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Livelihood Capital Assets and Sustainability: A Case Study of Selected Villages of Sundarban, India

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Abstract: In marginalized, ecosystem-dependent rural communities, access to livelihood capital is essential for achieving sustainability. This research aims to critically evaluate the current state of livelihood capital assets in the specified rural regions, recognizing that rural communities depend on various activities and access to productive resources. Sustainable livelihood capitals include physical, natural, financial, social, and human assets. The study analyzed the current status of these assets and their sustainability in selected villages within the Gosaba and Hingalganj Blocks, located on the fringe of the Sundarbans. The impact of livelihood capitals on advancing sustainability was assessed using a normalization score based on a sample of 160 households from each study area, selected through cluster random sampling. The sustainability levels of livelihood capitals were examined using the Prescott-Allen method (2001). The five sustainability categories proposed by Prescott-Allen (Unsustainable, Potentially Unsustainable, Moderate, Potentially Sustainable, and Sustainable) were used to evaluate the assets. Results showed that human capital generally remains at a moderate level, while financial capital often appears unsustainable in these regions. This emphasizes the need for targeted interventions. Natural capital in villages like Pakhiralay, Mathurakhand (Gosaba CD Block), and Madhabkati, Samsernagar (Hingalganj CD Block) was found to be relatively potentially sustainable. Conversely, villages such as Satjelia, Kumirmari, and Lahiripur (Gosaba CD Block), along with Jogeshganj (Hingalganj CD Block), were classified as moderately sustainable in terms of natural capital. Social capital in the villages of the Hingalganj CD Block showed moderate levels. In contrast, most villages in the Gosaba CD Block exhibited moderate social bonds characterized by collective activities and resource sharing. Physical capital varied from moderate to potentially sustainable across the selected villages. The village-level Sustainability Index (SI) indicated that Mathurakhand (1.159) and Samsernagar (1.010) had notably high SI scores (the maximum possible SI being 5.000), followed by Pakhiralay, Satjelia, and Hemnagar, which had moderate scores. The study concludes that evaluating asset portfolios related to livelihoods provides a standardized approach to understanding the socio-economic conditions of rural communities. The findings highlight issues such as low capital formation, insufficient investment, and vulnerability to natural disasters, underscoring the need for policies that promote livelihood diversification and create new employment opportunities.

Keywords: Livelihood Capital Assets; Sustainability,Sustainability Index (SI), Prescott-Allen Framework, Multiple Regression

1. Introduction

Robert Chambers and Gordon Conway officially introduced the concept of Sustainable Livelihoods in 1991. According to Chambers and Conway (1992), the Sustainable Livelihoods approach emphasizes five key types of household assets: natural, social, financial, physical, and human capital. These are often called livelihood capital assets, which can either limit or enhance livelihood opportunities (Serrat, 2008). This approach supports community development programs (United Nations General Assembly, 1997) and provides a framework for understanding complex rural livelihood systems (Tavakoli et al., 2017). To empower and improve the livelihoods of rural households, implementing comprehensive rural development policies is essential (Jiao et al., 2017). The Sustainable Livelihoods Approach (SLA), regarded as an asset-based method, currently offers detailed and integrated assessments of vulnerability to various influences (Kelly & Adger, 2000; The Task Force on Climate Change, Vulnerable Communities, and Adaptation, 2003; Scoones, 2004). In developing countries, the Sustainable Livelihood Framework helps identify individuals' livelihoods based on their capital and assets (Weldegebrial, 2012). The asset-based approach is rooted in a "bottom-up" perspective, emphasizing resource mobilization at the micro-level rather than the macro level (Knutsson & Ostwald, 2006). According to basic microeconomic principles, the values of different capitals are non-substitutable (Pindyck & Rubinfeld, 2001). However, the value of one capital can be complementary, meaning it increases or decreases in relation to another. To better understand sustainable livelihoods, both substitution and complementarity must be evaluated (Scoones, 1998). Ignoring livelihood capital in rural areas makes achieving sustainable rural livelihoods impossible (Sajasi Gheidari et al., 2016). Households and their access to livelihood capitals are crucial in assessing development, especially in rural areas of developing countries (Barimani et al., 2016). Dehghani Pour et al. (2018) studied how livelihood capitals influence livelihood strategy choices within the Hara Biosphere Reserve. Their findings showed that financial, social, and human capitals had a significant and positive impact on the selection of commercial and mixed strategies, while physical assets supported fishery or livestock strategies. Similar research by Forouzani et al. (2017) among Karun farmers found that their social capital was above average, natural capital was moderate, and human, physical, and financial capitals, along with overall assets, were below average. Udoh et al. (2017) documented the sustainable livelihood assets of farming households in Nigeria's southern region, discovering that these households possessed sufficient physical, social, and natural assets but lacked financial and human assets.

