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Revalorizing indigenous sea salt production within the blue economy framework: Livelihood resilience and policy perspectives from Mandarmani Coast, West Bengal

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Abstract

Traditional sea salt production along the Mandarmani coast of West Bengal, once a vital component of the coastal economy, is now in a state of rapid decline due to rising tourism, aquaculture encroachment, land-use change, and policy neglect. This research investigates the potential of reviving this heritage industry through a sustainable blue economy framework, focusing on its socio-economic, environmental, and policy dimensions.

Based on field-based surveys, participatory rural appraisal (PRA), and stakeholder interviews with salt workers, cooperatives, and local officials, the study reveals the deep-rooted livelihood dependence of marginalized coastal communities, particularly women and seasonal migrants, on artisanal salt production. However, structural barriers such as poor mechanization, lack of branding, saline land degradation, seasonal employment, and limited access to welfare schemes like NMAY and CRS have rendered the sector economically vulnerable.

The research maps the spatial contraction of salt pans using GPS-assisted data and documents the lived experiences of traditional producers, highlighting intergenerational knowledge loss and deteriorating working conditions. Simultaneously, policy analysis indicates critical gaps in implementation and outreach, with fragmented institutional support and limited investment in innovation and infrastructure. This study argues that the revival of traditional sea salt production can align with India's blue economy goals by integrating livelihood security, ecological sustainability, and local cultural heritage. It proposes a set of policy recommendations, including cooperative strengthening, eco-labeling, financial access, and inclusive planning, to reposition salt as a climate-resilient, community-led economic resource in coastal Bengal.

Keywords: Traditional sea salt production, Mandarmani coast, livelihood vulnerability, sustainable blue economy framework, policy assessment and ecological sustainability

1. Introduction

The coastal region of Mandarmani, located in the Purba Medinipur district of West Bengal, has long been shaped by its relationship with the sea. Among its diverse coastal economies, traditional sea salt production once held a prominent place, sustaining the livelihoods of local communities through low-tech, eco-friendly artisanal practices. Historically rooted in the indigenous knowledge systems of the *Malangis* and coastal cultivators, sea salt production in this region was not only a source of employment but also a cultural expression of resilience, adaptation, and self-sufficiency.

In recent decades, however, traditional salt manufacturing has experienced a sharp and alarming decline. The unregulated expansion of coastal tourism, land-use transformation for aquaculture, and increasing salinization have encroached upon salt pan lands. Simultaneously, weak infrastructural support, lack of branding and market access, and poor mechanization have eroded the economic viability of small-scale salt producers. Compounding this decline is the ineffective implementation of welfare and livelihood schemes, such as the Namak Mazdoor Awas Yojana (NMAY), Coastal Regulation Zone (CRZ) policies, and other social protection frameworks intended to support salt workers. As a result, the artisanal salt economy of Mandarmani stands at the brink of extinction.

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At the national level, India is the third-largest salt producer globally, with Gujarat, Tamil Nadu, and Rajasthan contributing over 90% of the output. However, coastal West Bengal, despite its rich historical legacy, is marginally represented in current salt industry statistics and policy focus. In the global discourse on the blue economy, which promotes sustainable use of marine resources for economic growth and livelihood enhancement, traditional salt-making remains an underutilized domain. Its potential to contribute to food security, climate adaptation, biodiversity conservation, and rural employment is largely overlooked in favor of industrial-scale alternatives.

This research paper situates the crisis of Mandarmani's traditional salt sector within this larger context. It seeks to assess the challenges faced by the salt-making communities from a bottom-up perspective and to explore the policy, economic, and ecological factors behind the decline. Through a field-based methodology combining participatory tools, stakeholder interviews, GPS mapping, and policy audits, the paper attempts to bridge the gap between grassroots realities and top-down policy frameworks.

By doing so, this study contributes to the ongoing conversations on sustainable coastal development, livelihood diversification, and inclusive blue economy strategies. It argues that the revival of traditional salt production is not merely about economic rehabilitation, but also about reclaiming cultural identity, promoting gender equity, and advancing environmental stewardship. Repositioning artisanal salt production as a component of West Bengal's blue economy could offer a pathway for building local resilience in the face of climate risks, economic marginalization, and socio-environmental disruptions.

2. Statement of the Problem

The traditional sea salt industry in Mandarmani, once a thriving livelihood source for coastal communities, is in rapid decline. The confluence of unregulated coastal tourism, land conversion for aquaculture, saline water intrusion, and a lack of institutional support has led to the abandonment of salt pans, erosion of artisanal knowledge, and loss of employment for vulnerable populations, particularly women and seasonal laborers.

Despite national policies like the Namak Mazdoor Awaz Yojana (NMAY), Coastal Regulation Zone (CRZ) norms, and various state-led social protection initiatives, the lived experiences of salt workers reflect a different reality, one marked by poverty, seasonal job insecurity, and gendered exploitation. Additionally, policy frameworks have failed to recognize the socio-economic and ecological significance of traditional salt production in West Bengal's blue economy discourse. There exists a critical gap in research, representation, and revival strategies specific to coastal Bengal. Unlike Gujarat or Tamil Nadu, Mandarmani's salt economy remains under-researched, its decline undocumented, and its potential undervalued. Without timely intervention through community-driven, environmentally sustainable, and policy-integrated approaches, this heritage industry may soon disappear, taking with it an entire ecosystem of livelihoods, local knowledge, and coastal stewardship.

3. Literature Review and Estimated Research Gaps

The comprehensive literature on salt manufacturing in India presents a multidimensional perspective encompassing historical evolution, socio-economic conditions of workers,

production systems, environmental sustainability, health risks, and policy interventions.

- **Socio-Economic and Labour Conditions:** Numerous studies highlight the precarious livelihood conditions of salt workers across major producing states like Gujarat, Tamil Nadu, and West Bengal. Choudhery & Rumani (2006)^[8] and Yadava *et al.* (2006)^[35] reveal widespread poverty, lack of basic amenities, and exploitative labor arrangements including child labor and seasonal employment. Studies by Sahu (2012)^[28], Bhattacharya *et al.* (2018)^[5], and Sagunthala & Sadasivam (2023)^[27] further emphasize social insecurity, weak legal protection, and gender-specific vulnerabilities, especially for women who face lower wages and higher exposure to occupational hazards.
- **Health and Occupational Hazards:** A recurring theme is the poor health of salt workers. Multiple studies (Durairaj & Murugan, 2016; Rekha & Anandhy, 2019; Prakash & Soris, 2018)^[13, 25, 23] document high incidences of dermatological disorders, eye diseases, musculoskeletal pain, and heat-related illnesses due to prolonged exposure to saline and harsh weather. Safety equipment and healthcare access are notably absent, compounded by low awareness and inadequate welfare schemes.
- **Production and Marketing Challenges:** Small-scale salt producers face declining productivity, lack of mechanization, poor branding, and unstable market access. Murugan & Muthalagu (2017)^[19] and Brahma & Sudhakar (2022)^[6] detail infrastructural deficits, waterlogging, and post-harvest degradation affecting marginal producers, particularly in Tamil Nadu. Despite India being the third-largest salt producer globally, the benefits remain inequitably distributed, as stressed by Nagaraja (2015)^[20] and Panigrahi *et al.* (2024)^[22], who call for inclusive modernization strategies and better support for cooperatives.
- **Environmental Aspects and Sustainability:** Environmental studies provide strong support for solar saltworks due to their high purity, low emissions, and ecological compatibility (Sedivy, 2009)^[31]. Choudhery & Rumani (2021)^[9] explore hydrographic variations in salt pans, emphasizing their ecological uniqueness and potential for integrated coastal resource management. Climate change, as noted by Panigrahi *et al.* (2024)^[22], has already impacted salt production patterns, necessitating adaptive approaches.
- **Historical and Political Economy Perspectives:** A significant body of literature traces the colonial transformation of India's salt industry. Historical accounts (Sarkar, 2018; Ojha, 2023; Jana, 2024)^[29, 21, 16] chronicle how indigenous systems were dismantled by British monopolies, particularly in Bengal's coastal regions like Tamluk and Hijli. Chatterjee (2021)^[7], Karim (2022)^[17], and Fine (2022)^[14] expose the exploitative labor models imposed during the colonial era, including the infamous Inland Customs Line and excise-based taxation. Gandhi's Salt March (1930) emerges as a pivotal moment in turning salt into a symbol of resistance against imperial domination (Taylor, 2023; Balaji, 2023)^[34, 1].
- **Gender and Social Protection:** Recent studies place focus on women workers and social protection measures. Suyambulingam *et al.* (2023)^[33] investigate gendered inequalities and implementation gaps in

welfare schemes like PMJDY, CRS, and TNRLM. Findings indicate that women over 40, working early morning shifts, are particularly disadvantaged.

Awareness of legal rights remains low despite the presence of national legislations and international conventions on labour rights.

Table 1: Estimated Research Gaps

Domain	Gaps Identified	References
Longitudinal & Seasonal Data	Few studies track long-term health, economic or migration patterns seasonally.	Yadava <i>et al.</i> (2006); Durairaj & Murugan (2016); Chatterjee (2021) ^[35, 13, 7]
Gender & Caste Disaggregation	Insufficient data on women and intersectionality. Limited insights on caste, class, and gender-based division of labor and discrimination.	Jana (2024); Rekha & Anandhy (2019); Suyambulingam <i>et al.</i> (2023) ^[16, 32, 25, 33]
Environmental Impact	Lacks longitudinal studies on salinity spread, wetland loss, or sea-level rise.	Ojha (2023); Choudhery & Rumani (2021); Sedivy (2009) ^[9, 31, 21]
Ecological Impact Analysis	Underexplored links between salt pan degradation, climate change, and environmental sustainability.	Ojha (2023); Choudhery & Rumani (2021); Sarkar (2018) ^[9, 29, 21]
Technological Adoption	No in-depth analysis of innovation uptake or mechanization feasibility. Little analysis on modernization feasibility or techno-economic viability for small producers.	Brahma & Sudhakar (2022); Nagaraja (2015); Murugan & Muthalagu (2017) ^[6, 19, 20]
Mental Health	Lack of biometric, nutritional, and mental health data across salt-producing zones.	Banerjee Bhattacharya (2017, 2018); Prakash & Soris (2018) ^[4, 23]
Health Metrics	Minimal biometric, nutritional, or psychological assessments of salt workers.	Banerjee Bhattacharya (2017, 2018); Prakash & Soris (2018) ^[4, 23]
Comparative Regional Studies	Focus largely on Gujarat and Tamil Nadu; West Bengal underexplored.	Panigrahi <i>et al.</i> (2024); Sarkar (2018) ^[22, 29]
Subaltern Voices & Oral Histories	Worker's lived experiences, especially pre-Gandhian resistance, are underrepresented.	Chatterjee (2021); Taylor (2023) ^[7, 34]
Policy Effectiveness	No measurable outcomes for schemes like NMAY, CRS, TINP, ESI, etc.	Sahu (2012); BOBP-IGO (2006); Sagunthala & Sadasivam (2023) ^[28, 27]
Source: Author's Own Composition, 2025		

4. The Study Area

The location of a study area encompasses not only its geographical coordinates but also its broader geo-environmental characteristics, which directly or indirectly influence its landscape and ecological dynamics. The Mandarmani coastal stretch, a significant segment of coastal Bengal, stands out due to its pristine natural beauty, dynamic coastal processes, and growing anthropogenic influences.

