

Balancing Tradition And Transition: Ethical Education Vs. Formal Education In Livelihood Choices Of Indian Sundarbans

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ABSTRACT

This study investigates the dynamics of livelihood among communities in India's Sundarbans, with a particular emphasis on how fishing and farming practices alter in response to environmental issues and socioeconomic shifts. The project investigates how resilience and livelihood strategies are shaped by improving formal education and providing ethical environmental education, based on fieldwork done in both riverine and non-riverine villages. The study analyzes the relationship between environmental conditions, livelihood assets, and occupational vulnerability using a theoretical framework of livelihood dynamics. To evaluate changes in livelihood patterns over time, data analytic techniques include skewness assessments, frequency distributions, chi-square tests, and family-wise occupational index computations. The results show that during the past 20 years, there has been a notable shift in livelihood patterns, characterized by an increase in occupational mobility and diversification. Traditional jobs like farming and fishing continue to be important components of livelihood plans, but formal education is having an increasing impact on outmigration and the transition towards alternative livelihoods. It becomes clear that ethical environmental education is essential to preserving traditional ways of life and encouraging environmental stewardship. The widespread adoption of formal schooling poses a risk to the maintenance of indigenous cultural identity and occupations.

Key Words: Livelihood dynamics, Livelihood vulnerability, Occupational mobility, Resilience, Family-wise occupation index

Introduction

In the Indian Sundarbans, fishing is more than just a job. It's a daily struggle against the unpredictable elements of the natural world and hazardous environmental circumstances. Fishermen face daily challenges in the choppy waters and biological dangers that characterize their profession (Ghoshal, 2006). For individuals whose livelihoods depend on the Sundarbans' delicate environment of mangrove trees and rivers, there are particular difficulties.

Recent years have seen a noticeable shift in the occupational patterns of fishermen, driven in part by the increasing threats posed by the environment (Sarkar, 2009). The unpredictable weather patterns brought on by climate change have resulted in declining crops and fish stocks. The lives of individuals who depend on the fragile balance of the Sundarbans environment are further threatened by rising sea levels and coastal erosion (Mandal, 2010).

Due to these difficulties and the need for alternate sources of income in light of the unpredictable nature of the environment, many fishermen have made the decision to move into terrestrial employment (Sarkar, 2009). But the move away from fishing is not an escape from environmental issues; rather, it's a practical adjustment to how their traditional way of life is evolving.

In the meanwhile, the Sundarbans' agriculture suffers unique environmental difficulties. Farmers are forced to rely mostly on rainfall for cultivation due to the existence of saline groundwater at significant depths, which limits their alternatives for irrigation. The susceptibility of farming communities to the whims of

weather has been further aggravated by the seasonal character of agricultural activities and increasing population pressures (Danda, 2007).

The Sundarbans people's tenacity is evident in spite of these difficulties. They never give up in the face of difficulty, whether they are farmers tilling the fertile but unstable soil or fishermen navigating dangerous waters. Although the environment poses a serious threat to their way of life, it also serves as a constant reminder of how interdependent human societies are with the fragile ecosystems they rely on. The people of the Sundarbans show a deep appreciation of the mutually beneficial interaction between humans and the natural environment by overcoming these obstacles and blazing a trail ahead of them with tenacity and will.

The people of the Sundarbans have made many practical adaptations, but one of the most important things in enabling them to resist environmental challenges to their livelihoods is ethical teaching. Sundarbans residents have a strong sense of duty to the environment when they adopt an ethical approach to environmental issues. People are better able to make judgments about their livelihood practices when they internalize ethical concepts that place a high priority on the preservation of biodiversity and the sustainable use of resources. Through ethical teaching, they are urged to fish in a way that minimizes damage to marine ecosystems and to use land in a way that preserves the delicate balance of the Sundarbans.

Moreover, ethical education fosters a feeling of community service and camaraderie among Sundarbans people. It motivates people to help one another through difficult environmental times by fostering empathy and teamwork. When communities come together to tackle shared problems and combine resources and expertise to create long-lasting solutions that benefit everyone, they become more resilient.

In the end, ethical education plays a much more significant role in the lives of the Sundarbans people than just helping them adapt to environmental concerns. It encourages a comprehensive strategy for sustainable living that places equal emphasis on the welfare of human societies and the natural world. Education gives people the strength, tenacity, and profound regard for the fragile balance of their ecosystem to face the difficulties facing their livelihoods. It does this by instilling in them a sense of ethical duty and environmental stewardship.

Theoretical Framework

This paper is situated within the context of livelihood dynamics, as articulated by Chambers and Conroy (Ellis, 2000). According to this framework (Fig.1), livelihood encompasses the capabilities, assets, and activities necessary for sustenance, with sustainability hinging on the ability to withstand stress, recover from shocks, and enhance future prospects without depleting natural resources (Ellis, 2003). Central to this framework are livelihood assets, which encompass natural, physical, financial, human, and social capital, shaping livelihood strategies within a complex web of social, economic, political, and environmental contexts (Scoones, 1998).

Livelihood vulnerability arises from the interplay between endogenous and exogenous contexts, wherein the former includes social relations, norms, and values, while the latter encompasses trends, seasonality, and shock factors (Ellis, 2000). These contextual influences mediate the adoption and adaptation of livelihood strategies, with resilient livelihoods demonstrating the ability to adjust to changing circumstances. In this paper, we adopt a framework to elucidate livelihoods vulnerability in the Sundarbans, examining how assets, mediated through contextual factors influence vulnerability over time.

