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Improving Water Quality in the Rufiji Basin of Tanzania

*Name of Participants: Damas
Patrick Mbaga*

DESCRIPTION AND BACKGROUND

The National Water Policy (NAWAPO) of 2002 and subsequent Water Resources Management Act No. 11 (WRM Act) of 2009 maintained natural hydrological boundaries (basins) as units for management, designated an order for decision making on water allocation that prioritizes basic human and ecosystem water needs, and formalized community participation in freshwater resources management. Institutionally, freshwater resources management follows a nested approach, with the Tanzanian Ministry of Water operating at a national scale, nine basin water boards responsible for water allocation at a basin scale, catchment water committees operating at a catchment scale, and formally recognized Water User Associations (WUAs) as mechanisms for public participation at sub basin levels. As a result, Tanzania presently has among the strongest enabling legal environments for sustainable freshwater resources management worldwide.

(Mwakalila & Masolwa, 2012), The Rufiji Basin covers an area of 183,791 square kilometers (about 20% of Tanzania) and is one of the largest of the 9 basins in Tanzania. The basin comprises of four major rivers - Great Ruaha, Kilombero River, Luwegu and Lower Rufiji. Land use in the basin is mainly for agriculture, mining, forestry, livestock keeping, and fishing, wildlife, navigation and human settlements with an estimated 1.4million people currently living in the Rufiji basin. The population in the basin is rapidly increasing thereby increasing pressure on land and water resources. The basin is expansive, remote and inaccessible in some parts thereby increasing the cost of regular monitoring of the basin. And issues of water security is well explained by (Brief, 2018).

WUAs are significant to water resources governance and formally recognized in the Tanzania Water Policy. The formation of WUAs by the SUSTAIN-Initiative and RWBO in parts of the basin provides an opportunity to engage water users in inclusive water resources management. By bringing WUAs into the management of water resources, RWBO is aiming at achieving 3 main objectives:

- Reduce the cost of water quality data collection – which is often expensive due to the long distances water officers have to travel;
- Establish water quality database at the local level - gather water quality data through the use of reliable and low-cost technology;
- Actively engage local communities and water stakeholders in the management of water resources, specifically, water quality monitoring.

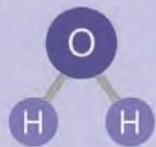
Since early 2017, in collaboration with RWBO, the SUSTAIN-Africa Initiative introduced the miniSASS technology and also, trained WUAs in Mngeta and Mkoji sub-catchments of the Rufiji to use the tool. Mini Stream Assessment Scoring System (miniSASS), a tool developed in South Africa, is a simple tool which can be used to monitor river health. The tool supports collection of a sample of macro organisms (small animals) from the water and depending on which groups are found, the results can define the general health of the river as well as water quality. The results from mini-SASS are indicative of the health status of the river and whether further complex analyses are required.

AfriAlliance MOOC#2 Final Assignment

Abstract

Good quality water is as important as the availability of water and; quality water is critical for household, agricultural and even industrial usage and even more critical for environmental well-being of landscapes. Low quality water due to pollution can increase the cost of water with negative effects on human health, agricultural production and other economic activities. Monitoring of water quality was for a long time the preserve of specialists with almost no community engagement. The prohibitive cost and the lack of easily accessible technology for the less technical hands means that communities and local stakeholders of water resources were not actively engaged in water quality management. IUCN and the African Wildlife Foundation (AWF) through the SUSTAIN-Africa Initiative and support from the Rufiji Water Basin Office (RWBO) are changing this phenomenon.

Keyword: Water quality, Community, Technology, Monitoring.



TECHNOLOGICAL SOLUTIONS

As part of the capacity building to WUAs, there was a need to bring a technology which is suitable to the WUAs according to their needs; Affordable low cost-cost, low-tech but reliable, so miniSASS (Mini Stream Assessment Scoring System) technology was employed. miniSASS is a simple tool which can be used by anyone to monitor the health of a river. You collect a sample of macroinvertebrates (small animals) from the water, and depending on which groups are found, you have a measure of the general river health and water quality in that river. MiniSASS tools include (miniSASS net, miniSASS tray, magnifying glass, tweezers and pipette as well as assortment of sample bottles). And issues for technological solution is explained by (Vallejo & Wehn, 2016).

