



Disadvantaged nomadic tribes of Jammu and Kashmir in the frame of livelihood security through animal rearing

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ABSTRACT

This study was conducted to examine various disadvantages associated with livelihood of nomadic tribes and role of animal rearing in their upliftment in Jammu and Kashmir. It was found that majority of nomadic families belonged to very small flock size category and the number declined towards large flock size category. The results revealed that nomadic families took up one of the combinations of economic activities available to them, though animal domestication has been their dominant livelihood option. The estimates of linear function indicated land holding size, literacy, income from other sources and mortality as the significant determinants of livestock possession. The nomadic tribes experienced various kinds of disadvantages and among them mortality of animals was more severe and was observed maximum in large flock size category. The government spending under sub-tribal plans for the development of this section of society has received a setback in recent years. The findings of the study emphasized upon concerted efforts for redressal of the problems and sustainable upliftment of nomadic tribes.

Key words: Animal rearing, Disadvantaged, Economic backwardness, Herds, Social taboos

Migratory pastoralism is very common practice among nomadic communities in different parts of Himalayas. Pastoralists rely on natural resources over rangelands for their livelihoods. Social inequality, structural problems, poorer government policies and institutions drive the disadvantaged groups towards the multiple deprivations namely lack of assets, physical weakness, isolation, vulnerability and powerlessness (Chambers 1988) and among these, the smaller size class of livestock holders and women are the most sufferers (Rajasekha 2004). The incidence of poverty was reported higher among disadvantaged groups in rural areas (deHaan *et al.* 2003) and the people belonging to social groups (STs, SCs and OBCs) remain poorer and disadvantaged in terms of lower prices, lower wages compared to other households (Krishna *et al.* 2003). Poverty, inaccessibility to food, education, healthcare are the prime factors responsible for contributing to their disadvantages (Chubb and Moe 1990, Minakshi *et al.* 2000, Mehta and Shah 2001, Thorat and Mahamallik 2005, Mutakar 2005, Mehta 2006). In spite of the formulation of tribal sub-plan to ensure the flow of benefits

to the tribal population and those belonging to social castes, in physical and financial terms to place them in mainstream development process, yet these people continue to face multiple disadvantages compared to rest of Indian population. Many weaknesses are restricting them to participate in sharing the benefits from economic growth of the country (Biradar and Jayasheela 2007).

Jammu and Kashmir, located in the north Western corner of India, is mostly mountainous and occupies a central position in the Asian sub-continent. Out of the total mountainous area in India, nearly two-thirds (2.3 million ha) fall in Jammu and Kashmir. In Jammu and Kashmir, livestock sub-sector has been an important contributor to the state income. This activity is mostly taken up by nomadic tribes, viz. Gujjar and Bakarwals residing on upper hills of the state. Gujjar and Bakarwals are two major tribes in the state, which follow the year round migratory system of animal rearing. This section of the population is marginalized from development owing to their sufferings from unemployment, poverty, poor health and insufficient sanitation. Since animal husbandry is a dominant livelihood source of nomadic tribes, therefore, their upliftment depends more on development of this economic activity. Therefore, an attempt was made to investigate in to the livelihood of disadvantaged nomadic tribes in relationship with animal rearing in Jammu and Kashmir, and to come up with options of their development.

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MATERIALS AND METHODS

The present study concentrated on the nomadic tribes, viz. Gujjar and Bakarwals of the Jammu and Kashmir, who round the year carry their flocks for grazing from Rajouri and Poonch districts in Jammu division and travel to Ladakh division through migratory routes across the Kashmir valley. A total of 148 nomads rearing small ruminants were randomly selected and post-stratified based on flock size into four categories, viz. very small (<14 adult animals), small (14–<35 animals), medium (35–<56 animals) and large category (>56 animals). The primary data on different aspects of goat rearing were collected under UGC, Sponsored Rajiv Gandhi Chair in Contemporary Studies on Livelihood and Food Security, during 2012–13 and 2013–14, through personal interview method with the help of structured and pre-tested survey schedule.

