INFORMATION SENSIBILISATION

PARTICIPATORY GIS FOR MANGROVE ECOSYSTEM MONITORING

PRESENTATION OF THE EXPERIENCE

THE TOOL	The tool is used to map Mangrove/wetlands, using Participatory Geographic Information System.
STRUCTURE	Tool proposed by Hen Mpoano, Network of Deltas of Gulf of Benin. Contact: jmensah@henmpoano.org
LOCATION	Greater Amanzule Wetland (GAW), Western region Ghana
DATE & DURATION	From 2014 to 2018

CONTEXT

The Greater Amanzule Wetlands (GAW) covers approximately 50,000 hectares of land area stretching from the Ankobra Estuary in the Nzema East and the Ellembelle Districts in Ghana to the Tanoe-Ehy marsh at the Ivory Coast border. The GAW is rich in biodiversity and supports numerous livelihood activities. Over 50 communities comprising more than 7,000 farming and fishing families depend directly on the GAW resources as sources of food, fuel-wood, fish, shell fish and drinking water. However, the onset of development, population growth and urbanization in the Western Region makes the GAW vulnerable to wetlands loss threatening livelihood security, sustainable fisheries, rare and protected species.

ISSUES TO BE RESOLVED

- Lack of data on the status of mangroves in the western region of Ghana.
- Requirement for securing a conservation status for the mangroves/wetlands
- Exploitation of mangrove/wetland ecosystems in recent times due to industrialization and urbanization.
- Over 50000 hectares of wetland (mangroves, peat and fresh water swamp) without any formal protection

These issues are related to (i) the cost of high resolution imagery for mangrove/wetland mapping, (ii) the unavailability of recent cloud free images of wetland areas, (iii) need for management actions within wetlands.

OBJECTIVES

To use participatory GIS as a tool for community participation in the conservation, planning and management of mangrove ecosystems associated with the Greater Amanzule Wetland landscape.

MAINS STAKEHOLDERS

- Community Conservation Committees (CCC): provided information with respect to status of mangrove, assisted with mapping, developed management plans based on result of mapping exercise
- Mangrove Harvesters: assisted with mapping, helped to identify degraded areas, assisted with mangrove restoration effort
- District Conservation Committees: Report activities into Medium Term Development plan of the district
- Traditional Authorities: Instituted rules and sanctions for protecting mangroves and wetlands

STRATEGY / APPROACH

The approach used can broadly be categorized under three areas: (i) Strengthening Governance within Greater Amanzule Wetland area, (ii) Wetland Management, (iii) Livelihood Enhancement and Diversification.

COMPONENTS

1. Participatory mapping with community members

This is basically local knowledge mapping of resources and their attributes. Printed orthophotos as visual allow to facilitate discussions and identify features. Members of the CCC and general public provided information about the ownership of the land; extent of wetland resources; potential threats; and resource use patterns, among others. The output of the mapping provided a baseline data for initial mapping and subsequent ground trothing.

2. GPS survey and groundtruthing

Guided by the results of the participatory mapping, an initial delineation of the resources was conducted within the GIS environment. A GPS survey of the wetlands allows to ascertain the validity of the participatory mapping. The survey involved community members who relied mostly on the mangrove ecosystem for their livelihood and had been trained on the use of GPS devices. Community assistants and Data collectors surveyed specific areas within the wetland with handheld GPS units and mobile apps.

3. Production of mangrove maps

Data from the field were used as training samples for 'post processing' the mangrove/wetland map. The features were extracted by visual interpretation of the aerial photos. The wetland area was delineated into classes such as mangroves, degraded mangrove stands, water bodies, built up, fresh water swamp forest, terrestrial forest and farms.

