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Ishrat F Bhat
Ph.D Student, School of Agri.
Economics & HBM, SKUAST-
Kashmir, Shalimar Campus,
Srinagar, Jammu and Kashmir,
India

SH Baba
Associate Professor and Head,
Division of Social Sciences,
FoFy, SKUAST-Kashmir,
Srinagar, Jammu and Kashmir,
India

Nasir Husain
Assistant Professor, Division of
Social Sciences, FoFy,
SKUAST-Kashmir, Srinagar,
Jammu and Kashmir, India

Masroor Majeed
Ph.D Student, Division of Agri.
Statistics, SKUAST-Kashmir,
Shalimar Campus, Srinagar,
Jammu and Kashmir, India

Impact of cross-bred livestock technology on livelihood security of tribal masses in Kashmir valley

Ishrat F Bhat, SH Baba, Nasir Husain and Masroor Majeed

Abstract
Enhancement of agricultural productivity and livestock in particular is an effective way of empowering tribal masses and securing their livelihood. An attempt was made in this study to analyze the impact of adoption of cross bred livestock technology on various facets of tribal livelihood. The results revealed that domestication of livestock accounts for large share of family income in tribal areas. It was observed that cross bred livestock are more productive and have improved the income level of tribal households significantly. Additionally, the livelihood indicators were very prominent at livestock farms of adopters and even the capital stock generated at their farms were more compared to non-adopters. The regression estimates confirm that adoption of livestock technology significantly contribute to more farm income. Moreover, there is an apprehension that poor livestock keepers may not benefit much from demand driven growth because of small scale production, illiteracy, meagre holding size, lack of access to credit, poor access to location specific technology, and markets for their produce and their inability to comply with food safety standards are becoming stringent across different tribal regions of Kashmir valley. Findings of the study emphasized upon R&D efforts for evolution of location specific breeds and standardization of package of practices for livestock domestication for tribal areas. Also, there is an urgent need to aware the tribal people about the advantages of adoption of livestock technology and the essential role of extension agencies would have crucial role in the direction.

Keywords: Adoption, cross-bred technology, livestock, tribal people, livelihood, Kashmir valley

Introduction
Livestock makes multi-faceted contribution to socio-economic development of rural masses. Due to the inelastic absorptive capacity for labour in other economic sectors, livestock sector has the scope for generating more employment opportunities, especially for the marginal and small farmers and landless labourers who own around 70 per cent of the country's livestock. Livestock wealth is more equitably distributed than that of land. Being an important source of income and employment for this section of society, the livestock helps in alleviating poverty and smoothening of income distribution. Livestock is important both as savings and investments for the poor household and provides security or insurance through multiple ways in different production systems. In the mixed crop-livestock system, its importance goes beyond direct food production function. It supplies draught power and organic manures to the crop sector and hides, skin, bones, blood and fibres to the industries. Livestock makes substantial contributions to conservation of environment by utilizing huge amount of crop residues and by-products as feed/fodder and by supplying draught power and dung that save renewable environment polluting energy sources (chemical fertilizers, diesel, petrol, etc.). Driven by sustained economic growth and rising income, there is a structural shift of consumption pattern in favour of livestock products both in rural and urban areas. The income elasticity of demand for livestock products is high especially for certain wealth groups in rural areas (Kumar, 1998) [8] and expectedly the robust growth in the livestock sector is likely to continue (Delgado *et al.,* 1999) [5]. In view of rich interaction between crop-livestock it is realized that integrating livestock in a system approach would arrest the sustainability concerns of country's food security (Hann *et al.*, 1997, Patel, 1993) [7, 9]. The development of livestock sector like any enterprise are determined essentially by the level of technology and the efficiency of market mechanism, however, it is the use of capital that makes these two factors operational. Since livestock forms an important component of farm capital formation, therefore, the financial factor is expected to govern its ownership and adoption of cross bred technology. The livestock domestication is labour and capital intensive that discourage farmers to manage large herd of animals at their farms. Therefore, the adequacy of individual farmer's