- **Geographical Coordinates:** The study area is situated between 21°38'47"N - 21°42'25"N latitude and 87°38'23"E - 87°45'57"E longitude, making it a crucial coastal section along the Bay of Bengal.
- **Geomorphology & Geology:** Mandarmani lies within the Pichhaboni River sub-basin of the South Bengal Basin, characterized by a fluvio-coastal landscape shaped by riverine and marine interactions. Bounded by the left arm (eastern side) of the Pichhaboni River and the right arm of Jaldha Khal, this region forms part of the recent fluvio-coastal sedimentary and alluvial sub-formation of the Quaternary-Holocene sequence of the Bengal Coastal Formation, dating back approximately 6,000-8,000 years BP (Before Present).
- **Environmental & Ecological Features:** The Mandarmani coastal belt, part of the Medinipur coastal region, is flanked by Soula (coastal Kanthi) to the east and Tajpur to the west. It showcases a distinctive coastal environment, featuring an exceptional interplay of sea, sand, and sun, with a landscape enriched by coastal vegetation, including Casuarina trees, dune

grass, and mangroves. This stretch is ecologically sensitive, with a delicate balance between natural coastal processes and increasing tourism-related interventions.

- **Administrative Boundaries:** Administratively, the study area consists of six villages and forms a rural coastal stretch under the Kalandi Gram Panchayat of Ramnagar-II CD Block within the Contai Sub-Division of Purba Medinipur District, West Bengal. The growing tourism industry and developmental activities in this region have brought both economic opportunities and environmental challenges, making it a critical area for coastal management and conservation efforts.

5. Specific Objectives

- To assess the socio-economic conditions and livelihood vulnerabilities of traditional salt producers in the Mandarmani coastal region.
- To evaluate the extent, causes, and spatial patterns of decline in traditional salt production using field mapping and participatory methods.
- To examine the awareness, accessibility, and effectiveness of government policies and welfare schemes related to salt worker support in the study area.
- To propose integrated revival strategies aligning traditional salt production with blue economy principles, local sustainability, and community resilience

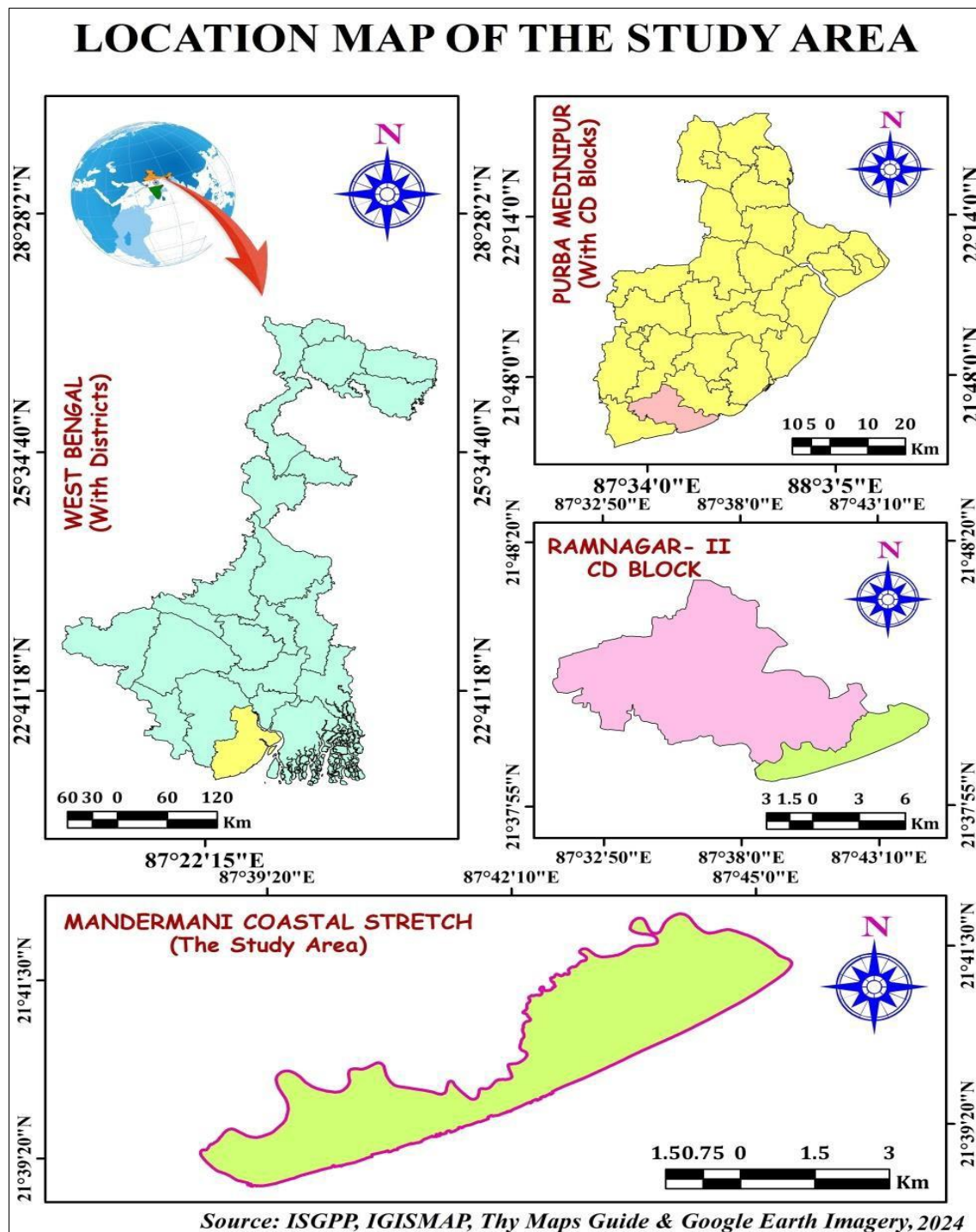


Fig 1: The Study Area

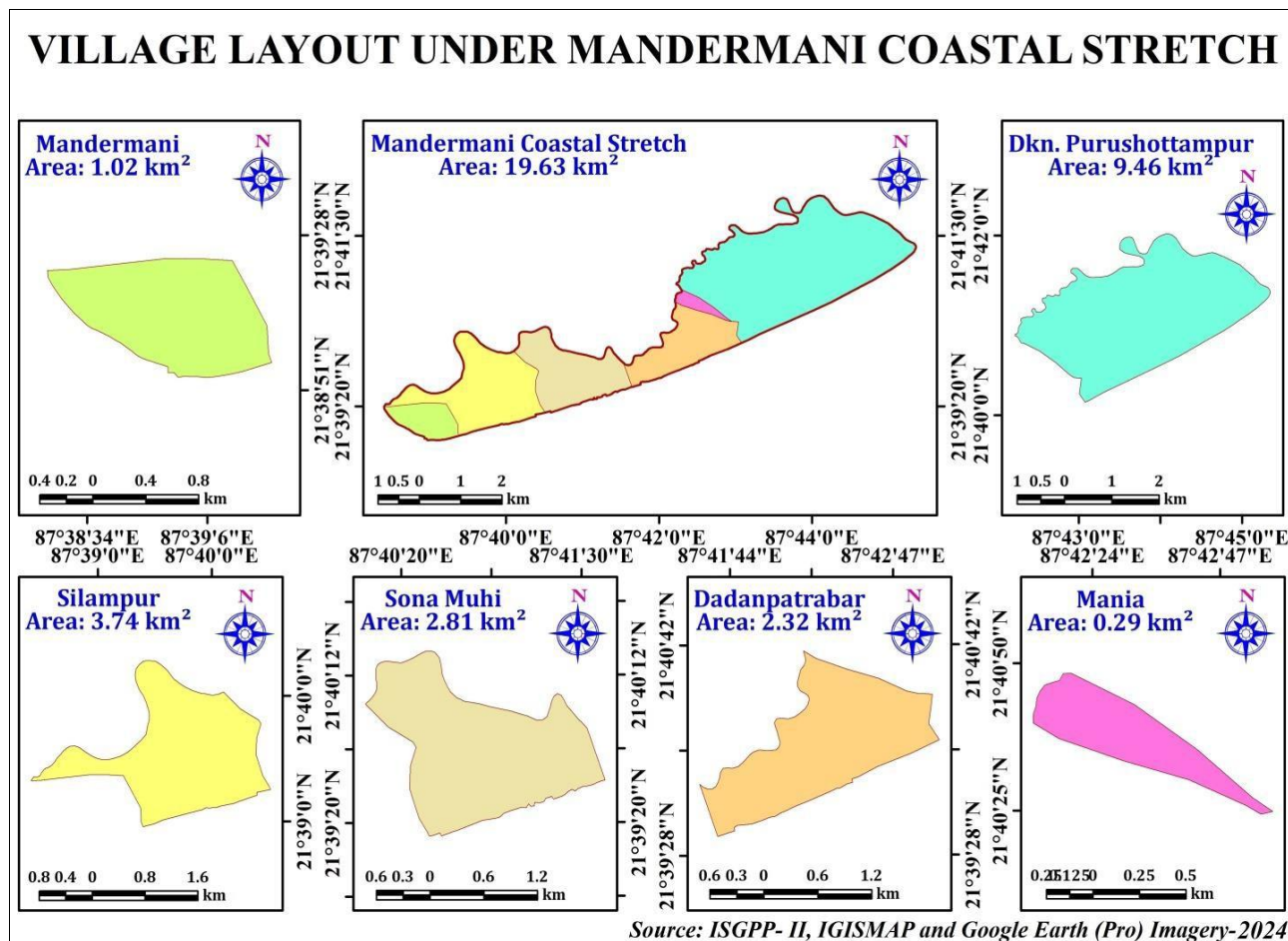


Fig 2: Layout of the Villages under Mandarmani Coastal Stretch

6. Materials, Methods and Methodology

This study adopts a mixed-method, interdisciplinary research design that integrates qualitative, quantitative, spatial, and policy analysis to comprehensively examine the socio-economic, environmental, and governance dimensions of traditional sea salt production in the Mandarmani coastal region of West Bengal. The approach is grounded in participatory and field-based inquiry, ensuring that the voices of salt workers, especially women and marginalized communities, are central to the research.

6.1 Research Design and Approach

The study uses an **exploratory and descriptive design**, combining:

- Qualitative tools (oral histories, focus group discussions)
- Quantitative surveys (structured household questionnaires)
- Spatial mapping (GPS and GIS-based mapping of salt pans)
- Policy review and institutional analysis

6.2 Data Collection Methods

a) Primary Data Sources

1. Household Surveys

- **Sample Size:** ~100-120 respondents (stratified by gender, age, and occupation)
- **Tools:** Structured questionnaire covering income, health, seasonality of employment, access to welfare schemes, and migration patterns.

2. Key Informant Interviews (KIIs)

Salt workers, local elders, women's groups, panchayat members, cooperative leaders, CRZ and fisheries officials.

3. Focus Group Discussions (FGDs)

Conducted separately with male and female workers to understand gender-specific issues and coping strategies.

4. Oral Histories and Ethnographic Narratives

Collection of intergenerational stories from salt-making families, including Malangis and Agariyas (if relevant to local history).

5. Field Observation and Transect Walks

Observation of abandoned or active salt pans, environmental conditions, salinity spread, and land use.

b) Spatial Data Collection

GPS Mapping

- Mapping of existing and defunct salt pans using handheld GPS devices.
- Collection of geo-coordinates to track landscape transformation.

