

Pig-based production system contributing towards the sustainable livelihood of tribes of Jharkhand

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ABSTRACT

Pig farming provides subsistence for millions of small and marginal farmers and landless labourers. The present study was conducted in two randomly selected districts of Jharkhand in 2013-14. The study assessed the extent of contribution of pig-based production system towards the sustainable livelihood of the tribes of Govindpur and Ormanjhi blocks of Dhanbad and Ranchi districts. The data were collected from 120 randomly selected households and the study was conducted through personal interviews of the selected respondents, personal observations and participatory rural appraisal techniques viz transect walk, social mapping, key informant interview, focus group discussions etc. The results indicated that the livelihood of tribal communities in the area had traditionally been dominated by the pig-based production system- cattle + goat + pig (C + G + P). The pig-based production system prevalent in the area was found to be substantially contributing to the sustainable livelihood of the respondents and was the integral part of day to day livelihood activities, nutritional security and traditional lifestyle of the tribal people in the area.

Keywords: Pig farming; pig production system; sustainable livelihood; tribes

INTRODUCTION

Livelihoods are ways of keeping oneself meaningfully occupied by using one's endowments (human and material) to generate adequate resources to meet the requirements of the household in a sustainable manner (Bernstein 1992). In simple terms these are combinations of the capabilities and resources people have (including social, human, financial, natural and material assets) and the activities they

undertake in order to make a living and to attain their goals and aspirations (Bhuvaneshwari 2008). Livestock contributes to food, economics, environment, health, education, society, infrastructure, nutritional security and thus in total to the livelihood security of tribes by providing transport and on-farm power. Among the different livestock piggery is believed to be the most productive and is the fastest growing sector. In India pig rearing and pork industry are run by

traditional pig farmers belonging to the lowest socio-economic stratum and Jharkhand is no exception. Pig production helps the marginal and backward farming community to generate wealth of assets or safety nets at the time of crisis and also fulfils a wide range of socio-cultural roles of tribes. Properly managed pig production system can play an important role in mitigating hunger, providing nutritional security and counteracting environmental degradation. Sustainable livelihood approaches are genuinely trans-disciplinary as they are produced, disseminated and are applied in the borderland between research, policy and practice (Knutsson 2006). Among the livestock systems pig is more efficient converter of low quality feed to high quality animal protein and also needs less feed per kg of body weight. Moreover as an important diversified activity the pig-based production systems of the tribes are more crucial for economic development of the state in specific and country in general. This study was designed to investigate contributions of pig system towards the sustainable livelihood of the tribes of Jharkhand.

METHODOLOGY

The present investigations were conducted in Jharkhand state which was selected purposively as livestock contributes 27 per cent of value output from agriculture. Out of 24 districts of Jharkhand Govindpur and Ormanjhi blocks of Dhanbad and Ranchi districts of Jharkhand state were

selected randomly for the study. From these two blocks four villages and from each village 30 farmers were selected randomly constituting a total number of 120 respondents. Questionnaire was pre-tested for its validity and reliability purpose before data collection. After normalization the testing of suitability of indicators and elimination of non-significant indicators were carried out using principal component analysis (PCA). For selection of suitable indicators PCA was run separately for production system so as to determine the weights by the factor loadings and Eigen vectors were obtained.

Selection of indicators: To bring the values of the selected indicators within the comparable range and also to standardize their values normalisation was required (Maiti 2013, Piya et al 2012, Feroze and Chauhan 2010, Nelson et al 2010, Gbetibouo and Ringler 2009, Vincent 2004). Normalisation was done by subtracting the minimum value from the observed value and dividing by range using the following formula (Kaiser 1958):

$$\text{Normalized value} = \frac{\text{Observed value} - \text{minimum value}}{\text{Range}}$$

After normalization the testing of suitability of indicators and elimination of non-significant indicators were carried out using principal component analysis (PCA). PCA was also used in earlier studies (Kolenikov and Angeles 2005,

Ravindranath et al 2011, Abson et al 2012, Maiti 2013). PCA compresses the data by reducing the number of dimensions without much loss of information.

Assigning weights to the indicators:

After selection of suitable indicators PCA was again run separately for the production system so as to determine the weights by the factor loadings and Eigen vectors were obtained. Kaiser normalisation was used to identify the Eigen values greater than one. According to the number of Eigen values greater than 1 the same numbers of components were extracted by using varimax rotational method for each indicator as shown in rotational component matrix. The methods followed by Kolenikov and Angeles (2005), Feroze and Chauhan (2010), Abson et al (2012), Maiti (2013) were adopted for this study to assign the weights to indicators.

