Hɛn Mpoano

Impact of Climate Change on Local Livelihoods; A Case Study of Ankobra Estuarine Communities

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Introduction

The Ankobra Estuary is very important to thousands of people in the Ellembelle and Nzema East District whose livelihoods largely depend on it. Unfortunately, climate change impacts are reducing the capability of the ecosystem to provide ecosystem services to the communities which greatly affect the livelihood of the inhabitants. Majority of the inhabitants have lost livelihood assets to floods and other climate change manifestations. These phenomena threaten human existence on the estuary and also deepen poverty and food insecurity within estuarine communities at a time when cost of living in the coast of Western Region is rising due to the development in the oil and gas sector. If not checked, the livelihoods of many in coastal districts will be lost which will further deepen their vulnerabilities. While there exist evidence of climate change and its adverse impacts in the area, a comprehensive study is yet to be undertaken to show the extent of these impacts on the livelihoods of the communities, and the coping strategies adopted by the people around the estuary.

This poster explores the impact of climate change on local livelihoods in the Ankobra Estuary. The specific objectives are to assess the perception of the estuarine communities about the manifestation of climate change impact.; to determine the factors contributing to climate change vulnerability across five Ankobra estuarine communities; to analyze the impact of climate change on the livelihoods of the Ankobra communities and to analyze the institutional processes and mechanisms that influence access to livelihood assets and strategies in the communities.

Methodology

Study Area

The Ankobra estuary located in the Ellembelle District of the Western Region of Ghana. The estuary is located geographically at 4°54'55"N and 2°17'44"W to the upper left, 4°54'55"N and 2°15'58"W to upper right, 4°53'41"N and 2°15'58"N to lower right and 4°53'41"N and 2°17'44"W to the lower left (Osman *et al*., 2016). The study area is bounded to the east by Nzema East district and to the south by the Gulf of Guinea (Osman *et al*., 2016).

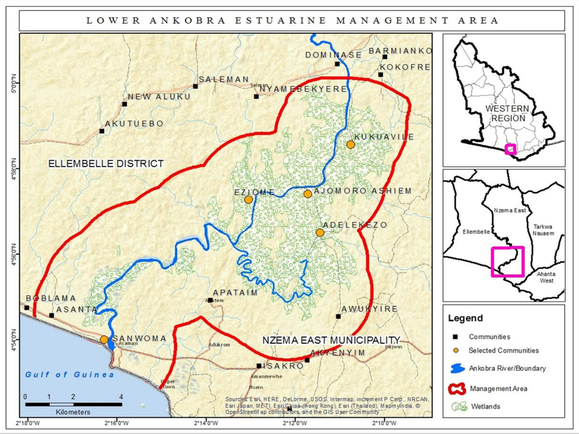


Figure 1 A map of the study Area

Data collection

Qualitative Approach

Focus Group Discussions (FDGs)- 5 comprising of 10 people each

Personal Observation

Key Informants interview (16 people)

Quantitative approach

Structured household interviews in 5 communities

110 Households out of an approximated 220 Households were purposively selected

Result

1.a. Local Perception about climate change

- ❖About 77% of the respondents had heard of climate change
- ❖Almost all the respondents (99.1%) perceived the climate to be changing.
- ❖To the local people climate change refers to increasing temperatures and inadequate/erratic rainfall. They associated the causes of the changing environmental conditions with the increases in environmental degradations, deforestation, flaring of gas at the Atuabo Gas Plant and the development of oil and gas facilities in the districts

1.b. Most observed climate change impacts manifestation

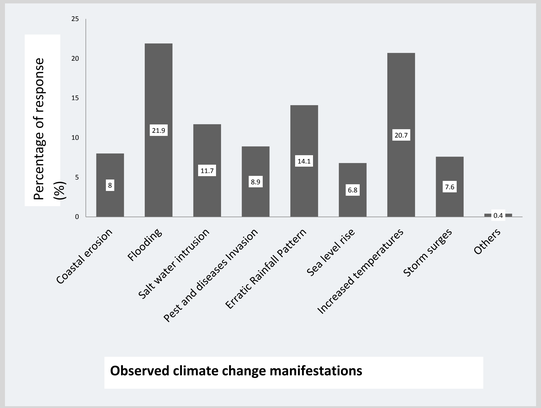
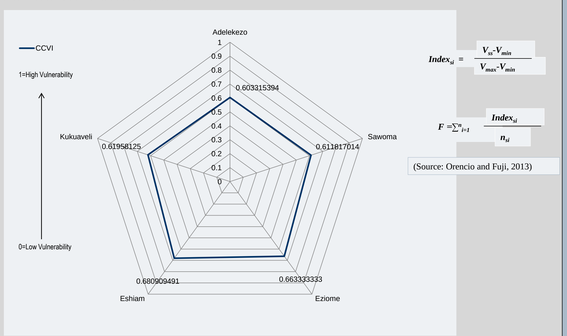


