Introduction

• Agriculture and forestry are the natural resource based economy of deltaas are increasingly unprofitable due to Climate Change.
• This results in large scale labour migration, in absence of alternative livelihood option in the Mahanadi delta, Odisha, India.
• Labour migration increased manifold in the coastal region of Odisha in the aftermath of super cyclones of 1999 and 2013.
• The present research discusses whether migration can be considered as an adaptation option when the mainstream of livelihood, i.e. agriculture is threatened by repeated flooding, sea level rise, cyclone and storm surges, salinization of soil and crop failure due to temperature stress imposed by climate change.

Methodology

• Migration has been analysed in the context of climate change using the concept of risk, represented as probability of occurrence of hazardous events, degree of vulnerability of the area as well as migration analysis using the indirect methods (vital statistics and census survival ratio).

The methodological framework of Risk Assessment has been designed by analyzing the term vulnerability in terms of sensitivity and adaptive capacity (IPCC AR5) with an equal weightage to the components and land overlay.

Risk (R) = [Hazard (H), Exposure (E), Vulnerability (V)]
Risk Induced Migration = [Hazard (H), Exposure (E), Vulnerability (V), Migration (M)]

• The estimation of Net Migration (the difference of in-migration and out-migration of an area in a period of time) has been done using indirect method, in absence of data on place of birth and place of enumeration.

• The average estimation of Census Survival Ratio method at district level and Vital Statistics method at block (sub-district) level have been applied to estimate the net migration of the study area.

- Mahanadi Delta is drained by a network of three major rivers: Mahanadi, Brahmaputra and Basan into the Bay of Bengal.
- The coastline of the delta is about 200 km long which stretches from south near Chikita to north up to Dhamra River.
- Using SRMT 30m digital surface elevation data area within 50m contour from the coast line has been extracted within the vicinity of Mahanadi delta.
- The total study area is 11317.69 Sq. Km. The 5m contour spread across 45 Blocks of Khordha, Puri, Jagatsinghpur, Kendrapara and Bhadrak districts. Chikita lake falls within 5m contour line.

Socio-Economic Profile

- Migration over past several decades in Mahanadi Delta has taken place for survival and livelihood opportunities.
- Nuns and Kerala and International destinations—state migration is mostly found for migrant labours.
- The age of the migrants ranged from 15-40 in the case of male and 26-40 in the case of female migrants.
- The migrants mostly belong to Below Poverty line ($ 1.25 per day per person, World Bank, 2008) category, have low level of literacy, are small or marginal landowners and mostly unskilled.

- The study indicate migration in sustaining rural livelihoods in Mahanadi Delta to a considerable extent. Both autonomous and planned migration to adapt to changing climatic vagaries are observed. With declining agricultural incomes and increasing unprofitability of rural households to sustain with farming alone, the countryside in Odisha is witnessing an emergence of what one can term “migrarion” livelihoods — where migration and agriculture form the major providers (Sharma et al., 2014), accounting for more than 55-60% of the annual incomes. NSS data shows that the dependence on domestic remittances has risen most strikingly in Odisha since the 1990s (Tumbe, 2010). In 2007-08, rural Odisha received 14.25 billion dollars in domestic remittances, 6th highest in the country. The benefits of these remittances are autonomous to the community. Migration either autonomous or planned are served as a positive contributor to enhance the adaptation capacity of the community.

Conclusion

Migrant Network Analysis

Three districts namely, Kendrapara, Jagatsinghpur and Jagatsinghpur show negative net migration for female population. Bhadrak district only shows negative net migration for total and male population.

Kendrapara district ranks first (7.23%) in positive net migration followed by Puri (3.01%). Negligible in-migration can also be seen at Kendrapara (0.13%) and Jagatsinghpur (0.09%) particularly for male population.

The migrants moved to urban areas like Puri, Bhubaneswar, Cuttack etc. for better job opportunities and social well-being.

Migrant Network Map of Mahanadi Delta

Net Migration Map of Mahanadi Delta

Key Findings of Focus Group Discussions

- The economy is largely agriculture based which are being increasingly affected by frequent floods, cyclones, salinization etc. and lack of transportation facilities/markets.
- The repeated floods and breaks of returns from existing livelihoods are forcing them to take up jobs in construction industry outside the state.
- Preferred destinations: Internal destinations are Chennai, Gujrat, Tamil Nadu and Pondicherry, internation Ballabgarh, Patiala and Mahishpur in the same district, Khordha, Brahmapuri under Rajmahal Thalis of the same district (Revenue and Disaster Management, 2011).
- A list of male and female who have school education are now going to Puri, Bhubaneswar for work in small industry. Contractors and Early migrants provide a network for new migrants.
- Migration is bringing limited economic success.