The complexities surrounding the sustainability of livelihood capitals in economically disadvantaged rural communities are multifaceted, requiring an understanding of how different types of capital—natural, social, human, financial, and physical—interact. Each type serves a specific role in supporting livelihoods. Studies from various regions highlight the importance of these capitals in achieving sustainable livelihoods. For example, an assessment of rural households' livelihood sustainability in the Migori River watershed in Kenya used a Livelihood Sustainability Index (LSI), which revealed high levels of social,

physical, and natural capital but low levels of human and financial capital. This indicates a need for targeted efforts to improve these specific areas (Opiyo et al., 2023). Likewise, in the Gosaba block of Sundarban, India, livelihood capital's sustainability was below average, with little progress in human capital, pointing to the need to strengthen financial, social, and physical capitals to improve access to forest-based resources (Das & Das, 2023). In Dena County, Iran, clear disparities were seen in livelihood capitals, with social capital being more sustainable than the weaker financial and natural capitals, emphasizing the importance of strategic regional planning (Sharifi et al., 2019). In China, research linking livelihood capital to resilience found that boosting social, physical, and financial capitals could significantly enhance resilience, while human capital has an indirect effect by influencing coping strategies (Ma et al., 2024). Additionally, the sustainability of livelihood capital has been linked to reducing rural-urban income gaps, with studies in China showing that increasing livelihoods capitals can effectively lessen this inequality (Wu et al., 2024). Livelihood capitals—covering natural, human, financial, physical, and social resources—generally determine access to resources (Costanza et al., 2014; Fisher et al., 2014). As Nowrozi and Hayati (2015) note, building and maintaining sustainable livelihoods for rural households requires a thorough assessment of current conditions, especially from the perspective of household heads. This study aims to evaluate the current state of livelihood capital assets in the designated area. Rural communities depend on a variety of activities to meet their basic needs, which requires access to productive resources, emphasizing the importance of resource availability for shaping livelihood strategies. Frameworks like the Sustainable Livelihood Framework (SLF) are essential tools for researchers studying livelihood sustainability. The SLF effectively examines household livelihoods and addresses rural poverty by exploring the relationships among assets, vulnerability, coping strategies, and structural factors that influence sustainable outcomes. This comprehensive approach sheds light on the complex factors affecting livelihoods and underscores the evolution of rural livelihood concepts, emphasizing sustainability and the need for integrated strategies to address community challenges.

2. Materials and methods

2.1 Study Area

The Indian Sundarbans are located in West Bengal along India's eastern coast. This region spans a 19-block area, including two districts: North 24 Parganas (with 6 blocks) and South 24 Parganas (with 13 blocks). The landscape is part of the recently formed delta system created by the merging of the Ganga, Brahmaputra, and Meghna rivers. The region's average elevation is very low, with islands typically ranging from 3 to 8 meters in height, and they often become completely submerged during tidal surges (Hazra et al., 2002). We selected the villages of Gosaba and Hingalganj Block CD as the focus of our study because of their strategic locations. These villages are near the Sundarban Reserve Forest (SRF) and are surrounded by a complex network of streams and seasonal rivers (Figures 1a and 1b). In the Gosaba CD Block, the western boundary is defined by the River

Bidya, while the eastern boundary is marked by the Rivers Gomar and Raimangal (Ghosh & Mistri, 2020). According to the 2011 Census data, the villages of Mathurakhand, Pakhiralay, Satjelia, Lahiripur, and Kumirmari, located within Bali I, Rangabelia, Satjelia, Lahiripur, and Kumirmari Gram Panchayats, cover areas of 7.85, 4.79, 9.65, 8.51, and 20.20 square kilometers, with populations of 3,826, 3,946, 8,757, 6,851, and 17,451 residents, respectively. In the Hingalganj CD Block, the River Kalindi flows through its eastern part, while the Raimangal runs through its western section. The 2011 Census shows that the villages of Kalitala (located in Kalitala Gram Panchayat), along with Samsernagar, Madhabkathi, Hemnagar, and Jogeshganj (all in Jogeshganj Gram Panchayat), cover areas of 8.39, 6.82, 12.09, 9.26, and 7.27 square kilometers, with populations of 6,609, 4,394, 4,304, 7,687, and 3,960 residents, respectively. Many settlements in the study area are situated near both the Sundarban Reserve Forest (SRF) and the Sundarban Mangrove Forest (SMF).

2.2 Methods

This research employs a descriptive-analytic approach and relies on survey data collected from households in the designated study area. During the initial phase of selecting villages within the Gosaba and Hingalganj CD Blocks, a multistage cluster sampling method was used. Gram Panchayats near the forest edge were selected based on established clusters. From these clusters, villages were chosen through simple random sampling. The sampled households are from the villages of Mathurakhand (22), Pakhiralay (39), Satjelia (38), Lahiripur (28), and Kumirmari (33) in the Gosaba CD Block, and Kalitala (27), Samsernagar (36), Madhabkati (35), Hemnagar (36), and Jogeshganj (26) in the Hingalganj CD Block. Households were selected using a 95% confidence level, ensuring that the actual value is within ±5% of the survey estimate. Households were sampled proportionally to their population sizes. Demographic data indicate that the average age of respondents is 45 years. The survey results show that 85.62% of respondents are male, while 14.38% are female. Respondents reported an average household size of 4.26 persons, and 49% of households are classified as below the poverty line (BPL).

