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AfriAlliance MOOC#2 Final Assignment

Hydroclimatic and socioeconomic impacts of River sand mining in the IWRM mirror: a perspective from Ikpa river basin, Southeastern Nigeria.

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Abstract

Water and the society are interconnected and linked, this study aims at assessing and understanding the impacts of climate change and anthropogenic activities on the socioeconomic status of people in Ikpa river basin using the IWRM model. The discussion is organized around the various manifestation of water struggles involved with meeting competing water needs of different socio-economic groups; potential for conflicts triggered by scarcity of drinking water problems due to pollution from human activities. The study concludes by linking the four dimensions of social innovation using the IWRM model.

DESCRIPTION AND BACKGROUND

Nature and society are interwoven and mutually constituted. While people are strongly involved in everyday production and reproduction of the environment they live in; the environment, on the other hand, exerts some impacts especially when its stability is disrupted. A river is viewed as a body of flowing water confined within a channel regardless of size, and it flows downhill through local topographic lows, carrying away water over the earth's surface (Montgomery, 2000). It is an essential component of the human existence which is continuously changing from its evolution. It is a unique system with potential to deliver enormous essential services (source of drinking water, source of food, medium for transport, source of hydropower to drive machinery, habitat for flora and fauna to thrive, as well as provision of bathing spot) to humans and the ecosystem (Toroimac et al, 2015; Okon and Ikebude, Ekpo et al, 2012). River systems change their course and morphology overtime as a result of natural and human pressures such as climate change, sand mining, as well as water withdrawal for agricultural and industrial needs respectively. These natural and human activities affect the vital services provided by the river, which often leads to deterioration of water quality and jeopardization of the ecological systems specifically the case of sand mining activities.

IWRM according to Global water partnership (GWP) is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. IWRM is identified as an effective model which promotes good water quality and availability for sustainable use. The effects of climate change and anthropogenic activities have led to serious socioeconomic and environmental problems with manifestations in the forms of flood, loss of drinking water supply, loss of land due to erosion, loss of crops and trigger conflicts amongst stakeholders. Integration of upstream and downstream water-related interests of stakeholders is one of the critical components of IWRM and it proves to be the best in the management of water resources at a basin scale. This is due to the fact that it takes into consideration all the water needs that relate to the basin.

Therefore, there is need for water managers to adopt IWRM strategy to mitigate and eliminate environmentally unfriendly activities such as river sand mining and deforestation which could have devastating impact on the socioeconomic status of the people in Ikpa river basin.

TECHNOLOGICAL SOLUTIONS

Employing technology to improve and ensure effective monitoring of water resources in Ikpa river basin is necessary for river basin resources assessment, monitoring and development of anthropogenic activities which could be injurious to the river system and environment at large.

- **The use Remote sensing and Geographic information system (GIS):** this involves the process of detecting and monitoring the hydrological characteristics of Ikpa river basin. The use GIS technology will enable the water and land mangers to carry out scientific assessment of the area remotely via satellite imageries. This will involve conducting periodic landuse/land cover assessment of the basin to monitor changes overtime.
- **Hydrometeorological station:** the use of electronic equipment will enable in situ collection of climatic and hydrological data in Ikpa river basin. Such data include rainfall, velocity, discharge, wind direction, etc, within Ikp. for analysis and effective decision making.

CAPACITY DEVELOPMENT

AfriAlliance describes capacity Development (CD) as the inherent responsibility of people, organizations and societies themselves in which support by external parties can play an important role.

To effectively mainstream new ideas and technology such as remote sensing, geographic information science (GIS) and electronic hydrometeorological devices in to water resources management in southeastern Nigeria, there is need for proper training of the technical personnel on how the technology function.

- Technical staff from public institutions, agencies and departments such as University of Uyo and Cross river basin development authority should be trained on how to effectively use new technologies for water resources monitoring.
- Symposiums should be organized to educate stakeholders in the river basin on the need to engage in environmentally friendly economic activities that would not destabilize the condition of the ecosystem specifically water resources.
- Local field studies should be conducted in the coastal areas of Ikpa river basin where activities of river sand mining and coastal lumbering occur to sensitize the local stakeholders on the potential impact of such activities on the socioeconomic status of the area and train them on a more effective ways carrying out such activities.
- Federal and state government officials, who are the representatives of government should be enlightened about the developments in the river basin.

SOCIAL INNOVATION

GOVERNANCE STRUCTURES

Lautze (2011), describes governance as essentially the processes and institutions through which decisions are made. It also involves and relates to "the processes of interaction and decision-making among the actors involved in a collective problem that lead to the creation, reinforcement, or reproduction of social norms and institutions" (Hufty, Marc, 2011). Hence, governance structures play critical roles in the adoption and implementation of new programmes and ideas.

- The mitigation of the effects of climate change and human activities on water resources particularly drinking water quality is a public health-focused activity and it will be effective and efficient if it is properly planned, mainstreamed into the governance structure and implemented as a policy. More so, it is pertinent for the state and local governments to make and monitor policies prohibiting activities that are injurious to the supply of quality water and the environment at large.
- The Nigeria Federal Ministry of Water Resources (FMWR) and Akwa Ibom state ministry of water resources and rural development should prioritize and regulate the activities in Ikpa river basin. This can be in the form of developing guidelines or list of activities that can be conducted within Nigerian river basins.
- Agencies empowered by the government to monitor water resources utilization such as Nigeria Hydrological Services Agency (NIHSA), should develop strategies to monitor and mitigate the engagement of the local populace in environmentally deteriorating activities.
- The government through the national legislature should promulgate laws that safeguard the quality of water resources for urban use and consumption, agricultural purposes and industrial purposes.
- The use of sophisticated technologies should be funded by the state and federal government and effectively deployed in the area.

BUSINESS ROAD MAP

According to AfriAlliance, Social innovation relies on means other than market mechanisms in order to link the demand and supply sides. Inorder to get the technology and innovation to the end users, it is pertinent for the stakeholders to continuously interact and assess the innovation at the various stages of creation or development. In the case of Ikpa river basin there is need to engage the various stakeholders during the various stages of the innovation process. Such stakeholders include; community members, government representatives, private and public institutions including universities, agencies and private companies.

- The community members who are at the heart of this innovation process should be sensitized and briefed on the benefits of complying with the innovation.
- Key departments in public universities, government agencies and commissions technical personnel should be enabled to carry out independent analysis and make recommendations.

Summary

Access to water in the right quantity and quality is an important aspect of IWRM, human development and civilization through its support for livelihood and other forms of socioeconomic activities. Thus, water related issues should be considered holistically through an integrated approach that takes into consideration all the affected stakeholders and ecological factors. The idea of “social innovation’ in this study indicates that the availability of water on its own is not only attached on the physical processes of the hydrological cycle; but that its processes of circulation, and utilization are fundamentally technological and social. The innovation of new technologies such as GIS and electronic hydrometeorological stations helps to monitor the human activities that occur at the basin and shows the potential for water quality deterioration. It is therefore, critical for anthropogenic activities conducted at coastal environments of river basins to be monitored. The community members engaged in environmentally unfriendly activities should be educated on the implications of such activities. Finally, policies and laws should be made by the government to protect water resources and the environment from injurious activities.

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