4. Validation of maps

Finally, the maps were validated in the communities through meetings and by pasting the maps in the communities (on signposts) for feedback

COST

US$ 1,500 per community

MEDIA USED

- Printed maps
- Sign posts

DESCRIPTION OF THE EXPERIENCE

COMPONENTS	ACTIVITIES	TECHNICAL PROCESSES / ORGANIZATIONAL	RESULTS / ACHIEVEMENTS	DIFFICULTIES ENCOUNTERED	UNEXPECTED EFFECTS
1. PARTICIPATORY MAPPING WITH COMMUNITY MEMBERS	• Printing of maps of the area on A0 flexy/paper material • Meeting with community members to delineate mangroves	• Production of map using existing aerial photos • Observing community entry protocols	• Knowledge of the resources/mangroves • Community produced map of the location and extent of mangroves	• Unavailability of data/ imagery for specific areas • Land ownership and conflicts	• Generated community support for the process • Better awareness of the environment
2. GPS SURVEY AND GROUNDTRUTHING	• GPS Training: Community-training on basic GPS application for mapping mangroves GPS survey and groundtruthing • Determination of areas to groundtruth. • Conduct the survey with community members • Debrief with mapping team to document some important observation	• Selection of participants was determined by the community leaders • The determination of the area to survey is based on the community map • The survey is conducted with GPS receivers and mobile devices	• Communities members learnt a new skill • Some beneficiaries are supporting other projects with this skill Community map validated • Communities members put their knowledge of mapping in practice	• Inaccessibility to some areas of interest	• Generated community support for the process • Better awareness of the immediate environment
3. PRODUCTION AND PRINTING OF MAPS	• The determination of the area to survey is based on the community map • The survey is conducted with GPS receivers and mobile devices	Mangrove delineation conducted through the visual interpretation of available images	Map of the distribution, location and extent of healthy mangrove forest and location of degraded mangroves.	Unavailability of data/ imagery for specific areas	Basis for management decisions and action plans. - Basis for mangrove replanting effort in selected communities
4. VALIDATION OF MAPS	Printed maps were pasted on sign post within communities for validation and communication	Validation of the maps was done at the community level, where the maps are made available to the community members for their feedback.	• Created awareness of how community members were exploiting the resources. • Feedback from community members incorporated in the final maps	Not too many feedbacks were received. This is probably because community members didn't know who to channel their feedback	Strategic way of communicating the status of the mangrove resources to the community and the general public

ANALYSIS OF THE L'EXPERIENCE

CRITERIA 1 : Degree of participation

INDICATORS	POSITIVES ASPECTS	NEGATIVES ASPECTS	NON-CONTROLLED ASPECTS
Community entry	• Level of acceptance of any project, activity or intervention in A community hinges largely on the community entry strategy • The participatory process starts right from the community entry. It ensure total inclusion and ownership of the project or activity	Bad community entry strategy often leads to some resistance from local authorities	Some communities may just kick against specific interventions due to the community dynamics and priorities
Ownership and total inclusion	• Means of communicating the importance of mangroves and to bring the extent of exploitation to the attention of the people. • It involves key actors in in the community right from the onset. (people whose livelihood and decisions affect the resources)	In some cases, a quick analysis of the stakeholders will help to identify key actors and understand their interests. When some major actors feel side-lined they may sabotage the project.	You must always make provisions for late adopters and laggards in the community

CRITERIA 2 : REPLICABILITY

INDICATORS	POSITIVES ASPECTS	NEGATIVES ASPECTS	NON-CONTROLLED ASPECTS
Limited resources	Recognizing the limited access to high resolution, multi temporal imagery in this part of the world, developmental projects should take advantage of available limited resources like Google images and update through this participatory process.	Remotely sensed images are often commercial and are quite pricy. Developmental projects may not have enough budget for imagery and other equipment like GPS units.	Cloud-free imagery may be unavailable for specific locations
Ownership and total inclusion	• Beneficiaries are exposed to the harsh realities of their actions on the mangroves. The beneficiaries later became advocates for mangrove restoration • Beneficiaries have been equipped to carry out such exercises, to evaluate the impact of their restoration effort.	The GPS training may be a little technical. Hence the needs of individuals selected for training should be assessed. Criteria for selecting beneficiaries should ensure that they have some level of literacy.	Local authorities may influence the selection process

This tool sheet is the result of field experience, and didn't benefit from scientific or technical evaluation. It will be improved and strengthened over time.

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