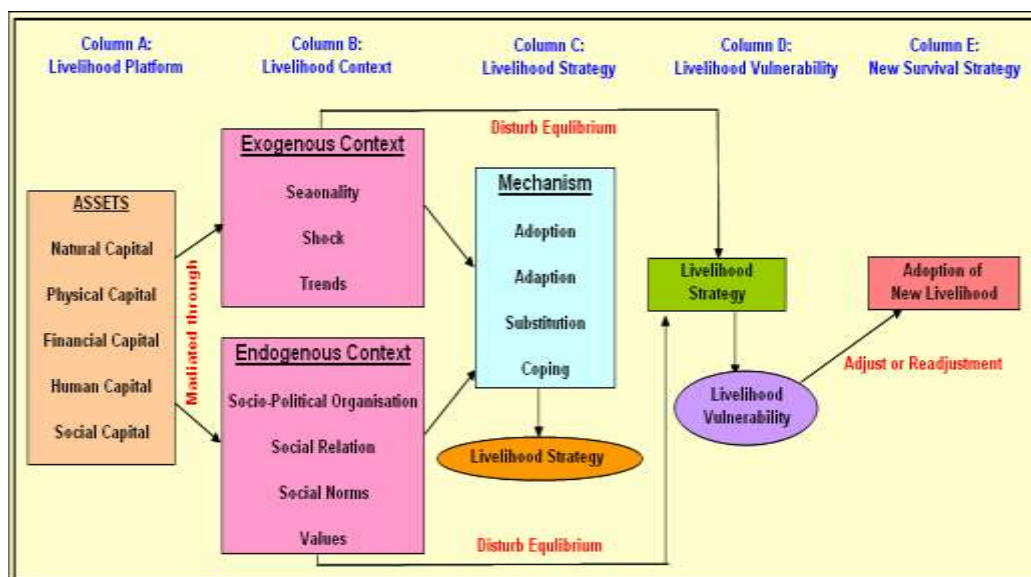


Fig. 1

The exploration of livelihood vulnerability in the Sundarbans necessitates a nuanced understanding of the unique challenges faced by both fishing and agrarian communities. By delving into the intricacies of livelihood systems and their interactions with environmental, social, and economic factors, this study aims to shed light on the resilience and adaptability of communities grappling with multifaceted livelihood challenges in the Indian Sundarbans.

Area under Study

This study focuses on five villages situated along the left course of the Matla River in the Indian Sundarbans (fig. 2). These villages—Bhangankhali, Purandar, Jhorkhali-4, Phulmalancha, and Jhorkhali-2—offer a diverse representation of livelihood dynamics within the region. The first three villages are located directly along the riverside, spanning from north to south, while the remaining two are situated farther inland, approximately 4 to 7 kilometers from the riverbank.

The selection of these riverine villages was deliberate and multifaceted. Firstly, these villages are predominantly characterized by caste-oriented fishing communities, with a longstanding tradition of fishing passed down through generations (Sarkar, 2009). Secondly, their geographic positioning along the river allows for the observation of varying conditions—from the deteriorated northern riverine environment to the more energetic southern stretches. Lastly, the villages exhibit differences in livelihood assets and exogenous factors, including notable trends such as educational advancements and fluctuations in financial status. These unique village-specific trends play a pivotal role in driving occupational mobility and livelihood strategies within the communities.

In contrast, the selection of non-riverine villages—Phulmalancha and Jhorkhali-2—was based on similarities in agrarian occupation without significant variations in livelihood assets or contextual factors. Despite their geographic separation from the river, these villages offer insights into agricultural livelihood dynamics and responses to changing environmental and socio-economic conditions.

The characteristics of the selected riverine and non-riverine villages, including sample sizes, livelihood assets, exogenous contexts, and specific trends, are outlined in Table 1 and Table 2, providing a comprehensive overview of the study area's diversity and complexity.

Table 1: Characteristics of the Selected Riverine Villages

Criterion	Village's Name		Bhangankhali	Purandar	Jhorkhali-4
Riverine Case	Sample Families		60	90	64
	Livelihood Assets		Feeble \longrightarrow Strong		
	Exogenous Context	Shock	Feeble \longrightarrow Extreme		
		Seasonality	More \longrightarrow Less		
		Trends			
		Educational Increment	Low	High	Moderate
		Financial Status	Low	High	Moderate

Table 2: Characteristics of the Selected Non-Riverine Villages

Criterion	Village's Name		Phulmalancha	Jhorkhali-2
Non-Riverine Case	Sample Families		45	60
	Livelihood Assets		Strong	Feeble
	Exogenous Context	Shock	Feeble	More
		Seasonality	Less	More
		Trends		
		Educational Increment	High	High
		Financial Status	High	Low

The data presented in the table illuminates notable disparities in livelihood assets across the studied villages, particularly concerning fishing occupations. Jhorkhali-4 emerges as the village boasting the most robust fishing-related assets, followed by Purandar and Bhangankhali. Moreover, the southern location of Jhorkhali-4 affords some relief from seasonal challenges, potentially fostering greater longevity in occupational pursuits compared to Purandar and Bhangankhali. However, this advantage is counterbalanced by heightened vulnerability to biotic and natural hazards (shock), highlighting the delicate balance required for livelihood sustainability in the region. Fishermen in Jhorkhali-4 have developed resilience to absorb shocks, albeit at the expense of heightened sensitivity to their profession.

