

Explore the Impact of Livelihood Diversification on the Bedia Women in Hingalganj Block in Indian Sundarbans, West Bengal

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Abstract: Five types of capital, including physical, natural, human, financial and social capital, constitute livelihood. The livelihood capitals change determined the socio-economic condition of Bedia women. The main purpose of the study is to observe the livelihood capital change. It further analyses the impact of these changes on Bedia women in Indian Sundarbans. Based on the survey, 122 Bedia women's livelihood capital change measured using the livelihood capital index. Moreover, the multiple linear regression model has been used for empirical analysis of the impact of livelihood capital change from 2001 to 2023. The findings of the study show that the total livelihood capital index value was 0.6983 in 2001 and 0.6930 in 2023. The average livelihood capital value decreased in the study period. The impact of these changes on livelihoods is notable. Mainly, human capital, financial capital and natural capital mostly impacted occupation, economic condition, food intake capacity and health status of Bedia women. Finally, on the basis of the findings, some suggestions are proposed from the observations of livelihood capital.

Keywords: Livelihood Capital Index, Bedia Women, Multiple Linear Regression, Sundarbans.

I. INTRODUCTION

Tribal people are naturally descended, and nature shapes their lives. They have lived in a way that is clearly different from dominant and mainstream civilisation for many generations (Ramya et al., 2017). The Bedia is also this kind of tribal community in the States of Bihar, Jharkhand and West Bengal. According to the 2001 census (Census of India 2001), the total Bedia population is 55,979, which is 1.3% of the total tribal population in the State of West Bengal. In 2011, their population grew noticeably to 88,772. Remarkably, their population grew by a whopping 58.58% in only one decade. This rate is well above the all-India average of 49.7% but below the State average of 63.8%. In West Bengal, the Bedia community is mainly found in North 24 Parganas and South 24 Parganas districts, which form the Indian Sundarban region (Bandyopadhyay, 2019). In tribal culture, women have an important role in maintaining their household activities and economy (Dhanasree et al., 2014). So Bedia women also maintain these activities. They are the main breadwinners of their family. The livelihood of the Bedia family significantly depends on the Bedia women. The term "livelihood" refers to the systematic process of earning a living based on capacity, capital, and useful endeavours (Ahmed, 2018). The livelihood is made up of a variety of assets, tactics, pursuits, and other elements universally needed for survival (Chambers and Conway, 1992). The idea was broadened by the 1992 United Nations Conference on Environment and Development (UNCED, 1992), particularly in light of Agenda 21, which promoted the idea that attaining sustainable livelihoods may be a general objective for reducing poverty (Sati and Vangchhia, 2017). The DFID (1999) sustainable rural livelihoods framework (Carney, 1998) proposes three variables for livelihood strategies, and livelihood capitals are the most important variable. Behind livelihood diversification, there are many ways, including contemporaneous, temporal, and spatial diversification (Goulden et al.,

2013). The inter-relationship between capitals and socio-economic conditions demonstrates the ground conditions (Mahdi et al., 2008). The spatial diversification shows the changes in livelihood from place to place, and temporal change shows the changes in livelihood over time. There is a relationship between livelihood change and its impact on Bedia women. In the study area, the livelihood capital index value was 0.6983 in 2001 and 0.6930 in 2023.

Hence, the present study examines livelihood diversification and its impact on Bedia women. This research analyses the various responsible livelihood capitals which is impacted on the target people in Hingalganj block in the Indian Sundarbans region in West Bengal.

II. OBJECTIVES OF THE STUDY

1. To examine the changes in livelihood capitals of Bedia women
2. To identify the impact of livelihood change on Bedia women in the study area

III. METHODOLOGY

3.1 Study Area and Sampling

Sundarban is divided into two parts: Bangladesh Sundarban and Indian Sundarban. Indian Sundarban comprises 19 community development (C.D.) blocks, and it lies between 21°40'00"N to 22°40'00"N latitude and 88°03'00"E to 89°07'00"E longitude approximately. The area is exposed to threats like floods, cyclones and sea-level rise.

