

Contribution of livestock production systems towards the sustainable livelihood of the tribes of Jharkhand

MUKESH KUMAR¹, JANCY GUPTA², APARNA RADHAKRISHNAN³ and VIKRAM SINGH⁴

National Dairy Research Institute, Karnal, Haryana 132 001 India

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Cattle, buffaloes, sheep, goat, pig and poultry are important species of livestock production systems of the tribes of Jharkhand which contribute significantly to the rural economy. Keeping the above facts in view, the present study was undertaken to investigate contributions of livestock production systems towards the sustainable livelihood of the tribes of Jharkhand.

The present study was carried out during the year 2013–14 in Jharkhand, which was selected purposively as it is the home of 32 tribal groups that make up about 26.34% (2011) of the state population and 8.2% of ST population of India. Govindpur and Ormanjhi blocks of Dhanbad and Ranchi districts of Jharkhand were selected randomly for the study. From these 2 blocks, 4 villages were selected randomly and from each village 30 farmers were again selected randomly constituting 120 respondents. Data were collected personally from selected respondents through interview schedule and personal observations. The study adopted sustainable livelihood approach (SLA) for assessing the extent of contribution of livestock production systems (LPS) towards the sustainable livelihood of tribes. Department for International Development (DFID)-Sustainable Livelihood framework (1999) was followed for the selection of factors and indicators.

Selection of indicators: To bring the values of the selected indicators within the comparable range and also to standardize their values normalization was done by subtracting the minimum value from the observed value and dividing by range using the formula [Kaiser (1958)]:

After normalization, the testing of suitability of

$$\text{Normalized value} = \frac{\text{observed value} - \text{minimum value}}{\text{range}}$$

indicators and elimination of nonsignificant indicators was carried out using principal component analysis (PCA).

Socio-economic profile of the respondents: Results

Present address: ^{1,3}PhD Scholar (mukeshbhuag@gmail.com, aparnaradhak@gmail.com), ²Principal Scientist and Ex-Head (jancygupta@gmail.com), Dairy Extension Division. ⁴Scientist (kmmnms@gmail.com), ICAR Hqrs.

revealed that the majority of the respondents were of middle age category (71.64%) had middle school to high school level of education (72.50%). The family size of the respondents was medium (52.50%), joint family type (66.67%) with medium level of income from LPS (51.66%), and medium livestock holding (53.33%). Majority had low social participation (57.5%), medium extension contact (54.17%) and low to medium mass media exposure (75.00%).

Determinants of sustainable livelihood in major LPS

Cattle+ goat- LPS : In cattle+ goat-LPS, 19 indicators were identified and PCA was applied to obtain SL index values (Table 1). Among these indicators, extension contact (5.96), source of energy (5.20) and house hold assets (5.11) had highest influence on sustainable livelihood of the respondents. This implies that the higher the extension contact of respondents the higher the LPS inclined towards sustainability and the higher the SL index. The result also depicted that as the energy becomes more renewable and recyclable the sustainability of the production system increases.

Cattle+ goat+ pig – LPS: Among the indicators for cattle+ goat+ pig – LPS, education of family members (5.98), use of traditional knowledge in LPS (5.98) farm energy (5.95), ICT tools (5.99), livestock density (6.37) and access to natural resources (6.28) had highest influence on sustainable livelihood of the respondents (Table 2). In C+G+P- LPS, wide variation was observed in education of family members i.e. from illiterate to graduate. It is gratifying to note that the more educated the respondents the more their involvement in sustainable LPS. The day-to-day life of tribes are closely related to the traditional knowledge and natural resources, so as the use of traditional knowledge of tribes and access to natural resources which increased the sustainability of the production system.