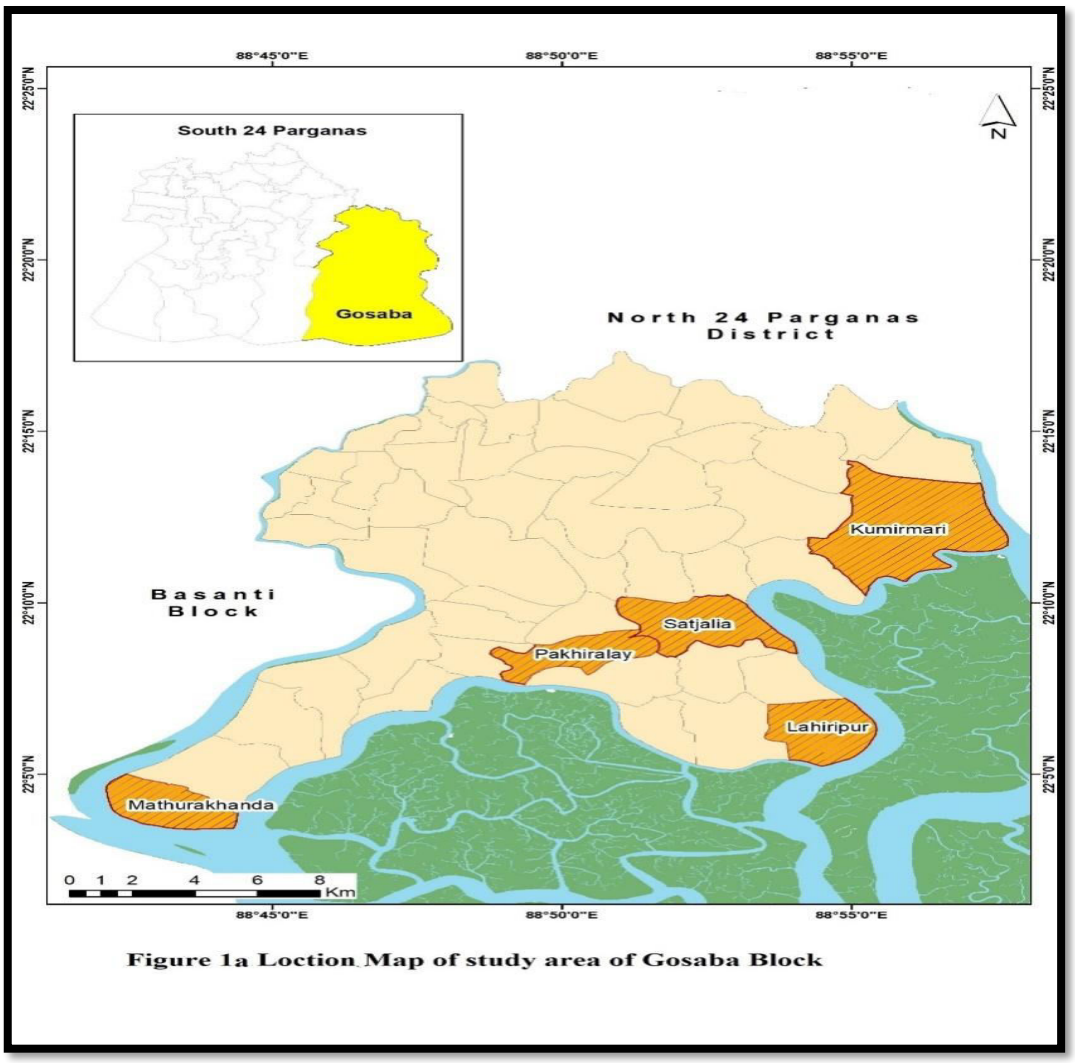

Figure 1a Loction Map of study area of Gosaba Block

2.2.1 Sustainability of Rural Livelihoods Capitals

Various approaches using the Sustainable Livelihoods Framework (SLF) have been adopted to develop indices that improve our understanding of the different aspects related to the sustainability of rural livelihoods. Assessing the asset portfolio tied to livelihoods (Table 1) within households has become the primary method for understanding the socio-economic conditions of rural communities in developing countries, with many indices based on this approach being created and used worldwide to measure different facets of livelihoods (Baffoe & Matsuda, 2018; Abbassi et al., 2020).

Step 1: Firstly, an overall index was computed by standardizing each component of the livelihood capitals utilizing Equation 3.1. The normalized indicators varied from 0 to 1.

The resulting normalization score will be as outlined below. Normalization score=

$$rij = (Xij - xjmin)/(xjmax - xjmin) \ldots\ldots \text{(Equation1)}$$

(Xij: The value of the i index; *xjmin*: The minimum i; *xjmax*: The maximum i; i: The index; j: The location)

