

**TECHNICAL EXCHANGE PROGRAMME, JICA  
VISIT REPORTS**

**§  
BOTWANA  
SWAZILAND  
SOUTH AFRICA**

**By**

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and  
Lubanga Makanji**

**SOCIAL FORESTRY TRAINING PROJECT  
MUGUGA  
April 1996**

## INTRODUCTION

The fact finding trip to the East and southern African countries came as a necessity for planning and implementation of the course for the ~~course on~~ promotion of social forestry in Africa.

The objectives of the visit were:

To familiarise with social/agroforestry activities especially on research, their promotion, policy framework for development.

To access the human resources development strategies and the possibilities of collaboration for promotion and development of social forestry between the countries/institutions in question and Kenya.

The funds for the trip and the course were provided by the Japan international cooperation agency (JICA) under the technical exchange programme.

The visit to the Southern African countries of Botswana, South Africa and Swaziland was undertaken by two training officers namely, Mr. Lubanga Makanji and Mr. Akula Mwamburi. This was of course enabled in so many ways by Mr. T. Shima, a Japanese expert and the SFTP training leader together with other JICA experts in the programme and the agency's Kenyan HQ.

The itinerary for the visit ran as bellow:

Botswana	20-11-96 to 23-11-96	3 days
South Africa	23-11-96 to 29-11-96	7 days
Swaziland	29-11-96 to 2-12-96	3 days

Time was considerably short due to the distances that had to be covered both in air and on the ground. This became an even more serious constraints since the visiting team wanted to obtain information from as bellow (grassroots) as possible. However the team, with of course the assistance of their hosts in the respective countries managed as much as possible to learn much about the forestry/social forestry activities from the trip.

Most times the methodology of collecting the information hereunder involved free interaction with officers in the various ministries/departments. Except in one country, farm and/or field visits adequately cleared any misunderstanding. Where possible printed materials were collected with of course photographic (print/slide) backing some of which are attached in appendix 1.

Perhaps it's important to note that though the objectives of the visit was basically on information collection, the healthy technical/cultural exchange that occurred during the trip opened the eyes for both the visitors and the hosts to the multiple areas of possible cooperation between the East and Southern African countries especially on social forestry development.

# **BOTSWANA**

## **INTRODUCTION**

A landlocked country of 582,000 square Kilometres at an altitude of 900 -1100 m above sea level. Annual rainfall stands at 200 -750 mm and temperatures of between 10-40 degrees centigrade. The population stands at 1.13 m with annual increment of 3.5 % (1991 census). The mining sector accounts for 90% of the exports and 45% of the GDP. Meat and meat products accounting for 4.3% of the exports. A small proportion of the land is classified as freehold (6%) with 23% being game reserves and the rest tribal lands.

## **FORESTRY AND FORESTS**

The western part of the country is covered with dry savanna type vegetation. Valuable forests are found in the north where deciduous forests cover about 6% of Botswana. Plantations cover 985 ha of which about 71.1% is government owned, 26% NGO owned and 2% privately owned. Forestry economic output is estimated to be \$ 42.14 million including fruits, nuts, roots and wild vegetables. Wood is still the main source of energy for 80% of the population hence creating a major deforestation threat.

## **POLICY**

The forest policy formulated in 1968 is too general and lacks interrelationship to other natural resource utilization sectors. It points to the establishment of forest reserves only and does not give clear guidelines on the allocation of the necessary resources including research guidelines. This policy needs a drastic change to reflect the present and the future national goals particularly addressing community forestry and the conflict between forestry administration, the position of tribal lands act and the role of communities. Institutional strengthening to reflect the national and ever growing demands for social forestry products should also be addressed.

## **SOCIAL/COMMUNITY FORESTRY**

The social forestry sector is presently not so well developed both in physical and human resources element. Government nurseries have been on seedling production but the demand is still to be satisfied.

There seems to be an overreliance on brigades which were established to absorb the primary school manpower in training in carpentry etc, to foster community forestry. Though this has worked in some areas. NGOs eg the Forestry Association of Botswana (FAB) are also relied upon for promotion of social forestry.

## **TRAINING AND HUMAN RESOURCES**

Less than 300 people are formally employed in the forestry sector. Government and NGOs have depended on volunteer and expatriate manpower which mostly have had 2 year contract thus being disruptive to extension services management. Training for the local staff has been acquired in other countries sometimes not relating to the countries social forestry/ extension needs and situations.

## **RECOMMENDATIONS**

### **Institutional**

Optimizing and diversifying sustainable use of forest resources through equal distribution of institutional resources at all levels.

### **Research**

Making provisions for undertaking research necessary for promotion of social forestry development. This could be done collaboratively with other national and regional levels.



**Inter-institutional/ agency collaboration**

Provide for and enhance an inter agency collaboration and networkings a strategies towards harmonization of landuse practices/strategies for management of natural resources.

**Local knowledge**

Provision for collection, documentation and practical usage of local knowledge by the communities for enhancement of social forestry.

**Human resources development**

Provide for institutional requirements towards in-service training of the present staff establishment, towards necessary knowledge skills and attitude for social forestry development. This could also be effectively done collaboratively with other regional institutions/agencies/programs already in the social forestry field.

## **SWAZILAND**

A landlocked country of 17000 Km<sup>2</sup> and a population of about 850 000, Swaziland is divided into four distinct geographical and climatic regions. These are highveld, midveld, lowveld and the Lubombo. Altitude ranges from 600-1300 metres above sea level. and rainfall from 500-2300 mm with temperatures of -2 to 37 degrees centigrade.

### **FORESTRY AND FORESTS**

Swaziland has a well developed forestry industry with over 100,000 ha of privately owned exotic plantation forests mainly of Pinus. Pulp production is about 180,000 tonnes per year marketed in South Africa, Korea, Thailand and Indonesia. The forestry sector accounts for 18-22 % (\$683 million ) of the GNP and 16-18 % of the formal sector employment. Majority of the rural dwellers rely on wood as a source of energy for cooking, heating and construction. Forests make 8% of the total land area.

### **SOCIAL FORESTRY**

Though Swaziland boasts of the largest percentage of manmade forests in Africa, the contribution of these forests to the provision of basic forest products to rural people is minimal. Most of the time produce from the forest is export oriented and legislation prohibits harvesting of even the waste. This prompted the Swazi government to establish a Forestry Section in the public sector within the Ministry of Agriculture and Cooperatives. The aim of this was to provide extension services to arrest progressive degradation of the land caused by deforestation. This was to be done through promotional campaigns eg the National tree planting days and staff training. The governments' attempt are however still hampered by lack of human resources (trained personnel) in the field of natural (participatory) human resources management field.