To quantify the determinants of Livestock Possession the following regression equation was formulated and estimated.

$$LP = F(LHS, IFS, LIT, LDM, MFR, U)$$

where LP, livestock possession; LHS, land holding size (ha); IFS, income from other sources (₹); LIT, literacy (%); LDM, loss due to mortality (No.); MFR, male female ratio; U, error term.

A number of variables were attempted in the model on the basis of their expected impact on endogenous variables; however, only those variables that gave best fit to the estimates were specified in its final structural form.

Rank based quotient (RBQ) was calculated using the following formula (Sabarathnam and Vennila 1996):

$$RBQ = \sum_{i=1}^n \frac{F_i(n+1-i)}{N \times n} \times 100$$

where F_i , frequency of farmers for the i^{th} rank of constraints; N, total number of respondents; n, total no. of ranks; and I, rank.

RESULTS AND DISCUSSION

Socio-economic traits of nomadic tribes: Out of 148 families, 70, 43, 17 and 18 respectively belonged to very small, small, medium and large flock size categories (Table 1). The family size was higher in large category followed by medium and small. The sex ratio was favourable among large category nomads and the engagement of male family members would not significantly affect their animal rearing due to more females in the family. On an average, a flock size of 11, 31, 51 and 80 animals, was owned respectively by very small, small, medium and large flock size categories. The families possessed small holdings despite their nomadic behaviour. The literacy rate, land holdings and total assets exhibited direct relation with the flock size.

The small ruminant rearing is an important livelihood option for the nomads of Jammu and Kashmir, where majority of them earn their livelihood from goat/sheep rearing and partially from agricultural wages, which is

Table 1. Socio-economic characteristics of sampled households

Particular	Very small	Small	Medium	Large
Households (no.)	70	43	17	18
Average no. of animals	11.0	31.0	51.0	80.0
Age of farmers (yrs)	41.0	44.0	46.0	46.0
Farmer literacy (%)	11.4	11.7	18.6	33.3
Landholding size (ha.)	0.16	0.27	0.36	0.60
Average family size (no.)	4.0	4.69	4.88	5.22
Sex ratio	733	727	743	832
Total assets (₹ '000)	39.0	49.0	57.0	76.0

exclusively a part time activity being performed en-route while grazing animals during migration. Goat/sheep rearing is an activity of resource poor landless people and bakarwals (a socially backward class among the tribal's of the state). The nomads reared animals generally under extensive system of production. The rearers used to feed these animals on common property resources (CPRs), open access grazing resources, fallow lands etc., and in some cases were integrated with other components of farming system. The rearers also purchased green leaves and maize corn from other farmers. Seven production systems followed by rearers were identified (Table 2), of which maximum number of 73 households (49%) followed by 43 households (28.8%) performed goat + crop + sheep + cattle/horse rearing and goat + crop + cattle/horse rearing production systems respectively and only 1 household (0.67%) followed goat rearing only.

Table 2. Distribution of sample households as per existing production systems

Production system group	No of household(s)	Per cent
Goat rearing only	1	0.67
Goat + cattle/horse rearing	5	3.35
Goat + crop + cattle/horse rearing	43	28.8
Goat + crop cultivation	6	4.03
Goat + crop + sheep + cattle/horse rearing	73	49.0
Goat + crop + sheep rearing	9	6.1
Goat + sheep + cattle/horse rearing	12	8.1

Animal rearing (dominant livelihood option): The nomads, rearing small ruminants, have very limited sources of income which come primarily from animal rearing followed by other livestock. Animal rearing was the most contributing factor towards income generation and ranged between 60–90% from very small to large flock size category (Table 3). The income from this source depicted a positive relationship *vis-à-vis* the size of the flock. The other sources, contributing towards the income of the animal rearers were cattle, crops, casual labour, agricultural labour and other sources. All the sources of income except animal rearing demonstrated a negative relationship with respect to the size of the flock. The negative relationship could be explained by the fact that most of the labour under small to medium size categories was used for rearing animals only

