Socio-economic Status of the Livestock-rearers in the Flood-prone Districts of Odisha

Jeebanjyoti Behera[1*], Sujeet Kumar Jha[2], Maneesha Bhuyan[2]
and Aditya Kumar Malla[1]

[1]*Department of Extension Education, College of Agriculture, OUAT, Bhubaneswar, India.*
[2]*Division of Dairy Extension, ICAR-National Dairy Research Institute, Karnal, India.*

Authors' contributions

This work was carried out in collaboration among all authors. Author JB conceptualized the idea of the work, constructed the data collection instrument, analyzed the data, did the first reporting and collected the data. Authors SKJ and MB helped in managing the analyses of the study, searching the literature and interpreted the results. Author AKM assisted in the Data collection, editing and formatting the article. All authors read and approved the final manuscript.

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ABSTRACT

Flood has been found to be the most frequent to Odisha among all-natural calamities. Flood affects in same way to both humans as well as animal's life. Animals, those who survived from these floods are threatened by the non-availability of feed and shelter. Fodder fields are also completely destroyed like other agricultural crops. These feed deprived and shelter less animals are stressed and immune-suppressed, thus become susceptible to contagious diseases. The present study was conducted to know the socio economic status of the livestock-rearers under the given resources viz. demographic, physical, economic, flood-related information and social. Ex-post Research Design was followed for the present study.A total of 120 livestock-rearers were selected, using simple random sampling method from 8 villages of 4 blocks from the 2 Districts of the Odisha for the purpose of the study. The respondents of the study area were marginal farmers having average operational land holding of 0.11 hectare. It was found that 31.74 percent of the average income of respondents was earned from crop cultivation, 26.00 percent from livestock. All the respondents of

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*Corresponding author: E-mail: jeebanjyoti417@gmail.com;

the studied area had experienced flood events during the last 10 years, which means the flood is a regular annual event in studied district. This study throws light on the existing conditions of the farmers of the flood-prone districts of Odisha, which is very fragile and needs immense care.

1. INTRODUCTION

Flood is among the foremost important disasters which may destroy the entire physical and socio-economic environment that occurred almost in all part of the world [1]. Flood could also have occurred seasonally in the same portion within the world and sometimes suddenly occurred within the world due to physical phenomena and human factors [2]. Floods have the following characteristics: Long, short and no warning, depending on the type of floods (for example, flooding within parts of a major river may develop over a number of days or even weeks), speed or onset may be gradual or sudden; and there may be seasonal patterns of flooding [3]. Flood has been found to be the most frequent to Odisha among all-natural calamities. In Odisha, the whole coastal line of 482 Km is exposed to frequent flood and waterlogging in most of the years [4].The state is precipitated with around 80 per cent of the annual rainfall over a short monsoon period of 3 months, which also coincides with the main cropping season. Due to the flatness of the coastal plains, the slopes in the inlands are precipitous. This gives rise to heavy siltation, flash floods and poor discharge of floodwaters into the sea and thus the embankments are breached repeatedly [5]. Floods being the measure concern for Odisha, as large number of perennial rivers pass through the state. Heavy rainfall in the upper catchment area and/or the erratic rainfall in different districts of Odisha are the major concern for the incidence of major floods, which would damage standing crops, increase erosion and make productive lands waterlogged [6].

