and poultry species in their local market (Table 4).

Feeds and Feeding practice for animals/birds in selected areas

Farmers used different types of feeds for their livestock. Poultry farmers used a wide variety of supplementary feed for their poultry species mainly boiled rice and rice polish, some of fed broken rice. Cattle and goat farmers fed their animals rice straw, rice polish and wheat bran as feed ingredients

Table 5. Feed and feeding practice for animals/birds in selected areas

Parameters (%)	Location		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
Feed source					
Natural source	82.66± 5.05	89.04±4.99	85.90	0.61	NS
Purchase	17.14±1.14	10.96±2.01	14.10	0.54	NS
Feed scarcity season					
Summer	76.00±4.03	67.00±5.02	71.50	0.82	NS
Rainy	15.00±2.04	23.00±2.04	19.00	0.50	NS
Winter	9.00±0.66	10.00±0.56	9.50	0.60	NS

* Significant at 5% level ($P < 0.05$), NS= Non significant ($P > 0.05$)

with green grasses. Feed and feeding practices of two locations were not differed significantly where the most of the hilly community farmers (85.90%) were depended on natural source as feed to their animals and average of 14.10% used purchased feed for their animals (Table). About 71.50% farmers faced feed crisis in summer season due to drying condition followed by 19% in rainy and 9.50% winter seasons (Table 5).

Productive and reproductive performance of the livestock and poultry

The productive and reproductive traits were shown in Table 6. The production availability of existing livestock and poultry at farm households were very poor because most of the animals were indigenous with poor genetic make-up. There was no significant ($P > 0.05$) different of birth weight, adult body weight and milk production of cattle of the selected areas (Table 6). Result also showed that adult body weight of sheep and goat have no significant ($P > 0.05$) different. There was no significant ($P > 0.05$) different of chicken egg

production of two villages. Overall 10.55% farmers practiced artificial insemination and 89.45% farmers depended on natural mating for their cattle breeding purpose of two villages. Irrespective of the average first mating was observed in 31.42 months of cow and 33.00% showed repeat heat which was unexpected to the farmers and have significant ($P > 0.05$) different of two villages. There was no significant ($P > 0.05$) different of calf/kid care after calving of the selected villages (Table 6).

Disease and Health Management

Distinct categories of diseases have been observed at both sites (Table 7).

In the villages of Adarshogram and Tulatuli, between 13% and 24% of the cattle had FMD, while 72% and 74% of the livestock had warm infected (Table 7). On the other hand, the two main conditions affecting goat productivity and health, which was 15.5%, were PPR and pneumonia. Newcastle disease (ND) is the most common and widespread disease that causes a large loss of chicken in the examined locations. It is

Table 6. Productive and Reproductive performance of animals in selected area

Parameters	Location		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
Production					
Birth wt. (Kg/calf)	11.00 ±0.65	12.00±0.54	11.00	0.88	NS
Adult Body wt. (Kg/cattle)	95.00±0.60	110.00±0.49	102.50	0.67	NS
Milk Prod. (L/d)	1.50±0.31	1.80±0.34	1.65	0.74	NS
Adult Sheep Body wt. (Kg)	26.00±1.12	25.00±1.00	25.50	0.91	NS
Adult Goat Body wt. (Kg)	23.00±0.54	22.00±0.47	22.50	0.60	NS
Chicken Egg Production (No./year)	85.00±0.77	83.00±0.82	84.00	0.84	NS
Breeding					
Natural mating (Cattle)	93.70±4.06	85.20±4.00	89.45	0.57	NS
AI (Cattle)	6.25±1.45	14.86±1.10	10.55	0.05	*
Age of first mating (months)	32.65± 2.11	30.19±2.03	31.42	0.63	NS
Repeat heat show (%)	26.00±0.04	40.00±0.01	33.00	0.05	*
Calf/kid care after calving (%)					
Mucous cleaning	54.46±0.26	77.78±0.26	66.12	0.55	NS
Navel cleaning	52.46±1.47	75.46±1.62	63.96	0.71	NS
Antiseptic use after navel cutting	53.47±0.95	71.23±1.06	62.35	0.58	NS
Fed colostrum	53.47±3.02	70.12±2.90	61.79	0.62	NS
Bedding materials use	34.65±1.01	36.36±0-88	35.50	0.92	NS