GIS Analysis

- Use of satellite imagery and temporal land use data (e.g., Landsat, Sentinel) to detect spatial patterns of salt pan decline and encroachment.
- Mapping proximity to tourism resorts, aquaculture farms, and tidal inlets.

c) Secondary Data Sources

Government records from

- Salt Commissioner's Office
- CRZ Notifications
- Ministry of Commerce and Industry (Namak Mazdoor Awas Yojana, Coastal Cluster Development Programme)
- West Bengal's District Gazetteers and Panchayat Reports

Previous literature and field reports from:

- BOBP-IGO
- Environmental NGOs
- Census and NSSO data for demographic trends

6.3 Policy Assessment

A structured review of welfare schemes (*e.g.*, NMA, CRS, ESI, PMJDY, and TNRLM) was conducted using a policy audit framework, which includes:

- Scheme awareness levels among beneficiaries
- Accessibility and enrollment processes
- Delivery gaps and implementation barriers
- Performance indicators (housing provision, RO water access, seasonal employment support)

6.4 Analytical Tools and Techniques

- **Descriptive Statistics:** Frequencies, averages, and cross-tabulations for socio-economic data.
- **Regression Analysis:** To identify predictors of livelihood vulnerability (income, land tenure, access to welfare).
- **SWOT Analysis:** To assess the potential of salt revival under the blue economy lens.
- **Thematic Analysis:** Coding of qualitative narratives to identify recurrent themes (*e.g.*, gendered roles, heritage value, policy neglect).
- **ArcGIS/QGIS:** For spatial visualization of salt pan dynamics and ecological stress zones.

6.5 Ethical Considerations

- Informed consent obtained from all participants.
- Gender-sensitive and inclusive approach maintained during fieldwork.
- Anonymity assured in reporting sensitive socio-economic or health information.

6.6 Limitations

- Seasonal nature of salt production may limit year-round observation.
- Historical data on salt production in Mandarmani is limited and fragmented.
- Remote sensing resolution for small salt pans may pose

technical challenges.

7. Results and Discussion

7.1 Historical Context of Salt Manufacturing and Its Decline in Midnapore including Study Area

The Midnapore coastline, primarily covering the districts of Purba Medinipur and Paschim Medinipur, was once a significant hub for salt production. The coastal saline wetlands provided an ideal environment for traditional salt pans. According to Ray (2010), salt production in this region dates back to the colonial period when British authorities regulated and taxed salt, affecting its indigenous production. However, despite state control, local production persisted until the mid-20th century when industrial and policy changes began to impact its sustainability.

Factors Contributing to the Decline

Economic and Policy Constraints

The liberalization policies of the 1990s and the increased import of industrially refined salt led to a significant decline in traditional salt-making activities. As per Banerjee & Chakraborty (2015) ^[2], local salt producers struggled to compete with large-scale industrial production, which benefited from better infrastructure, technology, and government incentives.

Environmental and Climatic Challenges

Coastal erosion, changing monsoon patterns, and rising sea levels have also contributed to the diminishing status of salt pans in Midnapore (Das, 2018). Erratic weather conditions have disrupted salt production cycles, reducing yields and increasing costs for small-scale producers.

Technological Disparities

Lack of technological advancement has also been a crucial factor. Traditional salt production methods involve solar evaporation techniques that are labor-intensive and time-consuming. Sinha *et al.* (2020) ^[32] argue that without mechanization and modern processing techniques, small producers find it difficult to remain viable in a competitive market.

Socio-Economic Impact on Local Communities

The decline of salt manufacturing has directly impacted the livelihoods of thousands of workers in Midnapore. Several studies (Choudhury & Ghosh, 2021) ^[10] suggest that unemployment and forced migration have risen as traditional salt-making families shift to other occupations, such as fishing and small-scale trade. The lack of alternative employment opportunities has exacerbated economic distress in these coastal regions.

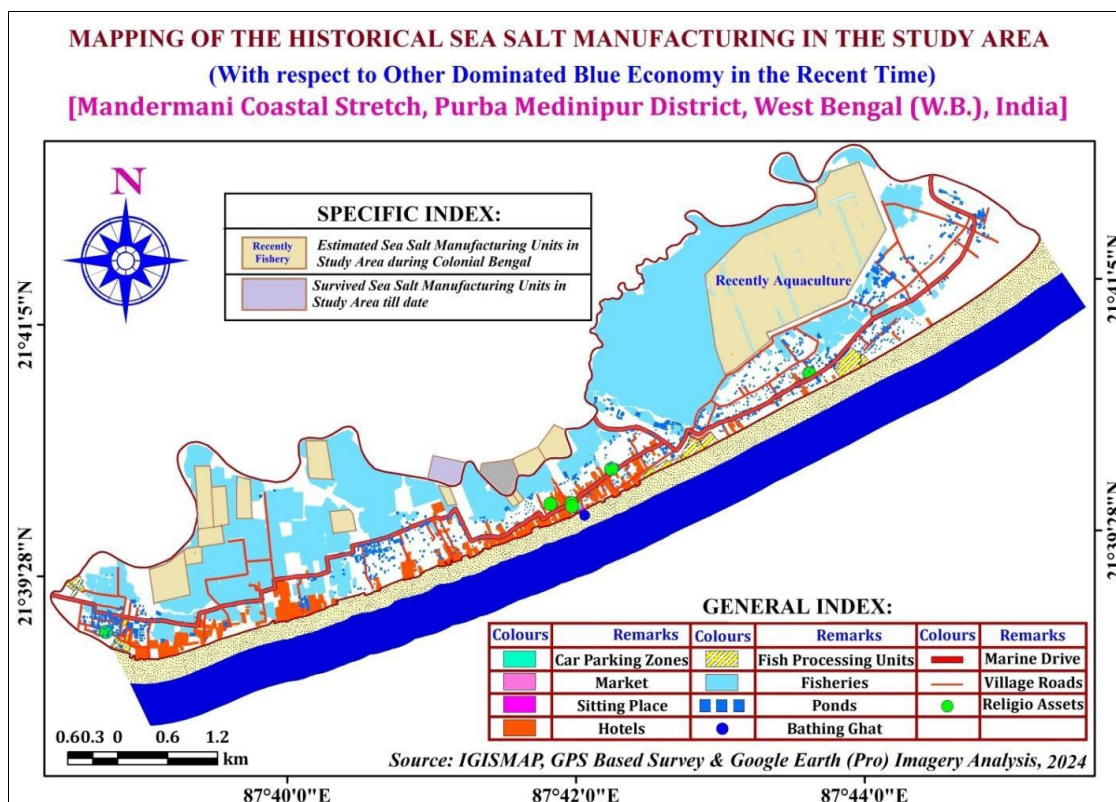


Fig 3: Historical Sea Salt Manufacturing Units in the Study Area

7.2 Sea Salt Manufacturing as the Endangered Blue Economy and Allied Livelihood in the Study Area

7.2.1 Production Zones and Respondents' Profile

Table 2: Address of the Salt Manufacturing Units/ Spots

Sl. No.	Address of Salt Manufacturing Units	Number of Respondents	% of Respondents
1.	Mandarmani Section	11	29.73
2.	Silampur Section	9	24.32
3.	Dakshin Purushottampur Section	3	8.11
4.	Surroundings of Mandarmani Coastal Stretch	14	37.84
	Total	37	100.00

Source: Field Survey, 2025

Here's a synthesized interpretation of the sea salt manufacturing database for the project. This analysis unpacks production zones and respondents' profile of salt makers in Mandarmani and nearby coastal stretches:

- Main production areas: 38% of units are in Mandarmani surroundings, 30% in Mandarmani proper, and 24% in Silampur, identifying the region's traditional salt-making heartlands.

- Respondent roles: 68% are direct salt manufacturers, but owners (3%) and managers (5%) are rare, revealing a predominantly labor-based livelihood.
- Residential permanence: Nearly 92% have lived in the area ≥ 20 years; this is a deeply rooted traditional community, not recent migrants.

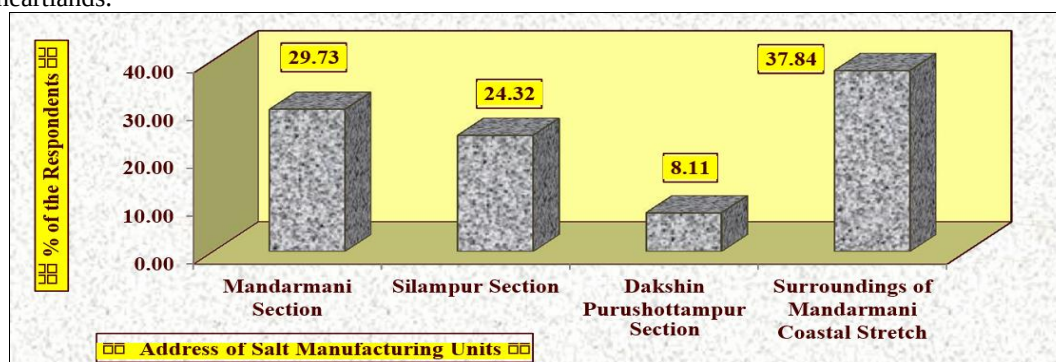


Fig 4: Address of the Salt Manufacturing Units/ Spots

Table 3: Working Category of the Respondents related to Salt Manufacturing

Sl. No.	Working Category related to Salt Manufacturing	Number of Respondents	% of Respondents
1.	Owner	1	2.70
2.	Manager	2	5.41
3.	Salt Manufacturer	25	67.57
4.	Salt Manufacturing Organizer	3	8.11
5.	Allied Family's Member	3	8.11
6.	Others	3	8.11
	Total	37	100.00

Source: Field Survey, 2025

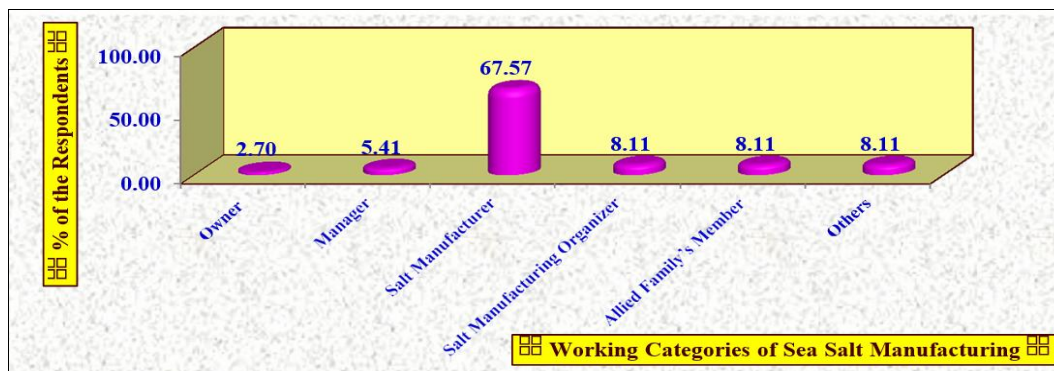


Fig 5: Working Category of the Respondents related to Salt Manufacturing

Table 4: Residential Address of the Respondents from Salt Manufacturing

Sl. No.	Residential Zone	Number of Respondents	% of Respondents
7.	Mandarmani Section	7	18.92
8.	Silampur Section	11	29.73
9.	Sonamuihi Section	2	5.41
10.	Dadanpatrabad Section	0	0.00
11.	Dakshin Purushottampur Section	3	8.11
12.	Surroundings of Mandarmani	14	37.84
	Coastal Stretch		
	Total	37	100.00