Livelihoods of the majority of farm households in the state are affected due to floods. High population habitats in the flood-prone coastal and delta regions, increased encroachment in the flood plains because of comparatively better livelihood opportunities and development are important contributors to the increased vulnerability of flooding [7]. The poor socio-economic condition of most people in the flood plains and the local economy being primarily dependent on the monsoon paddy adds up the vulnerability of the community [8]. The livestock-rearing is an integral part of the rural livelihood systems in Odisha. Livestock-holding in Orissa is owned mostly by the marginal/smallholders and the landless farmers. Even though productivity levels are very low, the livestock wealth of Odisha is impressive in numbers, across all species, constituting a natural resources base with immense livelihood implications [9].The livestock sector in Odisha has ample scope to substantially enhance the production to fulfil the domestic market demands, create employment and income-generating opportunities for the rural poor and enhance their food and livelihood security [10]. However, floods areregular annual feature in Odisha. Flood remains for about 5-15 days in many parts of coastal belts, thereby causing damage to life and properties as well as the crop fields; which is ultimately affecting the livelihood security of the victims [11]. The flood causes submergence of crop plants while restricting respiration and gaseous exchange; thereby ceasing all growth processes leading to death and decay. Furthermore, the crops are also damaged due to sand cast. [12]. Flood affects in same way to both humans as well as animal's life. Animals, those who survived from these floods are threatened by the non-availability of feed and shelter.Fodder fields are also completely destroyed like other agricultural crops. These feed deprived and shelter less animals are stressed and immune-suppressed, thus become susceptible to contagious diseases. Outbreaks of fatal diseases such as Hemorrhagic Septicemia (HS), Black Quarter (BQ) can occur which will further aggravate the death toll of livestock [13].

Socio-economic status (SES) is a combined measurement of the economic and social position of a person or a group in relevance to others within the society. It has a profound role in determining one's accessibility to the common resources, livelihood pattern, household food & nutritional security, etc. [14]. It also guides the psychological and behavioural components of a sample viz. knowledge, attitude, perception, adoption, change-proneness, level of aspiration, risk-bearing ability, economic motivation, etc. Considering all these issues, the present study was conducted to measure the socio-economic

status of the livestock-rearers based on five resources namely, demographic, physical, economic, flood-related information and social. The study investigates some of the most challenging and important outcomes of the impact of the flood on livestock-rearers.

2. MATERIALS AND METHODS

2.1 Study Area

The present study was carried out in the flood-prone districts of Odisha which was purposively selected, because these districts are most frequently exposed to flood-related disasters. Ex-post Research Design was followed for the present study. According to the Disaster Management Plan 2013 (Animal Development Sector), Odisha, Out of 30 Districts in the state, 17 districts are major flood-prone districts and 13 are minor-flood prone. From each category, one district was selected randomly. Thus, Dhenkanal and Balasore districts were selected from minor-flood prone districts and major-flood prone districts, respectively. From each selected district two blocks were selected using simple random sampling. Accordingly, Odapada and Gondia block from Minor-flood prone district (Dhenkanal); Bhograi and Jaleswar blocks from Major-flood prone district (Balasore) were selected, randomly, for the present study. Thus, the present study covered 4 blocks from two districts. From each block, two villages were selected, using simple random sampling. Hence, a total of eight villages were selected for the present study.

2.2 Selection of Respondents

A livestock-rearer, who has more than 10 years of experience in livestock rearing was considered as the respondent for the present study. Village-wise lists of livestock-rearers were prepared with the help of livestock enumerators of the respective villages. The household head was considered as respondents for the present study. Subsequently; 15 respondents from each village-wise lists of livestock-rearers were selected, using simple random sampling. Thus, the total sample size for the present study was One Hundred Twenty (120).

3. RESULTS AND DISCUSSION

3.1 Demographic Resources

Result portrayed in Table 1 states that the average age of the respondents of the study area

was 52.04 years, which signifies that the livestock-rearers have matured enough with regard to livestock-rearing experience. Working productivity of any activity is affected by age, which require physical energy. On the other hand, young farmers are considered to be more open minded and bold in trying to apply new technology for more agricultural output [15]. The average age of family members was 31.83 years which shows that the younger generation is higher in the family composition. The average formal education of the respondents was almost 7 years of schooling which means they were having a primary level of education. The average family education status was 8.86 years of schooling which shows a poor level of literacy. The education has a positive impact to farmers' skills in managing livestock during disasters like flood [16,17,18].