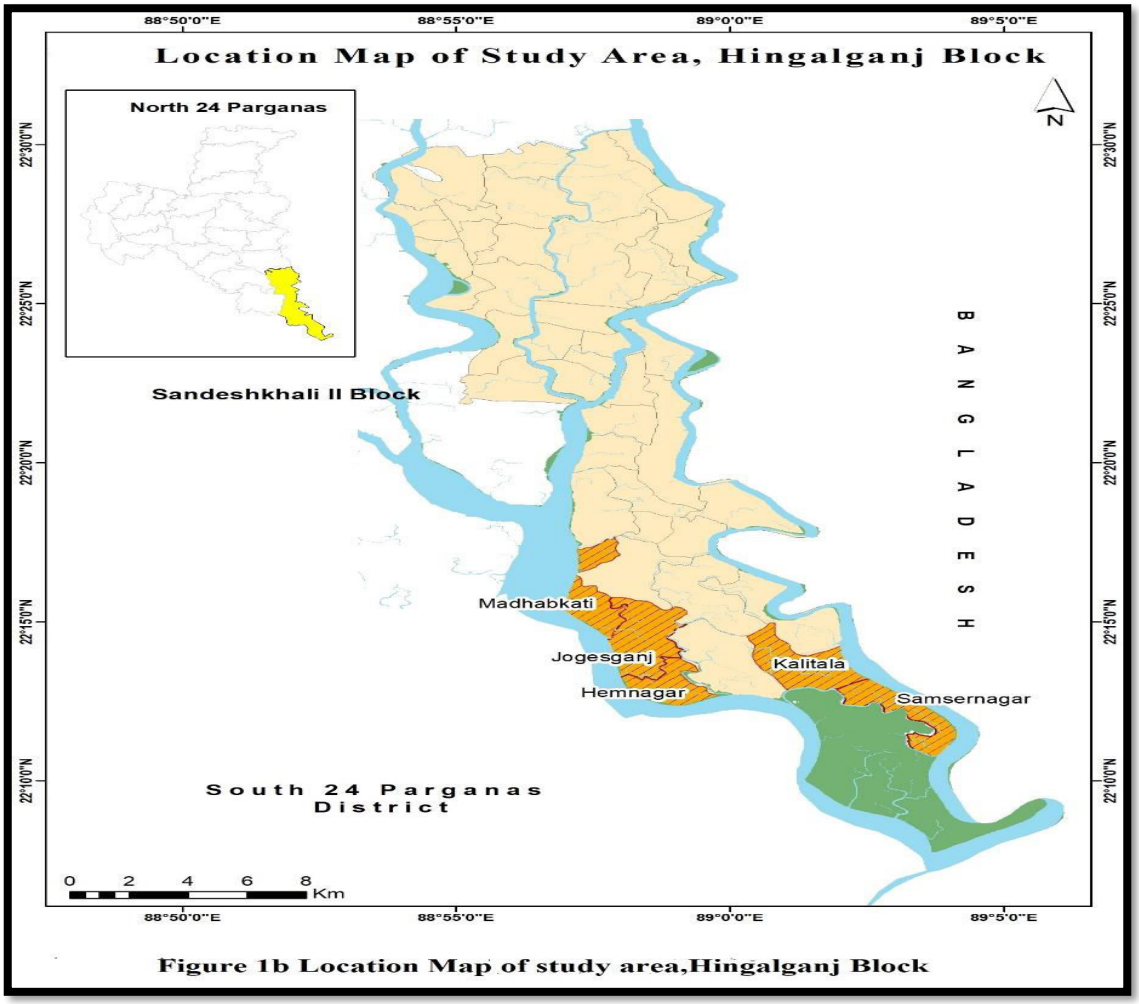

Figure 1b Location Map of study area,Hingalganj Block

Step 2: The sustainability index for each capital was determined by analyzing the average values of the standardized data across all five capitals.

Step 3: Prescott-Allen proposed five categories of sustainability levels, which were utilized to evaluate the sustainability of livelihood capitals (Rokn-O-Din Eftekhari et al., 2011).

The Prescott-Allen framework for sustainability indicators was used to evaluate the sustainability of livelihood capitals by converting quantitative data into qualitative metrics. The "Barometer of Sustainability" tool measures progress toward sustainable societies by combining various indicators, which together help analyze the relationship between human activities and ecological systems through indices (Louette, 2007). The Barometer includes a mix of dimensions from both human and ecological subsystems. When these dimensions involve many separate components, it is important to

consolidate them into a single metric to prevent potential distortions (Prescott-Allen, 1997). Therefore, a performance scale is recommended to combine these different indicators. Prescott-Allen classified sustainability levels into five categories based on a sustainability score that ranges from 0 to 1.

Unsustainable: (Desirable performance) where the calculated score ranges between 0 and 0.20

Potentially unsustainable: (Acceptable performance) where the calculated score ranges between 0.20 and 0.40

Moderate: (Transition performance) where the calculated score ranges between 0.40 and 0.60

Potentially sustainable: (Unwelcome performance) where the calculated score ranges between 0.60 and 0.80

Sustainable: (Unacceptable performance) where the calculated score ranges between 0.80 and 1.0

2.2.2 Village-Level Livelihood Capital-Based Sustainability Index (SI)

The assessment of sustainability at the village level regarding livelihood capitals was carried out by calculating the average values of the standardized data for each of the five capitals included in this study. To determine the overall effect of the village-level Sustainability Index (SI), the geometric mean of the various sustainability classifications (S_1, S_2,... S_n) was computed. This method is based on the creation of a Composite Vulnerability Index (CVI) as outlined by Hajra et al. (2021), which combines the square root of the geometric mean of the ranked variables.

$$SI = 5\sqrt{(S1 * S2 * S3 * S4 * S5)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(Equation2)}$$

2.2.3Influence of Livelihood Capitals on Sustainability Index by Multiple Regression Analysis

A multiple regression analysis using the stepwise method was conducted with SPSS (PASW Statistics 26.0.0) software to evaluate the impact of livelihood capitals on the Sustainability Index (SI) at the community level. The models were created following the equation proposed by Dranove in 2012.

$$Y = \beta 0 + \beta 1\chi i1 + \beta 2\chi i2 + \beta 3\chi i3 + \ldots\ldots\ldots + \beta n\chi in + \varepsilon i \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation (3)}$$

Here, Y represents the contribution of livelihood capitals to accessing PS; βo is the intercept of the regression equation; $\beta 1$, $\beta 2$, $\beta 3$, ..., βn are the regression coefficients; and X_1, X_2, X_3, ..., X_n are the independent variables; ε is the regression residual; and i=1, 2, 3, ..., n.