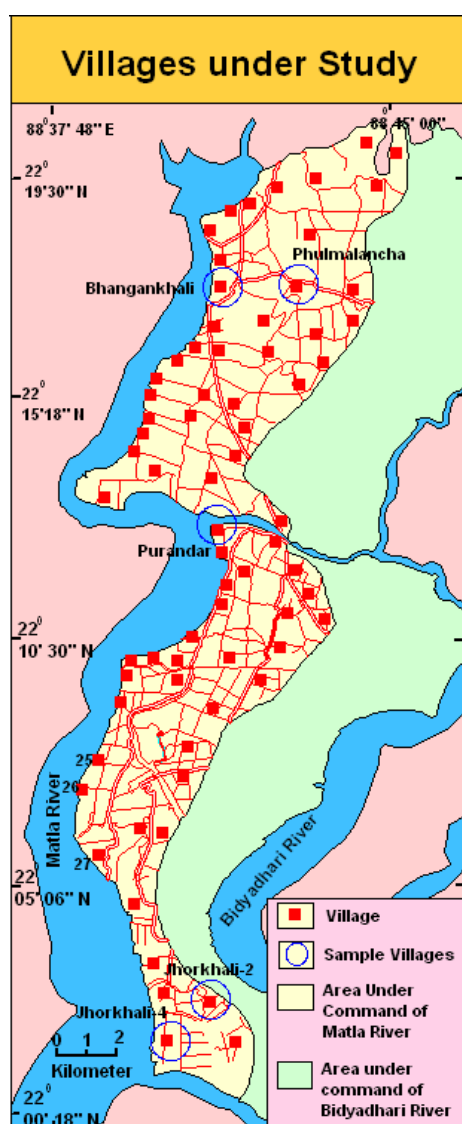


Fig. 2

Conversely, the observed shift from fishing to land-based occupations, primarily witnessed in Purandar and subsequently in Jhorkhali-4 and Bhangankhali, can be attributed to factors such as increasing formal education and improved financial support (trend). This transition reflects evolving livelihood strategies shaped by shifting socio-economic dynamics, underscoring the intricate interplay between environmental conditions and human decision-making.

Turning to the non-riverine villages, a similar narrative emerges. Phulmalancha, with its higher per-capita land occupancy and reduced exposure to natural hazards, may exhibit greater stability in agricultural occupations. However, the upward trajectory of formal education presents a potential catalyst for change both for Phulmalancha and Jhorkhali 2, as individuals may reconsider their allegiance to traditional livelihoods in pursuit of improved opportunities elsewhere.

In Purandar and other non-riverine villages, increasing formal education levels could be playing a significant role in fostering occupational diversity or prompting shifts in livelihoods. As individuals gain access to higher education levels, they may be more inclined to explore alternative livelihood options beyond traditional occupations. The upward trajectory of formal education presents a potential catalyst for change, as individuals may reconsider their allegiance to traditional livelihoods in pursuit of improved opportunities elsewhere. This phenomenon could lead to a diversification of livelihood strategies within these communities, potentially impacting the overall socio-economic landscape of the region.

Rationale to the Problem

Over the past twenty years, the Sundarbans, a region facing rapid population development, has experienced notable changes in the dynamics of its livelihood. The main causes of this change include a variety of endogenous and exogenous variables that have an impact on both agricultural and fishing communities (Danda, 2007; Kanjilal, 2000). Growing population density in this area puts constant strain on the resources that are available, which results in declining agricultural output per person and depleting fishing stocks as a result of irresponsible fishing methods (trend) (Danda, 2007; Kanjilal, 2000).

Agriculture in the Sundarbans predominantly revolves around mono-crop cultivation, which is highly susceptible to the seasonal onslaught of cyclones and saltwater inundation (shock) (Mandal & Ghosh, 1989). Similarly, fishing in the deep rivers poses inherent risks due to sudden animal attacks and the seasonal occurrence of cyclones in the Bay of Bengal (shock) (Kanjilal, 2000). As a response to these challenges, many younger individuals are opting for urban migration in pursuit of alternative livelihood opportunities, leading to a gradual decline in rural occupations (trend) (Jalil, 2000).

Social cohesion within riverine communities is notably stronger compared to their non-riverine counterparts (Ghoshal, 2006). The collaborative nature of fishing necessitates intense social interactions among fishermen and their families, fostering a deep sense of community and shared identity (Hunter, 1875). In contrast, agricultural activities in the Sundarbans typically involve less collaborative efforts, resulting in comparatively weaker social bonds (Sarkar, 2009).

Furthermore, the intrinsic value of natural resources plays a pivotal role in shaping livelihood patterns in the region. Aesthetic components of the environment, such as proximity to rivers, influence individuals' cognitive perceptions and economic decisions, with riverine communities experiencing a stronger attachment to common property resources (Sarkar, 2009).

The discourse pertaining to the function of moral education in cultivating an intense connection with the unspoiled ecosystem of the Sundarbans and strengthening ties to traditional professions contributes an additional stratum to the intricacy of livelihood dynamics within the area. Communities that have a strong connection to the environment tend to be more devoted to traditional means of subsistence like farming and fishing because of their cultural history and feeling of responsibility.

On the one hand, those who were brought up in an atmosphere that placed a high emphasis on ethical education and the inherent worth of protecting the environment are more likely to remain devoted to their family's professions. This moral foundation strengthens the significance of sustainable livelihood practices by fostering a sense of obligation to preserve the rich biodiversity and ecosystem services of the Sundarbans.

Conversely, the increasing prevalence of formal education in some villages may weaken the connection with ancestral occupations and promote outmigration and occupational diversification. As individuals gain access to formal education, they may aspire for alternative livelihood opportunities perceived to offer greater financial security and social mobility. This trend can erode the traditional fabric of riverine communities, leading to a loss of cultural identity and a decline in the transmission of indigenous knowledge associated with local occupations.

From a livelihood asset perspective, fishing occupations rely heavily on natural capital, specialized physical equipment, and human capital, all of which contribute to their resilience. In contrast, agriculture in the Sundarbans is supported by quasi-natural resources, such as fertile soil, but lacks the specialized human and physical capital found in fishing occupations.