Table 3. Category-wise income generation under various production systems (/annum/household)

Particular	Very small	Small	Medium	Large
Animal rearing	41768 (58.2)	61941 (67.2)	123337 (81.0)	139384 (84.7)
Agricultural labour	5636 (7.9)	5398 (5.9)	5212 (3.4)	4604 (2.8)
Casual labour	17436 (24.3)	15660 (17.0)	14323 (9.4)	9902 (6.0)
Crop	5380 (7.5)	7753 (8.4)	8120 (5.3)	9417 (5.7)
Others	1500 (2.1)	1393 (1.5)	1293 (0.8)	1279 (0.8)
Family's total net income	71720	92144	152285	164587

Figures within parentheses indicate percentage to total net income.

as 80–90% of the income came from it and the labour could not be spared for rest of the activities e.g. under crop production very small size flock holders enjoyed advantage on returns to scale compared to the large size which despite having more area for cultivating crops would not be interested to pursue the activity with any zeal owing to its low productivity compared to animal rearing. The income from other sources too was more under very small size category, indicating that the small livestock holders actively took part in other activities for income generation. The results therefore conclude that small size categories enjoyed comparative advantage against large size category of households due to higher labour productivity.

Determinants of the livestock possession: Regression analysis was carried out to look into the determinants of the livestock possession/flock size. Five parameters, viz. landholding, income from other source, literacy, male-

female ratio and loss due to mortality were considered important factors influencing the livestock possession/flock size (Table 4). Out of the five identified factors, only one (male female-ratio) demonstrated a negative influence with respect to the flock size; however, it was suggestive of a greater role of women in rearing of animals. The other factors showed positive relationship and were significant at 1% and 5% level of significance.

Incidence of mortality: The nomads face many difficulties in feeding their flocks on account of the receding pastures, edible species replaced by noxious weeds, while migrating from one place to another. The nomads along with their flocks get trapped in snow, rains, piercing cold winds, acute communicable disease infestation, which together result in the mortality of the animals. Four important determinants of the mortality were rain and cold, toxic grasses, diseases and attack by wild animals (Table 5). The mortality due to rain and cold increased up to the medium flock size category however, the large flock size category recorded a decline in both adult and young stock. On the contrary, the mortality was more in young stock in the very small and small size category and decreased in the medium and large size category. The mortality due to toxic grasses showed a declining trend with the increase in the flock size. Also with respect to diseases, an increasing trend with the flock size categories except medium size category under both the adult and young stock was observed. The reasons for this kind of the trend could probably be due to more human resource available with the large size categories to identify better pasture lands for feeding their animals and have more access to the veterinary-clinics compared to other categories. With better healthcare, even though the percentage of mortality due to disease was less compared to the very small category, yet in totality the mortality was more due to large number of animals which died mostly due to communicable diseases. The wild animal attacks too were more pronounced in the young stock and depicted increasing trend with the size of the flock, which too could be due to more number of animals. Although nomads make all out efforts towards sustaining their living but they annually loose a good number of animals due to mortality.

Poor possession of essentials: The nomads rearing animals maintain limited assets due to their migratory life style. Out of 5 assets created/maintained (Table 6) by the nomads, only the residential accommodation which was

Table 4. Estimates of determinants of livestock possession

Exogenous variable	Regression coefficient	T value
Land holding size	0.451	7.44*
Income from other sources	0.124	1.84**
Literacy	0.293	4.88*
Male female ratio in the family	-0.024	-0.39
Loss due to mortality	0.265	4.03*
Constant	0.955	0.367
Coefficient of determination (R^2)	0.50	

*Significant at 1% level, **Significant at 5% level.