## **TRAINING**

There is no formal institution on intensive training in social forestry. However efforts to start such a programme are underway. A closer look at the training needs points out severe deficiencies in dissemination packages not only for Social forestry but also other integrated land use systems/practices as a whole.

## **POLICY**

The present Forest policy in Swaziland seems to be geared towards plantation forestry and is defined as per production and export and community incomes. Policies and legislation to implement Social forestry seem to be presently lacking.

## **RECOMMENDATIONS.**

- Community participation in project planning should be promoted.
- Institutional strengthening at all levels i.e. grassroots to policy level is required.
- Skills development for Social forestry extension and promotion needs to be done .
- Research on adaptability and suitability of Social Forestry practices should be carried as a way of finding out what practices the local people carry out..

# **SOUTH AFRICA**

## **INTRODUCTION**

South Africa covers an area of 1221000 km<sup>2</sup> and is divided into nine provinces namely Western Cape, Eastern Cape, Northern Cape, Free State, Kwazulu - Natal, North West, Gauteng, Mpumalanga and Northern province. A country occupying the southern tip of Africa, narrow coastal plains rise to the plateaus in the interior with the Drakensburg Mountains in the East reaching 3299m (10822 ft). The North is mainly desert. The Limpopo, Molopo and Orange Rivers mark the N. boundary. The Vaal, a tributary of the Orange is another important river. The majority of inhabitants are Africans (71%). Although South Africa is highly industrialized, agriculture is still important, with cereals, fruit growing, and cotton, as well as livestock being the main produce. Fishing is a valuable source of income and whaling continues although efforts at conservation have reduced its scale. Rich and varied mineral resources include gold, diamonds, chrome, platinum, uranium, coal, manganese, phosphates and iron. Hydroelectricity is an available source of power. Well-developed industry includes metals, machinery, chemicals, food processing and textiles.

Main exports include metals (especially gold), citrus fruits, sugar, wines and textiles. The land area of South Africa of 1,221,000 km<sup>2</sup> is inhabited by about 39.7 million people who enjoy a GNP of US\$2980 well above many African countries e.g. Kenya \$270 and Uganda \$ 90. South Africa's parks constitute 6% of the total land area and give a GNP/parks of \$170,716.

## **FORESTRY AND FORESTS**

The area under forests is 45,000 sq. km which is just about 4% of the total land area. The forests are mainly in Western Cape, Eastern Cape, Kwazulu - Natal, and Mpumalanga provinces.



## **FORESTRY ACTIVITIES**

Forestry activities in South Africa can be broadly categorized as "public and private." The Public forestry activities are carried out on farm and these are not well developed.

Private activities constitute plantation forestry and these are well developed. The main player in this sector is the South African Paper and Pulp Industry (SAPPI).

## **FORESTRY POLICY**

Forestry policy in South Africa is still under review as the country is less than two years into majority rule. However the old policy was on plantation establishment for local consumption and export . The land tenure system is one issue of critical importance in coming up with a policy that will address the needs of almost 87 % of the population who do not own land but now have to be accommodated and involved in forestry activities.

## **SOCIAL FORESTRY/COMMUNITY FORESTRY**

This is an area that is less exploited in this country. However there exist programmes being pioneered by the Independent Development Trust, a National NGO to involve the rural communities in tree planting especially for Agroforestry. The Forestry department is also involved in promotion of community forestry though to a small extent. Currently however many homes have some trees in the homestead for aesthetics and shade.

## **TRAINING**

There is little if any training in Social Forestry. However plans are underway for training in social forestry in the near future. These activities will be carried out by the Intermediate Technology Group,an NGO.

## **CONSTRAINTS TO SOCIAL FORESTRY/AGROFORESTRY DEVELOPMENT**

First and foremost, land tenure problem is a constraint to Social forestry development. Most of the land (87%) is owned by non-black farmers. The 13% owned by black communities is communal land. Therefore it is difficult for the farmers to make decisions on tree planting.

Secondly, the former ruling regime trained many foresters for engagement on plantation forestry. Therefore, the extension services in forestry are heavily understaffed with some of the extension officers already in place manning very large areas and in some cases only issuing licences for forestry activities.

## **FUTURE/PROPOSED ACTIVITIES**

Under the Rural Development Programme, there will be expansion of extension services. Training (on job/in service) will be provided in order to enhance the skills of extension officers. There is also a willingness to collaborate with other countries e.g. through SADC and also with other African countries. Already, many countries in SADC send their officers for higher education in forestry to South Africa.

## **RECOMMENDATIONS**

There should be close working relations between countries in the eastern region of Africa and the extension arm of the Forestry department in South Africa. This could take the form of visits and training particularly in South Africa. KEFRI is in a position to provide experts in extension and Social forestry.

## RESOURCE PERSONS

We would like to thank the following people whose time and understanding not only contributed to information presented above but also went to great lengths to ensure our stay was comfortable for the days we were in their country.

Country	Name	Organisation
<b>Botswana</b>	Mr G. Alidi	Chief, Forestry section
	Ms Patricia Walker	Forestry Association of Botswana (FAB)
	Dr. D. Munthali	Botswana College of Agriculture
	Ms. K. K. Mogotsi	Centre for Inservice and Continued Education
<b>South Africa</b>	Ms. Fiona Archer	Independent development trust (IDT)
	Mr. Pierre Cumbrick	Department of Water affairs and Forestry (DWAF)
	Mr. Tim Fenn	Independent development Trust (IDT)
	Mr. Solly Manyaka	Independent Development Trust (IDT)
<b>Swaziland</b>	Ms Elizabeth K. Angura	Chief Forestry section, Ministry of Agric & cooperatives
	Mr. Clifford Dlamini	Forester, Forestry section.





Photo I

Utilisation of relatively degraded area as pasture, using the prickly pear (Mexico) for fodder and fruits in South Africa. Notice the border planting on the left. The farmer says productivity per acre is more viable with this practise compared to pure grazing



Photo II

War zone! When this *Acacia saligna* was introduced in South Africa, sheep farmers immediately recognised its fodder potential in grazing land. The transport department however feels the tree has become a weed and is clogging avenues. A fungus (Rust fungus) introduced to control its spread (the stone like outgrowth in the centre) is threatening to wipe it and the farmers are not happy. Who will win ?