CAPACITY DEVELOPMENT



For the component of capacity development to the Water User Associations in the Rufiji Basin, this has been done in different ways including trainings and study visit. For training WUA have trained on the use of Water Quality data collections using miniSASS tool, trained on protection and conservation of water sources and other natural resources, climate change and adaptation method, good governance, climate smart agricultural etc. for study visit WUAs conducted study visit to Zigi catchment of Pangani River Basin, in that area there is Associations of Farmers and Water User called UWAMAKIZI (Umoja wa Wakulima wahifadhi Mazingira na Kiui na Zigi- it is a Union of farmers for the environmental conservation purposes using pay for ecosystem services in the conservation process), this association is working closely with Tanga Water Supply and Sewarege Authority (TAWASSA) they are implementing Payment for Ecosystem Services to improve water quality and quantity from water sources used by the Tanga Municipality, so the main aim of study visit was The tour took place in three sites where they learned how to manage erosion from agricultural lands to prevent water pollution in rivers and conserve land humus in the field through fanya juu and fanya chini technique. Another site was along the river where they visited one of the farmer who conserved the river banks from the 60m policy of river conservation from human activities and the last site was tree nursery where UWAMAKIZI they plant and take care of their trees before distribution, here they got a chance to know how the big association with large number of small groups from far distances they manage their nursery, commitments and contributions on success and on how and why those kind of trees in their nursery. Capacity developed is the best method to achieve social innovation as shown by (Innovation et al., 2015).

SOCIAL INNOVATION



GOVERNANCE STRUCTURES

There is well define Governance structures with the regards to Water Resources Management in Tanzania, as stipulated in 2002 National Water Policy and 2009 Water Resources Management Act. Hereunder are the well-defined Water Resources Management institutions in Tanzania with their responsibilities

National Level -The Ministry with the mandate for water is responsible for managing the nation's water resources as for now it is Ministry of Water.

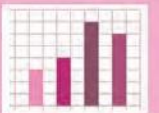
Basin Level -This is the level for data collection, processing and analysis, water allocation, pollution control, preparation of water utilization plans, collection of the various fees and charges, and resolution of various water related conflicts, water is managed at the basin level.

Catchment Level -The role of catchment Water Committee includes preparation and implementation of catchment plans, and resolution of conflicts within the catchments.

District Level -The Districts are responsible for planning and development of water resources in accordance with Basin plans, protection and conservation of natural resources in the villages and wards, establishment of bye-laws on the management of water resources, conflict resolution in accordance with established laws and regulations.

Community Level and Water User Associations -Water User Associations (WUAs) or Water User Groups (WUGs) is the lowest appropriate level of management. These associations are responsible for local level management of allocated water resources, mediation of disputes among users and between groups within their areas of jurisdiction, collection of various data and information, participate in the preparation of water utilization plans, conservation and protecting water sources, and catchment areas, efficient and effective water use and ensuring return flows, enforcement of the law and implementation of conditions of water rights, and control of pollution (Kabogo et al., 2017).

BUSINESS ROAD MAP



As explained by (Innovation et al., 2015) that Social innovation relies on the means other than market mechanisms in order to link the demand and supply sides. There has been a regular communication in both sides, technology user and technology developer and most cases the main discussion is how to improve the equipment and developers are eager to know how is the performance of their tools. As for this case since the introduction of miniSASS technology to the two WUAs the technology has been adopted by different organization in the country such as SNV at Katuma catchment, National Environmental Management Council at Kihansi Catchment to mention few. Based on the tools from the developer we have produced training materials which has been translated into Swahili language to as to be used by other WUAs across the country.

Summary

Social inclusion is the only way to tackle water and climate change challenges, local community should be involved from the design to the implementation of any water and climate change related projects. When they are involved they feel to be part of the process and outcomes of the project will be seen easily.

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