The equilibrium between endogenous and exogenous factors determines the stability of livelihood systems in the region. Fishing occupations, with their stronger base of livelihood assets and social capital, exhibit greater resilience to external shocks compared to agriculture. This resilience is further reflected in the differential response of fishing and agricultural communities to changing environmental and socio-economic conditions. To comprehensively understand the nuances of livelihood vulnerability in the Sundarbans, the study encompasses three riverine and two non-riverine villages, each characterized by unique locational settings and differential strengths in livelihood assets and exogenous influences. By elucidating these complexities, the investigation seeks to offer insights into the evolving livelihood dynamics and vulnerability patterns in the region, facilitating informed policy interventions and sustainable development initiatives.

Materials and Methods

Samples were collected from the five aforementioned villages, encompassing entire family units spanning three successive generations. This sampling approach enables the examination of generational changes in family occupations over time. The sample size ranged from 89 to 45, depending on the size of the families, and comprehensive information was gathered from selected families regarding individual occupations (in the 1990s and 2011-12), individual education levels, age, and places of out-migration.

Building upon the preceding discussion on the role of livelihood assets and contextual factors in influencing occupational vulnerability, this section delves into the vulnerability of both fishing and agricultural livelihoods. The inquiry is divided into two parts: firstly, an exploration of the shifting priorities of these livelihoods and an examination of their quantitative strength; and secondly, an investigation into the various factors contributing to livelihood vulnerability.

Livelihood is not an inert event of life. With the course of time it adapts different strategies for the means of survival. Present study is planned to highlight the changing precedence of aquatic and terrestrial occupations in the aforesaid villages. Family-wise occupation index (FOI) has been calculated in two time points (1990s and 2011-12) for such an inquiry. A person may be engaged in one or more than one occupations. But all the occupations are not equally important to produce a strong occupational environment. Fishing in the sea and also in the deep river is the indication of stronger mode of fishing livelihoods. However, in this context other occupations like – shallow river fishing, prawn collection, net making are less important. Similarly, a person engaged in agriculture in all sessions signifies a better agricultural environment in comparison to relying on different options other than agriculture.

To measure FOI, different waitage have been assigned to different occupations of aquatic livelihoods according to their importance. Hence, a geometric scale has been preferred with the loading of 32 for sea fishing, 16 for deep river fishing, 8 for shallow river fishing, 4 for prawn seed collection, 2 for fishing net making, and 1 for fishing business in accordance. Following the same procedure FOI has been calculated for non-riverine villages by assigning relative waitage, like - 8 for engagement as a farmer in two sessions, 4 for engagement as an agricultural labourer in two sessions and 2 for engagement in agriculture in rainy season only, 1 for occasional engagement in agriculture in rainy season. By taking the average value, person-wise (male and female both) functional score is calculated for those who are equally engaged in two or more occupations. Thereafter, family-wise total score is calculated by adding individual score, and finally family-wise FOI is derived by dividing total functional score by number of workable persons (age from 15 to 70).

The calculated FOI is now presented in a frequency distribution table (table 3 and 4). With the help of the frequency table, frequency polygons in two time points are drawn (3a, 3b, 3c and 4a, 4b). The figures no. 3a, 3b, 3c indicate that FOI distribution appears to be a normal curves in all three cases of 1990s for the fishing villages. Though, in the present context these graphs are significantly altered showing positively skewed pattern. To quantify this change, skewness value is measured in three respective cases (table 5). The negative skewness indicates more number of the families with higher FOI. Accordingly it signifies more strength in fishing livelihood, while positive skewness represents the vice-versa. The skewness value represented in figure no.5 indicates a trend of positive skewness from 1990s to present time (table 5).

Result

The observed changes in the Family-Wise Occupational Index (FOI) across the riverine and non-riverine villages of the Sundarbans, as depicted in Table 3 and Table 4, reflect a significant transition in livelihood patterns over the past two decades. This transition is indicative of a broader phenomenon of occupational mobility and diversification, as noted in studies examining similar shifts in rural economies (Bhattacharya et al., 2018; Dasgupta & Shaw, 2014).

Table 3: Family-Wise Occupational Index (FOI): Riverine Villages

FOI (Family-wise)	Bhangankhali			Purandar			Jhorkhali		
	Past (1990s)	Present (2011-12)	Expected Distribution*	Past (1990s)	Present (2011-12)	Expected Distribution*	Past (1990s)	Present (2011-12)	Expected Distribution*
0.1 - 1.1	0	2	0.46875	0	19	0.703125	0	5	0.5
1.1 - 2.1	8	10	3.28125	4	12	4.921875	8	11	3.5
2.1 - 3.1	15	15	9.84375	12	17	14.765625	9	12	10.5
3.1 - 4.1	17	19	16.40625	20	13	24.609375	19	16	17.5
4.1 - 5.1	14	11	16.40625	34	15	24.609375	17	10	17.5
5.1 - 6.1	5	3	9.84375	13	2	14.765625	9	4	10.5
6.1 - 7.1	1	0	3.28125	7	8	4.921875	1	3	3.5
7.1 - 8.1	0	0	0.46875	0	4	0.703125	1	3	0.5
Total Families	60	60		90	90		64	64	