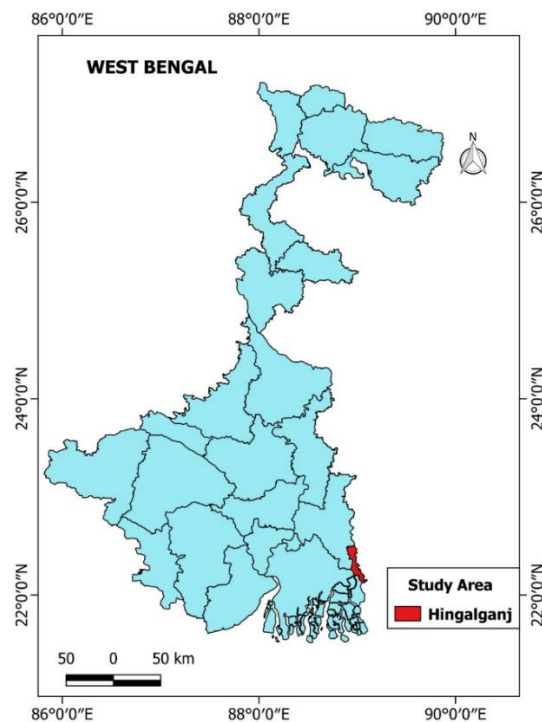


Fig.1: Location Map of the Study Area

The present study area is Hingalganj C.D. block, which is situated in North 24 Parganas. Bedia community people have been living in this region since the reclamation phase of the Sundarbans (Figure 1). This C.D. block has been purposefully chosen considering the majority of the Bedia women population and various socio-economic variables. This research is mainly based on the primary survey. A structured questionnaire has been used for primary data collection, and the questions have been raised mainly on the changing patterns of livelihood capital and its impact on the Bedia women during the 2001 to 2023 period. The total number of surveyed households is 122. It has been surveyed in the age of 40 to 55 years old of Bedia woman.

At the same time, some secondary data have been obtained from the Gram Panchayat (GP) Office, BDO Office (Hingalganj C.D. Block), District Statistical Handbook, 2013 (North 24 Parganas and South 24 Parganas), Statistical Abstract, West Bengal, 2011, District Human Development Report, 2009 (North 24 Parganas) and other related research articles.

Finally, data have been tabulated, arranged and represented as necessary.

3.2 Methods

This research study primarily assessed the level of Bedia women's livelihood capital change and its impact from the period of 2001 to 2023. To find out the livelihood capital value Livelihood Capital Index through the entropy method and to analyse the impact of livelihood change, multiple linear regression model was used. QGIS-3.1.2 and SPSS-26.0 software were used to prepare maps and data analysis.

IV. RESULT AND DISCUSSION

4.1 Changes in Livelihood Capital Index

Livelihood Capital Index (LCI) value shows the actual socio-economic condition of Bedia women in this study area. The value has changed over the period from 2001 to 2023. For the analysis of the LCI value, twenty indicators related to five types of capital have been framed. In Rupmari village, the LCI value was 0.5079 in 2001, which increased to 0.5205, whereas the LCI value of Jogeshganj village decreased from the value 0.7794 to 0.7739. The LCI value of Kalitala village has also decreased. The value was 0.8076 in 2001, which decreased to 0.7848 in 2023. The overall change in the LCI value is from 0.6983 to 0.6930, which also indicates the declination of livelihood conditions (Table I).

TABLE I: LIVELIHOOD CAPITAL INDEX IN HINGALGANJ

Sl. No.	Name of the Village	2001	2023
1	Rupmari	0.5079	0.5205
2	Jogeshganj	0.7794	0.7739
3	Kalitala	0.8076	0.7848
Average		0.6983	0.6930
Source: Compiled by the Researcher from Field Survey, 2024			

4.2 Impact of the Diversification of Livelihood Capitals on the Bedia Women in Hingalganj Block

Changing LCI values have an impact on the socio-economic condition of Bedia women in this study area. Every individual livelihood capital has a pivotal role in this. In this study, it has been identified that livelihood capital has a specific effect on occupation, economic condition, food intake and health status of the Bedia women. This has been discussed using multiple regression analysis. The equation is;

$$Y_i = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

Where,

i = 1, 2, 3 ...122;

a= Y-intercept

b = slope of the line

Y_i =Dependent Variable

X_1 = Natural Capital

X_2 = Physical Capital

X_3 = Human Capital

X_4 = Financial Capital

X_5 = Social Capital

4.3 Impact of Livelihood Capital on the Occupation in Hingalganj Block

In Hingalganj block, the occupation of the Bedia women is not in respected condition. In this area, most of the Bedia women are engaged in daily labour (43.44%), and 22.13% of the Bedia women are not engaged in any work and are fully financially dependent on their husbands and children. Therefore, occupation is influenced by livelihood capital, which is measured using multiple regression analysis.