Table 5. Incidence of mortality across flock size categories (%/annum/household)

Particular	Very small		Small		Medium		Large	
	Adult	<12 months	Adult	<12 months	Adult	<12 months	Adult	<12 months
Due to rain and cold	2150 (8.19)	1113 (22.78)	8100 (8.31)	3844 (24.23)	14165 (8.87)	5365 (20.60)	20544 (8.40)	8867 (20.05)
Due to toxic grasses	184 (0.53)	54 (1.11)	200 (0.21)	133 (0.84)	253 (0.16)	224 (0.86)	239 (0.10)	317 (0.72)
Due to disease	123 (0.35)	81 (1.67)	1100 (1.13)	88 (0.56)	1265 (0.79)	335 (1.29)	3822 (1.56)	633 (1.43)
Due to wild animals	369 (1.06)	27 (0.56)	300 (0.31)	663 (4.18)	1012 (0.63)	1453 (5.58)	478 (0.20)	2533 (5.73)
Total loss due to mortality	2826	1276	9700	4728	16694	7377	25083	12350

Table 6. Value of assets of sampled household (Number/ household)

Particular	Very small	Small	Medium	Large
Tent	0.83	0.96	1.05	1.17
Kotha	0.82	0.93	0.95	1.0
Blankets	5.26	6.07	6.85	7.66
Utensils	14.7	15.6	16.5	17.1
Average family size	4.0	4.69	4.88	5.22

made of wood, mud and pine cuttings (commonly known as Kotha) involves a sizable investment which ranged between 58–69% of the total value of the assets and exhibited a positive relationship with the size of the flock. Except medium and large flock size category, all the members of nomad families did not enjoy availability of tent or Kotha to live in and any sort of vagary may not only affect their livestock but also the humans. In the similar fashion, their families had less number of other essential items. The percentage of possession of assets increased with the increase in the flock size.

Imbalanced dietary intake: The consumption behaviour of nomad families was equated with the ICMR dietary recommendation (Table 8). It was found that the nomad tribes had imbalanced dietary intake which may have unfavourable influence on their well being. They were consuming animal based product more than recommended levels owing to their possession/preparation within family. However, their intake with respect to other food items like cereals, millets and vegetables, etc. was less than ICMR recommendations which signifies yet another disadvantage.

Deceleration in plan expenditure: Government has been favouring nomadic tribes with number of schemes for improvement of living condition. However, the examination of Tribal sub-plans over the years indicates poor government support in the form of actual expenditure for this section of population in the state. The estimates of public spending registered a decline, so was the case with per capita expenditure which too exhibited a sharp decline. The constant series of the expenditure under sub-tribal plans and their estimates on per capita basis presented gloomier picture of the government spending for development of Tribal population in the state (Table 9). This declining trend

of spending needs to be reversed and the expenditure should be enhanced to achieve the desired growth in their development process.

Migratory behaviour and poor access to amenities: The migration from one place to other along with animal flock has been part of living of Gujjars and Bakerwals. The migration of small ruminants and grazing practice has put a lot of pressure on the pasture resources. It is very evident that around 88% of the sample households possessed very small and small flock sizes, owing to the non-availability of fodder for the animals. Another dimension of the feeding practices of these nomads who come from Jammu region is that during the spring season, when the pastures are lush green in the Kashmir and Ladakh valleys, they migrate with their flocks to these areas and with the onset of winter they return to Jammu region which is a sub tropical area and provide green fodder during winters. This is an important determinant of increasing the overall livestock population in the Jammu compared to Kashmir and Ladakh regions of the state, where overall population of livestock is registering a declining trend. This is the reason that the Kashmir valley imports more than 70% of meat from outside states and the earning from the horticulture sector goes into the purchase of meat.