Source: Field Survey, 2025

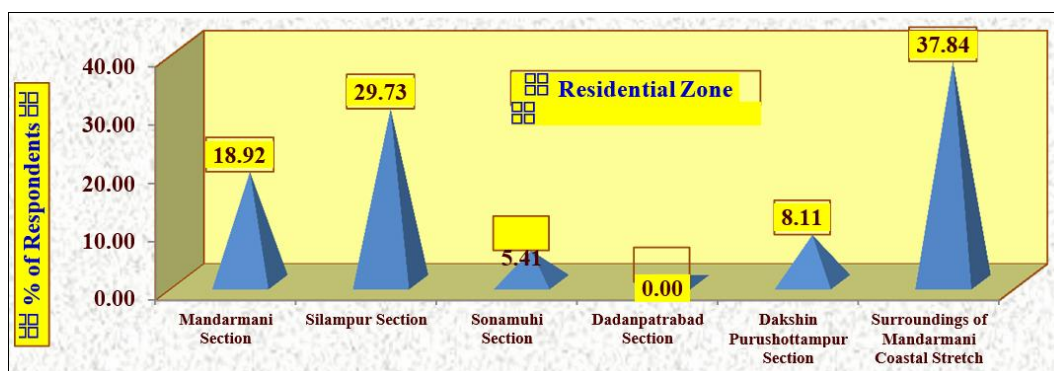


Fig 6: Residential Address of the Respondents from Salt Manufacturing

Table 5: Residential Duration/ Year of Experience with the Place

Sl. No.	Residential Duration (Years)	Number of Respondents	% of Respondents
1.	<5	0	0.00
2.	5-10	0	0.00
3.	10-15	1	2.70
4.	15-20	2	5.41
5.	20-25	4	10.81
6.	25-30	9	24.32
7.	≥30	21	56.76
	Total	37	100.00

Source: Field Survey, 2025

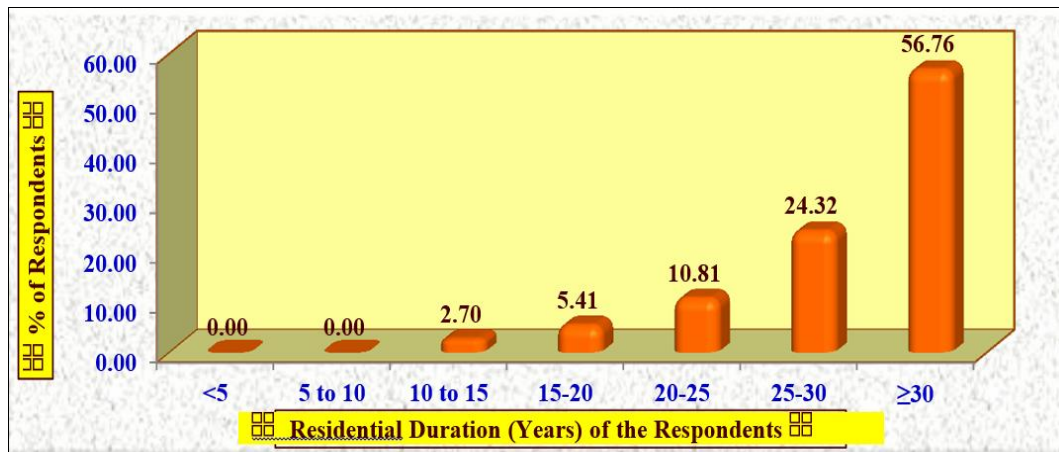


Fig 7: Residential Duration/ Year of Experience with the Place

Table 6: Residential Nature of the Respondents

Sl. No.	Residential Nature	Number of Respondents	% of Respondents
1.	Migrated (<10-years)	0	0.00
2.	Semi-permanent (10-20-years)	3	8.11
3.	Permanent (≥20-years)	34	91.89
	Total	37	100.00

Source: Field Survey, 2025

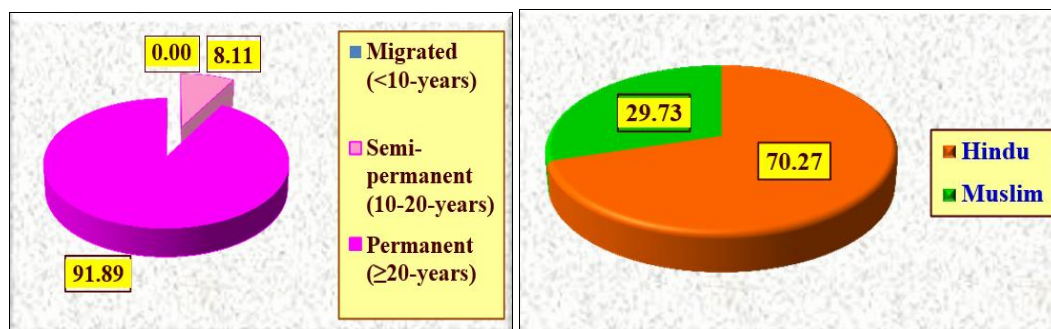


Fig 8: Residential Nature of the Respondents

Fig 9: Religion of the Respondents

7.2.2 Social and Demographic Features

Table 7: Religion of the Respondents

Sl. No.	Religion of Respondents	Number of Respondents	% of Respondents
1.	Hindu	26	70.27
2.	Muslim	11	29.73
3.	Christian	0	0.00
	Total	37	100.00

Source: Field Survey, 2025

Table 8: Caste of the Respondents

Sl. No.	Caste of Respondents	Number of Respondents	% of Respondents
1.	Unreserved (UR)	9	24.32
2.	Schedule Caste (SC)	12	32.43
3.	Schedule Tribe (ST)	1	2.70
4.	Other Backward Caste-A (OBC-A)	8	21.62
5.	Other Backward Caste-B (OBC-B)	7	18.92
6.	Economically Weaker Section (EWS)	0	0.00
	Total	37	100.00

Source: Field Survey, 2025

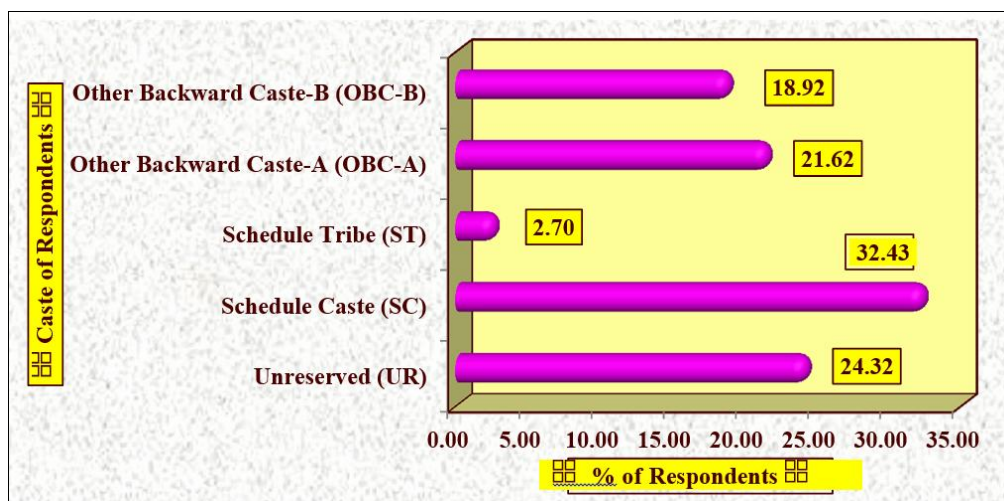


Fig 10: Caste of the Respondents

Table 9: Age (Years) of the Respondents

Sl. No.	Age (Years) of Respondents	Number of Respondents	% of Respondents
1.	<25	0	0.00
2.	25-35	1	2.70
3.	35-45	8	21.62
4.	45-55	17	45.95
5.	55-65	10	27.03
6.	65-75	1	2.70
7.	≥75	0	0.00
	Total	37	100.00

Source: Field Survey, 2025

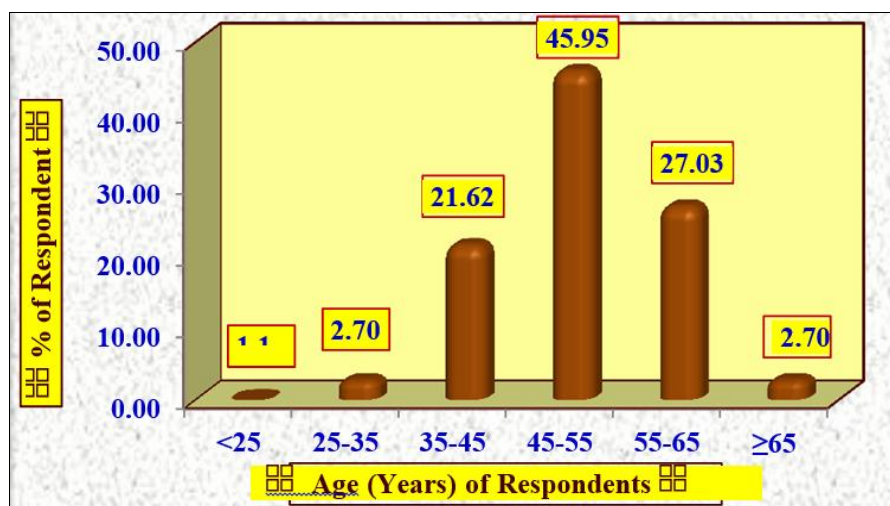


Fig 11: Age (Years) of the Respondents

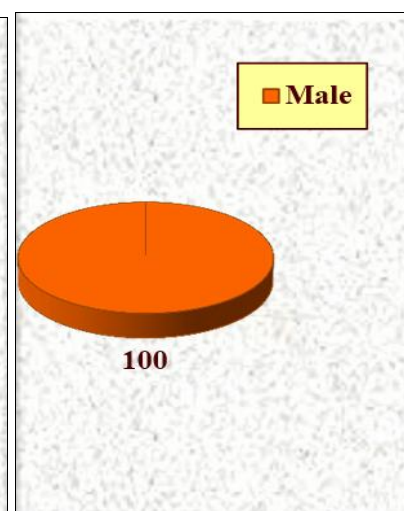


Fig 12: Sex of the Respondents

Table 10: Sex of the Respondents

Sl. No.	Sex of Respondents	Number of Respondents	% of Respondents
1.	Male	37	100.00
2.	Female	0	0.00
	Total	37	100.00

Source: Field Survey, 2025

The synthesized interpretation of the sea salt manufacturing database indicates the socio-demographic aspects of salt makers in the study area:

- **Religion:** 70% Hindu, 30% Muslim, a significant minority community engaged in this sector.
- **Caste:** 32% SC, 22% OBC-A, 19% OBC-B, and just

24% UR, showing that salt manufacturing is dominated by socially marginalized groups.

- **Gender:** 100% male respondents, confirming a complete exclusion of women from the active salt workforce.

