Socio-Economic Changes in Sagar Island before and After Cyclone Aila

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ABSTRACT

Cyclone Aila, which struck the coastal belt of West Bengal on 25 May 2009, was one of the most devastating disasters in the history of Sundarbans. Among the worst affected regions was Sagar Island, a densely populated part of the delta. The cyclone not only caused massive physical destruction but also reshaped the socio-economic fabric of the island. Before Aila, the economy of Sagar was largely dependent on agriculture, fishing, shrimp farming, and forest resources, while society maintained a rural, resource dependent lifestyle marked by kinship ties and limited infrastructure. After Aila, Stalinization of agricultural land, collapse of fisheries, widespread migration, emergence of alternative livelihoods, and social disruptions created a new reality for the islanders. Using government reports, published academic/NGO work, and field testimonies, this article analyses in detail the socio-economic conditions before the cyclone, the devastation caused by Aila, and the long-term transformations that followed. The study concludes that while the disaster intensified vulnerabilities, it also generated resilience, diversification of livelihoods, and policy attention, thereby reshaping Sagar Island's socio-economic trajectory.

Key Words: Aila; Agriculture; Fisheries; Stalinization; Migration; Gender; Adaptive Strategies; Policy;

INTRODUCTION

The Sundarbans, spread across India and Bangladesh, is the world's largest delta and mangrove ecosystem. Located at the confluence of the Ganga, Brahmaputra, and Meghna rivers, it is home to millions who rely on fertile soil, abundant water bodies, and forest resources. Within this region lies **Sagar Island**, the largest inhabited estuarine island of West Bengal. The island is historically significant for the Gangasagar pilgrimage but is also highly vulnerable to cyclones, tidal surges, Stalinization, erosion, and climate change.

Cyclone Aila struck on **25 May 2009**, with wind speeds around 120–140 km/h and heavy tidal surges. It brought unprecedented destruction, killing many, displacing thousands, and severely damaging agriculture, fisheries, infrastructure, and housing. For Sagar Island, Aila was not merely a temporary calamity but a turning point that altered livelihoods, social relations, and development trajectories.

This article investigates how socio-economic conditions in Sagar Island transformed before and after Cyclone Aila. It first describes pre-Aila economic and social systems, then documents immediate and long-term impacts, and finally analyses post-Aila changes, adaptive strategies, and policy implications.

METHODOLOGY

The analysis is based on:

1. **Government Reports** – including damage assessments by the Government of West Bengal and district level disaster management offices.
2. **Published Academic and NGO Studies** – research by institutions working in and around Sundarbans, including geoinformatics studies, livelihood studies, and climate vulnerability reports.
3. **Media and News Reports** – for more recent updates about land loss, embankment damage, migration, etc.

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4. **Field Testimonies** – oral histories and interviews from local inhabitants, especially women and youth (as available from secondary sources), supplemented by local NGO survey reports.

Where possible, quantitative data (area lost, proportion of households affected, migration rates) have been integrated to strengthen the empirical basis.

Socio-Economic Conditions Before Aila

Economic Structure

- **Agriculture:** Paddy cultivation (including aman and boro), pulses, oilseeds, vegetables. Irrigation was limited; often rain fed, with occasional freshwater flooding and tidal inundation.
- **Fisheries & Shrimp Farming:** Fishing in rivers and the Bay of Bengal was a major livelihood. Shrimp farming (especially in ponds) had become profitable for some households.
- **Forest Resources:** Collection of honey, crabs, fuel wood, fish fry, edible forest products and forest grazing were supplementary livelihoods.
- **Wage Labour & Seasonal Migration:** Some seasonal out-migration existed (to nearby towns) mainly among landless or marginal farmers.

Social Structure

- **Family & Kinship:** Joint and extended families were common; support networks often mediated access to shared resources, labour, loans.
- **Education & Health:** Literacy was lower than the state average; many villages had primary schools but secondary education often required travel. Health infrastructure was modest; clinics were basic, sometimes distant; outbreaks of diseases (waterborne especially) during monsoon periods were common.
- **Housing & Infrastructure:** Many houses were “kacha” (mud, bamboo, thatch); roads often unpaved; embankments existed but were weak and intermittently maintained; electricity, clean water and sanitation were limited.

