

## **Integrating conservation and livelihood activities towards community adaptation to climate change challenges along Wami-Ruvu mangrove ecosystem, Bagamoyo, Tanzania.**

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### **Abstract**

*The health condition of mangrove ecosystems in Bagamoyo district is largely threatened by over-exploitation from various human uses and high vulnerability to climate change impacts. Poverty level within communities in the district has accelerated unsustainable resource use in quest for daily living and livelihoods. It is difficult to isolate local communities from mangrove exploitation which they depend on as major source of generating income. Fighting Against AIDS Poverty and Environment Conservation (FAAPECO), which is a non-governmental organization working in Bagamoyo district embarked on dealing with some of these challenges since 2005. FAAPECO conducted a research on exploitation of mangrove for different uses by communities in Magomeni and Makurunge villages in Bagamoyo District. The findings showed that average mangrove use in a year was firewood (28%), charcoal (30%), building (14%), timber (18%) and others (11%). Though the percentage did not reach even 50% for a specific use but a combination of percentages for the uses is that threatens the future of mangrove ecosystem. Following these results, FAAPECO developed a project that accommodated community livelihoods and conservation initiatives among its core activities. It involves a wide local community stakeholder's awareness raising on sustainable mangrove forests conservation in association to climate change impacts. Other activities included participatory mangrove replanting in degraded areas, strengthened alternative livelihood opportunities through promoting beekeeping and strengthened natural resources governance. Capacity building was conducted at different local leadership levels. The project covered Magomeni Ward with focus on three villages: Mjimpya, Razaba and Kitame within the Wami-Ruvu rivers mangrove ecosystem. Training and awareness campaigns were conducted to 100 community members. Trainees were facilitated to form four groups for implementing a pilot alternative livelihood activity of beekeeping using 80 modern beehives. The four groups and quantity of beehives provided are Utondwe (15), Chanyuki (15) Tuwepamoja (25) and MACAG (25). Based on this work by FAAPECO it is obvious that community based initiative contribute significantly on natural resources conservation income to associated local communities*

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### **Introduction**

Bagamoyo district fall within the Tanzania's coastline that stretches approximately 1,424 kilometres characterized by a mixture of coastal resources (MNRT, 2007; Sallema and Mtui 2008; Mahenge, 2009). This district is known to have a number of natural resources with nationally and internationally significant among which includes the mangrove forests. Coastal communities in the district, as in other coastal areas are among the poorest groups in Tanzania and mangrove is one of the coastal dependent resources for making local livelihoods.

Mangroves of Bagamoyo district form one of

the 10 management blocks (Table 1) designated in the National Mangrove Management Plan (Semesi, 1991, 1992). Mangrove ecosystems of Bagamoyo districts like any others in Tanzania coastline are threatened by human activities such as over-exploitation through clearance for rice field, development for settlements, salt making, shrimps farming, sourcing fire wood, boiling salt making, making timber, lime burning and boat construction. Furthermore mangrove ecosystems are among the coastal assets that are vulnerable to natural events particularly climate change impacts such as sea level rise, severe drought, flooding and El-Nino.

### **Natural Resources Exploitation for Community Livelihoods**

Fighting Against AIDS Poverty and Environment Conservation (FAAPECO) is civil society organization that has been registered to work in Bagamoyo district since 2005. Since its establishment this organization has been striving in the implementation of community based activities. FAAPECO came to realize that degradation of mangrove ecosystems has been going on and was persuaded to take stringent actions as a way to

raise awareness to reduce the problem. The major drivers were human based activities that were seen to be unsustainable. FAAPECO conducted a research on exploitation of mangrove forest ecosystem for different uses by local communities residing in Magomeni and Makurunge villages in Bagamoyo District (Table 1.) It was found that mangroves can be used in varying percentages for firewood, charcoal making, building, timber and other unspecified uses.

**Table1: The average use of mangrove from mangrove forests found in Magomeni and Makurunge villages on monthly basis 2006.**

<b>Month</b>	<b>Firewood (%)</b>	<b>Charcoal (%)</b>	<b>Building (%)</b>	<b>Timber (%)</b>	<b>Others (%)</b>
January	20	30	25	10	10
February	25	35	10	20	10
March	30	40	5	20	10
April	20	35	10	25	10
May	20	20	20	30	20
June	15	5	20	35	25
July	35	10	20	20	15
August	35	40	10	10	5
September	35	35	10	15	5
October	40	20	15	10	15
November	30	45	10	10	5
December	30	45	10	10	5
<b>Average</b>	<b>28</b>	<b>30</b>	<b>14</b>	<b>18</b>	<b>11</b>