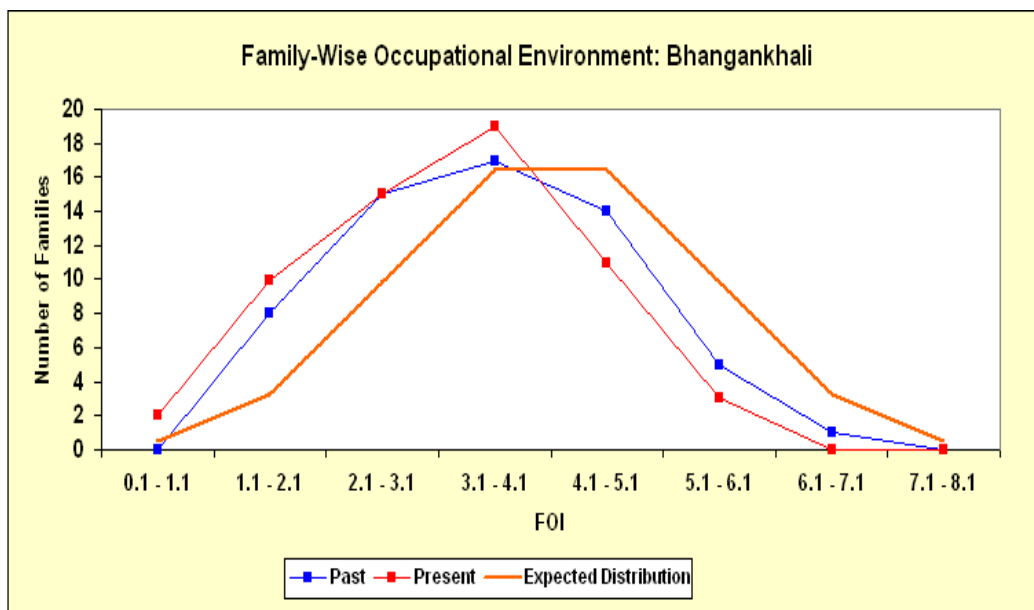
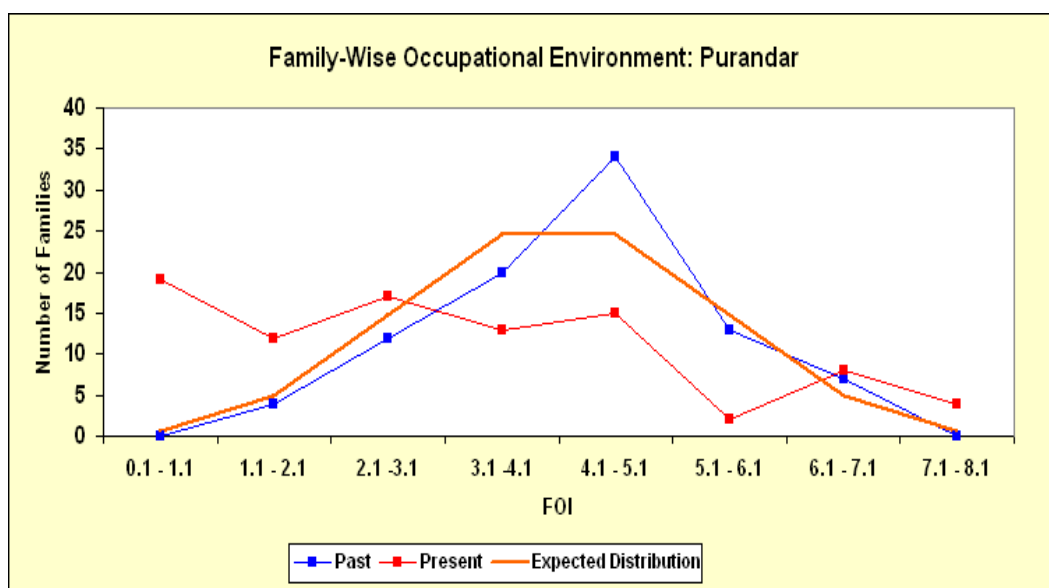
* Expected distribution signifies normal distribution (bionomial form)

The upward trend in FOI values, particularly evident from the 1990s to 2011-12, underscores the gradual decline of traditional livelihoods, with individuals and families increasingly opting for alternative occupations. This trend aligns with research highlighting the impact of socio-economic changes, population growth, and environmental factors on livelihood strategies in coastal regions (Kanjilal, 2000; Danda, 2007).

Table 4: Family-Wise Occupational Index (FOI): Non-Riverine Villages

FOI (Family-wise)	Phulmalancha			Jhorkhali 2		
	Past (1990s)	Present (2011-12)	Expected Distribution*	Past (1990s)	Present (2011-12)	Expected Distribution*
0.1 - 1.1	0	10	0.3515625	2	8	0.46875
1.1 - 2.1	5	15	2.4609375	7	15	3.28125
2.1 - 3.1	13	10	7.3828125	15	14	9.84375
3.1 - 4.1	10	3	12.3046875	13	10	16.40625
4.1 - 5.1	14	6	12.3046875	12	9	16.40625
5.1 - 6.1	2	0	7.3828125	10	3	9.84375
6.1 - 7.1	1	1	2.4609375	1	1	3.28125
7.1 - 8.1	0	0	0.3515625	0	0	0.46875
Total Families	45	45	45	60	60	60

* Expected distribution signifies normal distribution (bionomial form)

