LOCATION-WISE VARIATION WITH RESPECT TO LIVELIHOOD SECURITY OF FARMERS IN SUNDERBANS REGION OF INDIA: AN EXTREME WEATHER EVENT PERSPECTIVE

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ABSTRACT

Sundarban region of India faces extreme weather events almost every year. Due to these natural calamities, the livelihood security status of the farming community in Sunderbans is vulnerable. To assess the socio-spatial variation in livelihood security status of Sundarban region one study has been conducted in 6 blocks of Sundarban region by involving 1200 respondent farmers. One livelihood security index was developed under the study. From the study it has been found that Namkhana block has relatively better livelihood security status when compared to other blocks. Hingalganj block has scored lowest livelihood security status in almost all the parameters of livelihood security index. From the study it can be concluded that, as there were variation in livelihood security in different blocks; while formulating social security schemes, the most vulnerable section of the society as well as the areas with comparatively low livelihood security scores should be given priority.

Keyword: Livelihood Security, Extreme Weather Events, Sunderbans, Nutritional Security.

I.   INTRODUCTION

Sundarban region of India is located in southern most part of West Bengal state and the region faces severe cyclonic storms in almost every year. Due to these natural climatic disasters, the farming community residing in that area suffers serious physical, economic and psychological damage in almost every year. As a result of low economic status as well as vulnerable status of livelihood security, the farming community of Sunderbans region is deeply distressed. If rural livelihoods are no longer secure, farm families are finally forced to abandon agriculture (Keshavarz et al., 2017) There are 19 blocks in Sundarban region and almost all the blocks suffer the serious consequences of these disastrous climatic conditions. Farming community of Sundarban region had developed many coping up strategies but many of them were not well acquainted with modern agricultural sciences. Introduction of appropriate farming systems is going to be one of the important approaches to achieve better growth in agriculture and securing livelihoods of major segment of society (Harishkumar et al., 2016). Keeping in view all the above points one study has been conducted to find out the level of variation in different locations with respect to livelihood security. The concept of livelihood as given by Chambers and Conway (1992) was, livelihood encompasses the capabilities, assets and activities required for a means of living. The concept of farmer's perception towards livelihood security is central to the development strategies (Kumar and Rai, 2021). For formulating development strategy, the livelihood status of particular locality must be studied thoroughly and livelihood index can act as the tool of measuring livelihood. The sustainable livelihood security (SLS) index therefore provides a useful means of identifying the existence of the conditions necessary for sustainable livelihood or sustainable development (You and Zhang, 2017). Krishna et al. (2020) revealed that, the measurement of sustainability in terms of social, economic, and ecological indicators significantly influences the achievement of sustainable development goals. The current study tried to throw light on livelihood security disparities among farming community with respect to their situation which can guide in formulating effective social development schemes.

II.   METHODOLOGY

The study has been conducted in Sundarban region of India which is located in 2 southern most districts of West Bengal state namely South 24 Parganas and North 24 Parganas. A total of 19 administrative blocks comes under Sundarban region. Out of that those 19 blocks, 6 blocks were selected for the study. One livelihood security index was developed by involving the following dimensions: Nutritional security (17 items under the

dimension), Economic Security (21 items under the dimension), Health security (18 items under the dimension), Social Security (15 items under the dimension), Educational security (13 items under the dimension), Institutional Security (11 items under the dimension) and Infrastructural security (15 items under the dimension). All the statements were having either 'Yes' and 'No' response. For 'Yes' response 1 value was assigned and for 'No' response '0' value was assigned. The index for each farmer was calculated by following formula,

$$LSI=\frac{\sum_{i=1}^{17} NSi+\sum_{i=1}^{21} ESi+\sum_{i=1}^{18} HSi+\sum_{i=1}^{15} SSi+\sum_{i=1}^{13} EdSi+\sum_{i=1}^{11} InstSi+\sum_{i=1}^{15} InfrSi}{J}\times 100$$

Where, LSI= Livelihood Security Index, NS=Nutritional security, ES= Economic Security, HS= Health security, SS=Social Security, EdS=Educational security, InstS= Institutional Security, InfrS= Infrastructural security and J= Total number of statements in the index

The index was pretested in non sample area. After formulating and validating the livelihood security index it has been in used for primary data collection in Sundarban region. The data has been collected by using one structured interview schedule. For the study, six blocks out of 19 blocks in Sundarban region was selected randomly. From each block response from 200 randomly selected farmers were recorded. The total number of respondents under the study was 1200 farmers.