Education and Income

Table 11: Educational Status of the Respondents

Sl. No.	Educational Status of Respondents		Number of Respondents	% of Respondents
1.	Literate	Illiterate	5	13.51
2.		Primary Level (0-4)	11	29.73
3.		Upper Primary Level (5-6)	9	24.32
4.		Junior High Level (7-8)	6	16.22
5.		Secondary Level (9-10)	4	10.81
6.		Higher Secondary Level (11-12)	2	5.41
7.		Under Graduate Level (13-15)	0	0.00
8.		Others	0	0.00
	Total		37	100.00

Source: Field Survey, 2025

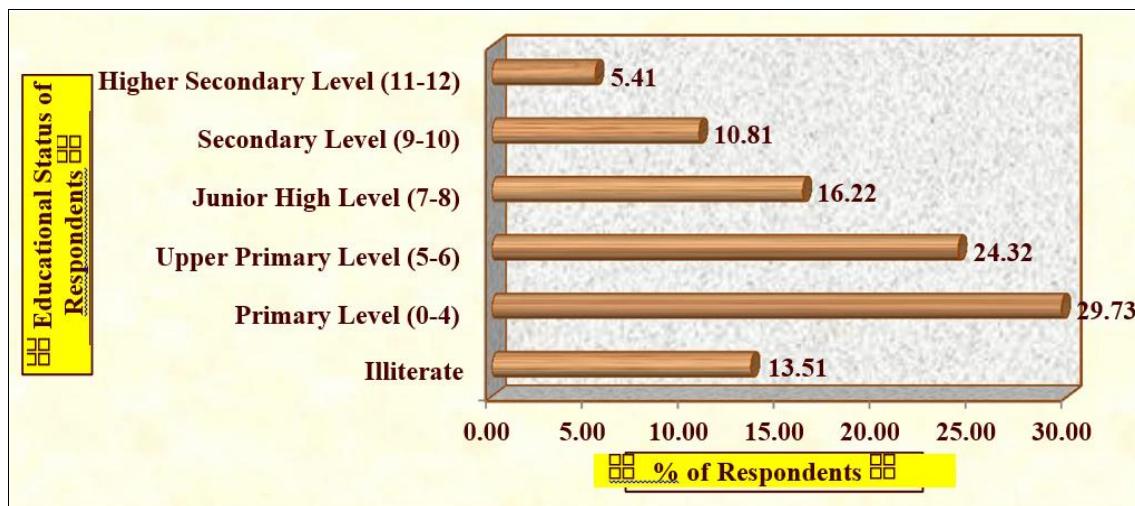


Fig 13: Educational Status of the Respondents

Table 12: Family Size of the Respondents

Sl. No.	Family Size of Respondents	Number of Respondents	% of Respondents
1.	<4	4	10.81
2.	4-6	19	51.35
3.	6-8	10	27.03
4.	8-10	2	5.41
5.	≥ 10	2	5.41
	Total	37	100.00

Source: Field Survey, 2025

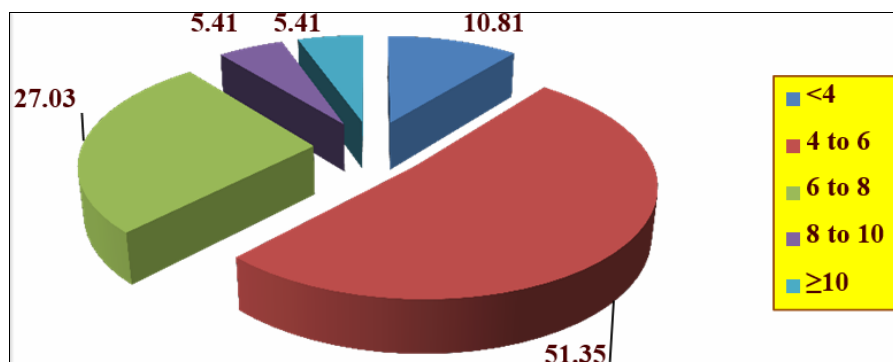
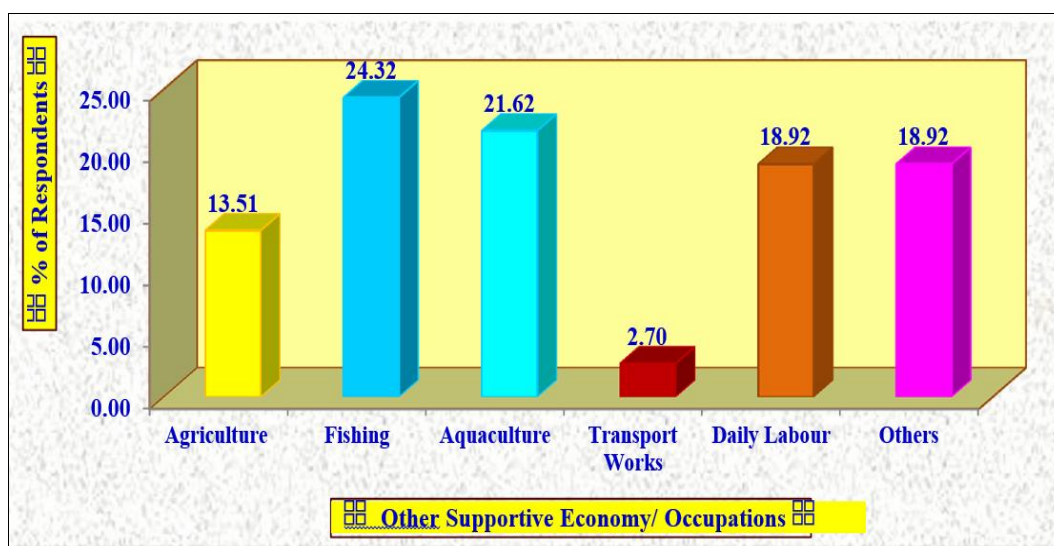


Fig 14: Family Size of the Respondents

Table 13: Other Supportive Economy/ Occupations (if any) of the Respondent

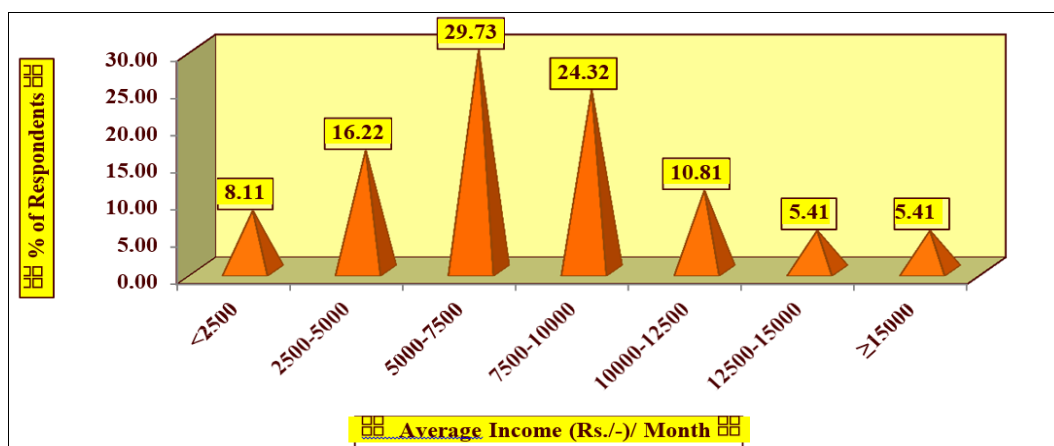
Sl. No.	Other Supportive Economy/ Occupations	Number of Respondents	% of Respondents
1.	Agriculture	5	13.51
2.	Fishing	9	24.32
3.	Aquaculture	8	21.62
4.	Transport Works	1	2.70
5.	Hotel Workers	0	0.00
6.	Tourism & Travel Workers	0	0.00
7.	Small Scale Business (Small shop, vendors, hawkers, etc.)	0	0.00
8.	Medium to Large Scale Business	0	0.00
9.	Govt. Service	0	0.00
10.	Private/ Non-govt. Service/ Job	0	0.00
11.	Daily Labour	7	18.92
12.	Others	7	18.92
	Total	37	100.00

Source: Field Survey, 2025

**Fig 15:** Other Supportive Economy/ Occupations (if any) of the Respondent

Sl. No.	Average Income (Rs./-)/ Month	Number of Respondents	% of Respondents
1.	<2500	3	8.11
2.	2500-5000	6	16.22
3.	5000-7500	11	29.73
4.	7500-10000	9	24.32
5.	10000-12500	4	10.81
6.	12500-15000	2	5.41
7.	≥15000	2	5.41
	Total	37	100.00

Source: Field Survey, 2025

**Fig 16:** Average Income (Rs./-)/ Month

The synthesized interpretation of the sea salt manufacturing database indicates the education and income aspects of salt makers in the study area.

Low education levels

- 14% illiterate,
- ~74% below secondary level,
- Only 5% have higher secondary, suggesting poor access to formal education limits opportunities for skill development or alternative livelihoods.

Income vulnerability

- 54% earn $\leq$ ₹7,500/month,
- Only 11% earn $>$ ₹10,000; this signals chronic economic marginality.
- Family sizes: Over half (51%) have 4-6 members, adding economic pressure.

7.2.4 Employment Dynamics

Table 15: Working Days/ Month

Sl. No.	Working Days/ Month	Number of Respondents	% of Respondents
1.	<10	1	2.70
2.	10-15	7	18.92
3.	15-20	16	43.24
4.	20-25	10	27.03
5.	$\geq$ 25	3	8.11
	Total	37	100.00

Source: Field Survey, 2025

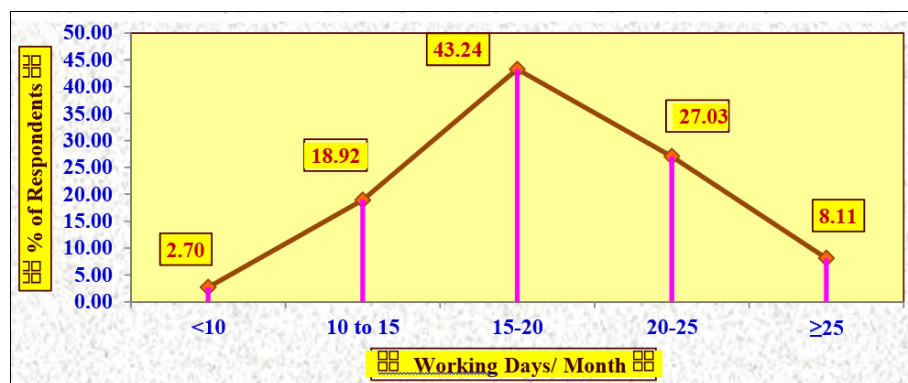


Fig 17: Working Days/ Month

Table 16: Working Months/ Year

Sl. No.	Working Months/ Year	Number of Respondents	% of Respondents
1.	<3	4	10.81
2.	3-6	10	27.03
3.	6-9	23	62.16
4.	$\geq$ 9	0	0.00
	Total	37	100.00

Source: Field Survey, 2025

Table 17: Status of Working

Sl. No.	Status of Working	Number of Respondents	% of Respondents
1.	Regular	23	62.16
2.	Irregular	8	21.62
3.	As per willingness	1	2.70
4.	During the Off Season of Fishing/ Aquaculture/ Others	5	13.51
5.	Others	0	0.00
	Total	37	100.00

Source: Field Survey, 2025

Table 18: Alternative Activities as the Life Earning Ways during Off Season of Sea Salt Manufacturing

Sl. No.	Alternative Activities as the Life Earning Ways during Off Season	Number of Respondents	% of Respondents
1.	Aquaculture	13	35.14
2.	Fishing	9	24.32
3.	Transport & Tourism related activities	2	5.41
4.	Daily Labour	9	24.32
5.	Others	3	8.11
6.	None about	1	2.70
	Total	37	100.00