### **Climate Change Challenges on Coastal Resources**

The National Adaptation Programme of Action (NAPA) of Tanzania ranked coastal and marine resources to be priority number 9 out of 11 economic sectors (URT, 2007). The environmental policy generally provides opportunities for the promotion of sustainable natural resource management practices. These will result in an adaptive response on different sectors such as agriculture, water, health and energy. The preparation of the Tanzania National Adaptation Programme of Action was a result of these driving forces. Bagamoyo was among the 13

districts in Tanzania where the stakeholders' consultation during NAPA preparation were undertaken. The NAPA reveal that coastal and marine resources for generations have had profound influences on the socio-economic well being and health status of not only the immediate communities but also those far removed from them.

It is obvious that climate change impact is the reality and is felt by people from local community to scientific community. There are different initiatives that have take a good step in adapting to climate change impacts in Bagamoyo (Mahenge

et al 2012; Tobey et al 2012). There is also a need to have plans that can enhance and provide technical assistance to indigenous adaptation options that can promote natural resource management particular mangroves hence improve the wellbeing of the entire Bagamoyo community.

#### **Advocating Integrated Natural Resources Conservation and Livelihood Initiatives**

FAAPECO has been implementing community based activities in close collaboration with communities and Bagamoyo District Authority. Its objectives also focus on environmental conservation, health and supporting livelihood activities for grass root communities. FAAPECO being a Civil Society Organization committed for environment conservation continued has a good network in collaborating with various stakeholders that include NGOs, local government, local community groups, academic institutions, research institutions, private companies, unspecified individuals and professional expert individual at different capacity.

FAAPECO worked hard through its network and managed to come up with a project titled *“Promoting Integrated Conservation and Sustainable Utilization for Beekeeping as Climate Change Mitigation and Adaptation in Wami-Ruvu Mangrove Ecosystem in Bagamoyo District, Tanzania”* within Magomeni Ward (Figure 1). The project received funding from the Global

Environmental Facility (GEF), Small Grants Programme (SGP) through United Nation Development Programme (UNDP), Tanzania Office. Following awareness training and provision of beehives, community members have been very positive in supporting mangrove replanting knowing that is a good site for beekeeping projects. Towards the end of year one of project implementation in December 2013, the key achievements was:

- A total 35 hectares out of 50 have been replanted with mangrove where Mjimpya (10), Razaba (15) and Kitame (10).
- A total of 100 community project beneficiaries members participated in the awareness training workshops on conservation knowledge and climate change adaptation awareness
- Capacity building to 40 community members on sustainable mangrove utilization, beekeeping and associated Laws and Policies.
- 40 community members were mobilized to participate in learn by doing on mangrove replanting field work.
- Targeted 40 Community Leaders were trained to improve governance skill on relevant Laws, Policies and Regulations. Leadership style self-assessment was also conducted.
- A total of 80 beehives were made and given to 4 community group members of MACAG (25), Tuwepamoja (25), Chanyuki (15) and Utondwe (15).