TABLE II: IMPACT OF CHANGING LIVELIHOOD CAPITALS ON OCCUPATION

Variable	Unstandardized Coefficients		Standardized Coefficients	t-Statistic	Sig.
	B	Std. Error	Beta		
Occupation (Y _i)	8.087	4.976		1.625	.107
Natural Capital (X ₁)	-.045	.347	-.012	-.130	.896
Physical Capital (X ₂)	-.128	.324	-.039	-.396	.693
Human Capital (X ₃)	5.310	.171	.064	1.644	.042*
Financial Capital (X ₄)	-4.499	.302	-.062	-2.660	.031*
Social Capital (X ₅)	-.152	.341	-.042	-.446	.656
R-squared	.610				
Adjusted R-squared	-.433				
F-Statistic	5.228				.045*
Source: Compiled by the Researcher from Field Survey, 2024					

Dependent Variable: Occupation (Y), * p<0.05, *Significant at 5% level

In Hingalganj C.D.block, the occupation is influenced by the various livelihood capitals. As per the result, the R-squared value has been found to be 0.610 that 61% of the variance has been explained by the explanatory variables. The adjusted R-squared has been found .433 and the F-statistic is 5.228, which is significant at 5% level of significance. It also shows that the relationship between livelihood capital and occupation which are statistically significant. Among the five capitals, only financial capital and human capital mostly control the occupation of the Bedia women, and it is statistically significant at 5% level (Table II). The results indicate the improvement of occupation through access to financial capital and human capital.

4.4 Impact of Livelihood Capital on Economic Condition in Hingalganj Block

In this area, the economic condition is not better due to the geo-environmental location. As access to livelihood capital is not at a satisfactory level, the work opportunity is low. For this reason, the source of income is limited; as a result, the economic condition is not better. The economic condition of Bedia women mainly depends on access to livelihood capitals. The capitals which are significantly impact the economic condition of respondents have been discussed below through the multiple regression model.

TABLE III: IMPACT OF CHANGING LIVELIHOOD CAPITALS ON ECONOMIC CONDITION

Variable	Unstandardized Coefficients		Standardized Coefficients	t-Statistic	Sig.
	B	Std. Error	Beta		
Economic Condition (Y _i)	1583.422	2351.930		.673	.502
Natural Capital (X ₁)	-19.732	164.115	-.011	-.120	.905
Physical Capital (X ₂)	111.032	153.058	.072	.725	.470
Human Capital (X ₃)	-66.017	80.627	-.081	-2.819	.041*
Financial Capital (X ₄)	154.424	142.622	.101	3.083	.021*
Social Capital (X ₅)	1583.422	2351.930	.325	.673	.502
R-squared	.520				
Adjusted R-squared	-.423				
F-Statistic	3.465				.032*
Source: Compiled by the Researcher from Field Survey, 2024					

Dependent Variable: Economic Condition (Y), * p<0.05, *Significant at 5% level

Table 3 shows that the R-squared value is 0.520 that 52% of the variance has been explained by the explanatory variable. The adjusted R-squared has been found .423 and the F-statistic is 3.465, which is significant at 5% level of significance.

As per the survey, there is a significant relationship between the independent variable (livelihood capitals) and the dependent variable (economic condition). The livelihood capitals are positively correlated with economic condition, which is at 5% significance level (p=0.03<0.05). In this area, financial capital is the most influential factor of the economic condition of the Bedia women. Similarly, human capital is the second most controlling factor of economic condition. It is indicating that better economic conditions have been found for the respective access to financial capital and human capital.

4.5 Impact of Livelihood Capital on Food Intake in Hingalganj Block

In Hingalganj block, most of the Bedia women suffered from insufficient food because of their poor economic condition. So they did not take a proper meal per day. Therefore, livelihood capitals impacted food intake, as determined by multiple regression analysis.