Corresponding Author:
Ishrat F. Bhat
Ph.D Student, School of Agri.
Economics & HBM, SKUAST-
Kashmir, Shalimar Campus,
Srinagar, Jammu and Kashmir,
India

financial resources has to be augmented from external sources for efficient and scientific management of livestock. Since tribal areas provide entirely different environment to livestock due to various specificities, therefore, it is imperative to examine the adoption of cross bred animals in tribal regions of Kashmir Valley. The livestock population in the state was about 11 million, of which 31 per cent was cattle and 38 per cent was sheep population (Livestock Census, 2007) [9]. The livestock sector in the state has made a stride in intensification, (Baba *et al*., 2011a), however, state still imports over 4 lakh live sheep and goats to meet its growing demand of meat. This emphasized upon development of this sector and increased adoption of improved breeds. In this backdrop, the present paper intends to investigate the influence of adoption of cross bred technology on livelihood of tribal people of Kashmir valley.

Data and Methodology
The study is based upon primary data collected in the tribal areas viz, Faker Gujri from the Srinagar district and Kangan area from the Ganderbal district of the Kashmir valley. A complete list of farmers from the upper and lower altitudes of these tribal areas was prepared and these individual farmers were categorized into marginal, small and large farmers on the basis of their land holdings. Then 100 tribal farmers were selected from the study areas 50 from each. Then the data were collected by using questionnaire designed for that purpose, the knowledge level of farmers about the adoption of cross bred technology.

To ascertain the influence of cross bred technology and other socio-economic variables on the adoption of livestock, multiple linear regression of the following structural form was formulated and estimated:

$$Y = f (OH, IR, FMLY, LIT, AGE, U)$$

Where,
Y= Livestock possession (Adult cattle unit/farm), OH = Size of operational holding (kanal), IR = Percentage area irrigated (%), FMLY = Average family size (No.), LIT = Literacy level of the head of the family (0 for illiteracy, 1 for primary, 2 for middle, 3 for secondary, 4 for higher secondary and 4 of higher education level, resp.), AGE = Age of head of the family (in years), and U =Error term.
The empirical evidence of relationship between livestock and various socio-economic variables in the state in this regard appears to be scanty; therefore, an attempt was made in this paper to examine the factors affecting adoption of livestock by tribal people.

Result and Discussion
Few Socio-Economic Indicators in Different Tribal Regions of Kashmir Valley
A cursory glance at (Figure 1) exhibited that adopters of livestock technology in tribal areas were having relatively larger land holdings and more area under plough as compared to non-adopters.

Table 1: Land utilization pattern at adopter and non-adopter farms in tribal areas

Particulars	Adopter	Non-adopter
Cultivated area (kanal)	6.75	5.4
Cultivated area irrigated (%)	13.0	17.0
Total holding (kanal)	8.03	6.0
Average family size (No./family)	7.6	6.1
Age of family head (years)	39	44
Literate family head (%)	45.0	32.0
Sex ratio	944	865
Agricultural workers (%)	20.2	13.1

A = Adopters, NA = Non-adopters.

Farm family head may be an entrepreneur, a farm manager, above all a decision maker and his level of education would be his strength. Figure 2, depicted that the higher percentages of heads of farm families were illiterate on non-adopter category in different tribal areas. Age determines length of experience but aged person may have less risk taking capacity compared to younger ones. In consonance to this, heads of adopter families were found to be younger than non-adopter family heads that may have prompted them to resort to cross-bred livestock technology.
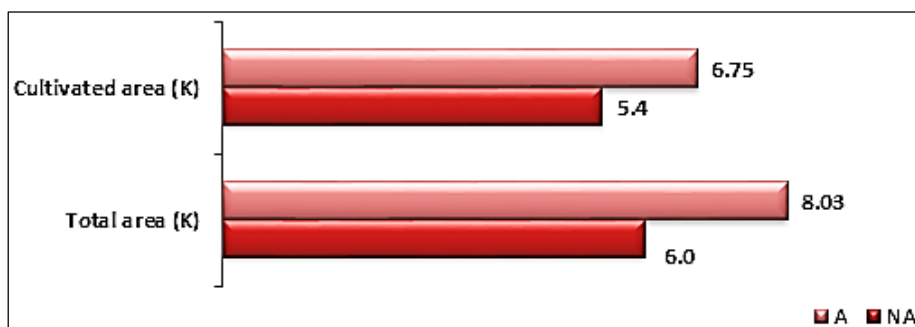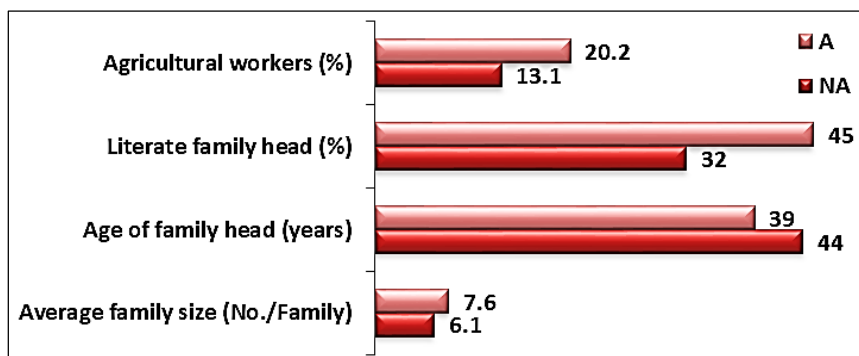

