

# Individual partner annual report: Tanzania

---

SUA Tanzania Annual Report 1999

## 1 Introduction

This report covers the period 1st January to October 31st 1999 for the research project called Charcoal Potential in Southern Africa (CHAPOSA) funded by European Commission and co-ordinated by the Stockholm Environmental Institute (SEI) according to contract No. IC18-CT98-0278. The partner African countries are Tanzania, Mozambique and Zambia and this report covers the Tanzanian part.

Implementation of the project in line with the set objectives was generally favourable although constraints were experienced in certain areas; more specifically in the acquisition of satellite imageries. The consequence is reflected in delayed implementation of some research activities and has necessitated change in the sequence of planned research strategies. Co-operation among the Tanzania Researchers who are based at Sokoine University of Agriculture (SUA) and the University of Dar es Salaam (UDSM) continued although there were few incidences of disruption due to researchers responsibilities as academic staff in the universities.

## 2 Researchers

The number of researchers remained four with responsibilities as follows:

R.E. Malimbwi (SUA)	Ecological aspects of charcoal production and country co-ordinator
S.B. Misana (UDSM)-	Ecological aspects of charcoal production
G.C. Monela (SUA)	Socio-economic aspects of charcoal production
G. Jambiya (UDSM)	Socio-economic aspects of charcoal consumption

The services of 10 research assistants were hired for the following activities:

- Socio-economic and ecological aspects of charcoal supply areas (3 assistants)
- Socio-economic aspects of charcoal consumption and marketing process (7 assistants)

This staffing situation was favourable.

## 3 Collection of literature.

Numerous literature related to charcoal were collected from SUA, UDSM, TATEDO and NEMC. Some of these literature were exchanged between partner countries and thus adding to the wealth of literature accumulation on charcoal potential.

## 4 Workshop, meetings and visits

Apart from the project initiation meeting held in Lusaka on 27th – 29th July 1999 two local meetings and one major excursion were conducted as indicated in the table below:

Date	Venue / place	Participants	Major deliberation / Activities
12 <sup>th</sup> – 13 <sup>th</sup> Feb 1999	Dar es salaam	Malimbwi, Misana, Monela & Jambiya	<ul style="list-style-type: none"> <li>Allocated indicators to researchers</li> <li>Selected the study area</li> <li>Agreed to purchase 2 Computers and follow up imagery acquisition</li> </ul>
16 <sup>th</sup> – 17 <sup>th</sup> June 1999	Morogoro	Malimbwi, Monela, Jambiya & Zahabu (Research asst)	<ul style="list-style-type: none"> <li>Noted little progress due to difficulties in acquiring satellite imagery</li> <li>Decided to proceed with ecological and social economic studies without satellite imageries.</li> <li>Agreed to intensify search for imageries.</li> <li>Prepared a working plan for the rest of the year and agreed to set end of July to be the dead line for questionnaire preparation.</li> </ul>
31 <sup>st</sup> July – 1 <sup>st</sup> June	Excursion to Ruvu fuelwood forest project and surrounding villages in Kibaha and Bagamoyo districts	Malimbwi, Misana, Monela, Jambiya & Zahabu (Research asst)	<ul style="list-style-type: none"> <li>Selected key villages with charcoal production namely, Msangani, Kerege, Zinga, Kongowe, Buma &amp; Yombo.</li> <li>Charcoal Producer questionnaire and village checklist were pre-tested.</li> </ul>
	Night session at Bagamoyo	Malimbwi, Misana, Monela, Jambiya & Zahabu (Research asst)	<ul style="list-style-type: none"> <li>Revised the questionnaire in light of pre-testing results</li> <li>Discussed and approved MSc. Research proposal on charcoal dynamics in Kitulangalo by MSc. Student / Research asst. E. Zahabu.</li> </ul>
	Visit charcoal producing villages along Chalinze-Segera highway.	Malimbwi, Misana, Monela, Jambiya & Zahabu (Research asst)	<ul style="list-style-type: none"> <li>Two villages were selected namely, Mbwewe and Kwang'wandu.</li> </ul>
	Visit Kitulangalo area along Morogoro Dar es Salaam highway	Malimbwi, Misana, Monela, Jambiya & Zahabu (Research asst)	<ul style="list-style-type: none"> <li>Selected two villages Gwata and Maseyu.</li> </ul>

## 5 Implementation of work plan

### 5.1 Socio-economic survey in charcoal production sites

The charcoal production questionnaire was administered to a total of 113 charcoal makers in the site as shown below:

Site	Number of villages	Number of respondents
Bana	6	60
Mbwewe	2	28
Kitulangalo	2	25
Total	10	113

In addition checklist was administered to village leadership for each village. This survey is considered complete and the data is in final stage of analysis.

### 5.2 Socio-economic survey on charcoal consumption areas (Dar es Salaam)

Five different questionnaire were prepared addressing

- (i) Charcoal consumers
  - (1) small scale consumers (households)
  - (2) large scale consumers (Institutions, restaurants etc)
- (ii) Marketing channel which include:
  - (3) charcoal transportation
  - (4) wholesaler merchants &
  - (5) retailers

Questionnaires for each of these categories were prepared, pre-tested and revised and their administering is currently in progress. Administration of the household questionnaire has just been completed, and data processing and analysis is expected to start soon.

### **5.3 Species and tree sizes preference and kiln efficiency determination.**

Data on tree species, sizes (dbh & height) and volume of billets making up a kiln have been collected for 9 earth kilns in Mbweve (7) and Dakawa (2). Measurements of weight of charcoal from each kiln have been made. Analysis of the data to determine tree species and size preference for charcoal making and kiln efficiency is in progress.