The study adopted sustainable livelihood approach (SLA) for assessing the extent of contribution of livestock production systems towards the sustainable livelihood of tribes. DFID- sustainable livelihood framework (Anon 1999) was followed as standard for the selection of factors and indicators (Fig 1). PRA techniques were used to delineate the different production systems and the various livelihood options of the tribes. The responses of the respondents were taken against each factor and indicators were scored and analysed for assessing the contribution of production system towards

the sustainable livelihood of the respondents. DFID livelihood assets pentagon was made as background and another pentagon was reconstructed for the field conditions of Jharkhand for pig-based production system by scoring the livelihood assets and indicators for the respondents and assigning weightage (Anon 2005).

RESULTS and DISCUSSION

Fig 2 indicates that C + G + P (35.83%) was the most prevalent livestock production system in Dhanbad and Ranchi districts of Jharkhand. Pig farming gets well integrated with dairy farming ie cow and goat. Local pig breeds available were less susceptible to diseases and provided a good source of livelihood even during the dry period of dairy animals. Even though C + B + G (18.33%) was the next profitable enterprise rather than having an enterprise of all dairy animals, profitability and sustainability were found to be high for pig-based enterprise. The systems prevalent in the state villages varied from place to place and household to household. The villages possessed systems as per their resources endowments, production and marketing prospects and the level of motivation and positive attitude among the farming community. Farmers generally took decisions on the systems to be adopted on the basis of cost, risk and return calculations apart from social factors in preferring crops for home consumption. Pig farming provided an additional income to the household. Pig meat was more preferred by all the tribal