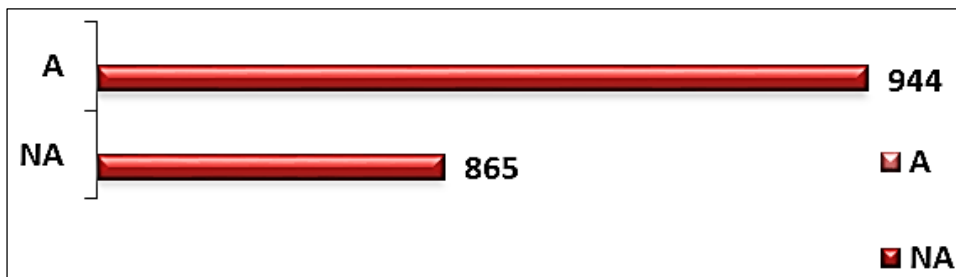**Fig 1:** Land Holdings

Fig 2: Demographic variables

Fig 3: Sex Ratio

The average size of family was found to range from 7.6 within adopter families and 6.1 within non-adopter families which helped the adopter families more compared to non-adopters due to more manpower. Another important aspect of tribal farm families is gender; sex ratio was seen to be more favorable among adopters (Figure 3). Explaining that adopter families have more availability of female labour, which is desired in view of the fact that livestock activities increasingly depend upon female labour, owing to scarcity of male labour in tribal regions. Dependence on livestock was found to be higher across different tribal regions compared to other occupations.

Capital Formation at Adopter and Non-adopter Farm Households
Capital formation means monetary value of all the productive wealth generated at the farm; including implements, orchard plantations, livestock capital, poultry & the capital from the forest resources (NTFPs). For this paper, per farm total capital formation and livestock capital has been considered and portrayed in Figure 4. In consonance with cross-bred technology across tribal regions, more capital and livestock capital was generated at adopter farms owing to better financial resources compared to non-adopter. Higher capital formation at these farms was owing to more investment in livestock, orchard plantations & implements etc due to undulated topography in these higher regions. As far as their wealth is concerned, it was relatively more in adopter families compared to non-adopters. An interesting phenomenon could be noted in adopter tribal households that more cross-bred livestock was adopted by families where the disbursement of farm capital was more. The higher total livestock capital accumulation at adopter farms was because they had adopted cross-bred livestock technology. It is accordingly suggested that livestock technology need to be extended to the tribal farmers with a proper policy and supervisory services.
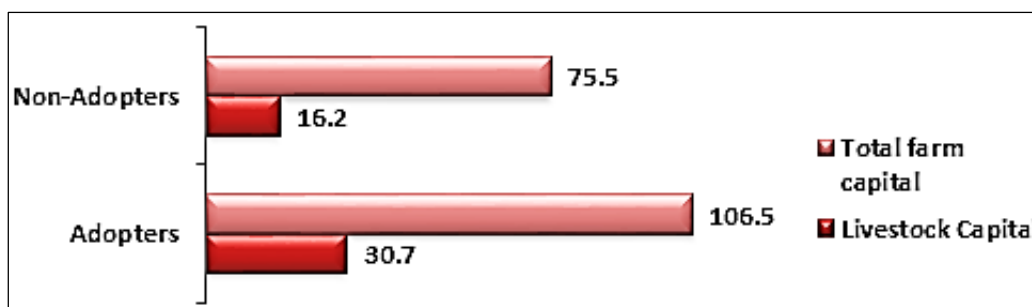
Fig 4: Capital formation (000 Rs/farm)