Impact of Cyclone Aila

Cyclone Aila caused widespread devastation. Key areas of impact:

Physical Destruction

- Thousands of “kacha” houses destroyed or damaged.
- Embankments breached in many places; some embankments washed away. For example, in Sagar Island about **84 km of embankment** had been strengthened after Aila; but many embankments remained damaged or partially damaged.
- Roads, communication, electricity infrastructure shattered.

Agriculture and Fisheries

- Saline water ingress from tidal surges flooded farmlands. Many paddy fields remained uncultivable for years because of high salinity.
- Shrimp farms/pisciculture ponds were destroyed; livestock perished in many cases.
- Soil fertility dropped; in some areas, soil salinity reached high depths after Aila.

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Social and Human Impacts

- Displacement of families; many lived in relief camps for weeks/months.
- Disruption of food supply, safe drinking water; spread of waterborne disease.
- Education disrupted: schools damaged; children unable to attend for long periods.
- Psychological trauma, especially among women, children, elderly. Loss of livelihoods forced shifts in gender roles and family dynamics.

Socioeconomic Changes After Aila

This section integrates the quantitative and qualitative shifts, focusing on Sagar Island where data is available, and using comparative insights when needed.

Economic Shifts

1. **Loss of Land and Stalinization:**
   - Between 2009 and 2019, Sagar Island's area reduced from ~246.76 km² to ~230.98 km² – a decline of nearly **6.5%-7%** over a decade.
   - Land erosion, sea level rise (~3-8 mm/year locally) has exacerbated soil salinity and loss of fertile lands.
2. **Migration:**
   - While precise numbers for Sagar immediately post-Aila are less documented, in the broader Sundarbans, many families shifted permanently or seasonally. For example, "climate refugees" from nearby islands moved into Sagar Island.
   - Across wider environmental disasters in Sundarbans, studies (though in Bangladesh) show that migrant households recovered somewhat faster in terms of income and housing than non-migrant households.
3. **Alternative Livelihoods and Adaptive Strategies:**
   - NGOs and government schemes introduced saline tolerant or flood tolerant crop varieties; small vegetable gardens using pump irrigation or raised beds.
   - Self-help Groups (SHGs) for women began producing handicrafts, duck/poultry rearing, beekeeping where feasible.
   - Some concrete / semi-pucca houses replaced former mud dwellings.
   - Embankment reconstruction and strengthening projects were carried out; in Sagar, the government committed funds and projects (e.g., Rs 1,339 core allocated, partially disbursed) for reinforcing embankments and for using geo-tube technology to stabilize eroding coasts
4. **Changes in Income Patterns:**
   - Increasing dependence on wage labour (off farm) and remittances from migrated family members.
   - Decline in incomes from agriculture and fisheries — some previous farmer households shifted to day-labouring or labour outside the island.
   - Loss of livestock and constraints on grazing and fodder made animal husbandry less reliable.

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Social & Gendered, Intergenerational Changes

- **Gender Roles:** Women became more visible in income generation through SHGs, handicrafts, small poultry or duck rearing, and managing household budgets when men migrated. However, they also bore the burden of care giving, recovery work, and resources often stretched thin.

- **Children & Youth:** Education was disrupted—school closure or attendance drops. Some younger people migrated for work, or delayed schooling. Early marriage in some cases rose among poor families under economic stress.

- **Household/family structure:** Migration has changed family dynamics: joint families more often split, with men away—this increased decision-making by women but sometimes weakened traditional kinship support systems.

- **Psychological & Community Effects:** Long-term insecurity, sense of loss, and increased inequality. Households with land or better access to credit or NGOs fared better; poorer, women headed, landless households more vulnerable.

Comparative Insights

Comparisons with nearby islands / regions (e.g. Gosaba, Ghoramara, Mousuni) show similar patterns of land loss, embankment damage, Stalinization, and migration. However, variation is evident based on access to relief, NGO support, infrastructure, and geography:

- Islands with stronger NGO presence and better embankment protection had somewhat faster recovery of agriculture post-Aila.

