

SUSTAINABLE FISHERIES MANAGEMENT PROJECT (SFMP)

Mangrove Nursery establishment in Tsokomey/Bortianor Training on Nursery Establishment



FEBRUARY 2018





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Cover photo: Community members from Tsokomey, Bortianor and Tetegu establishing mangrove nursery

Photo Credit: Development Action Association - DAA

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ACRONYMS

DAA	Development Action Association
DOPA	Densu Oyster Pickers Association
FC	Forestry Commission
NGOs	Non-Governmental Organizations
SFMP	Sustainable Fisheries Management Project
URI	University of Rhode Island
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

In January 2017, the DAA realized the importance of oysters to the local communities within and around the Densu Delta Ramsar Site. Of particular importance was how the decline in population of the oyster has affected the livelihood of several people in these communities, especially the women who depend solely on the oyster for their livelihood. DAA through financial support from the USAID and in partnership with the University of Rhodes Island (URI) initiated the *Densu Delta Community Co-Management Plan Project* under the Sustainable Fisheries Management Project (SFMP) with the aim to improve the oyster population; while at the same time enhancing the living conditions of the community. As part of this project, mangrove restoration was identified to be one means of restoring the oyster population through improved habitats. This training was therefore conducted to build the capacity of local communities in establishing their own mangrove seedlings for planting in the field.

SECTION 1: BACKGROUND

Mangroves have been classified as one of the most productive ecosystems on the earth (Macintosh and Ashton, 2002). They play vitally important socio-economic and cultural roles for coastal communities within the areas where they occur. They also have numerous ecological function of sustaining the ecosystem through soil stabilization, coastal protection, fish habitats and spawning grounds, and vital sources of protein for coastal communities. In recent times, attention has been drawn to mangrove as an option for sequestering atmospheric carbon dioxide thereby helping combat climate change. They also have invaluable natural filtration systems for pollutants. Mangrove also provide structural support to communities by acting as natural barriers between coastal storms and homes. The disappearance of mangroves therefore means the loss of these ecosystem services which will result in negative economic and social impacts in coastal communities.

In Ghana, mangrove forests are reported as one of the most threatened ecosystems (Nunoo and Agyekumhene, 2014). Mangrove and its associated resources in Ghana, such as wood, fish, oysters and crabs are exploited by the people living near the mangrove forests. There is overexploitation of these resources by local communities, leaving most of them in secondary or tertiary development stage (Ayensu *et al.*, 1996). Mangroves in Ghana have been over-exploited for diverse economic reasons including fuel (firewood, charcoal, wood for fish smoking), construction materials (timber, beams and poles, fence posts, thatch), fishing (atidza), industry (salt) and agriculture. With deforestation accounting for about 70% of the country's mangrove forest loss (IIED, 1992), most areas along the coast are depleted of their mangrove resources.

The current state of mangroves in Ghana calls for immediate interventions to restore the integrity of these ecosystems so as to enhance their ecological services. The financial requirement in restoring a degraded mangrove forest to its original state has left most degraded areas unrestored. Restoration of degraded mangrove areas in Ghana has mainly been carried out by non-governmental organizations through funding from international donors. Restoration activities by NGOs have however always been done in close consultation with local communities to ensure support, active participation and sustainability of such projects.

1.1 Training Objectives

The training was aimed at development of skills of selected target group on mangrove seedlings production and mangroves reforestation.