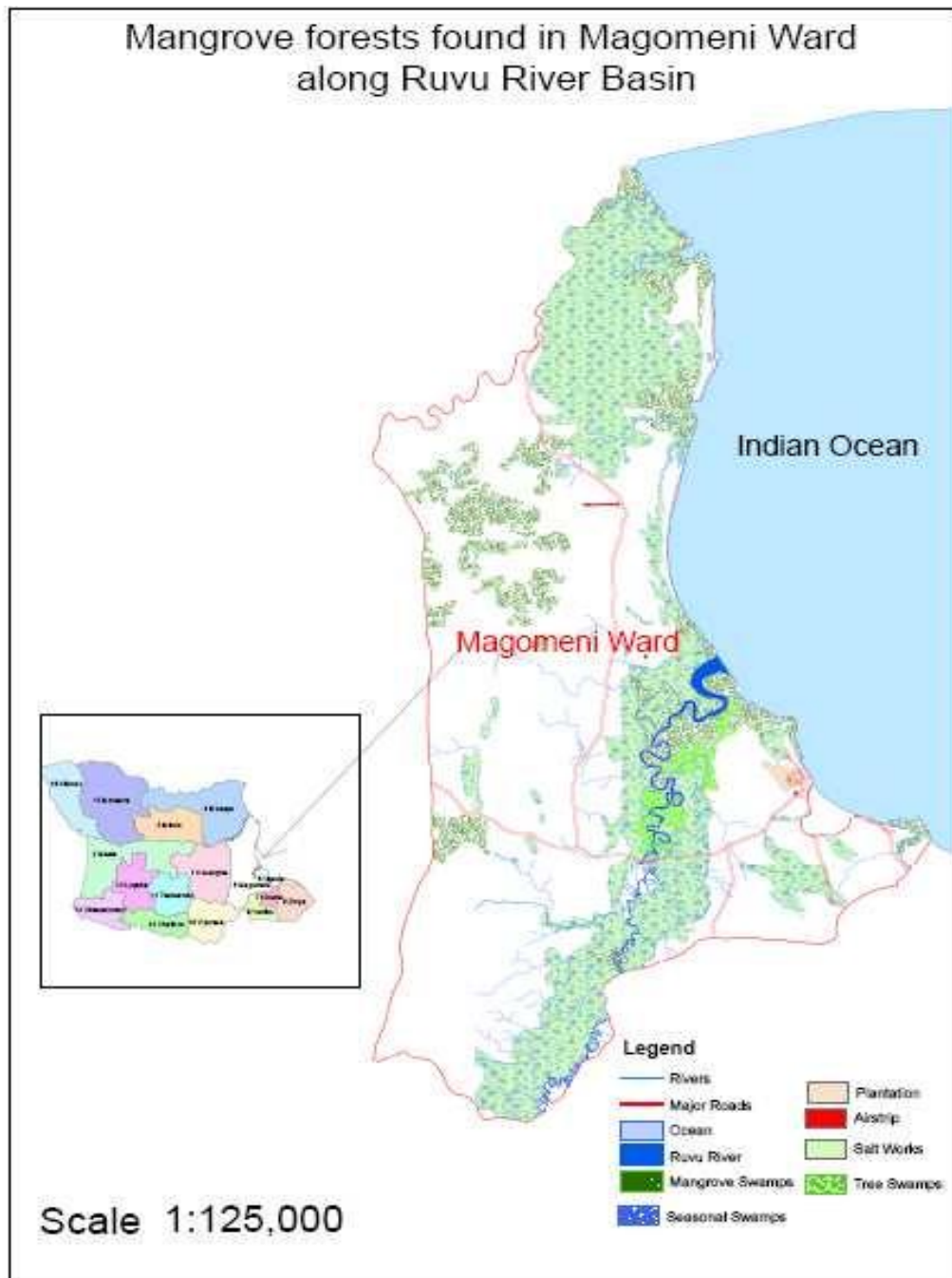


Figure1: A map of project location within Wami-Ruvu mangrove forest ecosystem.

### Conclusion and Recommendations

Community based initiative plays great role in assisting conservation of natural resources and in turn trigger economic and livelihood benefits to local communities

The civil society organization (NGOs, CBOs, RBO) can be used as engines to stimulate and stir community actions towards conservation stewardship and participation in activities related to governance of natural resources.

Mangrove ecosystems are basically protected area by Law in Tanzania however, the current natural resource conservation abuse to this important coastal resource pose threat to its future sustainability. It is recommended therefore to strengthen awareness campaign of Laws and Regulations on natural resources governance to the communities surrounding this ecosystem and involve them in conservation initiatives.

Civil Society Organizations are potential bodies for channelling conservation funds from development partners and donors. More fund is needed to be directed towards mangrove conservation due to their ecological and economical importance such as nursery grounds for marine organisms, filtration of siltation from river effluents, apiary sites, habitats for most forests organisms dwellers and medicinal value for human being.

Communities in coastal villages through environmental committees plays great role in natural resources conservation especially in mangrove management. There is a need for District Authority to ensure active involvement of respective villages to get support in implementing their environmental and natural conservation action plans.

Since fisheries sector also benefits from mangrove ecosystems as nursery and fishing ground, there is a need of more capacity build fisher folks to understand mangrove benefits and become frontiers in conservation.

Climate change accelerate sea level rise that results to coastal inundation hence decrease mangrove cover in areas where they exist. While thinking on mangrove

replanting and beach stabilization from impacts of sea level rise and strong waves consideration of more funding for such initiatives need to be thought following the ongoing changing climate. The vivid examples of coastal inundation in Bagaboyo district are seen at Mlingotini and Buyuni villages. Mangrove replanting programmes would help to reduce the rate of inundation.

Mangrove ecosystems are really important coastal resources. The degradation from human activities as well as natural threats such as climate change impacts through sea level rise and extreme weather events are evident not only in Bagamoyo district but the entire coast of Tanzania and other parts of the world. There is also a need for advocacy that focus especially on mangrove replanting schemes that involve communities.

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