III.   RESULTS AND DISCUSSION

Table 1: Variation in livelihood security score according to different blocks

Name of the block	N	Mean livelihood score
Kakdwip	200	47.93 [a] ±0.77
Namkhana	200	55.79 [b] ±0.92
Pathar Pratima	200	50.56 [b] ±0.62
Sagar	200	48.63 [a] ±0.52
Hingalganj	200	36.80 [c] ±0.34
Gosaba	200	40.15 [d] ±0.40
Overall	1200	46.64±0.32
F-value	123.67	
P- Value	<.01	

(Similar superscript suggest no significant difference)

From the table 1, it can be seen that the livelihood security scores varied in different blocks significantly. The highest livelihood security score of 55.79 ±0.92was observed in Namkhana block whereas the lowest livelihood security score was observed in Hingalganj block which was 36.80 ±0.34. This suggested that, as Namkhana block is well connected with the state capital of Kolkata and as a result of that different livelihood option has flourished in that block, whereas, remotely located Hingalganj and Gosaba block has comparatively low livelihood security. From the table 1, it can be concluded that the location as well as the accessibility of basic infrastructure had an impact on the livelihood security.

Table 2: Block wise mean score of respondents with respect to different dimensions of Livelihood security

Block	Nutritional Security	Economic Security	Health Security	Social Security	Educational Security	Institutional Security	Infrastructural Security
Kakdwip	49.47[a]±1.07	49.95[a]±0.93	47.33[a] ±0.78	42.73[a]±0.96	51.50 [a] ±1.03	39.95 [ac] ±1.44	54.53[a]±0.85
Namkhana	55.12[b]±1.61	55.60[b]±0.95	56.86[b] ±0.86	51.23[b]±1.59	58.50 [b] ±1.11	50.41 [b] ±1.29	62.83[b] ±1.01

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Pathar Pratima	48.26[a] ±0.96	56.45[b] ±0.90	52.92[c] ±0.70	48.33[c]±0.91	48.31[cd] ±0.81	38.55[c]±0.80	61.10[b] ±1.01
Sagar	61.38[c]±1.32	55.67[b] ±0.86	46.67[a] ±1.00	44.73[a]±1.10	50.54 [ac] ±0.94	47.73[b] ±1.17	33.67[c]±0.82
Hingalganj	30.41[d]±0.65	45.40[c] ±0.86	41.58[d]±0.59	30.40[d] ±0.55	48.04[cd] ±0.74	42.14[a] ±0.60	19.63[d]±0.73
Gosaba	49.35[a] ±1.11	49.48[a]±0.76	48.00[a] ±0.69	30.57[d] ±0.63	46.92[d]±0.53	40.27 [ac] ±0.77	16.47[e]±0.47
Overall	49.00±0.55	52.09±0.38	48.89±0.35	41.33±0.48	50.63±0.38	43.17±0.45	41.37±0.65
F- Value	79.87	25.95	46.23	76.45	22.73	20.43	627.40
P Value	<.01	<.01	<.01	<.01	<.01	<.01	<.01

(Similar superscript suggest no significant difference)

From the table 2, it is evident that all the parameters for livelihood security has been varied significantly within different blocks of the study area. In case of nutritional security the highest score was observed in Sagar block (61.38±1.32) followed by Namkhana block (55.12±1.61) and the lowest nutritional security score was observed in case of Hingalganjn block (30.41±0.65). As the farmers of Sagar block diversified their farming operations, the nutritional security was much higher than other blocks but in case of Hingalganj block due to its remote locality as well as less awareness level of farming community about scientific farming practices resulted in low nutritional security. As Wang et al. (2016) opined that assessment of sustainable livelihoods is a crucial prerequisite for targeting interventions, the findings of the study can guide to prioritise the intervention in the mostly needed block at the first place. In case of economic security, it has been found that three blocks namely Namkhana, Pathar Pratima and Sagar have good economic security score with 55.60±0.95, 56.45 ±0.90 and 55.67±0.86, respectively; whereas Hingalganj block lacked in this aspect also with economic security score of 45.40 ±0.86. Pradhan et al. (2020) reported that, the risk of livelihood failure determines the level of vulnerability of a household to income, food, health, and nutritional insecurity. Thus it can be said that, the status of Hingalganj block is more vulnerable than other blocks of Sundrabans with respect to livelihood security. The health security status was found to be highest in Namkhana block (56.86 ±0.86). Institutional (58.50 ±1.11) as well as infrastructural security status (50.41 ±1.29) was found to be highest in Namkhana block which inturn helped in development of other parameters of livelihood security. That was evident from the fact that, social security (51.23 ±1.59) and educational security (58.50 ±1.11) status of Namkhana block was highest among all the blocks. Thus, from the table it can be concluded that the blocks which are having good infrastructural and institutional security also performed well in other aspects of livelihood security parameters.

IV.   CONCLUSION

The research findings of the study revealed that, livelihood security of the most vulnerable section of the society should be given priority while formulating any developmental project. The farming community especially farmers who belong to Scheduled Caste or Scheduled Tribe community faced severe problems due to their low livelihood security status. The impact of extreme weather events is much more serious in those vulnerable sections of society. On the other hand, some blocks of the study area found to have good livelihood security status where as some of them were having very poor livelihood security status. The blocks which were having low livelihood security status should be given priority while developing any social sector project.

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