The constraints in the rearing of animals especially under transhumance system are too many in number. During the present investigation, the perception of the households about various problems faced by them in rearing animals was collected through a specially designed questionnaire that listed varied number of constraints right from the start of migration to its culmination. However, out of listed 25 constraints, 8 constraints were found most important in affecting the production/rearing of animals by the nomads. The ranking of the constraints as perceived by the rearers and analyzed by estimating Rank based quotient (RBQ) of each constraint is presented in Table 7. The lack of credit facilities was the most important constraint followed by the poor transport facilities provided by the government on the upper hills. The lowest rank was awarded to the education/medical facilities. Though there was a minor difference among the quotients of the other constraints, therefore, it could be inferred that all the constraints, like lack of availability of food, markets, veterinary facilities,

Table 7. Rank based quotient of constraints perceived by farmers

Constraint	Frequency distribution of ranking of constraints								RBQ	Rank
	1	2	3	4	5	6	7	8		
Lack of credit facilities	68	8	43	31	–	–	–	–	86.5	I
Poor transport facilities by Government on Pirpanchal	4	70	11	34	31	–	–	–	74.5	II
Lack of availability of food	10	11	91	–	–	–	–	34	62.2	III
Lack of markets	31	–	–	–	59	59	–	–	55.8	IV
Lack of veterinary facilities	39	–	–	36	–	–	74	2	54.2	V
Lower price of animals	–	31	–	46	–	–	69	–	49.4	VI
Scarcity of fodder	4	30	–	–	58	22	–	30	48.1	VII
Poor education/medical facility	–	–	–	–	–	65	2	81	23.6	VIII

Table 8. Per capita consumption of food and non-food items (g/day)

Particular	Actual consumption				ICMR dietary recommendation
	Very small flock	Small flock	Medium flock	Large flock	
Cereals and millets	353	375	392	405	420
Roots and tubers	51	56	61	69	75
Vegetables	38	42	44	48	125
Pulses and legumes	28	32	33	37	40
Meat	24	28	34	40	25
Milk	289	325	364	436	150
Eggs (No.)	25	30	34	52	180*
Oil	16	18	21	23	0.014
Sugar	17	21	36	51	30

*Requirement of eggs per capita per annum.

low price of animals and scarcity of fodder were by and large having equal importance. Therefore, the study proposes a comprehensive priority agenda for researchers and planners to rectify the discrepancies meted to these disadvantageous groups on account of poor policies of the government. The foregone constraint analysis revealed that pragmatic efforts need to be undertaken to provide the financial stability, extending mobile schooling, health and veterinary facilities and to pursue a strategic and well defined policy programmes for development of pastures along the grazing route of the migratory flocks. At the same time, protection of environmental damages through goat and sheep rearing need to be protected through proper regulations for use of the pasture lands.

Policy suggestions: This study perused the primary data collected from nomadic tribes, viz. Gujjars and Bakarwals of Jammu and Kashmir to investigate into the existing livelihood pattern of animal rearing in relation with various disadvantages accrued to these nomads. The study concludes that the nomads remain distressed and

marginalized owing to various constraints and poor government interventions. Although animal rearing was the most important source of livelihood to them, yet, it turned less remunerative, due to various impediments and poor access to the basic amenities. This study puts forth following policy suggestions for their sustainable upliftment:

- Government should create necessary infrastructure for their settlement around grazing sites.
- State government should frame policies to promote formal education and generate human capital among tribes through capacity building programmes, enabling them to harness benefits from available potential and overcome constraints through technical skill development to share the benefits of growth in economy.
- Pragmatic plans with regard to the creation of mobile health/veterinary clinics and transit camps equipped with necessary basic amenities be put in place to prevent animal and human loss occurring to the nomadic population during migration.

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Table 9. Year-wise Tribal sub-plan for Jammu and Kashmir (At current prices)

Year	Expenditure	Population	Per capita exp. (₹)
2002–03	117959000	1145623	102.96
2003–04	97000000	1186688	81.74
2004–05	100475000	1229225	81.74
2005–06	88644000	1273287	69.62
2006–07	158004000	1318928	119.80
2007–08	116533000	1366205	85.30
2008–09	58585000	1415177	41.40
2009–10	100041500	1465905	68.246
2010–11	141498000	1518450	93.19
2011–12	94360000	1572879	59.99