3. Results and Discussion

3.1 Sustainability of Rural Livelihoods Capitals

According to the classification of sustainability levels outlined by Prescott-Allen, the evaluation of livelihood capitals in the studied villages indicates that human capital is relatively moderate. The levels of educational achievement, health status, and willingness for innovation and skill development among villagers are considered moderate. Regarding financial capital, the villages are viewed as potentially unsustainable. The study areas continue to experience a low rate of capital formation and accumulation, mainly due to limited investment capacity. Although progress or credit from financial institutions has increased significantly over the past two decades, the credit-deposit ratio exhibits a fluctuating pattern.

The availability of economically important domestic species, including cattle, buffalo, pigs, sheep, and goats, is notably limited. Regarding natural capital, the villages of Pakhiralay and Mathurakhand within the Gosaba CD Block, and Madhabkati and Samsernagar within the Hingalganj CD Block, are considered relatively sustainable in potential. Conversely, the villages of Satjelia, Kumirmari, and Lahiripur in the Gosaba CD Block, along with Jogeshganj, Kalitala, and Hemnagar in the Hingalganj CD Block, are assessed as moderately sustainable concerning natural capital. In terms of social capital, the condition in the villages of the Hingalganj CD Block is regarded as moderate. Meanwhile, in the Gosaba CD Block, all selected villages except Mathurakhand show a moderate condition. Among community members, social ties are moderate to strong, demonstrated by collaborative activities like sharing food and resources and working together during difficult times. For physical capital, the status of the selected villages ranges from moderate to potentially sustainable (Table 2, Table 3). Specifically, the villages of Pakhiralay and Lahiripur in the Gosaba CD Block, excluding Madhabkati in the Hingalganj CD Block, are classified as moderate. Mathurakhand, Satjelia, and Kumirmari from the Gosaba CD Block, along with Madhabkati from the Hingalganj CD Block, are deemed potentially sustainable.Apart from a few essential possessions, the majority of households possess mobile phones and televisions. Groundwater from hand pumps serves as the primary source of drinking water. Nevertheless, certain regions continue to experience water scarcity, requiring residents to travel more than 500 meters to collect water.

The availability of sanitation facilities at the household level varies significantly, particularly in villages such as Samsernagar and Kalitala within the Hingalganj CD Block.

3.2 Village-Level Livelihood Capital-Based Sustainability Index (SI)

The evaluation of the village-level Sustainability Index (SI) revealed that Mathurakhand in the Gosaba CD Block (1.159) and Samsernagar in the Hingalganj CD Block (1.010) exhibit remarkably high SI values, with the highest possible SI being 5.000. The village of

Kumirmari in the Gosaba CD Block also shows elevated SI scores. Villages like Pakhiralay and Satjelia within the Gosaba CD Block, along with Hemnagar in the Hingalganj CD Block, display moderate SI levels. The sustainable livelihood capitals are assessed through the framework of the existing physical, natural, financial, social, and human capitals (Table 2, Table 3, Figure 2a, Figure 2b.).