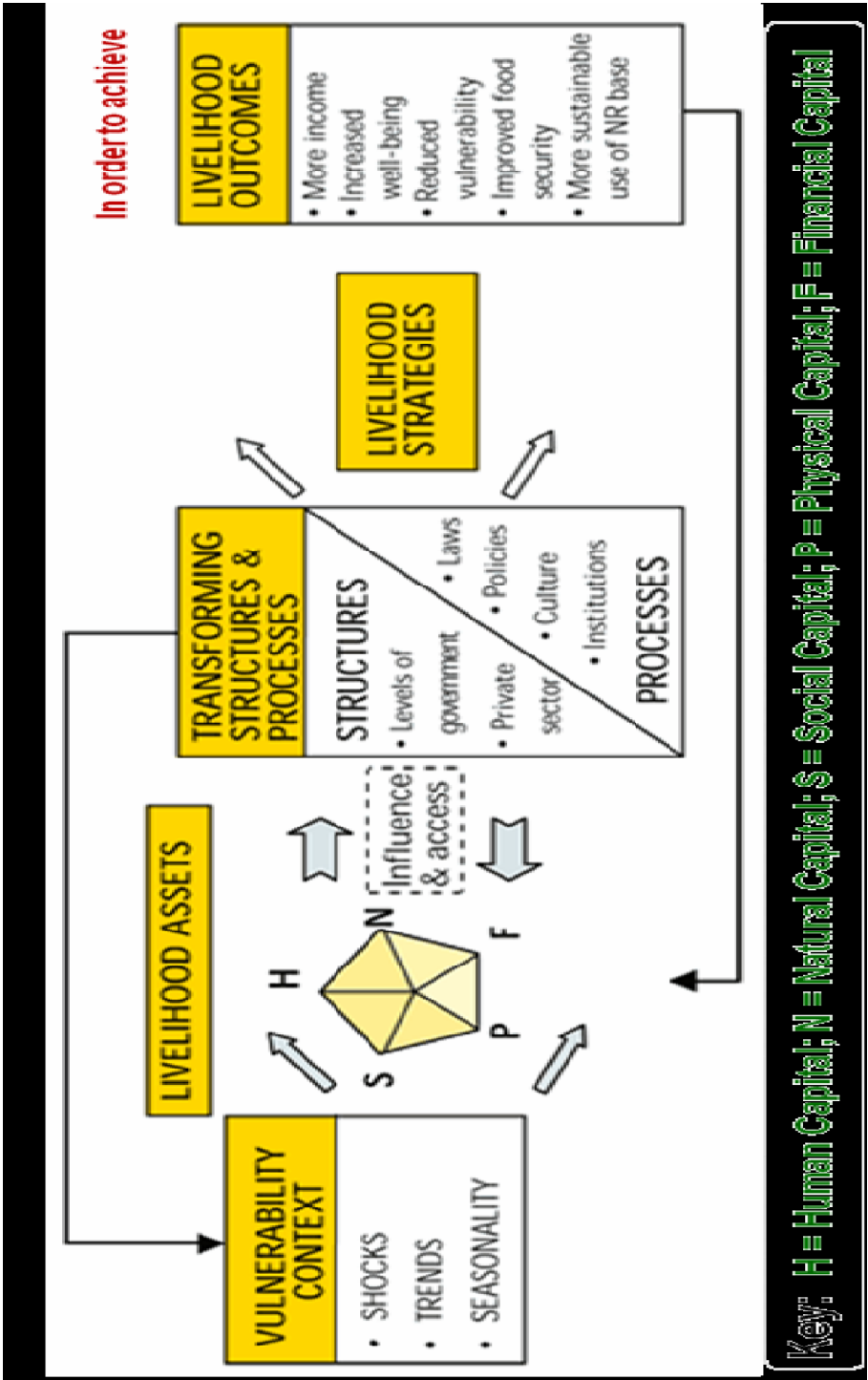


Fig 1. Sustainable livelihoods framework

Pig-based production system for sustainable livelihood

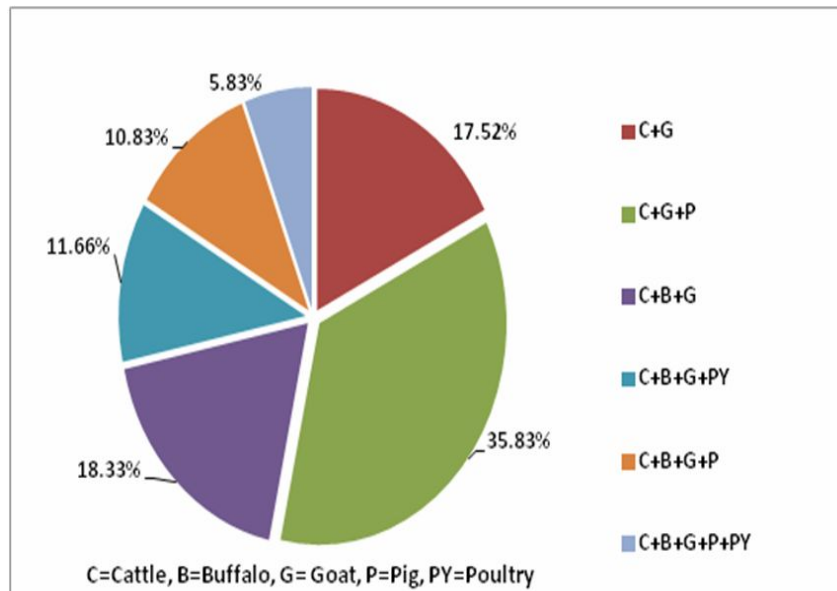


Fig 2. Distribution of respondents as per production systems (n= 120)

people of the state. The use of one or more animal species reduced the vulnerability to economic setbacks. The value of animals in identified systems was also related to their multi-functional role.

C + G + P- LPS: Among the indicators for cattle + goat + pig – LPS education of family members (5.99), use of traditional knowledge in LPS (5.98), farm energy (5.95), form of saving (6.28), livestock density (6.37) and access to natural resources (6.28) had highest influence on sustainable livelihood of the respondents (Table 1). In c + g + p- LPS wide variation was observed in education of family members ie from illiterate to graduate. It is

gratifying to note that more educated the respondents the more was their involvement in sustainable LPS. The day to day life of tribes is closely related to the traditional knowledge and natural resources so as the use of traditional knowledge of tribes and access to natural resources increase the sustainability of production system.

It is evident from Fig 3 and Table 2 that the SL component human capital (5.28 index value) was minimum compared to other components. The figure clearly shows a skewed pentagon with human capital nearly going flat. The major reason is that, given the preference knowledge and skills required for piggery development the

Table 1. Determinants of sustainable livelihood in cattle + goat + pig livestock production system

Variable	2 nd Run factor analysis (PCA) communalities		Weightage
	Initial	Extraction	
Education of family member	1.00	0.81	5.99
Health care	1.00	0.73	4.82
Indigenous knowledge	1.00	0.79	5.98
Farm energy	1.00	0.81	5.95
Dwelling place	1.00	0.77	5.65
ICT Tools	1.00	0.96	5.95
House hold assets	1.00	0.80	5.59
Land improvement activity	1.00	0.92	5.99
LS to natural resources	1.00	0.84	5.94
Extension contact	1.00	0.87	5.60
Habit of saving	1.00	0.82	5.19
Form of saving	1.00	0.95	6.28
Livestock density	1.00	0.67	6.37
Remittance	1.00	0.79	4.99
Service received	1.00	0.82	5.39
Organizational participation	1.00	0.86	5.59
Versatility of resources	1.00	0.85	5.63
Use of natural resources	1.00	0.89	6.28
Land holding	1.00	0.78	4.76