Source: Field Survey, 2025

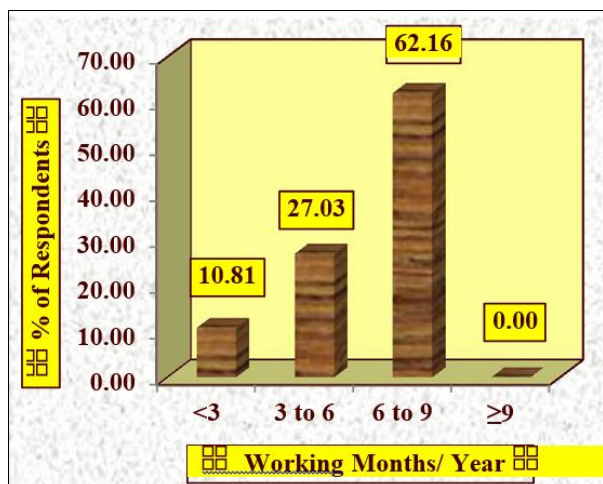


Fig 18: Working Months/ Year

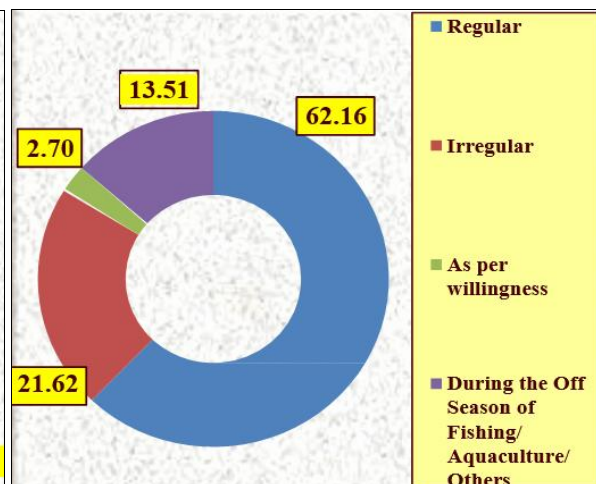


Fig 19: Status of Working

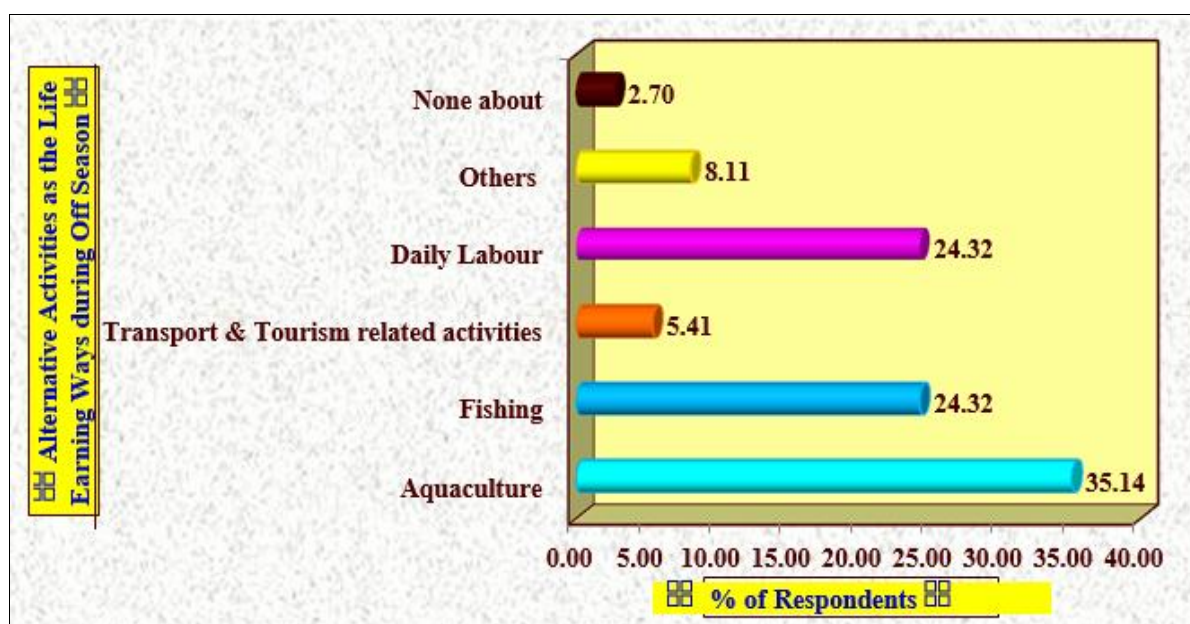


Fig 20: Alternative Activities as the Life Earning Ways during Off Season of Sea Salt Manufacturing

The above database and analysis show the employment dynamics of the salt manufacturing workers in the Mandarmani landscape.

Salt work is highly seasonal:

- 62% work 6-9 months/year,
- 11% work <3 months/year.
- Most (43%) work 15-20 days/month, reflecting limited, intermittent income.
- **Alternative livelihoods:** During off-season, they shift mainly to aquaculture (35%) and fishing (24%), but many (24%) survive as daily laborers, highlighting a lack of stable options.

7.2.5 Institutional Neglect

The above data table and diagram indicates the schemes or subsidies for salt producing workers from the end of government. From the field survey, it is seen that although there are some schemes or subsidies for salt manufacturing workers in other states of India, in the case of our state including the study area, no kind of govt. facilities is observed like schemes, projects, subsidies, etc. 100% of respondents have reported never receiving any government scheme/subsidy, underscoring absolute policy failure to support this traditional economy.

Table 19: If any scheme/ subsidy for work?

Sl. No.	Scheme/ Subsidy Facility	Number of Respondents	% of Respondents
1.	Regularly Drawn	0	0.00
2.	Partially Drawn	0	0.00
3.	Pastly Drawn	0	0.00
4.	None	37	100.00
	Total	37	100.00

Source: Field Survey, 2025

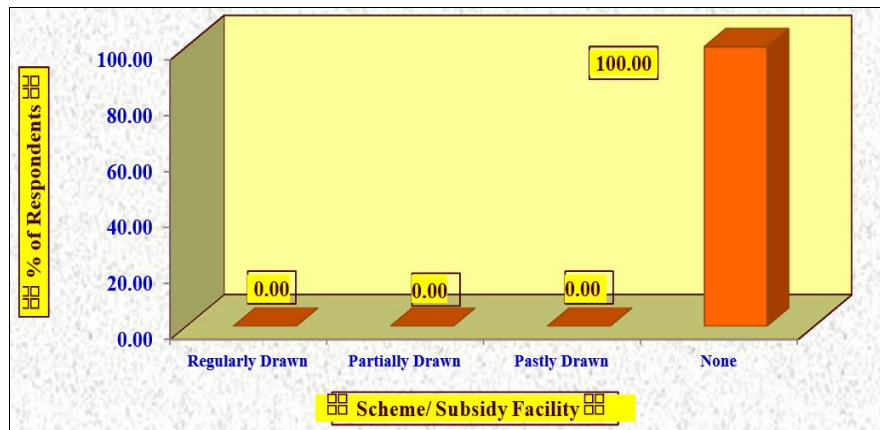


Fig 21: If any scheme/ subsidy for work?

7.2.6 Causes for coming in Salt Manufacturing

Table 20: Responsible/ Driving Factors for coming in this occupation

Sl. No.	Responsible Causes	Number of Respondents	% of Respondents
1.	Job in hand at home place	16	43.24
2.	Lack of employment opportunity in other sectors throughout time	7	18.92
3.	Low income in other economic activities	3	8.11
4.	Higher income scope and more profit opportunity from this activity	2	5.41
5.	No such type of work with which he is habituated from the beginning	21	56.76
6.	Family/ generation based traditional job opportunity	16	43.24
7.	Family orientation with salt manufacturing related activities	15	40.54
8.	Enforcement for more income from the family	7	18.92
9.	Provoking/ inspiring from friends/ relatives/ neighbours/ others to engage in	5	13.51
10.	Acute family crisis in terms of poverty from different dimensions	10	27.03
11.	Own interest to engage in it for more income and improving livelihood	7	18.92
12.	Seasonal support as life earning way and opportunity	11	29.73
	Total	37	100

Source: Field Survey, 2025

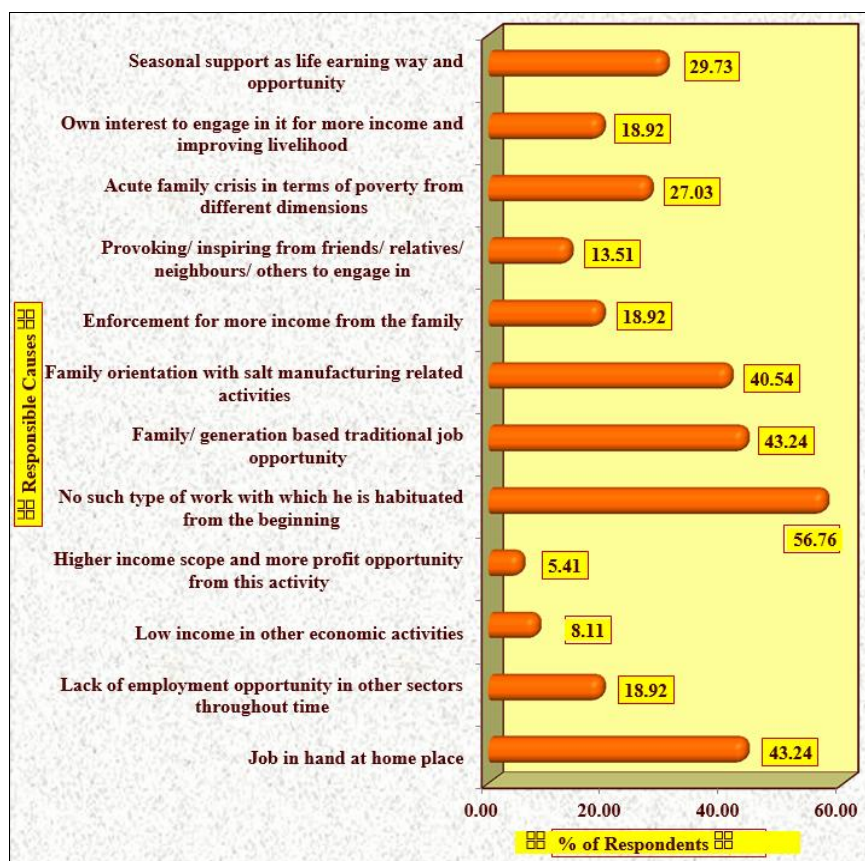


Fig 22: Responsible/ Driving Factors for coming in this occupation

The above data table and diagram show the responsible causes of salt manufacturing workers for coming into this occupation.

Top reasons include

- 57%: Habituation/traditional work
- 43%: Job at home, family/generational links
- 41%: Family orientation towards salt work

- 29%: Seasonal earning opportunity

Factors like poverty crisis (27%) and lack of alternatives (19%) show salt making is often a livelihood of compulsion, not choice.

Impacts of Tourism and Other Economies on Salt Livelihood

Table 21: Situational Impacts of Tourism or Other Growing Economy on Salt Manufacturing Livelihood in the Study Area

Dimensions of Impacts/ Influences	Major Impacts/ Influences from Tourism/ Other Economy on Salt Manufacturing	Number of Respondents				% of Respondents			
		High	Moderate	Low	Total	High	Moderate	Low	Total
Negative Impacts									
1. Loss of Land and Spatial Displacement	Encroachment by Tourism Projects	7	13	17	37	18.92	35.14	45.95	100
	Conversion to Aquaculture (Especially Shrimp Farming)	21	13	3	37	56.76	35.14	8.11	100
	Absence of Legal Recognition	11	14	12	37	29.73	37.84	32.43	100
2. Environmental Alterations Affecting Salt Viability	Salinity Pattern Changes	3	6	28	37	8.11	16.22	75.68	100
	Contamination of Brine Sources	5	8	24	37	13.51	21.62	64.86	100
	Climate-induced Stress	10	15	12	37	27.03	40.54	32.43	100
3. Socio- economic Vulnerability and Livelihood Erosion	Loss of Seasonal Income	12	13	12	37	32.43	35.14	32.43	100
	Inter-generational Occupation Loss	23	13	1	37	62.16	35.14	2.70	100
	No Financial Support or Schemes	36	1	0	37	97.30	2.70	0.00	100
4. Cultural and Identity Marginalization	Disappearance of Traditional Knowledge	17	14	6	37	45.95	37.84	16.22	100
	Erosion of Collective Practice	12	16	9	37	32.43	43.24	24.32	100
5. Market and Economic Inequality	Unfair Market Competition	18	15	4	37	48.65	40.54	10.81	100
	Middleman Exploitation	17	15	5	37	45.95	40.54	13.51	100
6. Policy and Governance Failure	No Formal Recognition in CRZ Planning	13	17	7	37	35.14	45.95	18.92	100
	Lack of Rehabilitation Framework	31	6	0	37	83.78	16.22	0.00	100
	Fragmented Institutional Oversight	32	5	0	37	86.49	13.51	0.00	100
Positive Impacts									
7. Opportunities (If Recognized and Protected)	Salt Heritage Tourism	11	16	10	37	29.73	43.24	27.03	100
	Artisanal or Organic Salt Branding	15	14	8	37	40.54	37.84	21.62	100
	Revival Through SHGs and MSME Schemes	7	9	21	37	18.92	24.32	56.76	100
Source: Field Survey, 2025									