3.2 Physical Resources

The variables presented in Table 2 shows the access to physical resources of the farmers. Operational landholding was considered as the total land area held under single management for the purpose of cultivation. The respondents of the study area were marginal farmers having average operational land holding of 0.11 hectare. The cropping intensity of the studied area was 168.87 percent which means that more than 100 per cent of the area is under two crops in a year. The cropping pattern of the surveyed household highlights a diversified cropping pattern followed in an agriculture. Herd Size (Standard Animal Unit) was ascertained by direct questioning and quantified following the scoring pattern suggested [19] (Table 2.1). The herd composed of cattle (both indigenous and crossbred Cow), Buffalo and goat. Most indigenous Cow are non-descript and some are upgraded with Gir and Sahiwal. The productivity (milk) of both indigenous and crossbred Cattle (Cow) was 1.85 kg/day and 6.9 kg/day respectively which were very low. Similarly, the average productivity (milk) of Buffalo was 2.66 kg/day. The average meat of goat was 9.11 kg/animal.

3.3 Financial or Economic Resources

From Table 3, it is evident that the average annual income of the livestock-rearers was 78950.58 ☐. The farmers' income can increase through land expansion, farm productivity increases through optimal utilization of land potential, and the application of agribusiness concept in farming [20].The same table states

that 31.74 percent of the average income was earned from crop cultivation, 26.00 percent from livestock. The respondents of the study area had spent 16.70 per cent of total household's expenses on livestock-rearing. The dependent ratio among the respondents of the studied locale was 0.34. It was operationalized as the number of persons in the household dependent on the numbers of earning members(s) of the family. This variable was measured by following [21], as the ratio of the earners unit(s) of the family to the consumer unit(s) of the family. That meant 3 family members/dependent units depended on 1 earning family member/unit.

Table 1. Demographic resource profile of the livestock-rearers (n=120)

Variables	Mean	Standard Deviation
Average age of the respondents (years)	52.04	9.68
Average age of the family members	31.83	6.12
Average score of educational status of respondents	6.65	3.07
Average score of family education status of respondents	8.86	1.62

Table 2. Physical resources profile of the livestock-rearers (n=120)

Variables	Mean	Standard Deviation
Operational Land-holding(ha)	0.11	0.19
Cropping intensity (%)	168.87	17.87
Herd Size(Standard Animal Unit)	2.91	1.38
Livestock	**Breed**	
Indigenous cattle	Indigenous Non-Descript, Upgraded with Gir, Sahiwal, Binjharpuri	
Crossbred Cattle	Holstein Cross-Bred, Jersy Cross-Bred	
Buffalo	Non-Descript	
Goat	Black Bengal	
Productive performance of the Herd	**Mean**	**Standard Deviation**
Indigenous Cattle(Cow)milkproductivity (kg/day/animal)	1.85	0.64
Indigenous Cattle(Cow) lactation days (days/animal)	272.43	11.24
Cross Bred Cattle (Cow)milkproductivity (Kg/day/animal)	6.9	1.14
Cross Bred Cattle(Cow) lactation days (days/animal)	287.13	13.26
Buffalomilk productivity (kg/day/animal)	2.66	0.24
Buffalo lactation days (days/animal)	277.25	14.15
Goat meat (Kg/animal)	9.11	0.54

Table 2.1. Categories of livestock and its score

Sl.No.	Categories of livestock	Score
1.	Cattle in milk- indigenous	1.00
	-Crossbred	1.19
2.	Cattle-heifer- indigenous	0.65
	-Crossbred	0.85
3.	Dry adult cattle-indigenous	0.80
	- Crossbred	0.85
4.	Young cattle stock- indigenous	0.40
	-Crossbred	0.48
5.	Oxen and bulls	1.26
6.	Buffalo in milk	1.26
7.	Buffalo-heifer	0.69
8.	Dry adult buffalo	1.01
9.	Goat/sheep	0.10

Table 3. Financial or economic resources profile of the livestock-rearers (n=120)

Variables	Mean	Standard Deviation
Average Annual Income of the respondents	78950.58	11068.66
Proportion of income from Crop	31.74	12.49
Proportion of Income from Livestock	26.00	17.56
Proportion of total household expenditure towards livestock	16.70	10.72
Dependent Ratio	0.34	0.11

Table 4. Flood-related information resources profile of the livestock-rearers (n=120)