The training specifically built capacity of the community members to, among others;

- Identify the various species of mangrove in Ghana and in their area
- Identify the services provided by mangroves in the Densu Delta wetland
- Identify maturity signs of seedlings and/or propagules
- Identify appropriate period for mangrove restoration
- Establish and operate a mangrove nursery for the various species of mangrove
- Understand the best methods and practices for mangrove restoration

1.2 Expected outcomes

- Various species of mangrove in the area identified
- Importance of mangrove to livelihood of community highlighted
- Threats to mangroves identified and measures to deal with them discussed
- Methods of nursery establishments highlighted

• Ten thousand mangrove seedling nursery established to produce seedling for restoring degraded areas at Tsokomey

SECTION 2: TRAINING METHODOLOGY

The training was conducted on 15th and 16th February, 2018 in Tsokomey. All activities of the training were undertaken in close collaboration with DAA who assisted with the trainee selection and general organization. The training combined both lectures and practical approach to providing participants with first-hand information-sharing and experience on mangrove issues. The training employed talks (PowerPoint presentations), video documentaries and exercises. Participants' participation was ensured by adopting a "learning by doing" approach in the training delivery. The training also introduced success stories from other coastal communities in Ghana, using pictures to encourage participants.

In all, a total of one hundred (100) community participants from 3 communities (Tsokomey, Bortianor and Tetegu) were taken through the training on mangrove nursery establishment and operation as well as mangrove restoration. The training was conducted in two sessions for two groups to maximize impact since too many people would have been difficult to control and supervise, especially during the practical sessions. The training was conducted in the local languages (Twi, Ga and Ewe) for better understanding to participants.

2.1 Lectures on Mangrove Importance and Threats

The lectures took the form of interactive discussions with participants on mangrove issues (Figure 1). Participants were taken through the importance of mangroves, threats facing mangroves and the conservation needs. The local threats to mangroves in the area were highlighted with the help of participants. The past, present and future situation for the mangrove areas in the Densu Delta Ramsar sites were discussed. Exercises were given, through which community members realized and admitted that the mangroves provided more services (especially fin and shell fish) in the past than they currently do. Participants mentioned several species of fish they caught in the mangrove areas in the past but do not get currently. They therefore agreed that it was important they restored the mangroves to enhance the benefits they derive from the mangroves.

Major threats to mangroves in the area were identified to be uncontrolled cutting of mangrove for fuel wood and for sale, mangrove cutting for Atidja fishing, and lack of replanting after cutting. Flooding, to a limited extent, also kills germinating seedlings thereby reducing natural regeneration in the area. Participants agreed that regulating cutting (by ensuring supervised cutting and cutting of only dry branches) and educating community members will help reduce the threats to mangroves in the area.

2.2 Introduction to Mangrove Nursery Establishment

Participants were taken through the various methods of mangrove restoration, during which mangrove nursery was highlighted as a good and preferred method for the Densu Delta wetland; since the nursery will allow seedlings to be grown to a suitable size that will withstand any harsh environmental conditions at the planting site. Nursery establishment and operation techniques were then introduced to participants, using demonstrations. Participants were taken through techniques such as selection of suitable site for a nursery, characteristics of good soil, site preparation, polypot preparation (Figure 2), filling and arranging polypot, selecting and preparing the seed, planting seeds, watering, weeding and general care and maintenance of a nursery.

An annotated manual on how to establish and operate a mangrove nursery was developed to be distributed to participants for reference (See Appendix 1).

SECTION 3: ESTABLISHMENT OF MANGROVE NURSERY

Field work was conducted on 16th February, 2018 to take participants through practical mangrove nursery establishment. This session offered the participants an opportunity to put into practice the knowledge they had acquired from the previous day's activities during the demonstration exercises. Trainers were on site to provide technical guidance to participants while they carried out the various activities.

With the financial support from USAID through DAA, and technical support from the trainers, the community members established an 11,000 red mangrove seedling nursery in the Tsokomey community for later planting within the Densu Delta Ramsar Site. The mangrove seeds were nursed using empty sachet water polyethylene bags (Figure 3). The empty sachet water bags were intentionally selected for use as polypots to (1) create/support employment for those community members who pick them for sale and (2) help rid the environment of plastics which have become a major contributor to environmental pollution in recent times.

3.1 Some Major Observations from the Training

The enthusiasm from local participants towards the education program was very high.

During the interactive sessions, community members became well aware of the impact that their personal activities were having on the mangrove resource. They also realized the effect of such negative activities on their livelihood as a result of declining mangroves.