Source: Field Survey, 2025

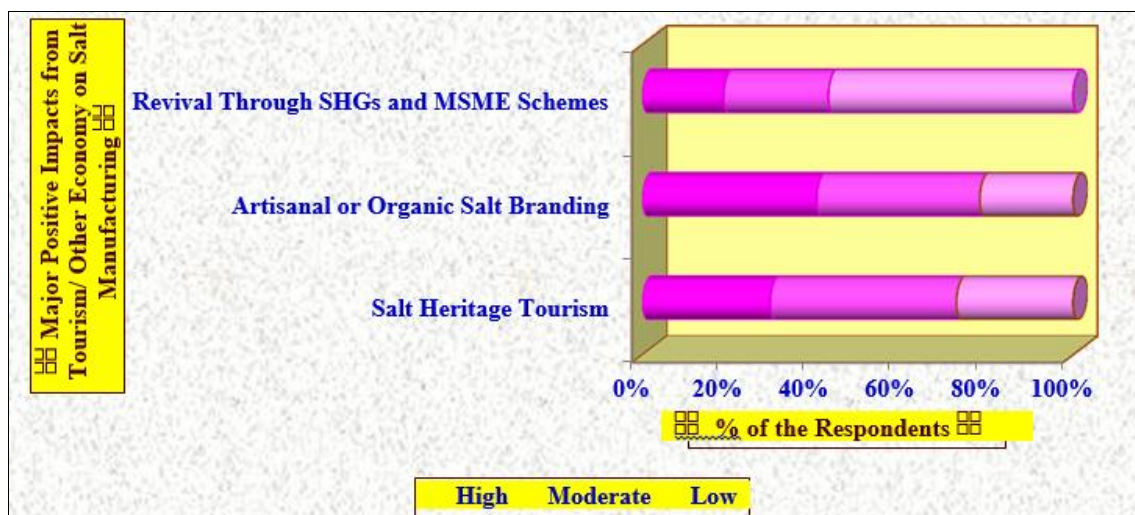


Fig 23: Positive Impacts of Tourism or Other Growing Economy on Salt Manufacturing Livelihood in the Study Area

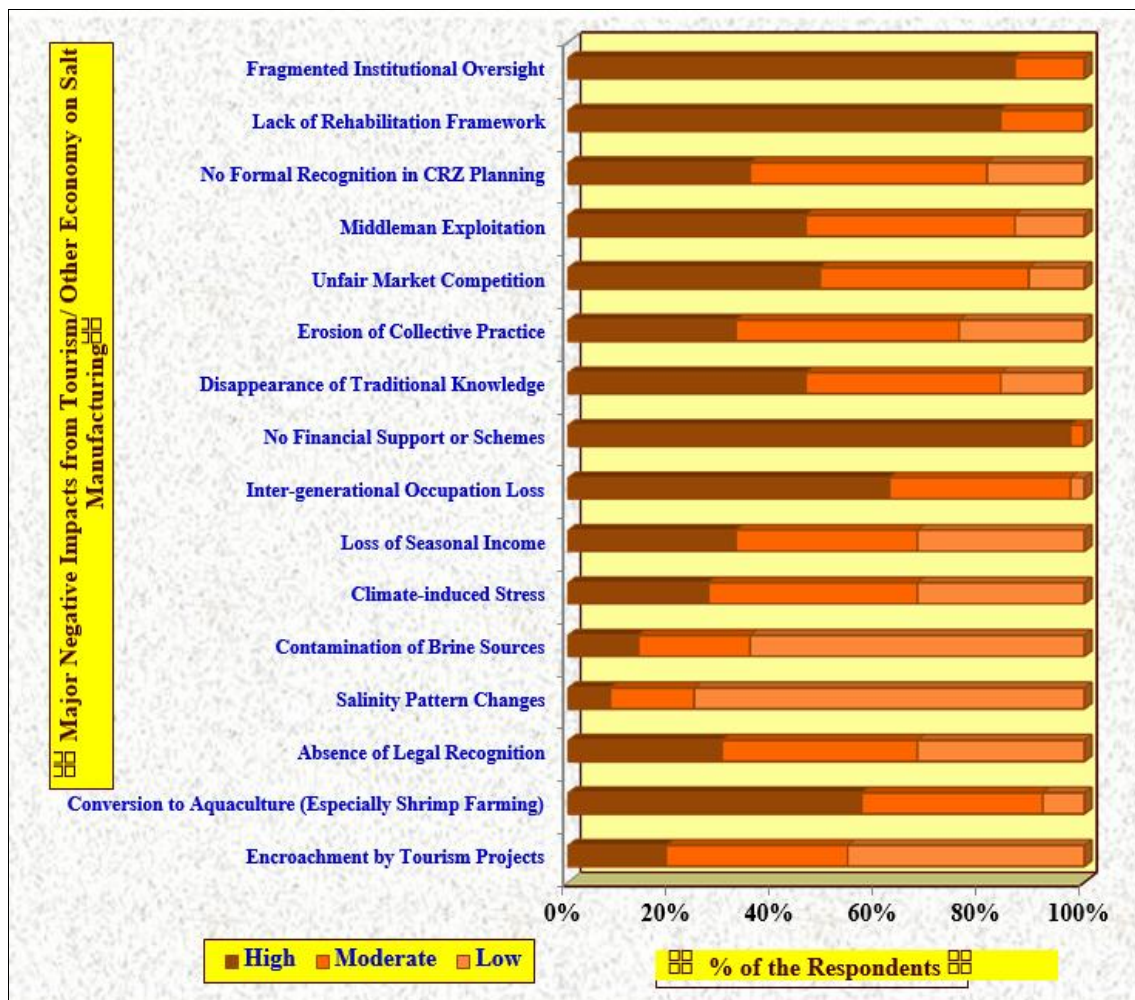


Fig 24: Negative Impacts of Tourism or Other Growing Economy on Salt Manufacturing Livelihood in the Study Area

The above table reflects the impacts of tourism and other economies on salt livelihood. As per analysis the major impacts are:

Negative impacts

Land & displacement

- 56% cite land conversion to aquaculture,
- 19% high encroachment from tourism,
- 30% face no legal recognition for their lands.

Environmental

- Climate-induced stress affects 27% highly,
- Salinity and brine contamination seen as low risks by most, but still present.

Socio-economic vulnerability

- 62% report intergenerational occupation loss
- 32%+ face seasonal income loss
- 97% cite no financial safety net, compounding vulnerability.

Cultural erosion

Nearly half fear the disappearance of traditional knowledge.

Market challenges

- 49% see unfair competition,
- 46% suffer from middleman exploitation.

Policy failures

- 87% cite fragmented oversight,
- 84% highlight lack of rehabilitation plans, showing salt makers are excluded CRZ plans and broader blue economy frameworks.

Supportable Positive Opportunities

- 41% see potential for organic/artisanal branding,
- 30% favor salt heritage tourism,
- But 57% think SHG/MSME revival is unlikely without external support, reflecting low optimism.

7.2.8 Key Observations relating the Sea Salt Manufacturing Livelihood:

- Sea salt manufacturing in Mandarmani is a deeply traditional, male-dominated, socially marginalized occupation facing existential threats from tourism, aquaculture, and climate pressures.
- Despite historic importance, salt makers face legal invisibility, market exploitation, and zero institutional support, driving rapid decline of this heritage economy.
- Opportunities like artisanal branding or heritage tourism exist, but need urgent policy recognition, CRZ protection, and financial support to revive livelihoods sustainably.

7.3 SWOT Analysis Matrix for Sea Salt Manufacturing in the Study Area:

Strength-Weakness (S-W) Analysis of Sea Salt Production

Table 22: Strength-Weakness (S-W) Analysis

	Strengths (S) (Internal positive attributes)	Weaknesses (W) (Internal limitations)
Internal SWOT Factors	- Labour-intensive with local employment - Low-cost and indigenous production system - Indigenous traditional ecological technique and minimal ecological disturbance	- Declining land access due to aquaculture and also tourism - Low price rate and market opportunities for sea salts - Lack of modernization, low productivity for outdated methods - Vulnerability to rain, evaporation cycles and coastal hazards
	Opportunities (O) (External favourable trends)	Health hazards for workers Threats (T) (External risks)
External SWOT Factors	- Revival via GI tagging or eco- branding - Eco-labeling, heritage branding, and salt tourism - Niche organic markets	- Total disappearance due to land grab/ conversion to resorts/ponds - Youth disinterest in salt work - Competition from industrial salt

Source: Field Observation, Sectoral Survey and Key Informant Interviews, 2025

7.3.1 SWOT Strategic Assessment for Sea Salt Manufacturing Livelihood in the Study Area:

To quantitatively assess the SWOT Matrix Index of salt production blue economy, especially in a context like the Mandarmani coast of West Bengal, we can use a structured method called the SWOT Index Assessment Model (SIAM) or SWOT Matrix Indexing. This method helps prioritize strategic actions based on the weighted significance and scores of internal and external factors.

Factorial Scoring:

Each factor is assessed through two values:

- Weight (W)** = importance of the factor (assigned between 0 and 1, total weights in each SWOT group should sum to 1)
- Score (S)** = current status of the factor (assigned

between 1 and 5: 1 = very poor; 5 = excellent for S&O, 1 = critical; 5 = negligible for W&T)

SWOT Index Formula:

$$\text{SWOT Index} = \sum (W_i \times S_i)$$

- Computing individual composite scores for: S-index, W-index, O-index and T-index
- Then derive a strategic position value using:
SWOT Strategic Index (SSI) = (S+O) - (W+T)

Interpretation of SWOT Strategic Index (SSI)

Table 23: Interpretation of SWOT Strategic Index (SSI)

SSI Value	Interpretation
+3.0 to +5.0	Strongly opportunity-driven; leverage strengths to capitalize on external growth.
+1.0 to +2.9	Moderate strength, but needs improvement in weaknesses.
0 to +0.9	Weak position, urgent improvement needed.
Below 0	Critical threats and weaknesses outweigh potential.