Photo V

The concept of social forestry can have slightly variations in meaning. At Abalimi Bezekhaya (planters of the home), social forestry practise includes vegetable gardening. Funded by the catholic church, the project runs 3-5 days beginners courses in home gardening and tree planting among other programmes.



Photo VI

The forestry association of Botswana (FAB)'s activities include promotion and education in community forestry. Their tree nursery in Gaborone offers an educational resource for the residents and staff.

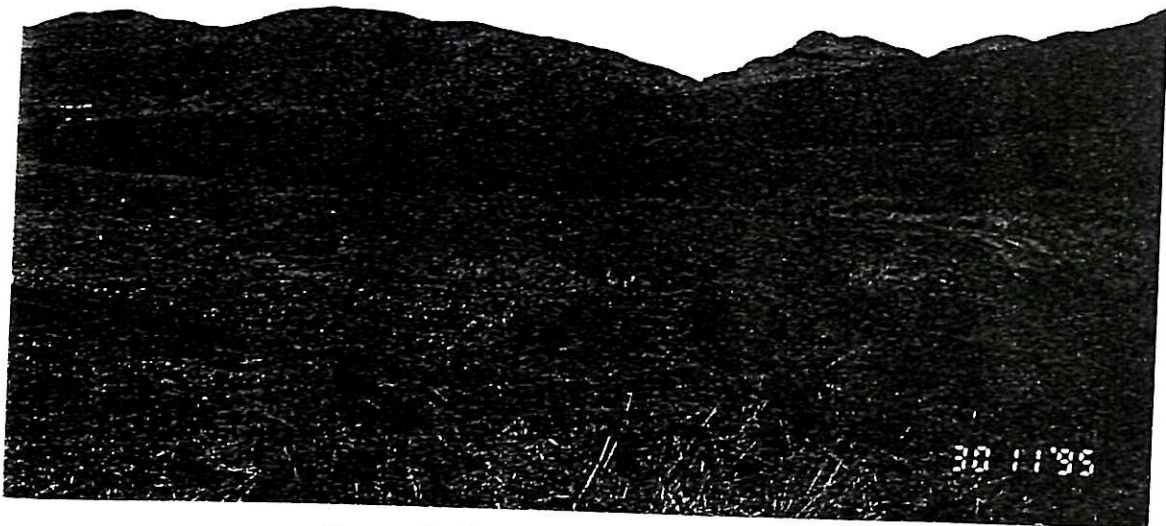


Photo VII

Community forestry in Swaziland. Eucalypts planted by the community for their own use. The harvesting is contracted to the private sector by the forestry dept. and the community is given the benefits. A panel of elders is responsible for liaison.

# **REPORT ON**

**TECHNICAL EXCHANGE TOUR TO TANZANIA**

**24TH - 27TH MARCH, 1996**

**KENYA/JAPAN**  
**SOCIAL FORESTRY TRAINING PROJECT (Phase II)**



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# 1. Introduction

Japan International Cooperation Agency (JICA) funds Forestry Research and Development Projects in both Kenya and Tanzania. In Kenya, Kitui Regional Social Forestry Project consisting of Pilot Forest Project and Training Programme has been in existence since 1986 while Kilimanjaro Village Forestry Project was started in 1991. Although the projects differ in funding and operation scales, they have similar objectives of developing appropriate dry lands afforestation techniques and disseminating results arising thereon to farmers and communities living in dry zones. Because of this common objective JICA has facilitated technical exchange tours where experts and staff of the two projects share experience and expertise relating to their tasks.

In early 1994 and 1996, the Tanzania project staff visited Kitui Regional Social Forestry Project and were conducted through the activities of both pilot forest and training programmes. According to the discussions held it was evident that the Tanzanian team had something to learn from the Kenyan project in Kitui. To reciprocate the good learning atmosphere offered by the Kenyan team and activities, Kitui project staff and counterparts were invited to Tanzania for knowledge enrichment.

A heterogeneous team drawn from training and pilot forest projects visited Tanzania's project between March 24th and 27th 1996. Team members felt that the visit was worthwhile and should be continued as evident from this report which reveals opportunities in technical collaboration towards the improvement of dryland afforestation and community involvement in afforestation interventions.

## 2. Tour Members

The Project officers and their counterparts-The Japanese experts of Kenya/Japan social forestry training phase II.

These were ;

- |    |              |   |                           |
|----|--------------|---|---------------------------|
| 1. | G.M.Muturi   | - | Pilot Manager.            |
| 2. | Mwawughanga  | - | Training Manager.         |
| 3. | O.Chahihu    | - | Silviculture counterpart. |
| 4. | R.O.Nyambati | - | Extension counterpart.    |
| 5. | T.Sairiji    | - | Team leader.              |
| 6. | Y.Iwata      | - | Silviculture expert.      |

### TOUR SCHEDULE

SUN	24 <sup>TH</sup>	Mar.	Move from Nairobi to Moshi.	Moshi
Mon	25 <sup>th</sup>	Mar.	Visit Tanzania/Japan Kilimanjaro village forestry Project office.	Same
Tue	26 <sup>th</sup>	Mar.	Regional Forest Office . Forest reserve. FAO/JAPAN Forestry for Rural Energy Hai.-Office and planting area.	Arusha
Wed	27 <sup>th</sup>	Mar.	Move from Arusha to Kitui.	

### PEOPLES MET

NO	NAME	DESIGNATION	OFFICE
1	Akira Sato	Project Team leader	Project Office
2	Takuya Homma	Silviculture	"
3	Naoto Noda	Nursery	"
4	Shinji Ogawa	Extension	"
5	Akimori Yasue	Co-ordinator	"
6	Babu G.T.Matunda	Project Manager	"
7	Leonard Chegere	Head Nursery	"
8	Joseph M.Butuyuyu	Head Silviculture	"
9	M.E. Makupa	Asst.Head Extension	"
10	Mtama S.Bahali	Asst. AFO	"
11	Daniel Issara	Regional Forestry Office Kilimanjaro	Regional Forest
12	Joseph Kindami	AFOT-Kilimanjaro	"
13	Cellina Mongo	Extension	Forestry for rural Energy Hai
14	Felician Mtoga	Plantation	"

### 3. Kilimanjaro Village Forestry Project

#### INTRODUCTION

The Kilimanjaro village forestry project Mkonga is located a short distance to the S.W. of SAME township. It lies on the foot of pare mts. at Mkonga site.