Community members established that fewer species and less abundant fishes and oysters were caught in recent times which were related to the declined mangrove forest in the area. This revelation made the community members very receptive to protection measures and also the restoration initiative.

The participants were able to use the knowledge they acquired in the classroom to establish an 11,000 red mangrove nursery with very little inputs from the trainer. This follows that the participants understood the lectures given and could apply the knowledge in future programs by themselves.

There were some errors in the information held by some participants about mangrove nursery and restorations which were corrected through the training. For instance, in filling up of polypots, participants had prior information that the pot should be filled to the brim which was not the correct way, since a small space is to be left on top for temporally holding water during watering or rainfall. Cutting of polypot was not well understood by participants prior to the training.

3.2 Figures



Figure 1: Trainer (in green shirt) delivering a lecture on mangrove importance, threats and conservations needs. In the white shirt is a community member, translating the lecture into Ewe and Ga for the participants



Figure 2: Participants preparing polypots during the demonstration session



Figure 3: Members using empty sachet water to establish a red mangrove seedling nursery at Tsokomey



Figure 4: Mangrove nursery at Tsokomey, established using empty sachet water

SECTION 4: CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The local communities are aware of the threats to the mangrove resources but could not link their negative activities (such as overcutting) to the challenge (such as low fish catches) they face in recent times.

The level of enthusiasm from the local community members about the restoration project was very high.

The field work revealed that there was a high potential for restoring the mangroves of the area, to improve the fisheries and livelihood of the local community while applying critical ecosystem services.

4.2 Recommendations

Frequent monitoring of the nursery is needed at the early stages to ensure high rate of seedling survival. This will also help identify seeds that are not viable early and replace them.

Continual awareness creation is important to help change the attitude of the communities towards responsible environmental stewardship.

- Such awareness should be conveyed in the local languages to the entire community on the good services mangroves provide for fishing communities.
- The education should highlight the link between mangroves and improved fisheries. This will increase appreciation for the resources and thus increase community support and participation in the conservation program.
- Audio-visuals are highly recommended for use in the education, since the literacy level of most of the community members is low.
- Signage is important as a way of educating the community members and visitors about the existence of ecologically important resources (mangrove) in the area.

The presence of strong government commitment by way of legal backing is very essential for mangrove management.

- The program should actively involve the District Assembly and possibly the Ghana Police in all activities to enforce existing laws and any by-laws that will be developed by the community.
- The Wildlife Division of the Forestry Commission should be liaised with, to help initiate and promote the Ramsar Concept of wise use in the area.

Local control and enforcement mechanisms have proven to have huge potential to achieve effective mangrove resource management.

• The project should try to develop community by-laws that protect the mangroves. This will ensure that the mangrove forest planted will not be destroyed in future as previously done.

Support from local communities should be sought, as it is important for long term sustainability of the mangrove restoration project to be carried out on a massive scale.

• Securing the support of Traditional Authorities like the chief and opinion leaders is critical to the success of the project. Chiefs can be instrumental in the community-level by-laws that the program seeks to develop, and they should be actively involved in all activities.

- Formation of volunteer groups is important to ensure that the area is regularly patrolled and monitored to help identify in a timely manner any illegal activities in the mangrove areas to be restored.
- The program should take steps to sustain community involvement which will be critical to the project's success and sustainability.
- The project should identify and provide income-generating alternative livelihood options for the communities as an integral part of the project. This will ensure that pressure on the natural resources is reduced and hence the mangroves resources are protected. Providing livelihoods will also serve as incentive to help sustain the interest of the community.
- Also, the alternative livelihoods will help divert attention from mangroves and thereby reduce the pressure on the resources for fuel wood and for sale. If possible, the project should consider woodlots and agro-forestry as an alternative to reducing mangrove cutting in the area and providing energy source for fish smoking.

Involving women groups is needed for conservation and success of the project; because from the training they proved to be the group that engaged most in mangrove cutting for smoking fish and sale of mangrove fuelwood.