Table 24: SWOT of Sea Salt Manufacturing Livelihood in the Study Area

SWOT Domain	Major Dimensions/ Factor	Indicators	Weight (W)	Score (S)	Weighted Score (W x S)	Dimension Specific Index
Strength (S) [Internal Positive Factor]	Traditional Knowledge Base	Generational expertise in salt-panning, evaporation, and seasonal scheduling	0.35	4	1.4	3.30
	Local Resource Availability	Abundant brine sources, and flat saline land and Climatic suitability (sun & wind)	0.30	4	1.2	
	Low Input Requirements	Manual techniques with minimal capital investment	0.15	2	0.3	
	Cultural Identity	Salt farming as a part of coastal heritage and local festivals	0.10	2	0.2	
	Labour-Oriented	Employment for landless labourers and women during lean agricultural seasons	0.10	2	0.2	
	Activity					
Total	T- Index		1.00		3.30	
Weakness (W) [Internal Negative Factor]	Outdated Technology	Manual methods with low yield, No mechanization & Poor quality control	0.25	2	0.5	2.60
	Poor Working Conditions	Lack of safety gear, Long hours and Exposure to heat and saline water	0.20	3	0.6	
	Limited Storage & Packaging	No warehousing, poor packaging infrastructure and wastage in monsoons	0.20	3	0.6	
	Financial Insecurity	No insurance. Limited access to institutional credit and Seasonal income	0.25	2	0.5	
	Lack of Market Access	Dependence on middlemen and Weak link to regulated wholesale or processed salt markets	0.20	2	0.4	
Total	T- Index		1.00		2.60	
Opportunity (O) [External Positive Factor]	Heritage Tourism Integration	Promotion as cultural experience in coastal tourism (e.g., salt trail tours)	0.20	3	0.6	3.00
	Policy Interventions	Inclusion in MSME support, artisan registry, cooperative revival programs	0.20	3	0.6	
	Value Addition Potential	Organic/specialty salt branding, iodization, artisanal packaging	0.20	3	0.6	
	Climate Adaptation Projects	Scope for support via climate-resilient livelihood schemes	0.20	3	0.6	

	NGO/CSR Engagement	Capacity building, micro-enterprise models, skill training for salt workers	0.20	3	0.6	
Total	T- Index		1.00		3.00	
Threat (T)	Encroachment by Tourism/Real Estate & Aquaculture	Conversion of salt pans into resorts, roads, aqua ponds and buildings	0.25	1	0.25	1.60
	Environmental Stress	Sea-level rise, salinity fluctuation, cyclones (e.g., Yaas), pond flooding	0.10	3	0.3	
	Labor Migration	Youth shifting to hospitality or construction jobs due to low profitability	0.25	1	0.25	
	Market Competition	Cheap industrial salt imports, dominance of large-scale producers	0.20	2	0.4	
	Loss of Traditional Knowledge	Disinterest among younger generations, absence of documentation or transmission	0.20	2	0.4	
Total	T- Index		1.00		1.60	

Source: Field Survey and Data Analysis, 2025

Table 25: Assessment of SWOT Strategic Index of Coastal Sea Salt Manufacturing in the Study Area

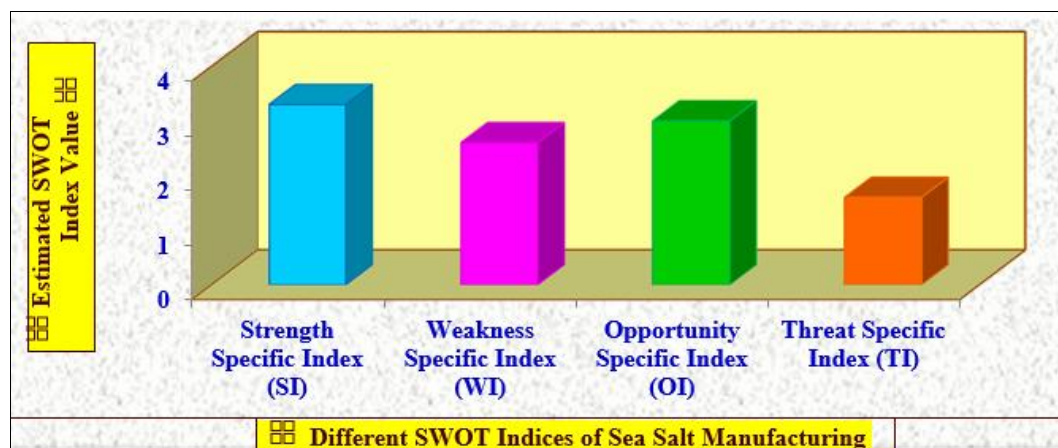
Different SWOT Indices	Estimated SWOT Index Value	SWOT Strategic Index (SSI)	Remarks
Strength Specific Index (SI)	3.30	$= (S + O) - (W + T)$ $= (3.30 + 3.00) - (2.60 + 1.60)$ $= 6.30 - 4.20$ $= + 2.10$	Moderate strength, but needs improvement in weaknesses
Weakness Specific Index (WI)	2.60		
Opportunity Specific Index (OI)	3.00		
Threat Specific Index (TI)	1.60		

Source: Field Survey and Data Analysis, 2025

The above SWOT Strategic Index (SSI) of +2.10 suggests that coastal sea salt manufacturing in Mandarmani region reflects a moderate strength, but needs improvement in weaknesses. Hence, its weaknesses (like outdated technology, poor working conditions, limited storage and packaging, financial insecurity and lack of market access) and threats (like land encroachment, environmental stress, market competition, loss of traditional knowledge and labor

migration) should be addressed and managed properly with revival policy and initiative based community participation for its superb upgrading like the past.

Although it has the highest strength index (SI = 3.30) among traditional livelihoods, severe weaknesses (WI = 2.60) like outdated technology, poor market access, and threats (TI = 1.60) from tourism/aquaculture encroachment have driven a massive decline.

**Fig 25:** Different SWOT Indices of Sea Salt Manufacturing in the Study Area

8. Major Findings

- **Production & Community Profile:** Concentrated in Mandarmani, deeply rooted male-only occupation, dominated by marginalized castes (SC/OBC), with nearly 92% residents settled ≥ 20 years.
- **Economic Hardship:** 54% earn $\leq ₹7,500/\text{month}$; income is highly seasonal; reliance on alternative daily wage work or fishing in off-seasons.
- **Institutional Neglect:** 100% report no government support; absence from CRZ and blue economy policies.
- **Vulnerability Drivers:** Encroachment from aquaculture (56%) and tourism (19%); climate stress; cultural erosion; market exploitation.

- **Opportunities:** 41% favor artisanal branding; 30% see potential in salt heritage tourism; but pessimism dominates without policy intervention.

9. Recommendations as per SWOT Analysis

Based on the above SWOT strategic assessment, a set of policy recommendations and a corresponding scientific policy framework are tailored to the revival of traditional sea salt production in Mandarmani under a blue economy strategy. This framework aligns with your SWOT analysis, SWOT Strategic Index (SSI = +2.10), and observed field realities.

Table 26: Policy Recommendations Based on SWOT Strategic Index Findings

SWOT Domain	Key Issue Identified	Strategic Recommendation	Responsible Stakeholders	Time Frame
Strengths (S)	Presence of indigenous knowledge and ecological techniques	Establish community salt heritage hubs and promote Malangi knowledge systems through documentation and local museums	Panchayats, Ministry of Culture, NGOs	Medium- term
	Low-input, eco- friendly methods	Encourage low-carbon certification and eco- labeling to access niche markets	MoEFCC, MSME Ministry, Export Boards	Short-term
Weaknesses (W)	Outdated technology, poor mechanization	Pilot low-cost mechanized tools (e.g., solar dryers, brine pumps) for small producers	ICAR-CIFT, IIT- KGP, NABARD, CSR bodies	Medium- term
	Poor working and storage conditions	Establish community salt sheds, safety gear banks, and ensure coverage under ESI and EPFO	Labour Department, Salt Commissionerate, Local NGOs	Short-term
	Limited financial access	Create Salt Microfinance Cells linked to SHGs and cooperative credit systems	NABARD, District Industries Centre, Banks	Short-term
Opportunities (O)	Scope for branding and salt tourism	Develop a GI-tagged “Mandarmani Coastal Salt” with packaging, tourist trails, and local exhibitions	West Bengal Tourism, APEDA, Coastal Ministry	Medium to long-term
	Policy inclusion opportunities	Integrate sea salt into coastal livelihood schemes (e.g., CRZ livelihood corridors, PMMSY)	MoEFCC, MoFPI, Ministry of Commerce	Medium- term
Threats (T)	Land conversion and aquaculture encroachment	Enforce coastal land-use zoning and declare Salt Conservation Zones (SCZ) under CRZ-III	State Coastal Zone Management Authority, ULBs	Immediate
	Youth disinterest and erosion of knowledge	Introduce “Skill India-Salt Sector Modules” for youth, incentives for salt entrepreneurship	NSDC, ITIs, Salt Cooperatives	Medium- term
	Industrial salt competition	Support artisan salt cooperatives with digital marketing and export training	Cooperative Department, E- commerce Boards	Short-term

Source: Field Survey 2025 and Strategic SWOT Index Assessment

Table 27: Scientific Policy Framework for Salt Economy Revitalization (SPFSER)

Component	Policy Strategy	Expected Outcomes	Indicators for Monitoring
1. Ecological Resilience	GIS-based zoning of salt pans, declaration of Salt Conservation Zones (SCZ)	Protected salt landscapes and biodiversity	Area (in acres) restored/preserved under SCZ
2. Livelihood Security	Inclusion of salt workers in MNREGA, PM-KISAN, CRS, NMAY	Seasonal income support, housing access, safety nets	No. of salt workers covered under schemes
3. Technological Transition	Subsidy for solar-powered drying, mechanized harvesting tools	Reduced physical strain, enhanced productivity	Productivity increase (tonnes/acre), tool adoption rate
4. Heritage and Branding	GI tagging of —Mandarmani Sea Salt, salt tourism trails, storytelling hubs	Economic upliftment via cultural tourism and niche markets	Tourist footfall, GI salt sales volume
5. Gender Mainstreaming	Gender audit of salt economy, SHG training for women-led salt cooperatives	Empowerment of women salt workers	No. of women-led salt units, wage parity index
6. Financial Inclusion	Creation of Salt Credit Cards, insurance coverage, cooperative financing	Better risk mitigation and financial empowerment	No. of beneficiaries availing micro-credit/insurance
7. Knowledge Conservation	Oral history archives, salt school modules in local curriculum	Retention of indigenous knowledge	No. of narratives documented, school programs started
8. Market Integration	Direct-to-consumer models, online platforms for artisanal salt	Price realization and market independence	% increase in producer prices, volume of direct sales

Source: Field Survey 2025 and Strategic SWOT Index Assessment

The SWOT Strategic Index of +2.10 indicates a moderate strength position with promising external opportunities but critical internal weaknesses. Therefore, the priority policy direction should be:

- **Short-term:** Improve working conditions, safety, and basic financial/market access.
- **Medium-term:** Promote branding, revive cooperatives, and integrate climate-smart technologies.
- **Long-term:** Institutionalize salt heritage, zoning protection, and youth engagement for sustainability.

10. Conclusion

The decline of traditional sea salt production along the Mandarmani coast of West Bengal reflects a broader crisis in India's coastal economies, where historical livelihoods are

increasingly marginalized by unregulated development, ecological stress, and policy neglect. Once a vital community-based occupation practiced by generations of salt workers, particularly marginalized groups and women, artisanal salt production in Mandarmani now faces existential threats from land encroachment, youth disinterest, industrial competition, and systemic exclusion from institutional support. Through a field-based, mixed-method approach incorporating socio-economic surveys, spatial mapping, policy audits, and SWOT analysis, this study has revealed the multidimensional nature of this decline. It has shown that despite the sector's inherent strengths such as labour intensity, low input needs, indigenous knowledge, and environmental sustainability, traditional salt production suffers from outdated techniques, poor working conditions, financial insecurity, and lack of

visibility in state and national blue economy agendas. The SWOT Strategic Index (SSI) score of +2.10 suggests that while moderate internal strength and external opportunity exist, these are significantly undermined by critical weaknesses and emerging threats. The study identifies urgent policy and institutional gaps, including inadequate implementation of welfare schemes such as NMAY and CRS, poor access to microfinance, and absence of market integration mechanisms. At the same time, opportunities such as heritage tourism, eco-labeling, climate adaptation funds, and community cooperatives remain underutilized. Reviving this sector demands more than preservation; it calls for transformative strategies. These must include targeted technological interventions, community-managed salt cooperatives, GI-based branding, safety net expansions, and the declaration of Salt Conservation Zones (SCZs). Integrating traditional salt-making into blue economy frameworks not only enhances climate resilience and food security but also reaffirms cultural heritage and social equity in vulnerable coastal regions. In conclusion, the future of Mandarmani's salt economy lies in a holistic, inclusive, and sustainability-driven revival strategy - one that positions artisanal salt production not as a relic of the past, but as a resilient pillar of a just and locally rooted blue economy.

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