Table 2. Index values of sustainable livelihood (SL) and its components for C + G + P- LPS of the study area

LPS	Human capital	Physical capital	Natural capital	Social capital	Financial capital	SL
C + G + P	5.28	5.70	5.63	5.44	5.47	28.02

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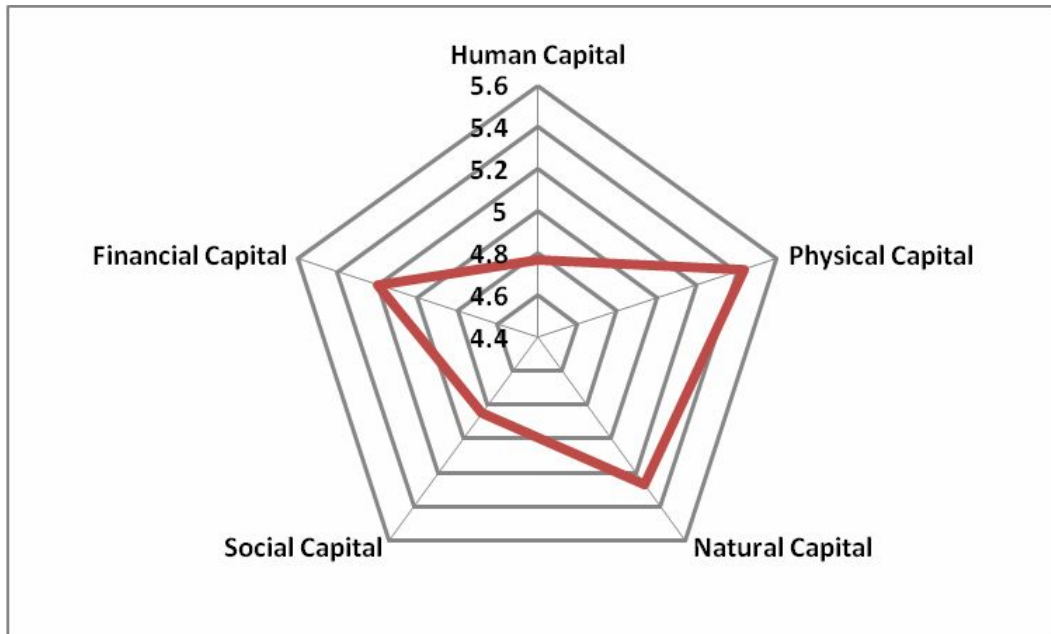


Fig 3. SL pentagon for pig-based production system

potential for making pig farming as an important source of livelihoods for small holders can be exploited by creating awareness among farmers about the scientific pig rearing and management which would ensure gainful income as well as nutritional security in the state. Though piggery was commonly practiced in this state there was a great demand of basic and scientific management techniques along with proper and sustainable veterinary services in rural areas. Low education level of individual tribes as well as their families, low access to information and low awareness on rights, policies and regulations were the major reasons for this. Principal component analysis was applied for the 19 identified factors of sustainable livelihood and index

values were obtained. Table 1 depicts that among the indicators for C + G + P- LPS, education of family members (5.99), use of traditional knowledge in LPS (5.98), farm energy (5.95), form of saving (6.28), livestock density (6.37) and access to natural resources (6.28) had highest influence on sustainable livelihood of the respondents. Table 1 also reveals that if the livestock density increases the physical capital component and the sustainable livelihood index also increases.

CONCLUSION

The livelihood of tribal communities in the area has traditionally been dominated by pig-based production systems.

However other livelihood options like dairy production, kitchen gardening, backyard poultry, goat rearing and artisan activities also played a vital role in the livelihood of tribal people. These all are found to be substantially contributing for the sustainable livelihood of the respondents and are the integral part of day to day livelihood activities, nutritional security and traditional lifestyle of tribal people in the area. Formulation of policies on sustainable livelihood of tribes ensured a number of rights and concessions for tribal people. Therefore the livelihood promotion among tribal people needs a paradigm shift focusing on pig production system to keep pace with sustainable development and poverty elimination in the area.

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