

**Report on Farmer's workshop on  
Agroforestry and ecosystem services in Kinole sub-catchment  
held on 13<sup>th</sup> and 15<sup>th</sup> November 2010**



Workshop facilitated and report compiled by

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## **1.0 Introduction**

### **1.1 Background**

PRESA (Pro-poor Rewards for Environmental Services in Africa) started its activities in Uluguru Mountains in early 2009. This involved public reverse auction for willingness to accept on ecosystem services through tree planting. Several hundred farmers participated in the auction, with 32 farmers received 'contract' with associated monetary incentives to engage in tree planting. Furthermore, other associated PRESA work was connected to understand some collective action studies in other parts of the Ulugurus. This initial work was done in collaboration with students from Michigan State University in 2009. In July 2009 a review of what has been done was conducted (including field verification of trees planted) and suggested way forward to fast track the PRESA main objectives in the site. This was followed by increment in ground work geared onto action-research where on basis of results from auction experiments, new farmers were encouraged to join the project. This included sensitization and design of further research activities.

In 2010 more ground work was conducted including first mass planting in March – May 2010 of which around 80 new households were identified plus nearly 20 households who were selected in the previous auction i.e. their number totalling 100 households (as per PRESA objectives). Most of the farmers managed to get tree planted at this time but few were unable to effect planting though already received the seedlings due to bad timing that escalated into unfavourable weather. On the basis of the public auction in 2009, simple voluntary contracts were developed with farmers allowing incentives of 150/- TZS for each surviving seedling in the field. The incentives was to be given after every 6 months for the period of one year i.e. assuming 100% survival the farmer is entitled to receive 30,000/- TZS per year. In November 2010 first monitoring was conducted for the trees planted in March – May 2010 to understand their survival and other aspects related to management of trees on farms. A recent attempt was made in December 2010 to increase the number of participating farmers to 200 (i.e. recruiting new 100 households).

Furthermore, the understanding of farmers on tree planting and its relationship to watershed management was the key factor to consider in promoting the project activities. This necessitated frequently field visits and training/workshops to discuss the same. This workshop was thus conducted to increase farmers awareness on the role of tree in watershed management in Kinole sub-catchment.

### **1.2 Workshop themes and objectives**

The workshop had three main objectives, namely;

- i) Increase interaction among farmers participating in the PRESA project to boost their collective action morale
- ii) Improve and refresh understanding of farmers on role of trees in watershed management in the Uluguru mountains
- iii) Stimulate debate among farmers on importance of watershed conservation in the Uluguru Mountains
- iv) Understand the constraints in tree planting and watershed management in the Kinole sub-catchment

## 2.0 Working sessions

### 2.1 Agroforestry interventions and ecosystem services

First session involved detailed presentation of suitable agroforestry practises in various ecosystems to address challenges of environmental degradation, poverty and food insecurity. The presentation also covered importance of tree component in agroforestry systems and attempted to explore factors to consider when planning for tree planting exercises under smallholder farming systems. Examples from local tree species and local conditions were drawn to simplify the delivery of information and discussions.

#### ***Definition of agroforestry***

Agroforestry is a dynamic, ecologically-based, natural resource management system that, through integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased economic, environmental and social benefits. Agroforestry gives technologies that assist in fostering food security, improving income and sustain the environment.

**Table 1:** Some livelihoods and ecosystem challenges and their possible agroforestry interventions

<b>Challenge</b>	<b>Agroforestry options</b>
Poor agricultural practices	Fertility improvement, trees for nutrient management , wind break, conservation agriculture with trees
Deforestation/scarcity of wood products	On-farm trees for fuel and wood products, afforestation program; appropriate tree species for Drylands
Overgrazing/shortage of fodder during dry season	Enclosure systems (e.g. Ngitili)and fodder banks
Declining quality of ecosystem services	Payment for environmental services, in-situ conservation, landscape level management, trees on farms to sequester carbon
Poor health and diseases	Medicinal and fruit trees, nutrition through biomass transfer
Poor rural income	Processing and marketing of tree products and services

### 2.4 Consideration of tree-based agroforestry interventions

Before farmers enter into tree planting there are some key factors that need to be considered to realize the returns of their investment. This includes tree species type, location of planting, farm management and duration of harvest of final product and other co-benefits.

#### ***Tree species type***

Type of tree species to be planted should take into considerations the end-need (direct benefits), availability of seeds/seedlings and environmental concerns. The above dictates the species choice at the very beginning of planning for tree planting.

#### ***Tree planting location***

Where tree are to be planted dictates future management and performance. Land tenure is very crucial in most parts of the country and has different arrangements and considerations. Sometimes in other areas tree tenure does not equal land tenure whereas in the other places planting trees in a piece of

land indicates declaration for land ownership. In order to avoid future conflicts arising from tree planting, care should be taken to ensure trees are planted in a secure land to ensure maximum protection, as this is a very long term investment. Furthermore, planting trees in open access/general land/no man's land/ has been a cause of failure in most of tree planting exercises due to poor management.