* Significant at 5% level (P<0.05), NS= Non significant (P>0.05)

followed by pox and coccidiosis, which also significantly differ (P<0.05), with ND affecting 42.42% and 71.28% of chickens in Adarshogram and Tulatuli villages, main respectively. In Adarshogram and Tulatuli villages, approximately 21.78%, 12.87% and 49.49%, and 41.41% of farmers provided anti-helminthes and vaccines for their livestock and birds, respectively. About 52% and 51% of farmers kept their animals in separate houses during sickness

and the rest of them kept in together. About 60.0% and 74.0% clean ing house regularly. Result also showed that 76% and 82% mortality occurred in the two locations at the age of calf/kids and most of the birds/animals were affected by several diseases during rainy season which was 60% and 58% of the two villages, respectively. Most of the farmers disposal their animals/birds after death to pit and the percentage was 82 and 92 (Table 7).

Table 7. Disease pattern of Livestock and Poultry in selected area

Parameters	Location		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
Disease patterns (%)					
FMD for cattle	13.00± 2.42	24.00± 1.12	18.50	0.62	NS
Worm infestation	72.00± 0.27	74.00± 0.29	73.00	0.50	NS
PPR for goat	14.00± 0.78	17.00± 0.81	15.50	0.79	NS
ND for poultry	42.42± 0.03	71.28± 0.05	56.85	0.05	*
Preventive Measure (%)					
Deworming	23.00± 0.76	13.00± 0.76	18.00	0.87	NS
Vaccine	50.00± 0.07	41.00± 0.27	45.50	1.01	NS
Keeping in Separate room during sick	52.00± 2.48	51.00± 2.40	51.50	0.25	NS
Keeping in Together during sick	46.00± 0.21	49.00± 0.27	47.50	0.52	NS
Cleaning house	60.00± 2.22	74.00± 2.32	57.00	0.58	NS
Affected age (%)					
Kid/Calf	76.00±0.20	82.00±0.27	79.00	0.60	NS
Growing	9.00±0.28	5.00±0.37	7.00	0.09	NS
Adult	15.00±0.66	13.00±0.72	14.00	0.86	NS
Affected season (%)					
Summer	14.00±1.13	18.00±1.43	13.00	0.63	NS
Rainy	60.00±1.41	58.00±1.70	59.00	0.88	NS
Winter	26.00±1.12	24.00±1.32	28.00	1.22	NS
Dead animal disposal (%)					
To pit	82.00±0.20	92.00±0.25	87.00	0.59	NS
Throw in the field	10.00±0.56	8.00±0.58	9.00	0.66	NS
Consumption	8.00±0.17	-	4.00	-	-

* Significant at 5% level (P<0.05), NS= Non significant (P>0.05)

Table 8. Average family income and expenditure of the farmers

Particulars	Study area		Average	P-value	Sig. level
	Adarshogram	Tulatuli			
a) Income Source					
Crop (Tk/yr)	17662.37	50565.66	34114.02	.002	*
Fishery (Tk/yr)	-	959.59	-	-	
Livestock (Tk/yr)	11735.24	20341.41	16038.33	.268	NS
Service (Tk/yr)	45782.17	38488.88	42135.53	.671	NS
Business(Tk/yr)	28304.95	33535.35	30920.15	.260	NS
Labor sale(Tk/yr)	52285.14	37000.00	44642.57	.527	NS
Rickshaw/van pulling (Tk/yr)	14613.86	23848.48	19231.17	.706	NS
Farm income (Tk/yr)	29397.62	71866.66	50632.15	.003	*
Non-farm income (Tk/yr)	140986.14	132872.73	136929.44	.704	NS
Gross income (Tk/yr)	170383.74	204739.37	187561.56	.136	NS
b) Expenditure (Tk/yr)					
Family expenses (Tk/yr)	131819.80	170259.29	150847.35	.006	*
Livestock rearing expenses (Tk/yr)	15148.67	18707.42	16356.38	.359	NS
Total expenditure (Tk/yr)	146518.51	186818.89	166467.70	.007	*
c) Net Income (Tk/yr)	23865.23	17919.47	20892.35	-	
d) BCR	1.16	1.10	1.13	-	