Figure 2 Most observed climate change Manifestations (n=510)

2. Climate change vulnerability level across Ankobra estuarine communities



$$Index_{ij} = \frac{V_{ij} - V_{min}}{V_{max} - V_{min}}$$

$$F = \sum_{i=1}^{n} \frac{Index_{ij}}{n_{ij}}$$

(Source: Orencio and Fuji, 2013)

Figure 3 A web showing estuarine communities vulnerability (Source: Field survey, 2015)

Results Cont'd

Sources of vulnerability across 5 estuarine communities

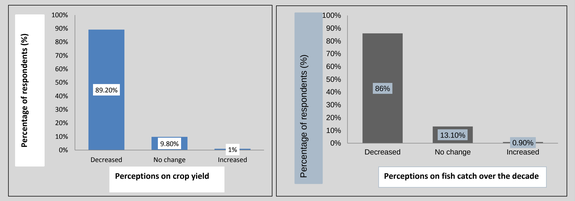
Index level	Description	Coastal Communities				
		Adelekezo	Sawoma	Eziome	Eshiam	Kukuaveli
Major factor	Geographic Factors	0.69	0.89	0.93	0.92	0.77
	Food Security Factors	0.66	0.61	0.76	0.77	0.53
	Economic and Livelihood Factors	0.81	0.52	0.87	0.67	0.81
	Demographic Factors	0.65	0.60	0.61	0.66	0.58
	Governance Factors	0.51	0.48	0.66	0.59	0.62
	Land Tenure	0.30	0.56	0.15	0.48	0.42
	CCVI	0.60	0.61	0.66	0.68	0.62

$$Index_{ij} = \frac{V_{ij} - V_{min}}{V_{max} - V_{min}}$$

$$F = \sum_{i=1}^{n} \frac{Index_{ij}}{n_{ij}}$$

(Source: Orencio and Fuji, 2013)

3. Impact of climate change on livelihood



Perception of crop yield now compared to 30 years ago

Perception of fish catch now compared to 30 years ago

❑71.6% attribute changes in agriculture to climate change

❑48% attribute decline in fisheries to climate change, the rest attribute the decline to galamsey activities on river

3.1 Coping strategies

i. Temporary Structures made of raffia and thatch
ii. Increased frequency of fishing
iii. cultivation of wetlands
iv. Rainwater harvesting
v. Farming on Elevated areas & Terracing practice
vi. Construction of wells
vii. Mixed Farming
viii. Purchasing sachet water for drinking
ix. Indigenous knowledge in weather prediction
x. Replanting of failed farms
xi. Remittances from relations and personal savings
xii. Petty trading
xiii. Migration
xiv. Insecticide, Pesticides and Chemical Fishing
xv. Fishing during flooding periods
xvi. Blocking and diverting the flow of water

4. Institutional processes and mechanisms influencing livelihood asset and strategies

❖Regulation of access to the natural resources is by the traditional authority except the Ankobra River & sea

❖Galamsey: Result of weak management of river body

❖Migrant Difficulty in accessing and controlling land and land resources

❖Disadvantaged Females: Access to and control of land and land resources

Discussions

Climatic variability in the Ankobra estuary is not different from what has been observed in coastal communities globally; general decreases in rainfall, increased temperature, frequent flooding, coastal erosion, tidal waves, among others (Pollner et al., 2010)

The study confirmed food security, governance, Livelihood and economic factors as contributing to climate change vulnerability in the communities. These suggests that over reliance on natural resources for food and income, as well as poor knowledge and participation in environmental management activities of institutions are contributing factors of vulnerability in the communities.

These results imply that communities can accurately perceive change and climate variability and impacts on their livelihoods for short time periods.

Recommendations

- Flood Early Warning System
- Local Plans and Resettlement
- Livelihood diversification
- Strengthened natural resource governance systems
- Sea defence wall

Conclusion

❑Vulnerability results from direct dependence on natural resources as sources of food and livelihood security.

❑major contributors to livelihood vulnerability are both climate and non-climate related

❑Non-climate factors are endogenous to the estuarine communities, thereby constraining their ability to recover from, and adapt to, climate impacts.

❑Lack of collective action for managing natural resources at the community level is key among non-climate sources of vulnerability

❑Short-term and long-term actions are required to build livelihood and ecosystem resilience.

References

Orencio, P. M., and Fujii, M. (2013). An Index to Determine Vulnerability of Communities in a Coastal Zone : A Case Study of Baler , Aurora , Philippines, (Unep 2002), 61–71. http://doi.org/10.1007/s13280-012-0331-0

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