Adult Cattle Units and Differential Adoption of Cross/Improved bred Animal:
Farmers in different tribal regions domesticate different kind of animals depending upon production environment in each region. In this section all kind of animals were converted in adult cattle units (ACU) for comparison between adopter and non-adopter of cross-bred technology. More livestock capital generation at adopters farms corroborated into more number of ACU on their farms compared to non-adopter farm families in all tribal regions of Kashmir valley (Figure 5). There appears a gap in possessions of ACU between adopter and non-adopter farm families in all tribal regions.
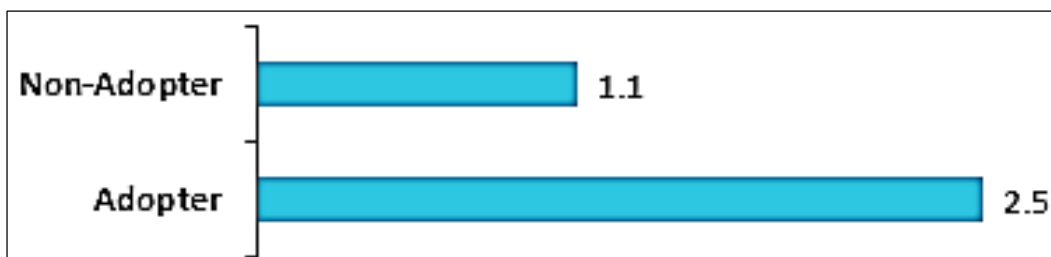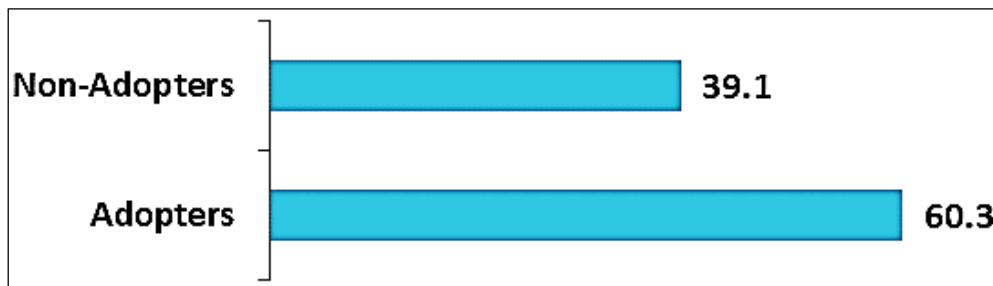
Fig 5: ACU (No.)

Fig 6: Adoption of cross-bred animals (%)

Crossbreeding of indigenous stock with exotic animals is a well-known strategy for improving the productivity of indigenous stock mainly of cattle, sheep and pigs (Kumar, Anjani, 2006). With an intention to find out the extent of adoption of crossbred animals at adopter farms in comparison to non-adopters, percentages were estimated and presented in (Figure 6). Generally the adoption of cross bred animals were found higher at farms that could be owing to better capital availability for purchase and management of cross-bred animals with them. The lower adoption level of cross bred animals indicated untapped potential of improving animal productivity for replacement of indigenous breed with improved animals.

Model Estimates

Regression function was formulated to quantify the determinants of adoption of cross bred livestock in the study area and their estimates presented in the (Table 2). The f - statistics for the function turned statistically significant at 0.05 level of probability, indicating variables specified in the function were best fit. As expected, regression coefficient of institutional credit turned positive and significant determinant of cross bred adoption. Literacy was another factor which has been instrumental in increasing livestock holding as evident from its estimated coefficient of the function. An educated entrepreneur has a broader vision and could understand the economic viability of livestock enterprise and in turn their ownership. The coefficient of average holding size indicated that more the size of land holding more will be the number of livestock at the farm. The large size land holding provide enough space for their shelter and could help in developing linkages between cultivated area and livestock. As indicated by regression coefficient, the relationship between average holding size and cross-bred livestock holding appears to be stronger. Another significant determinant was irrigated area. Since livestock is a labour intensive venture, therefore, family with more members would be able to manage more animals at their farm. These expectations were supported by the regression coefficients of average family size in the function (Table 2).