### **5.4 Woodland growth rate determination**

An inventory has been carried out in 500 ha of SUA Training Forest at Kitulangalo. The result of this inventory has been compared to earlier inventory results of 1996 to determine growth and change in species composition. Average stand growth rate of 2.3 m<sup>3</sup>ha<sup>-1</sup>year<sup>-1</sup> has been recorded for the re-growth miombo woodland.

### **5.5 Study of tree species composition and abundance in forest reserve versus public lands.**

Data has been collected in Kitulangalo area in both forest reserve and adjacent public land where charcoal production is in progress. These data are designed to study how tree abundance and composition are influenced by proximity to transport means. Analysis is in progress.

### **5.6 Study on Licensing System**

Charcoal licensing system has been studied in Morogoro and Ruvu Forest Project to determine current rules and regulations governing charcoal extraction together with taxation system and their efficiencies.

### **5.7 Interpretation of Satellite Imageries.**

There have been delays in the interpretation of satellite imageries because of difficulties experienced in the acquisition of the imageries. However, we have been able to obtain the 1995 imagery from the Institute of Resource Assessment (IRA) at UDSM and their interpretation is in progress.

## **6 Publications**

No publications have been produced in refereed journals since most of the work is still preliminary. It is expected that a number of publications will be made following completion of data collection and analysis.

## **7 Problems encountered and corrective measures taken**

### **7.1 Socio-economic survey in charcoal production sites**

During the reconnaissance survey in July, the period when we also pre-tested our charcoal producers' questionnaire, some villagers along Segera-Chalinze road were uncooperative because their charcoal had just been confiscated by forest officers. In the weeks that followed this event the exercise of actual questionnaire implementation became even more difficult. The Forest and Beekeeping Division (FDB), had sent a platoon of anti-poaching squad to the area to stop all illegal harvesting including timber and charcoal which were rampant at the time. A newly established village (Tabu-tupu) where charcoal makers were using power saws for large scale charcoal production was demolished and their houses pulled down. This situation appeared to contradict the on going implementation of the Tanzania Forest Policy which advocates empowerment of local communities to manage forest resources. But it is also a clear testimony that implementation of the policy is difficult in some areas. The use of force is sometimes necessary when peaceful negotiations become ineffective.

Fortunately some charcoal makers had legal permission and these enabled the survey to continue.

### **7.2 Kiln efficiency study**

This study faced similar problem as above as it was originally planned to be carried out at Tabu-tupu charcoal village. Another problem associated with this study was timing of charcoal making operations. The study requires determination of man-days used in tree felling, cross cutting, kiln loading, covering with earth, carbonisation and unloading charcoal. Complications arose when kiln operators did not turn up for the expected operations. The consequence is reflected in delayed data collection in addition to field assistants having to travel and walk long distances for nothing.

### **7.3 Satellite imagery acquisition**

This has been the most limiting activity. Our initial plan was to use satellite imagery to identify and locate sites with active charcoal production where we would carry out both ecological and socio-economic surveys.

Several requests were made to Satellite Application Centre in South Africa (the only source in Africa) but were not successful. The response was that there were no suitable imageries (cloud free) for our study area for the years of our interest.

Fortunately request from National Aerospace Laboratory in the Netherlands seem promising. However our study area can not be covered by only one scene. We are in final stages of choosing two sets of quarter scenes of green, red and infra-red bands for the years 1991 and 1998. Meanwhile, as already reported, visual interpretation of the 1995 imagery is in progress and some activities had to continue without the intended imageries. The acquisition of the 1991 and 1998

imagery however is still crucial to detect vegetation change due to charcoal making in the study area.

## **8 Future Research Activities**

### **8.1 Socio-economic survey on charcoal consumption**

The on going data collection of socio-economic aspects on demand side covers the dry season period (October to mid November). During this time, the frequency and amount of hot meals may be small as some household members may be at work or at school. In the month of December most people take holidays to join their families either in the city or up-country. It will be interesting to observe the demand trend this time and also during the wet season of March to May 2000.

### **8.2 Seasonal effect on charcoal production**

Some charcoal makers claim that it is easier to make charcoal during the rain season because the soil blocks used to cover the kilns are more coherent than during the dry season although carbonisation takes longer. Further more charcoal sources become less accessible. During the year 2000 charcoal production during the rain season will be studied.

Also only one type of kiln (the rocket earth kiln) has been studied so far. At Ruvu, box kilns are also used. Species, size preference and efficiency of kilns will be studied in Ruvu area during the year 2000.

### **8.3 Study of tree species composition and abundance in harvested areas versus charcoal potential areas.**

Some areas have been selected in Mbweve area for studying vegetation characteristics where harvesting has taken place and where no disturbance has been done (charcoal potential area).

### **8.4 Use of satellite imagery to detect vegetation change.**

Using data obtained under 5.5 and 10.3 together with other ground truthing sample plots satellite imagery of 1991 and 1998 will be used to map degraded areas versus intact areas and possibly establish rate of deforestation due to charcoal production.

## **9 Conclusion**

The project has made relatively good progress in light of encountered problems in the working environment. More efforts are still needed to bring greater achievements for the project objectives. Increased adherence to work plan, commitment and exchange of information are crucial to avert impending bottlenecks

## **10 Acknowledgement**

The Tanzanian researchers, on behalf of SUA and UDSM wish to acknowledge European Commission for funding the project, and the Stockholm Environment Institute for the excellent co-ordination. The Director of Forestry and Beekeeping, Prof S. Iddi was briefed about CHAPOSA and has expressed much interest in the project, and is eager to be informed about the findings. We thank him for his encouragement and facilitating the study site. We also wish to thank our counter parts in Zambia and Mozambique for their encouragement, especially when we were being frustrated with the satellite imageries issue.