**Fig. 3a****Fig. 3b**

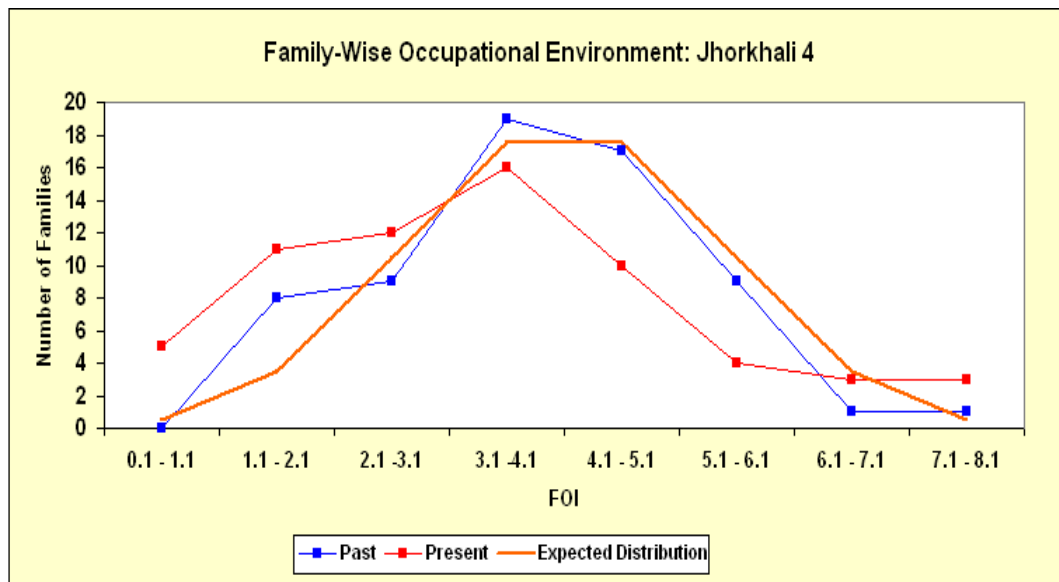


Fig. 3c

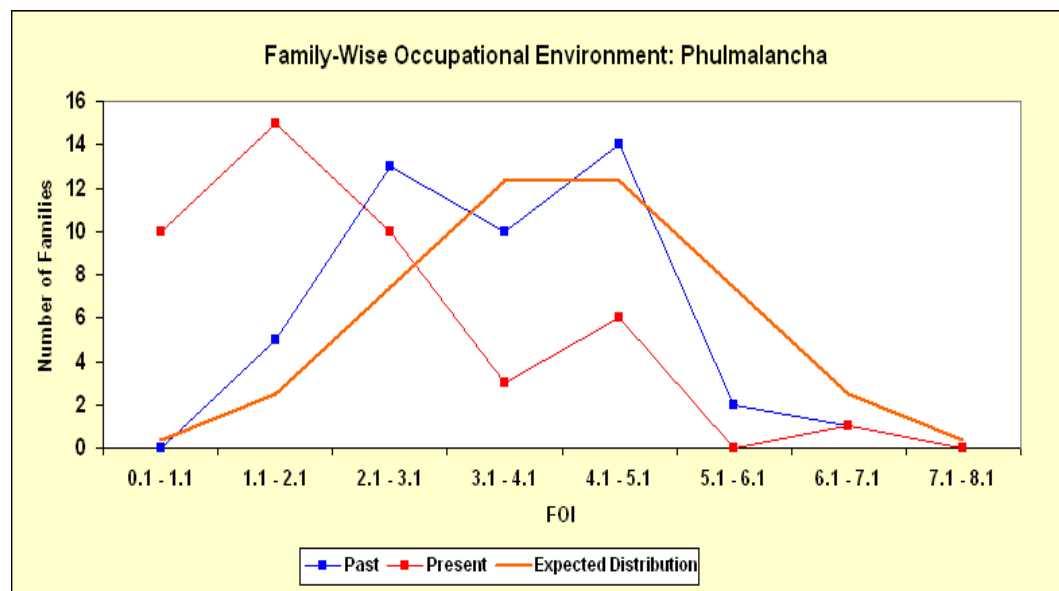


Fig. 4a

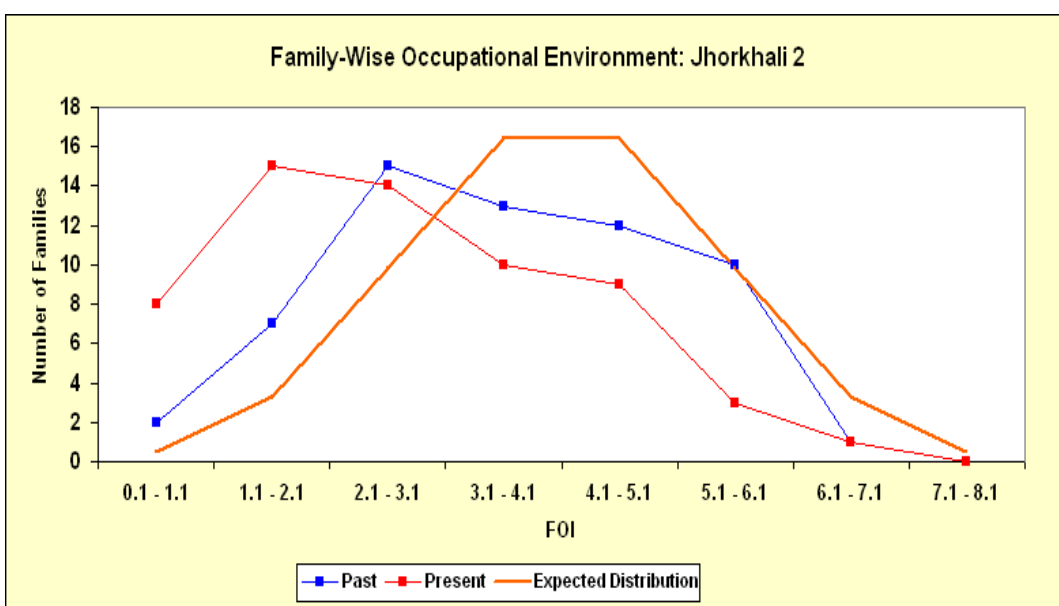
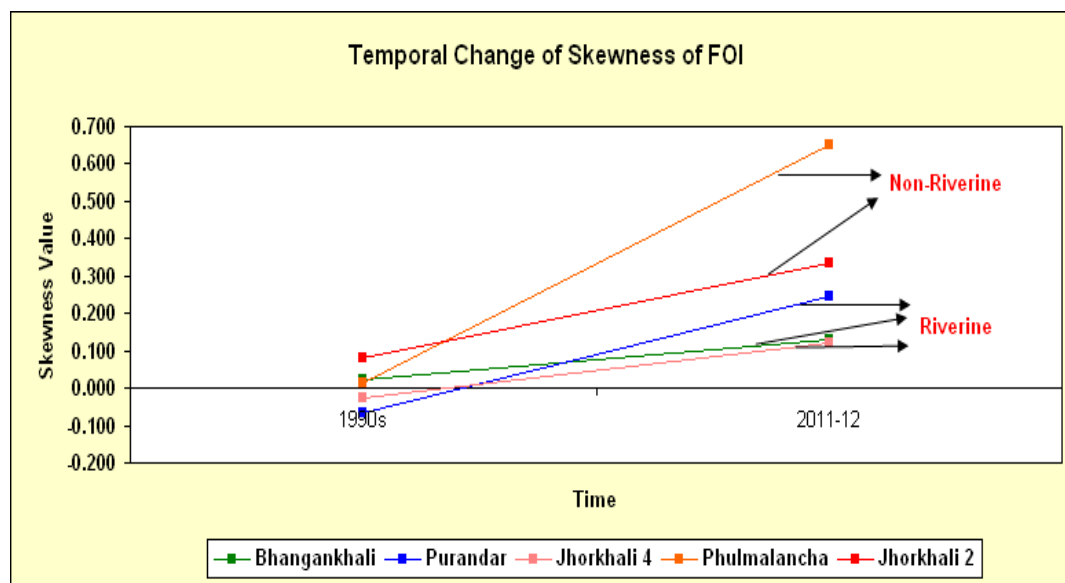