The climate is generally hot dry and windy. The rainfall is bimodal, erratic and with an average of about 200mm per annum. The altitude is 835m a.s.l and flat. The soils are of sandy loam in nature and dominated by thorny acacia spp. (*Acacia mellifera*) mainly and with scattered commiphora spp. The inhabitants are mainly pastorist masais.

#### TECHNICAL OBSERVATIONS ON PROJECT SILVICUTURAL ACTIVITIES

The project is mandated to operate on an area of 500ha. and practising various silvicultural approaches with an aim of achieving a reasonable survival of the various tree species being tried. Since 1981 when the project was incepted. Some of the silvicultural approaches observed include.

(a) Boundary tree planting

Conventional methods of bush clearing and pitting is employed no elaborate water harvesting techniques and intensive land preparation methods has been practised. Trees are planted in two rows at a spacing of 2 x 3m although flood watering is practiced intensively the trees appear not making much use of the water may be due to problems with infiltration. The species planted include *Tamarindus indica*, *Azadirachta indica*, *Jacaranda acutifolia*.

(b) Windbreaking

Windbreaking trials have been practiced with the following species *Cedrela odorata*, *Grevillea robusta*, *Melia excelsa*, *Azadirachta indica*, *Cassia siamea*, *Croton megalocarpus*, *Tamarindus indica*, *Leucaena leucocephala*, *Acacia nilotica*, *Acacia tortilis*, *Albizia lebbeck*, *Peltophorum pterocarpum*, *Cassia spectabilis*, *Delonix regia* have been planted at various spacings (m) eg. 2 x 3, 3 x 3, 2x2, 2.5 x 2.5. Tractor flood watering is being practiced with no specific prescribed quantity per seedling in a given period.

Planting pits vary between 30x30 and 90x90 cm<sup>2</sup> although 45x45cm is commonly used. No elaborate water harvesting and retention structures have been constructed and thus could be a factor behind slow early establishment and overall performance. Also in an area with such critical rainfall, close spacing only increase underground root competition for moisture and nutrients at the expense of surface biomass build up.



(c) Roadside planting practice

This has been practised along the same to Hedaru highway on the east side of the road. A total of 11,983 trees at a spacing of 2x2m have been planted. Specific species planted include:

<i>Azadirachta indica</i>	- 4,304
<i>Cassia siamea</i>	- 132
<i>Cassia spectabilis</i>	- 512
<i>Melia azaderach</i>	- 1,689
<i>Tamarindus indica</i>	- 4,461
<i>Delonix regia</i>	- 650
<i>Jacaranda acutifolia</i>	- 255
Total	<u>≈11,983</u>

The land preparation method adopted was the conventional involving of bush clearing, pitting and planting small sized water harvesting structures have been constructed but need to be elaborated and fencing of the trees need to be done to guard against animals. Also planting on both sides of the road would appear more effective for various purposes e.g. beauty, wind breaking, shade e.t.c. here also flood watering appears not to be very useful, may be underground water feeding methods should be tried.

(d) Agroforestry intervention

Agroforestry has been practiced with the following species *Albizia lebbeck*, *Sesbania sesban*, interplanted with agricultural crops in rows e.g. sowgum, pigeon peas, etc. the land preparation included tractor ploughing and pitting. The spacing adopted in 1x5m, <sup>2x10m</sup> however other fruit trees viz. *Carica papaya*, *Eriobotrya japonica*, *Mangifera indica*, *Psidium guajava* and *Syzygium cuminii* have been planted at a spacing of 3x3m.

(e) Fuelwood plantations

A total of 21 fuelwood supply plots. Covering an area of about 16ha. has been established on tractor ploughed fields, spacings of 2.5 x 2.5, 2x2 and 3x3m are being tried. The major species here include: *Acacia nilotica*, *Casuarina equisetifolia*, *Leucaena leucocephala*, *Cassia siamea*, *Azadirachta indica*, *Cassia spectabilis*, *Parkinsonia aculeata*, *Acacia polyacantha* and *Albizia lebbeck*.

Observation reveals that *Azadirachta indica* if planted on an intensively worked land, with proper water harvesting structure backed with underground water feeding methods promises to be a potential of fuelwood species in this project.



(f) **Research plots**

A total of 11.28 hectares is on research trials to date, they include, spacing trials water requirements trials, hole size trials etc. The tree species being tested include: *Azadirachta indica*, *Cassia siamea*, *Cassia spectabilis*, *Melia azadirachta*, *Tamarindus indica*, *Delonix regia* and *Jacaranda acutifolia*. Land preparation of uniform tractor ploughing and manual hoe ploughing. Intermediate silvicultural treatments include clear weeding.

(g) **Protection aspects**

It was noted that the most outstanding danger to planted trees are domestic animals, termite and mildly wild animals. Metal and wire protective measures have been practiced on some plots however considering the cost involved I would recommend the use of locally available material e.g. packed dead fence of *Acacia mellifera* bushes and termite resistant pegs on isolated plantings (spot fencing).

Also the local inhabitants should be involved in the practical protective measures to make them understand the importance of protection to the trees.

(h) **Arboretum**

It was observed that the project is trying to update its arboretum of 3.42ha. to date a total of 36 species are under intensive preservation at a spacing of 3x3m. Pipe watering and splash watering are practiced, land preparation method is of tractor ploughing, it is my recommendation that contour water harvesting trenches be established to back up elaborate micro-catchments. Manure inoculation (top dressing) could also improve growth.

(i) **Management roads**

A total of 19.8km of road length has been constructed however improvements should be made to render the roads all weather by improving on:

- (i) Murraming
- (ii) Side drain improvement
- (iii) Correct slope
- (iv) Culverting and correct ditches.

**Survival observation**

General observation indicates reasonable survival rates however the growth performance is not worthy the effort put in to keep the seedling surviving. Therefore good survival should be supported by early establishment and a reasonable after field performance.

## 4. Kilimanjaro Airport plantation

### KILIMANJARO AIRPORT PLANTATION (HAI DISTRICT)

In 1987, a tripartite Forestry Project funded by the government of Japan and implemented by FAO and government of Tanzania was started in HAI District Tanzania to: i) promote social forestry and ii) rehabilitate areas adjacent to Kilimanjaro airport to reduce dust storms that interfered with visibility. The project had a three year phase. Project activities were implemented under nursery, plantation and extension section. The forestry approach started with species screening to determine desirable and adaptable tree species. One of the major consideration in species selection was non attractiveness to birds which the airport authority felt could be a hazard to aeroplanes. To date this project can be rated as successful under the following areas.