Source of income and expenditure of the farmers

Table 8 revealed that the household income sources had variation for all selected farmers. Farm and non-farm were the two main categories of income sources of the farmers. The study area's farmers engaged in rickshaw pulling, minor trading, cattle, agriculture, fishing, and pretty business. Average crop farming (Tk.34114.02) and labor selling (Tk.44642.57) contributed the most to their farm income and non-farm

income, respectively (Table 8). The findings indicated that in both research areas, non-farm income (Tk.136929.44) exceeded farm income (Tk.50632.15). Tulatuli had a greater average annual gross income per farmer (Tk. 204739.37) than Adarshogram (Tk. 170383.74), but the net income was in opposite direction. Adarshogram has a higher Benefit Cost Ratio (BCR) of 1.16 compared to Tulatuli village's 1.10 (Table 8).

Table 9. Respondents response on livestock development at study areas

Parameters	Location		P-value	Sig. level
	Adarshogram	Tulatuli		
Problems (%)				
Skill-ness of rearing	19.61±1.13	45.65±1.48	0.01	**
Feed (concentrate) availability	73.71	13.53	0.03	*
Vaccination	13.73±2.30	27.54±1.30	0.05	*
Pasture land	52.94±1.46	26.81±1.12	0.05	*
Needs (%)				
Training	43.00±0.26	47.71±0.29	0.50	NS
Vaccination	41.00±1.02	34.64±1.05	0.77	NS
Technical support	8.00±0.65	16.99±0.76	0.57	NS
Training and Vaccination	31.00±0.82	2.5 ±0.36	0.21	NS
Interest to farming (%)				
Cattle	40.57±0.59	29.25±0.62	0.88	NS
Goat	3.69±0.05	25.16±0.05	0.01	**
Sheep	13.93±1.00	11.01±1.01	0.54	NS
Poultry	40.57±1.01	28.93±1.13	0.05	*
Pigeon	1.23±1.12	5.66±1.42	0.05	*

** Significant at 1% level (P<0.01), * Significant at 5% level (P<0.05), NS= Non significant (P>0.05)

Respondents Response of problems of livestock and poultry rearing

Poor genetic makeup, a high frequency of diseases, and insufficient feed and fodder all contributed to the extremely low output performance of livestock species. Table 9 showed that only 19.61% and 45.65% have the skill-ness about animal and poultry rearing and there was significant (P<0.05) differ of the two villages (Table). About 73.71% and 13.53% farmers faced problem about concentrate feed availability for their

animal in Adarshogram and Tulatuli villages, respectively and there was significantly (P<0.05) differ. Animal pasture land was higher in Adarshogram (52.94%) and lower in Tulatuli (26.81%) village and have a significant (P<0.05) different. About 31% and 2.5% farmers got both training and vaccination support about livestock and poultry rearing in Adarshogram and Tulatuli villages, respectively. Most of the farmers of two villages interested in rearing cattle (40.57%

and 29.25%) followed by poultry, sheep, goat and pigeon, respectively. There was significantly ($P < 0.05$) difference of interest of goat, poultry and pigeon farming between two villages, respectively (Table 9)

Opportunities and Targets

During the Focus Group discussion (FGD), farmers identified some obstacles to increasing the productivity of livestock as well as the socioeconomic condition of the village such as low productivity of animals; absence of modern technology intervention; absence of the controlling system of disease outbreak and lack of awareness of the farmers about livestock and poultry production. To establish a few goals in specific areas, such as raising awareness, creating a disease-control village for livestock and poultry using a strategic disease control model, making sustainable technologies available, providing technical support for the current stock, and introducing high animal productivity to ensure increased livestock production and improved livelihoods for the community of hilly peoples.

Conclusion

From the study areas, it was found that most of the community farmers were middle aged and illiterate in hilly areas. The majority of the farmers reared poultry and most of them had *deshi* (native) types of livestock species. External parasites (worm), FMD, PPR and ND were the major disease affected animals and poultry in those areas. Farm and non-farm were the two main categories of income sources of the farmers in both areas. Skill-ness about livestock rearing, concentrate feed availability, vaccination facilities, and lack of pasture land were the

main problems of the farmers for livestock and poultry rearing in selected two villages. It may be concluded that raising awareness, providing vaccination, making sustainable technology available, providing technical support for current stock to increase livestock production, and enhancing the livelihoods of local hill peoples.

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