Fig. 4b

Table 5: Temporal Change of Skewness of FOI: Riverine and Non-Riverine Cases

Type	Village	Skewness (in 1990s)	Skewness (in 2011-12)
Riverine	Bhangankhali	0.023	0.128
	Purandar	-0.068	0.245
	Jhorkhali 4	-0.026	0.121
Non-Riverine	Phulmalancha	0.014	0.652
	Jhorkhali 2	0.081	0.334

Furthermore, the skewness values presented in Table 5 provide additional insights into the nature and magnitude of these shifts. The noticeable increase in skewness from the 1990s to 2011-12 suggests a pronounced asymmetry in the distribution of FOI values, indicating a departure from the previously observed occupational patterns. This finding resonates with studies exploring changing occupational structures and patterns of economic activity in similar geographical contexts.

**Fig. 5**

To assure whether this change is significant or not; or in other words whether fishing as well as agricultural livelihood is vulnerable or not, a binomial symmetric distribution $[(0.5 + 0.5)^n]$ has been taken as a standard distribution. A significant departure from it signifies the distortion of its standard pattern. Chi square test has been adopted to identify whether the FOI pattern is symmetrical or not. The results have been exhibited in the following table (table 6).

The critical value of Chi square for fishing occupation is 18.475 at 0.01 significance level at 7 df. Hence, it is clear that in the initial period calculated Chi square values in all three respective cases are lower than the table value. On the other hand, calculated values exceed significantly from table value in the later period (2011-12). Thus results signify distortion of normal distribution of FOI from initial to terminal point. The result for agricultural occupation exhibits same thing as Chi square values in two respective cases exceed the table value in 2011-12. The most surprising thing to be noticed here is the significant increase of Chi square values for agricultural occupation in 2011-12. Except Purandar it ranges from 32.16 to 76.72 (two digits) for the fishing villages, but outstandingly it exceeds three digits for agricultural occupation. Once again it simply, grounds that occupational mobility is quite higher for terrestrial occupation.

Table: 6: Chi Square Values of Two Time Points

Type	Village	Past (1990s)	Present (2011-12)	Chi Square Value
Riverine	Bhangankhali	14.76	32.16	0.01% sig value 18.475
	Purandar	7.63	524.29	
	Jhorkhali 4	9.14	76.72	
Non-Riverine	Phulmalancha	13.03	348.48	
	Jhorkhali 2	15.86	117.26	

Hence, the distinct increase in Chi-square values for agricultural occupations compared to fishing livelihoods suggests a greater degree of occupational mobility and vulnerability in terrestrial-based livelihoods. This observation underscores the differential impact of changing socio-economic and environmental conditions on different sectors of the economy, as noted in studies examining livelihood transitions in coastal and rural areas.

In summary, the findings highlight a notable shift in FOI patterns over the past two decades, reflecting changing livelihood dynamics and occupational preferences in the Sundarbans. This transition underscores the need for targeted interventions and policy measures to support the resilience and adaptation of local communities in the face of evolving socio-economic and environmental challenges.

Discussion

The results of this study shed light on the variables influencing occupational mobility and vulnerability in both riverine and non-riverine groups, offering important insights into the shifting dynamics of livelihoods in the Sundarbans. We are able to derive significant conclusions and implications for practice and policy by integrating the data.

The Family-Wise Occupational Index (FOI) values have increased over the past 20 years, which indicates a noteworthy trend in the studied area toward occupational mobility and diversification. This change reflects how the Sundarbans' economic environment is evolving due to a number of causes, including population expansion, environmental deterioration, and economic globalization (Danda, 2007; Kanjilal, 2000). Traditional livelihoods are disappearing, especially in agriculture and fishing, which emphasizes how important it is for communities to adjust to changing socioeconomic conditions.