Developing natural resources into tourism facilities have been shown to enhance their protection.

- As a long term project, the mangrove areas should be developed for tourism activities such as bird watching and boating. This will help generate employment for the local community (tour guides, canoe operators etc.) and help secure community support for the protection of the mangroves.
- Detailed bird list of the area should be generated in consultation with the Wildlife Division of the Forestry Commission.
- Selected youth from the local communities should be trained in bird identification and responsible tourism; to be able to guide tourists in bird watch expeditions.

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APPENDIX 1

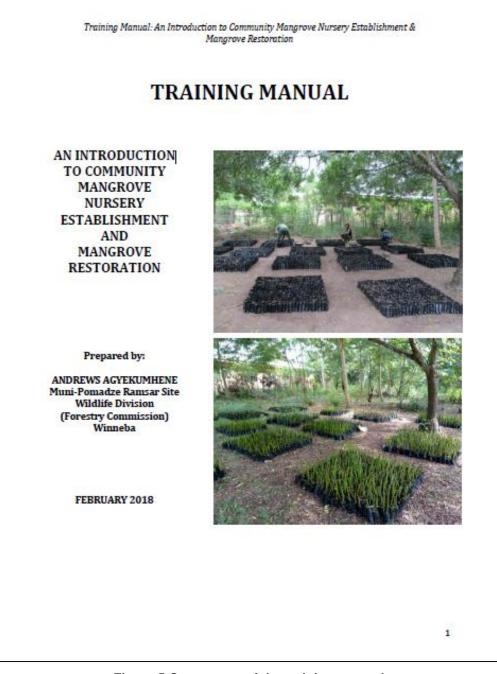


Figure 5 Cover page of the training manual

APPENDIX 2

2.1 Participants List

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0506933520	0540480150	0550292028	0550292028	0202712022	0264789900	0275914549	0548451100	0541015551
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	GLADYS	JOSEPHINE	ELIZABETH	EASTER	CHARLOTTE	OTTABL OTTE	MAWUSI	COMFORT	EDWIN	HORTOR
A Constant	BENTUM	KWADAMA	DORMEKPOR	AMARTEY		DOKU	GABLA	TAWIAH	GAKPO	GODWIN
	DOPA BORTIANO R	DOPA TETEGU	DOPA TETEGU	DOPA BORTIANO R	TETEGU	DOPA	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME
	0570575490	0240018546	0270404097	0549083435		0554828003	0554827979	0545379290	0243047451	0249865770
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DOPA TETEGU	DOPA TETEGU	DOPA TETEGU	DOPA TETEGU	DOPA TETEGU	DOPA TETEGU	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME
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DOPA TSOKOME	DOPA TSOKOME	DOPA BORTIANO R	DOPA BORTIANO R	DOPA BORTIANO R	DOPA BORTIANO R	DOPA TSOKOME	DOPA BORTIANO R	TSOKOME
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	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME	DOPA BORTIANO R	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME	DOPA BORTIANO R	TSOKOME
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KUMANYENU	FUMI	TSIKATA	AGBOMANYI	HUSUNUKPE	OKYERE	KORLEY	AMENUDZI	OSABUTEY
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DOPA TSOKOME	DOPA BORTIANO R	DOPA TSOKOME	DOPA TSOKOME	DOPA BORTIANO R	DOPA BORTIANO R	DOPA BORTIANO R	DOPA TSOKOME	DOPA TETEGU
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LAWEY	LAWEY	AGBADZI	АКАКРО	AGOROGO	KUKEKPOR	AMUDZI	FIAGBEDZI	ACQUAH
DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME	DOPA TSOKOME	DOPA BORTIANO R	DOPA TSOKOME	BORTIANO R
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BENTUM	KWADAMA	DORMEKPOR	AMARTEY	DOKU	GABLA	TAWIAH	GAKPO	GODWIN
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