### ***Tree tending and other silvicultural treatments***

Like many other plants, trees require care before and after planting in the field. The first phase of field establishment normally between zero and two years is crucial for survival and early growth. An important thing during this phase is to ensure minimal competition from other plants especially weeds and partial shade to reduce excessive evapo-transpiration. Normally, beating-up (re-planting of seedlings in place of the dead ones) is done in year one and two. This ensures the planting target is reached.

### ***Duration of harvest***

Tree has a wide range of period where farmer can reap the benefits. Conventional benefits like fuelwood, withies, building poles and timber depends on the species itself and farmer's needs, and are normally realized at a longer time. Other benefits such as soil fertility and environmental amelioration usually are realized shortly after a few years.

## **2.2 Group work and plenary sessions**

Discussions on issues related to the role of trees in the management of watersheds were held. Participants deliberated in groups (four in total) and then presented their observations for wider discussions in the plenary. Two separate issues were discussed, one on the tree component and the other one on water. The detailed discussions are presented in sections 2.2.1 and 2.2.2;



**Plate 1:** Participants conducting group deliberations during the workshop in Kinole November 2010

### **2.2.1 Plenary session on trees**

The aim of this session was to let the participants review together the role of tree in their individual use and also to the community as whole as the guardian of ecosystem services. It further tried to barriers in

tree planting and possible solutions that can help sensitize more people on tree planting and retentions in their farms. The guiding questions for discussions and resulted deliberations are summarized below;

**i. Do you think trees have any significant role and value to you?**

Trees have value and are important both to man and the environment. Some of the benefits of trees include;

- ✓ Provide environmental amelioration including attraction to rainfall, reduce exposure to sunlight
- ✓ Provide timber, fuelwood, fruits
- ✓ Soil conservation including fertility enhancement, soil erosion control,
- ✓ Protection of watersheds
- ✓ Provision of herbal medicine
- ✓ Biodiversity conservation
- ✓ Wild animals habitat
- ✓ Recreational use

**ii. What type of tree species commonly found in agricultural landscape in Kinole sub-catchment and their uses?**

Common name_Swahili	Scientific species	Uses
Mwembe	<i>Mangifera indica</i>	Fruits, shade, fuelwood
Mchungwa	<i>Citrus sinensis</i>	Fruits, fuelwood
Mkangazi	<i>Khaya anthotheca</i>	Timber, fuelwood, soil conservation
Mkuyu	<i>Ficus stuhlmannii</i>	Watershed conservation, fuelwood, medicine, fruits for animals/birds
Mkenge	<i>Albizia gummifera</i> and <i>Albizia petersiana</i>	Fuelwood, timber, handles for knives
Mkumbulu	<i>Pachystela</i> sp	Fruits, fuelwood
Mvule	<i>Milicia excela</i>	Timber
Mwiza	<i>Bridelia micrantha</i>	Fuelwood, medicine
Mtomokwe	<i>Annona senegalensis</i>	Fruits, Fuelwood, ropes
Mfenesi	<i>Artocarpus heterophyllus</i>	Timber, fuelwood, fruits
Mzambarau	<i>Syzygium cumini</i>	Fruits, timber, fuelwood
Mnazi	<i>Cocos nucifera</i>	Fruits, fuelwood, building material
Mtunu	<i>Harungana madagascariensis</i>	Firewood, medicinal
Mfuru	<i>Vitex</i> sp.	Fuelwood, timber, medicine
Mkarafuu	<i>Syzygium aromaticum</i>	Spice,
Mdalasini	Cinnamon	Spices, fuelwood
Mguji	<i>Brachystegia spiciformis</i>	Timber

**iii. What are the constraints in tree planting exercises in Kinole sub-catchment?**

- ✓ Low aspirations for tree planting due to inadequate knowledge of its importance
- ✓ Low awareness
- ✓ Failure by the extension staff and technocrats to reach farmers frequently
- ✓ Inadequate facilitation
- ✓ Wildfire
- ✓ Diseases and pests
- ✓ Availability of planting material and other farming implements

- ✓ Land tenure
- ✓ Absence of nearby Farmer Field Schools

**iv. What are the solutions for these constraints?**

- ✓ Increase awareness to farmers/community
- ✓ Provision of planting material where necessary
- ✓ Provision of assistance in case of tending costs
- ✓ Study tour and visits in order to learn from fellow farmers
- ✓ Frequent meetings among farmers
- ✓ Enforcement of bylaws governing environmental conservation



**Plate 2:** Participants making follow up to one of the discussions during the workshop, at Tandai village

Presentation by each group was followed by Q&A session. The following important questions/comments were raised;

**Q 1:** How does a tree conserve water?

**Answer:**

- Trees conserve water in a sense that the local area maintains moisture and thus avoids drought.
- It helps to reinforce river banks and thus reduce soil erosion at river banks to enable maintain the depth of river
- It reduced the surface runoff and hence keeps the water in a given environment for a longer time

**Q 2:** Mtunu tree is said to be poisonous, how comes it be mentioned to cure diseases?

**Answer:** - It is used for curing fungal diseases especially in head

**Q 3:** What are the benefits that individual farmer gets from planting trees?

**Answer:**

- Individual benefits are those that someone gets them directly like timber, fuelwood, fruits, medicine etc, while the community can benefit as well due to environmental services such as soil conservation, watershed management etc
- There is a Swahili saying that '**voluntary exceeds slavery**' so whoever plant trees voluntarily does it better unlike those who are 'forced' either by material or financial promises.

