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Economic Analysis of Diversified Farming on Tribal Farms in Himachal Pradesh

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ABSTRACT The data collected through two-stage stratified random sampling design from Bharmaur tehsil of Chamba district (H.P.) reveals the existence of diversified farming on tribal farms. In addition to growing traditional cereals, off-season vegetables and milch animals, the *Gaddi* tribals were further found to diversify their enterprises-mix by rearing sheep and goats. These small ruminants together accounted for nearly 52 per cent of the total farm income of *Gaddi* farms. The *Gaddi* are semi-nomadic and semi-pastoral tribe who constantly move, with their flocks of sheep and goats, in an annual circle from winter pastures in plains to the alpine lush green pastures in the summer. The impact of sheep and goat farming on the ecology and environment of the state has been a quite controversial issue with one school of thought advocating the environmental degradation whereas the other school negates it and favours the socio-economic gains associated with sheep and goat rearing. However, in the wake of various obstacles, problems and complications associated with sheep and goat farming, the *Gaddi* shepherds are despirited, depressed, frustrated and dejected. They are carrrying out their profession in a half-hearted manner. The study brought out the fact that state Government should come forward to tackle the day by day extinction of this profession of shepherding as it would create heavy imbalances in the economy of the tribal households in particular and the state in general.

The diversification of farm enterprises is one of the main characteristics of the tribal agriculture of Himachal Pradesh. The crop cultivation in the tribal areas is subject to a high degree of risk and uncertainty because of highly unpredictable weather conditions. It, therefore, provides only seasonal, irregular and uncertain income to the farmers. With a view to minimise the risk and uncertainties of income from crop enterprises and reducing the time lag between input-costs and returns, it is essential that farmers incorporate such enterprises in their production programme which yield regular and evenly distributed income throughout the year. Also, in view of the growing pressure of population and the limited scope of increasing addtional income through crop production beyond a certain point, diversification is considered essential for liberating tribals from the clutches of poverty.

Of the various tribes inhabiting Himachal Pradesh, the *Gaddi* are perhaps the most appropriate example of diversified farming. The *Gaddi* are semi-nomadic, semi-agricultural and semi-pastoral tribe. Small, scattered and skewed holdings have compelled them to diversify their enterprises through rearing sheep and goats, raising milch aniamals and growing fruits and off-season vegetables.

The present paper examines the economics of diversified farming with the following objectives:

1. To estimate the net returns from principal crops vis-a-vis sheep and goat farming,
2. to examine the share of different components of farm income, and
3. to study the ecological and environmental aspects of sheep and goat rearing.

METHODOLOGY

The study is confined to Bharmaur tehsil of

Chamba district, Himachal Pradesh (H.P.)—a native place of *Gaddi*. A two-stage stratified random sampling design was adopted for the selection of the sample. The farmers were stratified into two categories, *viz.*, small and large on the basis of land holding. The number of farmers in each category, average size of holding, number of sheep, goats and milch animals are given in Table 1.

Table 1: Sample size for the study from Bharmaur Tehsil Chamba District, H.P.

Category	Average				
	No. of Farms	*Size of holding (ha)*	*No. of sheep*	*No. of goats*	*No. of Milch animals*
Small	43	0.78	38	25	1.23
Large	29	1.41	87	52	2.53
All farms	72	1.03	58	36	1.75

To achieve the first objective different cost components like Cost A_1, Cost B and Cost C were used. The net returns were calculated by subtracting different costs from gross returns. To examine the share of different components of farm income, tabular analysis was followed and percentages were worked out. The data pertain to the year 1987-88.

RESULTS AND DISCUSSION

a) Net Returns from Crops, Sheep and Goats

The net returns from principal crops, sheep and goats were estimated over Cost A_1, B and Cost C and have been presented in Table 2. A perusal of the table reveals that on an average kidney beans is the most important crop, yielding net returns of Rs. 1320 per ha. The potato, where the net returns per ha, is Rs.1107 is the next important crop. The net returns from wheat and barley are worked out to be Rs. 997 and 920, per ha, respectively. The maize crop yields only Rs. 794 per ha, which is lowest among all the crops.

A comparative analysis of the net returns on small and large farms shows that the net returns over Cost C decrease with the increase in the size of farm.

The net returns from sheep and goats are estimated on per hundred basis. The table further transpires that net returns over Cost C from sheep and goats also decrease with the increase in the size of farm. On all farms, the net returns from sheep and goats are found to be Rs. 1377 and Rs. 1887 (per hundred) respectively.

It can be seen from the table that net returns are higher in case of goats as compared to sheep and other crops.

b) Different Components of Farm Income

The various components of farm income on tribal farms are presented in Table 3. It can be noted from the table that in addition to crops; sheep, goats, milch animals, fruits and off-season vegetables contribute towards farm income. The table shows that on an average crops account for nearly 31 per cent of the total farm income. Sheep and goats together contribute about 52 per cent of the total farm income. However, the per cent contribution of sheep is higher (28.10) than the goats (24.32). The milch animals account for 11.39 per cent of the total farm income whereas fruits and off-season vegetables contribute 5.40 per cent of the total farm income.

An analysis of the table with respect to farm size reveals that the proportionate contribution of crops to the total farm income is more on small farms (31.82 %) as compared to large farms (29.86 %). On large farms, the contribution of sheep and goats is to the extent of about 55 per cent. It is followed by small farms which account for nearly 49 per cent of the total farm income.