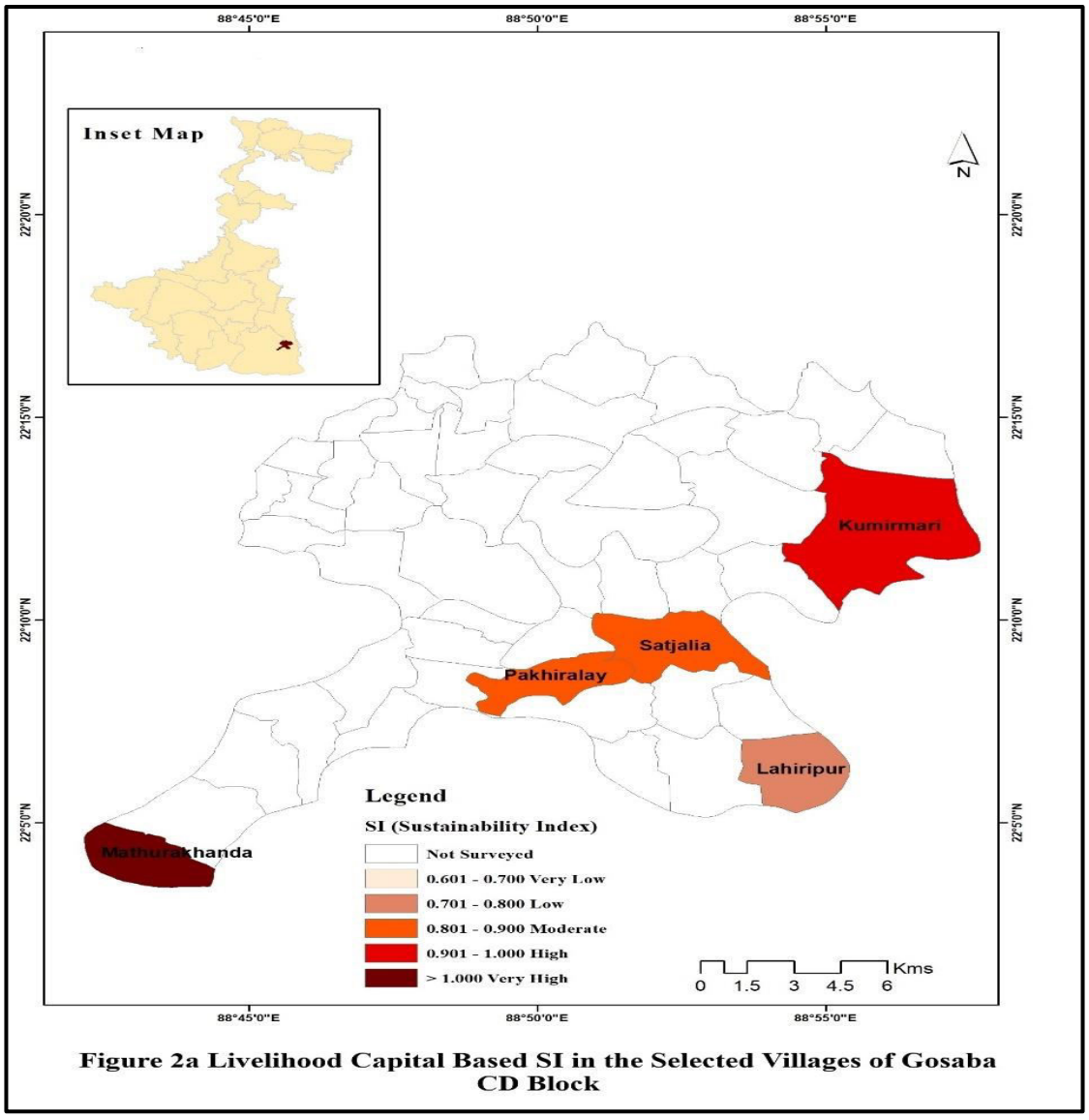

Figure 2a Livelihood Capital Based SI in the Selected Villages of Gosaba CD Block

3.3 Influence of Livelihood Capitals on Sustainability Index by Multiple Regression Analysis

For Gosaba CD Block

$$SI = -.1.220 + .912(\text{Naturalcapital}) + .682(\text{Socialcapital}) + .001 \ldots\ldots \text{Equation}(3)$$

The model explained 99.3% of the variability in the contribution of the livelihood capitals. An increase of 1 unit in social and human capital will result in an increase of 0.912 times and 0.682 times in the Sustainability Index, respectively (Table 4).

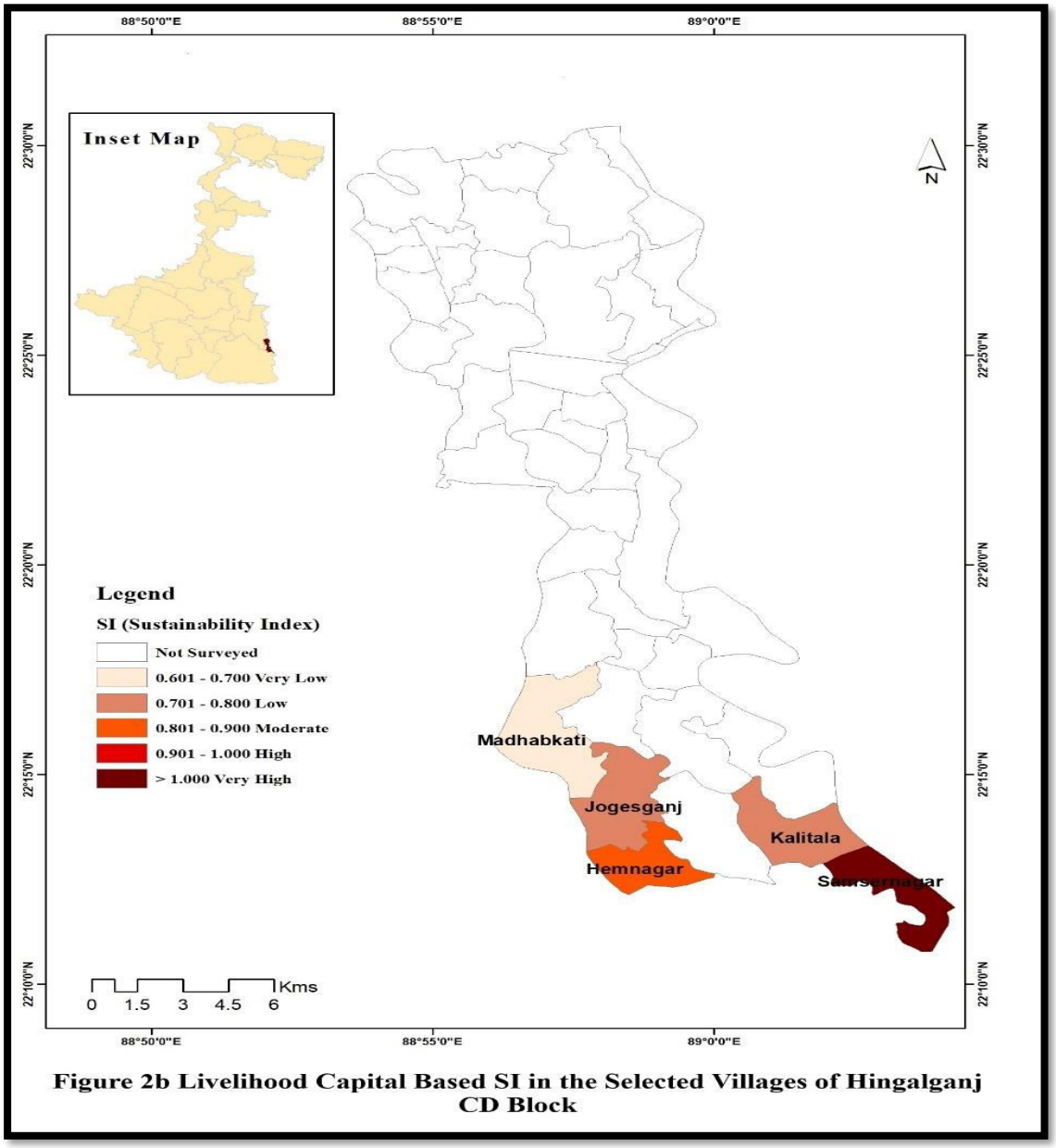

Figure 2b Livelihood Capital Based SI in the Selected Villages of Hingalganj CD Block