#### (a) Nursery

A central nursery adjacent to project offices has been established. Seedling production at this nursery is estimated at 120,000 seedlings per year. Through experience the project staff have considered a seedling culture duration of six months which produces seedlings that withstand prevailing environmental stresses such salinity and drought when out-planted. Main species found in this nursery were *Cassia siamea*, *Azadirachta indica*, *Carica papaya* and two *Acacia* species. Currently the nursery is buying water for seedling production as there is no water source at the site.

#### (b) Extension

The objective of this section was to promote tree planting by local Maasai community. The broad objective for community involvement was to encourage them have their own woodlot so that they can be self reliant in forest products and therefore avoid encroachment to plantation established by forest department. The extension arm has involved schools, women groups, NGO's and villagers. These parties were reached through seminars that were organized to sensitize people about importance of planting trees and their conservation. Since the Maasai women tend to shy off in presence of their male counterparts, the project promoted establishment of separate woodlot for men and women. From field observation it was evident that project has succeeded in promotion of village and community woodlot as well as planting of tree in the compounds. However, women woodlot were found to be poorer than men woodlot in terms of hectarage and management.

#### (c) Plantation

The existing plantations cover 1400 ha while 600 ha previously planted have failed. The sites for plantation establishment were ploughed by a tractor. After ploughing pits of 30 cm dimensions (depth and diameter) were dug and seedlings planted. After planting farmers were allowed to grow beans so that they could weed the trees as they tend their crop. Beans were chosen for



integration because of their nitrogen fixing ability since the soils were poor in nitrates. From field observation it was evident that trees that were integrated with bean production performed better than those grown in the absence of bean crop. Such performance could be attributed to absence of weed competition and water conservation through cultivation. Using this approach a survival of upto 60% has been achieved for seedlings planted up to 1990 in an area receiving an annual rainfall of 550 mm. *Cassia siamea* is the species that has widely been established in forest plantation. The choice of this species was based on its drought tolerance and that it does not harbor birds.

#### SUMMARY

Hai Forestry Project in Hai district of Tanzania seems to have achieved its objectives in promoting tree planting by Maasai pastoralists and rehabilitation of areas adjacent to Kilimanjaro international airport. Although project staff mentioned that funding was discontinued, the government of Tanzania has taken the management of what established through the tripartite arrangement i.e. by governments of Japan and Tanzania and FAO. Important lessons for social forestry project in Kitui include:-

- (a) Adoption of agroforestry activities in Tiva Project. Through such practices it is possible to reap some crop that can be perceived as a partial compensation for land preparation costs. If allowed to grow beans workers would be motivated as they would be looking forward to benefits other than their daily wages.
- (b) In current thinking about gender sensitization, it is important to see how different perceptions of tree growth and conservation among men and women can be tapped for better results.
- (c) Our project has already adopted complete weeding and intensive land preparation techniques which have started to bear positive results. Going by the Tanzanian experience at Hai we are definitely on the right track and regrets are not anticipated.

## 6. Conclusions.

Considering the rainfall of Kilimanjaro Village Forestry Project site where the trial plantation is being done, it proved that they have many difficulties in getting successful results in their trials. But serious efforts taken to overcome the difficulties impressed our tour members because their efforts are on the same line as we are trying here.

After consideration and careful observation to that project, we came up with additional intensified measures which can be very helpful and thus could improve their results successfully these are as follows:

1. Intensified water harvesting devices
2. Underground watering method

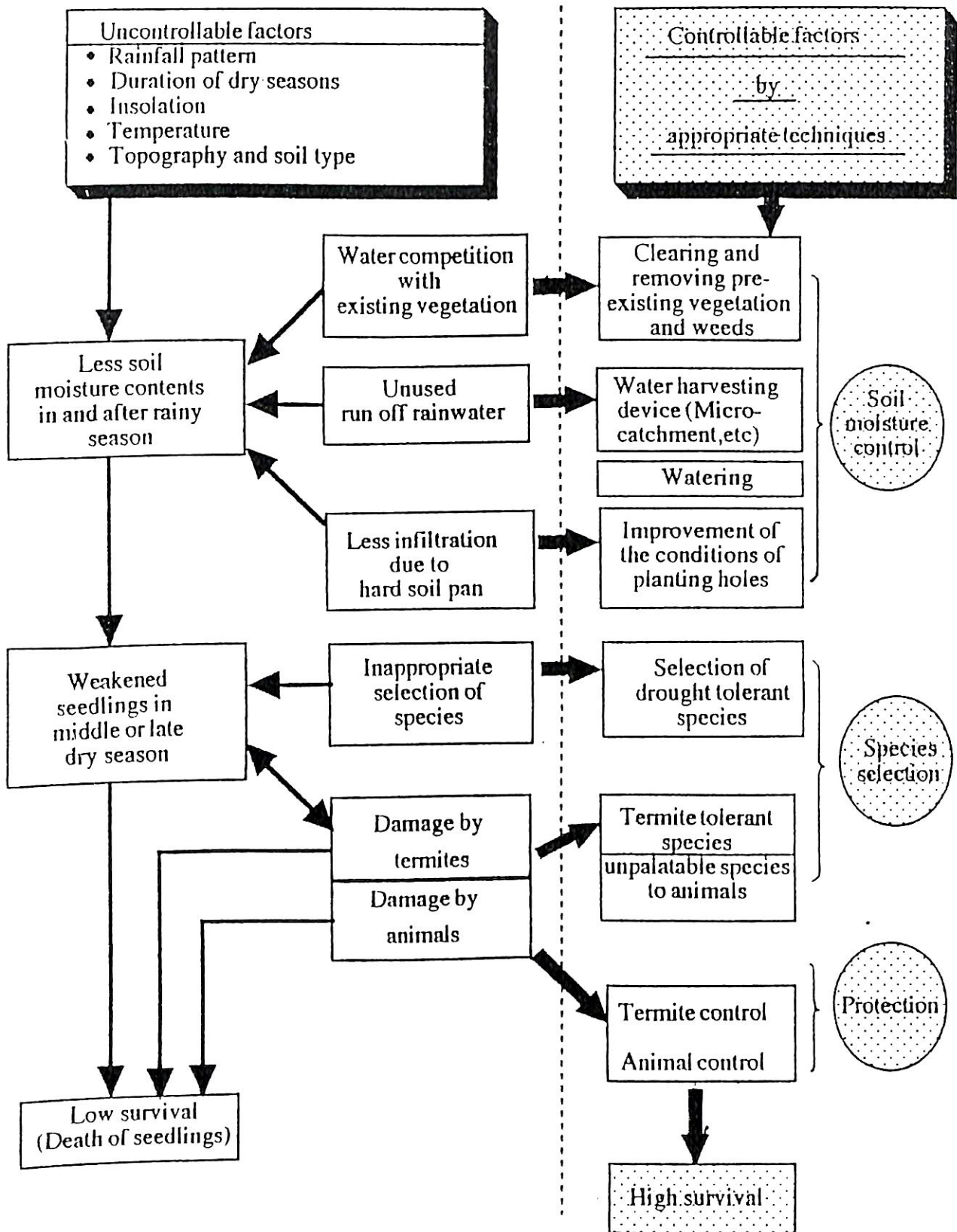
The overlap chart which shows the problems and counter measures taken is recommended to improve the results of planting trials in Kitui semi-arid area.