Variables	Frequency	Percentage
Experienced flood events (In last 10 yrs)	120	100.00
Having flood-related Information	120	100.00
Sources of flood-related Information	Radio, Television, Newspaper, Village gram panchayat and Fellow farmers	

Table 5. Social resources profile of the livestock-rearers (n=120)

Variables	Frequency	Percentage
Respondents having social migration	85	62.50
Social Participation of the family members	51	42.50
Respondents having Extension Contactfrom any source	120	100.00
Respondents having assistance received from External Agency	112	93.33
Respondents having farmer-to-farmer extension	108	90.00

3.4 Flood-related Information Resources

Table 4 vividly portrays that all the respondents of the studied area had experienced flood events during the last 10 years. Flood-related information can help farmers better manage risk, making the most of favourable climatic conditions while protecting their livelihoods from flood events. Table 4 shows that all the farmers used to get readily available and reliable climatic information. Also, Table 4 portrays the various sources of flood-related information such as radio, television, newspaper, village gram panchayat and fellow farmers. It also highlights that the farmers mainly seeks information regarding weather forecast, rainfall.

3.5 Social Resources

It was found that 62.50 percent respondents' any family member had migrated to cities in search of employment. The average number of days migrated by the members of family was around 287 days. The migrated family members generally returned back to their homes during the crop season and engaged themselves in farming. Most of their places of migration were Kolkata, Chennai, Gujarat, Bangalore, and Bihar. Table 5 shows the social migration of the respondents. Social Participation measure the involvement of the respondents in formal or informal social organization (Gram Panchayat, Self Help Groups, Farmers' Club etc.) as the members or as office bearers, this variable was being used. Table 5 shows that 42.50 per cent respondents of the study area were either member or office bearer in any formal or informal social organization. To measure the degree of exposure of the farming community to various extension workers/agencies for getting the proper information regarding crop cultivation, livestock rearing, and other aspects of agriculture as well as the adaptation strategies to combat the impact of flood challenges, It was noted that speedy and effective technology transfer and information dissemination is possible through regular extension contact. Table 5 depicts that all the respondents (100%) were having some form of extension contact round the year. In order to measure the assistance received from the external community organization an attempt was made to study this variable. This variable explores the type and number of organization and their assistance to the farming community. Table 5 vividly describes that 93.33 percent of the respondent received assistance in terms of financial support, critical farm input, demonstration, vaccination to animals, Feed and Fodder distribution and training from the external agencies. The external agencies that render

service were various organizations like Central and State Government. Department, KrishiVigyan Kendra (KVK), NGOs (Non-Governmental Organisations), etc. Farmers learn many things from their experiments and their fellow farmers adapt these successful experiments for the development of their farm. Results presented in Table 5 represents that 90.00 percent of the respondents used to get information from their fellow farmers regarding various livestock-rearing practices.

4. CONCLUSION

All the livestock-rearers involved in the growing of crops, as well as the rearing of livestock, are aware of regarding changing impact of flood scenario. This study has upheld the socio-economic condition of the livestock-rearers based on the various resources they have like demographic, physical, financial, flood-related information and social. This study reveals that average formal education of the respondents was almost 7 years of schooling which means they were having a primary level of education, which need to be improved. The respondents of the study area were marginal farmers having average operational land holding of 0.11 hectare. It was found that 31.74 percent of the average income of respondents was earned from crop cultivation, 26.00 percent from livestock. All the respondents of the studied area had experienced flood events during the last 10 years, which means the flood is a regular annual event in studied district. The policymakers both at the state and district levels lack clarity and awareness about the local impacts of the flood. Many times it has been noticed that the local institutions, both formal and informal, have been largely unable to communicate their needs, demands, and challenges to the formalized state institutions that determine policy for this studied area. Thus, this study throws light on the existing condition of the farmers of the flood-prone districts of Odisha, which is very fragile and needs immense care. The policymakers should keep these socioeconomic status in mind while formulating any strategies for the livestock-farmers in the flood-prone districts of Odisha.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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