For Hingalganj CD Block

$$SI = -.501 + .2.545\ (Socialcapital) + .017 \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation}(4)$$

The model explained 77.7% of the variability in the influence of the livelihood capitals. Increasing social capital by 1 unit will result in a 2.545-fold rise in the Sustainability Index (Table 5).

The rapid increase in population growth and density, combined with limited income opportunities from traditional methods and a lack of alternatives, has greatly worsened the current situation. A fragile ecological environment restricts people's livelihoods and often exposes them to natural dangers, leading to food insecurity, malnutrition, and various health problems. Additionally, dependence on forest resources in the outer

islands is a main reason for economic instability (Kar, 2022). In 2007, the unemployment rate reportedly reached an alarming 63% (Danda et al., 2011). As the main economic activity, agricultural productivity is sadly very low. It is heavily affected by soil salinity, land degradation from coastal erosion, freshwater shortages, land fragmentation, climate shifts, and limited access to modern infrastructure and marketing channels. As a result, more agricultural land is being turned into shrimp farming ponds (Nishat et al., 2019); while this might benefit wealthy people, it offers no help to poor workers. Geographical isolation and the absence of waterways greatly hinder development in this region. Only 42 km of railway and 300 km of paved road connect an inhabited area of 4500 km^2, with five blocks lacking any direct road access from the mainland (Nishat et al., 2019). In these areas, private mechanized boats are the only transportation option. This situation, along with economic stagnation, mainly highlights the limited access to essential public services and amenities, including water supply, sanitation, energy, education, and healthcare (Kar, 2022).

4. Conclusion

This research examines the sustainability of livelihoods, especially in rural communities, using the Sustainable Livelihood Framework (SLF). The main goal is to understand and improve sustainable livelihood outcomes for individuals facing challenges such as climate change and economic instability. A livelihood includes a variety of assets, strategies, activities, and other essential components necessary for survival. The SLF analyzes the complex relationships among assets, vulnerability contexts, coping and adaptation strategies, and internal and external factors that influence sustainable livelihood outcomes. This study introduces the concept of the 'asset pentagon,' which combines five key types of capital: natural, financial, human, physical, and social. These capitals are crucial for maintaining livelihoods at the levels of individuals, households, and communities. Human capital involves knowledge, skills, work capacity, and health, empowering people to pursue various livelihood options and reach economic goals. It is especially important for rural residents to explore different livelihood opportunities. Financial capital includes cash, liquid assets, pension funds, remittances, and bank reserves, all vital for making informed livelihood choices and sustaining livelihoods in resource-limited rural areas. It plays a significant role in reducing poverty, diversifying income sources, and building resilience. Natural capital refers to natural resources like land, water, and forests, providing essential ecological goods and services that support human livelihoods. Proper management of these resources is necessary to ensure long-term benefits and foster resilience. Social capital comprises bonds of trust, social ties, networks, and affiliations that promote cooperation and informal safety nets within communities. It creates opportunities for marginalized households through social participation. Physical capital includes critical infrastructure such as transportation networks, water supply, and healthcare facilities, along with productive tools like agricultural machinery, all essential for sustaining livelihoods. Enhancing physical capital helps reduce poverty vulnerability by improving risk management capabilities. This

research emphasizes that evaluating the asset portfolio associated with livelihoods is a standard method for understanding the socio-economic conditions of rural communities. The study provides empirical data and analytical insights on the sustainability status of livelihood capitals in specific rural areas, such as the Gosaba and Hingalganj CD Blocks, offering valuable regional perspectives. For example, it shows that human capital generally has a moderate level, while financial capital often remains unsustainable in these regions, highlighting sectors requiring targeted intervention. The findings point to specific challenges such as insufficient capital accumulation, low investment levels, and vulnerability to environmental disasters, all of which significantly hinder livelihood sustainability. It is important that policies include mechanisms that recognize and respond to these issues in key indicator areas. Since many major factors depend on external influences and local contexts, strategic initiatives should focus on core features aligned with existing resources and regional conditions (Mondal et al., 2022). A community-based adaptation (CBA) project is closely connected to rural and marginalized populations, aiming to improve livelihoods amid the immediate and long-term impacts of climate change. The Intergovernmental Panel on Climate Change (IPCC) notes that community-based adaptation efforts in developing countries provide valuable insights, despite their inherent limitations (IPCC, 2014). Recognizing the importance of indigenous knowledge for the success of CBA programs, the CARE Climate and Resilience Academy has developed a Climate Vulnerability and Capacity Analysis (CVCA) approach. This method systematically gathers local perspectives on changes in living conditions, resource shortages affecting livelihoods, community resilience strategies for natural disasters, and ongoing risks. It helps identify the most at-risk resources, key community institutions, access to vital services, and other critical factors (Ketsomboon & Dellen, 2013). To effectively address these issues, it is essential to empower local institutions, assign clear responsibilities, and provide adequate training and resources to support adaptation planning. Additionally, infrastructure such as transportation and communication systems must be improved to promote livelihood diversification and create new employment opportunities (DasGupta & Shaw, 2015). In conclusion, this study enhances understanding of livelihood sustainability by offering a comprehensive conceptual framework, a practical assessment method, and empirical evidence to inform community development programs and policy-making.