It is our hope that, some of these counter measures and putting them in practice, will help their project and make it a success in future.



<Problems>

<Counter measures>



environment, problems and countermeasures



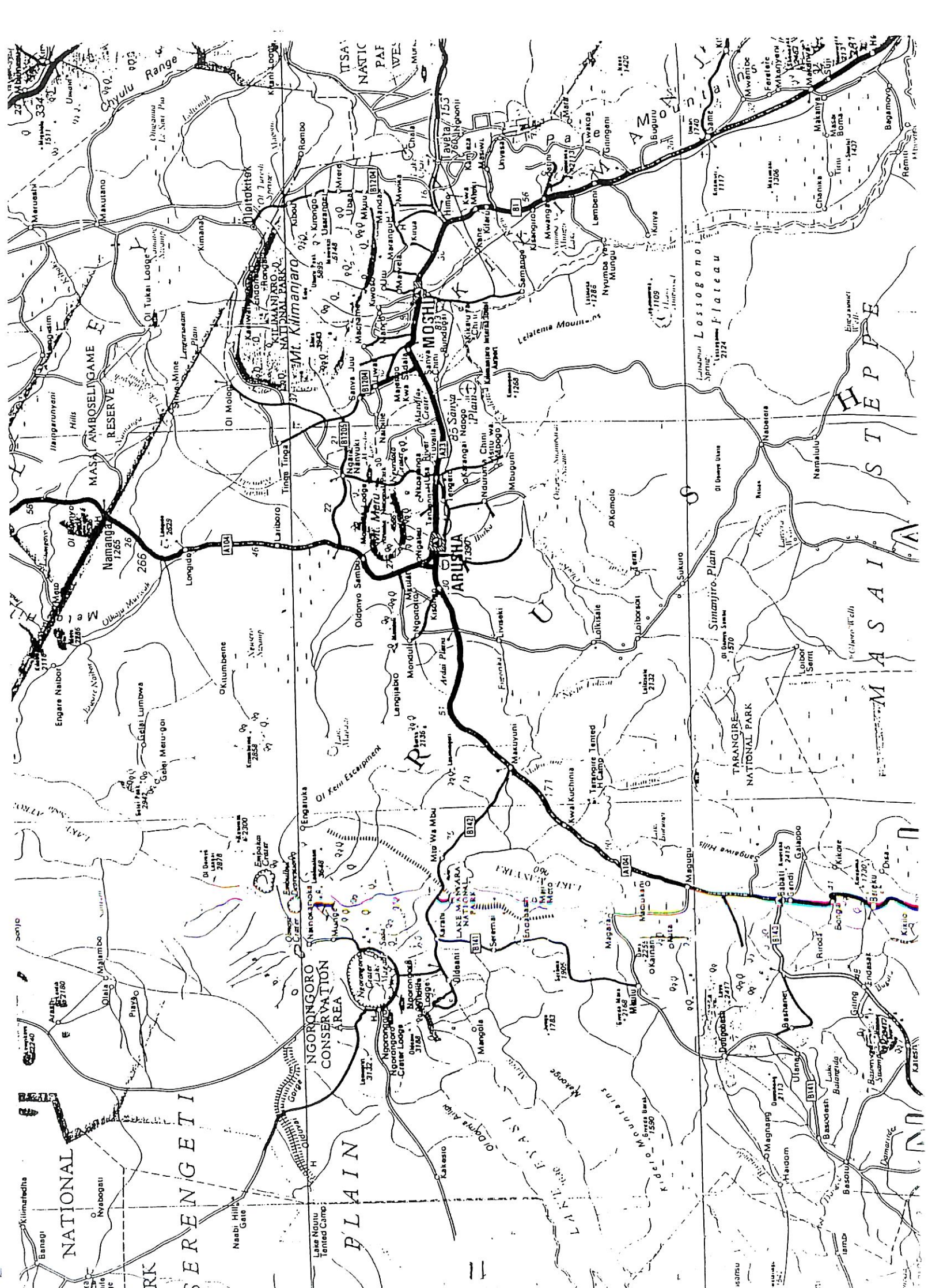




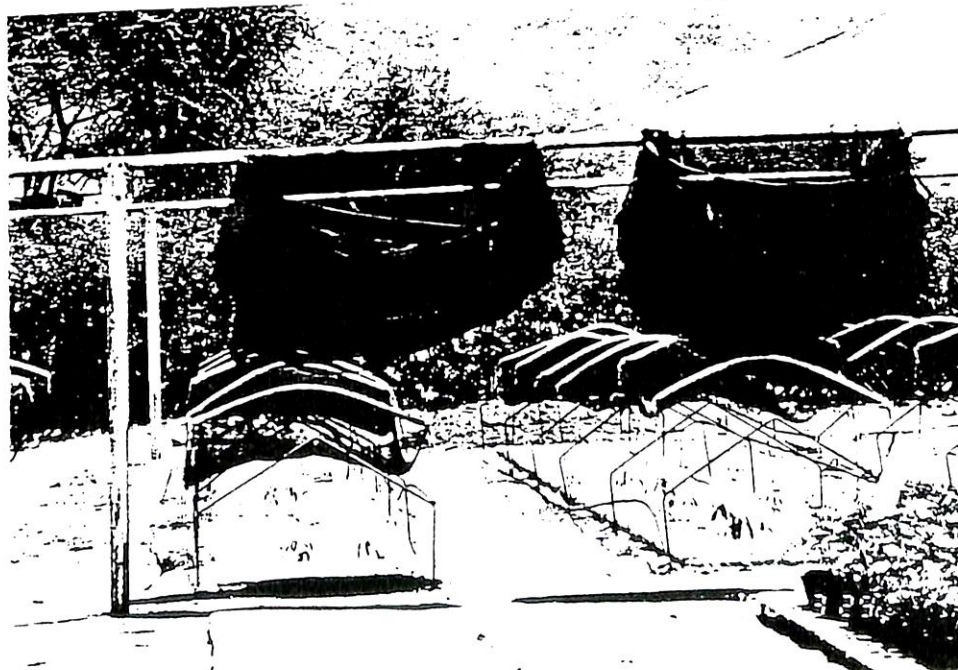
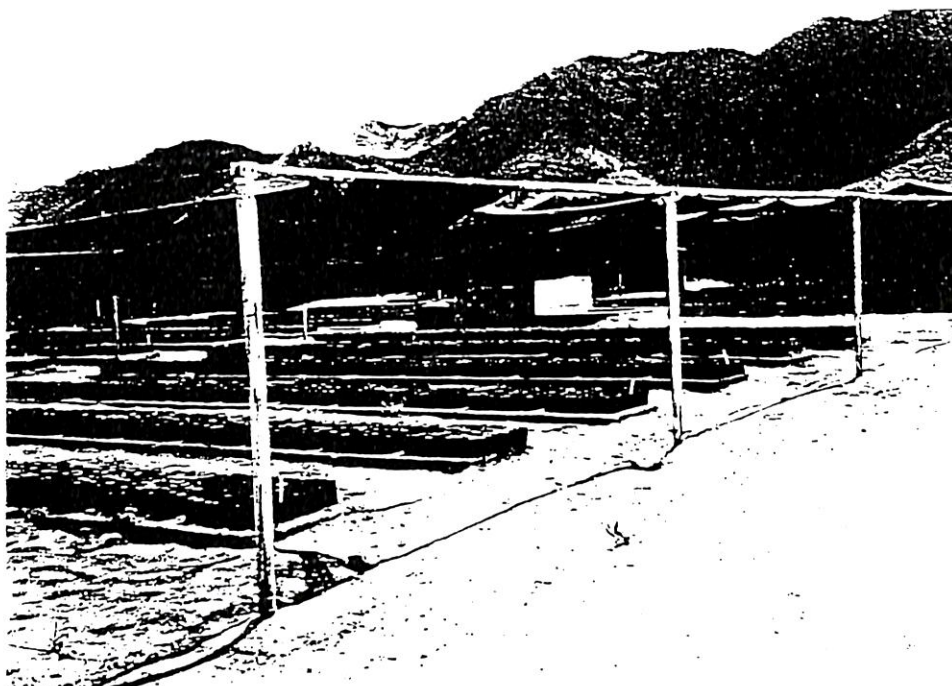
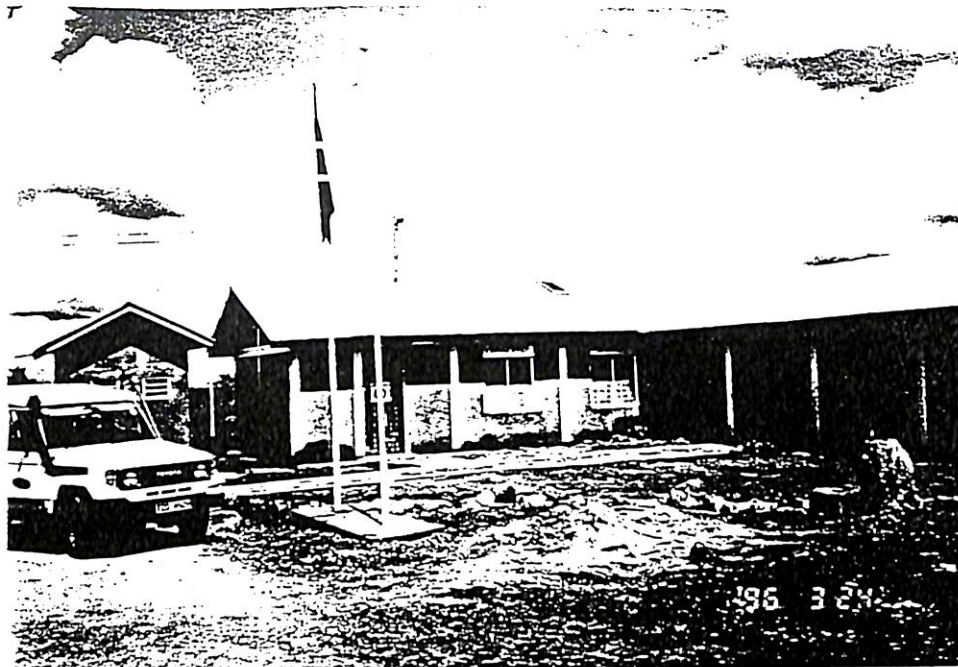
表 4

RAINFALL RECORD 1995  
LOCATION: Mkonga Nursery      ALTITUDE: 835 m

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1	3.0	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	8.0	-	32.5	-	-	-	-	-	-	-	12.5	-
4	1.0	-	-	0.5	-	-	-	2.5	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	24.0	-	-	-	-	-	-	-	-
7	-	-	-	3.5	-	-	-	-	-	-	-	-
8	-	-	-	2.5	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-
11	2.0	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	5.0	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	1.5	-	-	17.0	-	-	-	-	-	-	-
18	-	-	-	-	9.5	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	6.5	-
20	-	-	-	0.5	-	-	-	-	-	-	-	-
21	-	-	-	-	1.0	-	-	-	-	1.0	-	2.0
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	27.5	-	-
24	-	-	-	0.5	-	-	-	-	-	-	-	-
25	-	-	-	3.5	-	-	-	-	-	-	-	-
26	-	-	-	-	2.0	-	-	-	-	-	-	-
27	-	-	-	-	2.0	-	0.5	-	-	-	-	-
28	-	-	1.0	-	7.5	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	16.5	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-
Total	14.0	1.5	38.5	35.0	39.0	0.0	0.5	2.5	0.0	45.0	19.0	2.0
TOTAL	14.0	15.5	54.0	89.0	128.0	128.0	128.5	131.0	131.0	176.0	195.0	197.0
Days	4	1	3	4	6	0	0	1	0	3	3	1
DAYS	4	5	8	12	18	18	18	19	19	22	24	25