- Sagar, being a major inhabited island, had somewhat more visibility in government policy but also bore heavier burden due to population density and pilgrimage tourism (Gangasagar) which required more infrastructure.

DISCUSSION

The long-term transformations on Sagar Island reveal a dual reality:

- **Increased Vulnerability:**

  Agriculture and fisheries have not fully bounced back; land degradation from salinity and erosion continues. Frequent cyclones and storm surges, rising sea levels (3-8 mm/year) worsen risk. Poverty remains, especially among landless, marginal farmers, women headed households, and those without connections or resources to migrate. Infrastructure (roads, health, education) remains weak in many mouzas (administrative units), especially southern ones with high exposure.

- **Emerging Resilience & Adaptation:**

  Local people have diversified livelihoods. Women's SHGs, small enterprises, seasonal migration & remittances have become vital. Community and government efforts have strengthened embankments, improved housing, and raised awareness of disaster preparedness. Use of salt tolerant crop varieties and improved drainage in fields shows promise.

- There is evidence that migration, while stressful, has also become a coping strategy; households who could migrate sometimes fared better in rebuilding. But migration has social costs: family separation, loss of kin support, challenges for children's education, especially for girls.

Policy Implications & Recommendations

To build on the resilience and address long run vulnerabilities, the following policy and practice

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recommendations are suggested:

1. **Strengthen Embankments & Coastal Protection:**
   - Use climate resilient engineering (e.g., gesture, reinforced concrete, mangrove buffer zones).
   - Regular maintenance, community monitoring of embankment conditions.
   - Restore and protect mangrove forests as natural storm buffers.
2. **Promote Climate Resilient Agriculture & Land Use:**
   - Introduce and disseminate more salt/flood tolerant crop varieties; encourage raised bed cultivation, hydroponic or floating gardens in waterlogged zones.
   - Improve drainage systems to remove ingress of saline water.
   - Soil reclamation practices: periodic washing of soils by fresh water, liming, etc.
3. **Livelihood Diversification & Support:**
   - Expand SHGs, especially women's groups, with better access to microcredit, market linkages, and training.
   - Promote small-scale aquaculture, poultry/duck rearing, honey/beekeeping, handicrafts.
   - Skill training for youth in non-farm sectors (construction, services), to reduce dependence purely on agriculture.
4. **Education, Health & Social Support:**
   - Ensure school continuity post disasters: resilient school infrastructure and emergency plans.
   - Provide psychosocial support for vulnerable groups (women, children).
   - Health-care outreach especially for disease prevention after flooding and Stalinization.
5. **Migration Policy & Support Systems:**
   - Recognize migration as adaptation: provide support (skills training, safe migration routes, remittance facilitation).
   - Social safety nets for non-migrants and those unable to migrate.
   - Encourage local employment opportunities to reduce forced migration.
6. **Data Collection, Monitoring & Research:**
   - Detailed quantitative surveys on land loss, salinity levels, income losses, migration rates specific to Sagar Island.
   - Map risk zones (mouzas) by exposure, sensitivity, adaptive capacity (building on geoinformatics studies).
   - Longitudinal studies of intergenerational outcomes (education, health, income).

CONCLUSION

Cyclone Aila was a watershed moment for Sagar Island. Before Aila, the economy was predominantly

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subsistence, resource based, with social structures rooted in kinship; infrastructure was weak, but people had adapted to the delta environment in limited ways. Aila shattered many of those foundations: land, livelihoods, homes, and social ties were disrupted.

However, from this calamity has arisen a range of adaptive responses. Livelihoods have diversified; women have become more actively involved in income generation and community leadership; migration has become a coping strategy; and policy attention has increased. Yet, the threat is far from over: rising sea levels, continued erosion, climate change, and repeated storms mean that vulnerabilities are ongoing.

For Sagar Island to secure a sustainable and stable future, investments in resilient infrastructure, climate adapted livelihoods, inclusive social policies, and robust data and monitoring are essential. In particular, policies must be gender sensitive, intergeneration ally aware, and locally grounded. Only then can the people of Sagar Island move beyond survival and toward a future in which disasters are met with strength, not despair.

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