TABLE IV: IMPACT OF CHANGING LIVELIHOOD CAPITALS ON FOOD INTAKE

Variable	Unstandardized Coefficients		Standardized Coefficients	t-Statistic	Sig.
	B	Std. Error	Beta		
Food Intake (Y_i)	5.592	1.302		4.296	.000
Natural Capital (X_1)	-4.846	.091	-.146	-1.610	.031*
Physical Capital (X_2)	.050	.085	.057	.589	.557
Human Capital (X_3)	3.760	.045	.131	2.340	.033*
Financial Capital (X_4)	-.009	.079	-.010	-.112	.911
Social Capital (X_5)	-.006	.089	-.007	-.072	.942
R-squared	.548				
Adjusted R-squared	.407				
F-Statistic	2.172				.040*

Source: Compiled by the Researcher from Field Survey, 2024

Dependent Variable: Food Intake (Y), * $p < 0.05$, *Significant at 5% level

In Hingalganj block, the livelihood capitals significantly influence the food intake capacity of the Bedia women, which are positively correlated at 5% level of significance. Among the five capitals, natural capital is the most important capital which control to the food intake capacity of the Bedia women. Moreover, human capital is another most important that influence to the food intake in Hingalganj block.

According to the multiple regression analysis, the R-squared value is 0.548, which is about 54% of the variance in food intake, and it is explained by the livelihood capital variables, where the adjusted R-squared value is 0.407. The value of the F-statistic is 2.172, which is significant at 5% significance level ($p = 0.040 < 0.05$) (Table 4).

4.6 Impact of Livelihood Capital on Health Status in Hingalganj Block

In Hingalganj Block, the health status of the Bedia women is influenced by five livelihood capitals such as natural capital, physical capital, human capital, financial capital and social capital. Among these capitals, the main responsible capitals have been determined by the multiple regression model. The results have been discussed below.

TABLE V: IMPACT OF CHANGING LIVELIHOOD CAPITALS ON HEALTH STATUS

Variable	Unstandardized Coefficients		Standardized Coefficients	t-Statistic	Sig.
	B	Std. Error	Beta		
Health Status (Y_i)	2.337	.935		2.500	.014
Natural Capital (X_1)	.056	.065	.078	.852	.396
Physical Capital (X_2)	.037	.057	.061	.654	.514
Human Capital (X_3)	-4.031	.032	-.094	-1.953	.034*
Financial Capital (X_4)	5.098	.061	.158	2.614	.029*
Social Capital (X_5)	.005	.064	.007	.073	.942
R-squared	.735				
Adjusted R-squared	-.606				
F-Statistic	3.851				.048*

Source: Compiled by the Researcher from Field Survey, 2024

Dependent Variable: Health Status (Y), * $p < 0.05$, *Significant at 5% level

As per data table v, there is a significant relationship between the independent variable (livelihood capitals) and the dependent variable (health status). In Hingalganj block, financial capital and human capital are the most controlling factors of health status, which is at 5% significance level ($p = 0.048 < 0.05$). Financial capital is the most dominant factor of health status, which is statistically significant at 5% level ($p = 0.029 < 0.05$). Here, health condition is not in the expected condition because of low access to financial capital. Thus, it is detected that human capital is mostly influence to the health status which is significant at 5% level ($p = 0.034 < 0.05$).

The R-squared value is 0.735, which is about 73% of the variance in the health status, and it is explained by the livelihood capital variables. Thus, the adjusted R-squared value is 0.606. The value of the F statistic is 3.851, which is significant at 5% level ($p=0.048<0.05$) (Table 5).

V. CONCLUSIONS

The study reveals that livelihood capital is the most important element for determining the socio-economic condition of Bedia women. Access to livelihood capital has changed their lifestyle as well as standard of living. Moreover, these livelihood capitals significantly impact the occupation, source of income, food capacity and the health status of the Bedia women. Among these capitals, human capital and financial capital significantly impacted on occupational structure, economic condition and the health status of the Bedia women, whereas natural capital and human capital influenced food intake capacity. Therefore, it is vital to train and alert women to changes in livelihood and how they improve their socio-economic condition through more access to livelihood capitals. The socio-economic condition may be improved through the enhancement of work opportunities, increase the availability of drinking water, preservation of rain water for agriculture.

Conflict of Interest

The researchers declared no conflict of interest in this paper.

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