It can be inferred from the foregoing discussion that tribal farmers have attempted to diver-

Table 2: Net returns from crops, sheep and goats (Rs. / hectare)

Crops	Small Net Returns Over			Large Net Returns Over			All Farms Net Returns Over		
	Cost A_1	Cost B	Cost C	Cost A_1	Cost B	Cost C	Cost A_1	Cost B	Cost C
Wheat	1962	1941	1028	1878	1859	953	1928	1908	997
Barley	1847	1798	916	1799	1752	926	1827	1779	920
Maize	1966	1931	772	1972	1929	828	1968	1930	794
Potato	3952	3770	1121	3751	3576	1087	3871	3692	1107
Rajmash[1]	3121	3001	1315	3139	2959	1327	3128	2924	1320
Sheep*	5036	4906	1478	4843	4807	1227	4959	4920	1377
Goats**	6213	6031	1979	6076	5880	1751	6158	5970	1887

1. Kidney beans
*Rs. per hundred sheep.
**Rs. per hundred goats.

sify their enterprises-mix through raising crops, milch animals, rearing sheep and goats and by growing fruits and off-season vegetables on their farms. This has certainly helped them to have continuous and regular flow of income throughout the year.

c) *Ecological and Environmental Aspects of Sheep and Goat Rearing*

The impact of sheep and goat rearing on the ecology and environment has been a controversial issue in recent years. In general there is a mixed response in this regard. One school advocates the possibility of environmental degradation in terms of soil erosion, deforestation and pasture land degradation whereas another school of thought negates such possibilities and favours the economic aspect of sheep and goats rearing. Recently the ecologists have specifically said that sheep and goat rearing is the main factor responsible for destruction of ecology in the hill state of Himachal Pradesh.

The sheep and goats are both graziers and browsers, depending upon the type of forage available to them. The goats graze grasses and legumes from zero to eighty per cent. Basically they are browsers and thrive well in areas rich in bush plants. Sheep and goats are considered the voracious consumers of ground herbs and shrubs and for that reason sheep and goat rearing is branded as the root cause of land degradation.

Table 3: Components of farm income (In per cent)

Particulars	Size of Farm		All Farms
	Small	Large	
Crops	31.82	29.86	30.79
Sheep	26.30	29.72	28.10
Goats	23.16	25.38	24.32
Dairy*	12.54	10.36	11.39
Fruits and Off-season vegetables	6.18	4.68	5.40
Total Income (Rs.)	2137 (100.00)	3590 (100.00)	2722 (100.00)

* Milch animals

Sheep and goats as reducers, are considered to lead to a depletion of bio-mass, degradation of soil, destruction of economic plants, degradation of pastures and grasslands and reduction in natural streams, whereas as producers these small ruminants lead to natural fertilization of pastures through their droppings; destruction of harmful weeds, utilization of unproductive and inaccessible mountain pastures and economic gains by providing regular flow of income and employment throughout the year.

The study regarding bio-mass consumption of

livestock in Himachal Pradesh stated that sheep and goats consumed only 5.52 and 6.70 per cent of the total bio-mass consumption in a year (1982). The majority was that of cattle and buffaloes which accounted for 55 and 31 per cent of the total bio-mass consumption. This suggests that there is a need to keep check on buffaloes and cattle, especially the unproductive animals and not the small ruminants.

It was further felt that the destructive habits of sheep and goats are mainly due to the defective system of management.No special provision is made for grazing or feeding of the sheep and goats. The animals are either to provide for themselves with whatever form of food that comes on their way or are fed with leaves often recklessly lopped from young growing trees. Both these factors have rendered many fertile land devoid of vegetation and affected seriously the life of forest trees.

The graziers belong to the higher hills of the state. They stay in their homes for a limited period only and migrate to other places with their flocks of sheep and goats in search of seasonal pastures, and for the greater part of the year, their flocks graze in areas outside their domestic land. They move in an annual circle from their winter pastures in plains of Punjab and foot hills of Himachal Pradesh to the alpine pastures of the state. The soil erosion is expected to be very low when the shepherds are in plains during winter with their flocks, the reason being that in plains, the runoff is quite low. During summer, when the migratory herders are there in alpine ranges alongwith their flocks of sheep and goats, these animals do cause soil erosion to some extent but at the same time help in checking the glaciers by consuming the grass enroute and there by providing rough surface to the glaciers. Secondly, those inaccessible pastures enjoy the benefit of natural fertilization through sheep and goats' droppings.

However, the Government of Himachal Pradesh has put restrictions on various pastures and grasslands and limitations have been imposed on the waste lands and grazing grounds and private small forests. Shamlat land is now the property of the Government which has extinguished the rights of right holders. Forest department has planted forests on grazing grounds and only the rocky land has been left out which does not provide anything for grazing. In addition, prohibiting areas for grazing, till the required height of trees is obtained has also worsened the situation. A *Gaddi* shepherd cannot adopt his traditional profession as a shepherd if he was not a permit holder in 1965. This has imposed unexpected restrictions on self-employment and thereby discouraging the shepherding in the hill state of Himalayan region.

Keeping all this in view, the Government should make modest endeavour to maximise the forage production within the available resources with suitable scientific techniques. The open forest area, where timber production is low, may be developed as fuel, fodder production system. The pastures and other grazing areas need to be improved by controlled grazing through rotational and deferred or intermittent grazing system with livestock grazed according to the carrying capacity.

The introduction of high yielding varieties of grasses and legumes should find priority in the grasslands.It would be desirable to make best use of wastelands particularly its uneconomic patches for developing these into potential grassland or silvipasture systems to provide grazing /.hay round the year.

The Government should make all possible efforts to encourage the shepherds not to leave this age-old ancestral profession of shepherding as the extinction of this would create so many imbalances in the economy of the households of the study area in particular and state of Himachal Pradesh in general.

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