Table 2: Regression estimates of adoption of cross-bred adoption/technology

Variable	Coefficient
Constant	-.105
AGE	0.010 (0.010)
LIT	0.304*(0.082)
FMLY	0.111*(0.034)
IRA	0.016*(0.007)
AHS	0.028*(0.010)
ADF	0.125*(0.020)
Adjusted R^2	0.6110
f-statistics	71.274*

*Denotes significance at 0.05 or better probability levels
Figures within parentheses indicate standard errors of regression coefficients

Conclusion and Policy Implications

This study was undertaken to find out the pattern of adoption and non-adoption of livestock technology among families of different tribal regions of Kashmir valley. Micro level analysis clearly indicated that the families with more capital were well endowed to invest more on livestock technology in particular and in turn improve their livestock possession. Adopters of livestock technology have more capital compared to non-adopters which help them to invest on other farm and household activities and also implying a crucial role of institutional credit in the development of livestock sector in the state. The regression estimates also indicated that the farm capital along with literacy level of head of farm family, average holding size, proportion of irrigated area and average family size has been a significant determinant of livestock adoption across different tribal regions of Kashmir valley.

On the basis of the findings, it could be inferred that the livestock technology has been instrumental in improving livestock ownership and government should encourage farmers to invest in livestock by providing proper extension services and creating awareness among them. This would be a better preposition to tap unexploited potential that could accrue by increasing adoption of cross bred animals. Location specific loan schemes need to be launched where in due care needs to be taken on specific production environments that favor performance of different livestock species.

Acknowledgement

References

1. Baba SH, Wani MH, Bilal A. Zagar. Dynamics and sustainability of livestock sector in Jammu & Kashmir. *Agricultural Economics Research Review,* 24 (January-June, 2011a, 119-132.
2. Baba SH, Wani MH, Bilal A. Zagar. *Study of rural credit and its impact on agricultural growth and sustainable livelihood in Jammu & Kashmir.* Final Technical Report of UGC sponsored major research project. Research Report No.: 03, Division of Agricultural Economics & Marketing, SKUAST-K. Shalimar Campus, Srinagar (190 025) J&K, 2012.
3. Bhatia, Jitender UK, Pandey, Suhag KS. Small Ruminant Economy of Semi-Arid Region in Haryana. *Indian Journal of Agricultural Economics,* April-June, 2005; 60(2):163-183.
4. *DE&S* (various issues) *Digest of Statistics.* Directorate of Economics and Statistics, Planning and Development Department, Government of Jammu & Kashmir.
5. Delgado C, Rosegrant M, Steinfed H, Ehui S, Courbois

C. *Livestock to 2020: The Next Food Revolution,* Food, Agriculture and Environment Discussion Paper 28, International Food Policy Research Institute. Washington, D.C., U.S.A, 1999.

6. Gandhi VP, Mani G. Are livestock products rising in importance? A study of the growth and behaviour of their consumption in India. *Indian Journal of Agricultural Economics.* 1995; 50(3):283-293.

7. Hann C, De Steinfeld H, Blackburn H. *Livestock and the Environment: Finding a Balance*. AO/USAID/World Bank. WREN Media Eye, U.K, 1997.

8. Kumar P. *Food Demand-Supply Projections*. Indian Agricultural Research Institute, New Delhi, 1998.

9. *Livestock Census* Directorate of Economics and Statistics, Department of Agricultural Cooperation, Ministry of Agriculture, Government of India, New Delhi. Patel RK. Present status and promise of dairying in India. *Indian Journal of Agricultural Economics,* 1993, 2007; 48(1):1-33.

10. Sharma VP. Livestock Economy of India: Current Status, Emerging Issues and Long-term Prospects. *Indian Journal of Agricultural Economics.* July-September. 2004; 59(3):512-554.