**Q 4:** How have we benefited by tree planting under PRESA?

**Answer:**

- It depends on someone perspectives and objectives as this was voluntary engagement with some degrees of incentives but not total compensation.
- Under PRESA farmers have received various trainings on tree planting, watershed management, and ecosystem services at large
- Under PRESA farmers have received free seedlings something which have not happened for the last ten years despite various projects in the area
- Some farmers have benefited by auction experiment during the onset of the project and received cash incentives
- Currently the project has embarked on giving incentives on performance based where each farmer will receive 150 TZS for each surviving seedling/sapling after every six months per year
- Leaders of this farmers group have provided with study tour outside Tanzania and has led to more pro-active in conservation activities
- Farmer to farmer consultation has been very high and has enabled working as a group, the services which have attracted more people in tree planting

**Q 5:** How cutting trees cause destruction of watersheds?

**Answer:**

- Removes the soil cover and thus accelerate soil erosion
- If done along river banks, makes it weaker and prone to erosion
- Disturb natural filters in the wetlands

### **2.2.2 Plenary session on water and watershed services**

This session attempted to broaden debate among participants on the value of water and the importance of protecting watersheds in the Kinole sub-catchment. The guiding questions for discussions and resulted deliberations are summarized below;

#### ***i. Do you think water has value to you and why?***

Water has value both to individuals and to the society at large. Water gives life to all living organisms. Some of the direct benefits of water include;

- i. Domestic use e.g. cooking, drinking, washing
- ii. Agricultural use e.g. irrigation,
- iii. For animal consumption
- iv. Construction
- v. Hydro power generation

**ii. What are the sources of water in Kinole sub-catchment?**

The main sources existing in Kinole includes rivers/streams, wells and rain water. While rain water is seasonal and mainly used for cultivation of crops, rivers/streams and wells are permanent and serve purposes associated with domestic use and irrigation.

Mbezi is the main river passing through Kinole sub-catchment and is contributed by several streams. Major streams include Mbezi itself, Kivumaga, Mkungazi and Mzuazi. Other streams in Kinole includes Kwelekwe, Masalawe, River Mkalazi of Chohola, Sekulaka, Kisigisigi, Chamwidu, Lusasa, Luvundo, Kigogwe, Sanza, Kifuria, Rusasa, Maguluwe, Mazava, Kisaranganga and Mzuazi.

**iii. Are there any activities that cause destruction of watersheds in Kinole sub-catchment? What measures have been taken so far to revert this?**

- Deforestation
- Wildfires
- Littering in rivers including faeces, sewerage
- Washing (of bodies, clothes, bicycles, motorcycles) in the rivers
- Illegal mining in rivers and wetlands
- Extraction of small stones from rivers i.e. operation small stone quarries in rivers/streams
- Illegal fishing using poisonous chemicals
- Poor agricultural practises like cultivation near river banks
- Animal grazing along river banks and in wetlands

**iv. What measures have been taken so far to tackle these problems?**

- Nothing has been done
- Previously, the Ward authority managed to get rid of littering in rivers through strong law enforcement nearly three years ago, but recently the situation has worsened

**v. What should be done differently to confront destruction of watershed services in Kinole sub-catchment?**

- More awareness need to be provided to the entire community
- Available by-laws should be used properly
- More collaboration needed between Village government and the Village Environmental Committees to ensure bylaws are strongly enforced
- Ward Environmental Committee should work with respective villages to ensure law enforcement is strengthened
- Installation of sign posts prohibiting illegal activities in watersheds

The presentation session was succeeded by Q&A session as follows;

**Q 1:** How illegal fishing is conducted in Kinole sub-catchment?

**Answer:**

- Through use of chemicals such as DIP

**Q 2:** How water is used in operating of machines

**Answer:**

- e.g. Hydro power generation

**Q 3:** Why did the strategy of preventing people from littering in the rivers failed?

**Answer:**

- 3 yrs ago this strategy worked out very nicely, however, in recent days the situation has worsened due to poor leadership in the villages
- Other measures that can be taken includes use of local militia who are to be paid on the basis of capturing the culprits
- Installation of posters and sign posts prohibiting illegal activities in rivers/streams

### **3.0 Recommendations**

Several suggestions were given by participants in order to strengthen ecosystem management in the Kinole sub-catchment under the project. These include;

- i. Establish sub-groups and select representatives for the farmers involved in PRESA project. This can smoothen transfer of information instead of using only overall group leaders who make it difficult to reach all 200 farmers involved in the project.
- ii. A need for frequent training on various agroforestry systems and practises and other poverty alleviating skills to enable smallholder farmers under the project access these vital information
- iii. A need to conduct study tour or study visit to enable eye opening to some few farmers in order to learn from fellow farmers i.e. 'seeing is believing'. Iringa and Mbeya regions were suggested for this case