The occupational landscape of the Sundarbans exhibits asymmetry, with a notable shift towards non-traditional occupations, as indicated by the skewness values of FOI distributions (Ghoshal, 2006; Mitra, 2006). This pattern illustrates how susceptible local communities are to pressures and shocks from the outside world, such as changes in the sociopolitical landscape, market volatility, and environmental threats. The adoption of alternate livelihood techniques, however, also highlights how resilient communities are in overcoming these obstacles.

The Chi-square test results show considerable deviations from predicted distributions, especially in agricultural occupations, indicating the unequal impact of environmental and socioeconomic variables on livelihood patterns. With the exception of Purandar, where fishing livelihoods are more stable due to increased formal schooling, agricultural jobs are more vulnerable to external pressures such as market dynamics, land degradation, and climate change. The intricate relationship between environmental resilience and socioeconomic development in the Sundarbans is shown by this uneven vulnerability.

The study compares and contrasts the effects of increasing formal education and ethical environmental education when examining how education shapes livelihood dynamics. Sustainable livelihood practices are encouraged and a sense of responsibility for protecting the environment is fostered by ethical environmental education. It strengthens ties to traditional livelihoods like farming and fishing by creating a strong relationship with the pristine Sundarbans ecosystem. Ethically grounded communities are more likely to place a high value on cultural heritage preservation and environmental stewardship, which supports the sustainability of traditional livelihoods.

On the other hand, the growing number of people obtaining formal education could lead to a diversity of occupations and an exodus from rural areas. People who are more educated may look for other career options that they believe will provide them with more social mobility and financial stability. This pattern has the potential to weaken the traditional foundation of riverine communities, which would result in the loss of indigenous knowledge and cultural identity related to local jobs.

The riverine villages of Bhargankhali and Jhorkhali 4, where the frequency of formal education is comparatively lower compared to other locations, are where the differential influence of formal education on livelihood dynamics is most noticeable. In these communities, the importance of moral and environmental education becomes apparent in the continuation of customary jobs like fishing. The significant emphasis on moral values upholds indigenous livelihoods' cultural relevance and encourages a close connection to the natural world. Because of this, the people who live in these communities have a strong sense of loyalty to their traditional jobs and have the fortitude to overcome environmental hardship.

As an exception, however, are the villages of Purandar, Phulmalancha, and Jhorkhali 2, which are distinguished by a greater rate of formal education and a commensurate propensity for outmigration and diversification of sources of income. Residents now have more opportunity to consider alternatives to traditional jobs for their livelihood due to increased access to formal education. Consequently, Purandar witnesses a higher level of occupational mobility as people choose to migrate to cities or change their sources of income in reaction to shifting socioeconomic conditions. In this situation, the attraction of the financial opportunities that come with a formal education may outweigh the impact of moral environmental education, causing people to depart from customary means of subsistence.

This disparity draws attention to the complex interactions that exist in the Sundarbans region between formal education, moral environmental education, and livelihood decisions. Formal education provides avenues for diversification and socioeconomic growth, but the survival of traditional jobs in villages such as Bhargankhali and Jhorkhali 4 highlights the long-lasting importance of moral values in forming livelihood resilience. The incorporation of ethical environmental education into formal education curricula has the potential to

enhance resilience by promoting sustainable livelihood practices in the face of environmental change by instilling a sense of responsibility towards environmental stewardship and cultural heritage.

The study's conclusions have a significant impact on practice and policy in the Sundarbans and elsewhere. They highlight the necessity of focused interventions to help local communities adapt and become resilient in the face of continuous environmental and socioeconomic change. This could involve making investments in alternate sources of income, building infrastructure, and putting in place social safety nets to shield local populations against shocks and strains from the outside world. To further foster long-term resilience and well-being in the Sundarbans, initiatives to advance equitable economic growth and environmental sustainability are crucial.

Conclusion

In summary, the livelihood patterns seen in India's Sundarbans region show a complex interplay between environmental issues, socioeconomic changes, and local communities' adaptive reactions. The shifting patterns of employment, especially in the fishing and farming industries, highlight the intricate difficulties that the residents of this delicate ecosystem face.

It becomes clear that ethical environmental education is essential to preserving traditional ways of life and fostering a strong bond with the natural world. The resilience of communities experiencing environmental adversities is enhanced by ethical education, which instills values of environmental stewardship and cultural heritage preservation.

On the other hand, a divergent effect is brought about by the increasing ubiquity of formal education, which propels both occupational diversification and emigration from traditional livelihoods. Formal schooling can help people grow socioeconomically, but it also puts indigenous occupations and cultural identity at danger of disappearing.

The confluence of different educational effects emphasizes the complex equilibrium necessary in the Sundarbans for sustainable living. Incorporating moral values into formal education curricula can be an essential tool for fostering environmental awareness and protecting traditional ways of life in the face of changing socioeconomic difficulties.

In order to effectively tackle these issues, governments need to give priority to focused programs that enhance community resilience. This includes making calculated bets on alternative sources of income including sustainable agriculture, handicrafts, and ecotourism. Furthermore, it is critical to upgrade vital infrastructure—like energy and transportation networks—in order to improve access to resources, markets, and services. This promotes economic diversity and lowers vulnerability.

Policymakers can significantly contribute to the development of a more resilient and equitable future for the Sundarbans region and its people by proactively tackling these concerns. By working together with civil society organizations, local communities, and other relevant parties, policymakers can enable Sundarbans people to enhance their resilience, develop their adaptive capacity, and ensure a sustainable means of subsistence for coming generations.

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