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Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Table 1. Selected Indicators for Analyzing the Sustainability of Livelihood Capitals

Livelihood Capitals and their Definition	Variables taken	Literature Sources
Human (The skill, knowledge, good physical and mental health, the number of working age member and so on)	Age, Sex of young earning member interviewed, Education (Mean year of schooling), Household size, Health Status	Booth et al. (1998); Carney (1998); Kedir (2015); Nath & Inoue (2009); Putnam et al. (1993); Scoones (1998)
Financial (These are vital to building confidence in pursuing any livelihood strategy include cash, credit/debt, and savings)	Annual Household Income, Annual Income Generation from remittance, Earning from Livestock, Status of Household earning, Accommodation for household savings through banking services	McLeod (2001); Morse & McNamara (2013); Bajwa (2015); Nath & Inoue (2009); Putnam et al. (1993); Scoones (1998).
Natural (Water, land, forests, air, hydrological cycle, pollution sinks and so on from which resources are generated and people can draw on their livelihood needs)	Nature of land ownership (owner, shareholder, agricultural labour, other), Possession of Land	McLeod (2001); Nath & Inoue (2009); Putnam et al. (1993); Scoones (1998); Scoones (2009);
Social (This includes trust and solidarity, networks and connectivity, social cohesion and so on. This kind of capital ensures coordination and cooperation for mutual benefits)	Building Social Networks to fight against the Environment, Neighbours mostly trusted, Number of family Members engaged in any Community-Based Social Organization	McLeod (2001); Altasseb (2021); Narayan (1997); Nath & Inoue (2009); Putnam et al. (1993); Scoones (1998).
Physical (The basic infrastructure and the production equipment and technologies which enable people to derive benefits from any source)	Possession of Durable assets Access to Safe Drinking Water and Sanitation, Access to Safe Drinking water month in a year	Carney (1998); Makhetha (2010); McLeod (2001); Nath & Inoue (2009); Putnam et al. (1993); Scoones (1998).

Table 2: Sustainability of Livelihood Capitals of Selected Villages of Gosaba CD Block

Village	Human Capital	Relative Sustainability	Financial Capital	Relative Sustainability	Natural Capital	Relative Sustainability Level	Social Capital	Relative Sustainability	Physical Capital	Relative Sustainability	Sustainability Index (SI)
Mathurakhand	0.52	Moderate	0.20	Potentially Unsustainable	0.56	Moderate	0.54	Moderate	0.57	Moderate	1.15 (Very High)
Pakhiralay	0.53	Moderate	0.37	Potentially Unsustainable	0.30	Potentially Unsustainable	0.51	Moderate	0.61	Potentially Sustainable	0.86 (Moderate)
Satjelia	0.52	Moderate	0.25	Potentially Unsustainable	0.71	Potentially Sustainable	0.48	Moderate	0.58	Moderate	0.81 (Moderate)
Lahiripur	0.52	Moderate	0.27	Potentially Unsustainable	0.48	Moderate	0.59	Moderate	0.59	Moderate	0.78 (Low)
Kumirmari	0.48	Moderate	0.24	Potentially Unsustainable	0.58	Moderate	0.55	Moderate	0.60	Potentially Sustainable	0.90 (High)

Source: Computed by Author

Table 3: Sustainability of Livelihood Capitals of Selected Villages of Hingalganj CD Block

Village	Human Capital	Relative Sustainability Level	Financial Capital	Relative Sustainability Level	Natural Capital	Relative Sustainability Level	Social Capital	Relative Sustainability Level	Physical Capital	Relative Sustainability Level
Jogeshganj	0.54	Moderate	0.26	Potentially Unsustainable	0.57	Moderate	0.49	Moderate	0.53	Moderate
Hemnagar	0.59	Moderate	0.27	Potentially Unsustainable	0.59	Moderate	0.56	Moderate	0.57	Moderate
Madhabkati	0.52	Moderate	0.20	Potentially Unsustainable	0.65	Potentially sustainable	0.45	Moderate	0.61	Potentially sustainable
Kalitala	0.45	Moderate	0.31	Potentially Unsustainable	0.49	Moderate	0.49	Moderate	0.59	Moderate
Samsernagar	0.54	Moderate	0.36	Potentially Unsustainable	0.63	Potentially sustainable	0.	Moderate	0.58	Moderate

Source: Computed by Author

Table 4: Influence of Livelihood Capitals on Sustainability Index in the StudyVillages of Gosaba CD Block

Livelihood Capital	Unstandardized Coefficient	Std. Error of the Estimate	R	R square	VIF
Social	.912	.149	.997	.993	1.000
Human	.682	.252	.997	.993	1.000

Source: Computed by Authors

Table 5: Influence of Livelihood Capitals on Sustainability Index in the Study Villages ofHingalganj CD Block

Livelihood Capital	Unstandardized Coefficient	Std. Error of the Estimate	R	R square	VIF
Social	2.545	.787	.882	.777	1.000

Source: Computed by Authors