Cattle+ goat+ buffalo-LPS: In the dairy production system use of variables such as cattle + goat+ buffalo, use of traditional knowledge in LPS (5.98), farm energy (5.95), ICT tools (5.71), livestock density (5.97) and access to natural resources (5.855) had highest influence on

Table 1. Determinants of sustainable livelihood

Variable	Initial	C+G		C+G+P		C+G+B	
		Extraction	Weightage	Extraction	Weightage	Extraction	Weightage
Education of family members	1	0.646	3.697	0.814	5.987	0.822	5.066
Health	1	0.616	3.432	0.736	4.820	0.702	4.327
Employment Generation	1	0.744	4.708	0.791	5.885	0.777	4.789
Use of traditional knowledge in LPS	1	0.730	4.512	0.814	5.987	0.899	5.541
Access to information	1	0.712	4.099	0.774	5.654	0.674	4.154
Farm energy	1	0.665	3.900	0.966	5.954	0.966	5.954
Dwelling place	1	0.795	4.610	0.801	5.597	0.801	4.937
ICT tools	1	0.768	4.510	0.928	6.000	0.928	5.720
Source of energy	1	0.894	5.208	0.840	5.947	0.840	5.177
House hold assets	1	0.845	5.119	0.879	5.598	0.879	5.418
Land Improvement activity	1	0.871	4.078	0.829	5.190	0.829	5.110
Access to natural resources	1	0.765	4.703	0.950	6.285	0.950	5.855
Security related to natural resource	1	0.763	4.843	0.674	4.654	0.674	4.154
Social participation	1	0.802	4.017	0.804	5.856	0.604	3.723
Extension contact	1	0.947	5.960	0.795	4.990	0.795	4.900
Savings	1	0.772	5.078	0.866	5.594	0.866	5.338
Debt	1	0.668	4.715	0.850	5.639	0.823	5.073
Remittance of income by family members	1	0.840	4.703	0.895	5.716	0.911	5.615
Services received from financial service organization	1	0.809	4.963	0.789	4.763	0.773	4.764

Table 2. Index values of sustainable livelihood (SL) and its components for major LPS of the study area

LPS	Human capital	Physical capital	Natural capital	Social capital	Financial capital	SL
C+G	4.40	5.31	4.98	5.39	4.53	24.61
C+G+P	5.28	5.70	5.63	5.44	5.47	28.02
C+B+G	4.77	5.44	5.27	4.85	5.20	25.53

sustainable livelihood of the respondents. The Table 2 also revealed that as the livestock density and ICT tools increases, the physical capital component increases leading to improved sustainable Livelihood index. ICT tools help the farmers to get novel and updated information on improved management practices of livestock and traditional knowledge, reduces the destruction of natural capital and thus increases the SL index of the respondents. These results are in line with Mohammad *et al.* (2013), Sah (2005), Devi (2004), Gupta (2011) and George (1998).

It may be concluded that the C+G+P was the LPS that contributed maximum to the sustainable livelihood of the tribes. Tribes preferred goat and pig, and at state level pigs have the highest ratio. Similar results were obtained in this study (Deka and Wright 2011) in which tribes are found to prefer C+G+P- LPS. It was also found that buffalo and indigenous cattle gave poor return compared to goats and pigs; young buffaloes were preferred for beef purpose; and the market demand for pig and goat was maximum for social functions and festivals.

All these results paved way to the conclusion that the

livelihoods of tribal communities in the area have traditionally been dominated by LPS. Cattle+ goat+ pig (C+G+P) is the LPS that contribute maximum towards the sustainable livelihood of the respondents. Therefore, the livelihoods promotion among tribal people needs a paradigm shift focusing on LPS to keep pace with sustainable development and future challenges in the area.

SUMMARY

The present study aims to measure the contributions of livestock production systems (LPS) towards the sustainable livelihood in the tribal dominated state of Jharkhand. Data were collected using quantitative and qualitative methods comprising personal interviews and participatory rural appraisal techniques. The primary outcome of the study was that cattle+ goat+ pig (C+G+P) is the LPS that contributed maximum towards the sustainable livelihood of the respondents (sustainable livelihood index value- 28.02), closely followed by cattle+ buffalo +goat (25.53) and cattle+ goat (24.61). Overall, it was concluded that compared to other sustainable livelihood components, human capital had

minimum sustainable livelihood index value in all production systems.

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