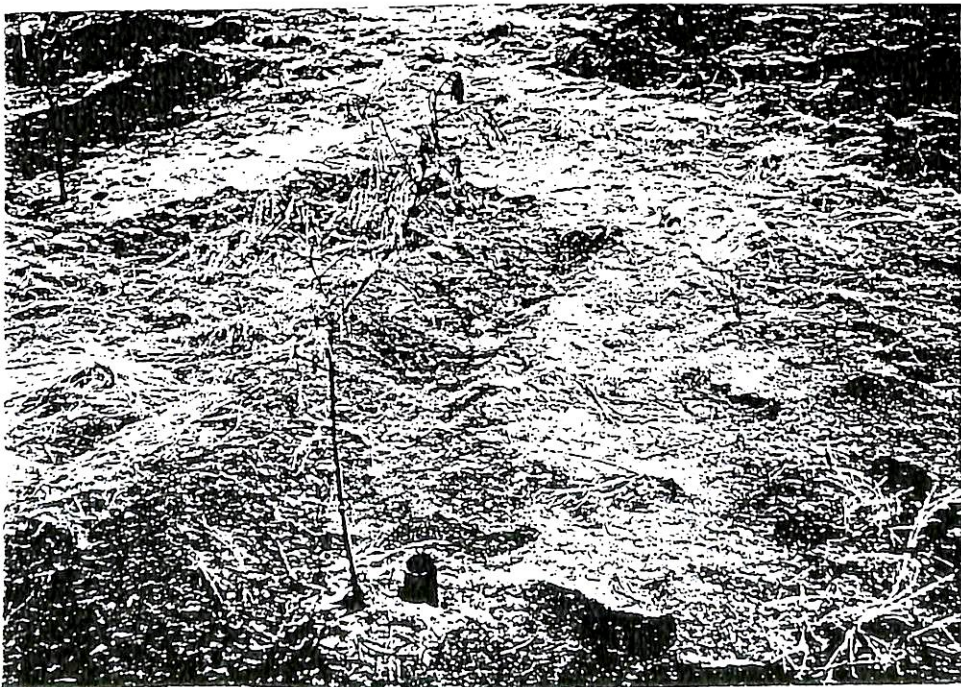
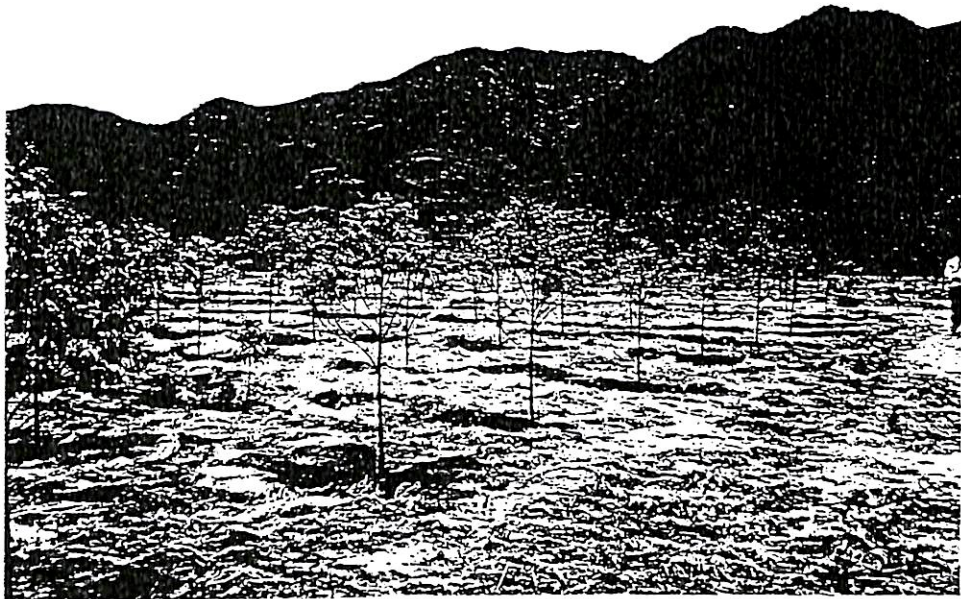
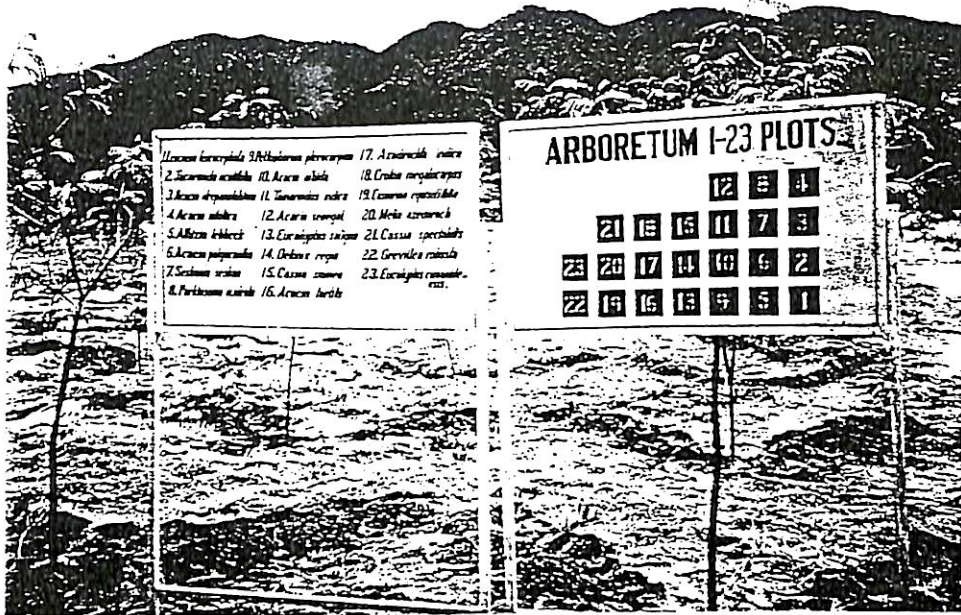


K.V.F.P



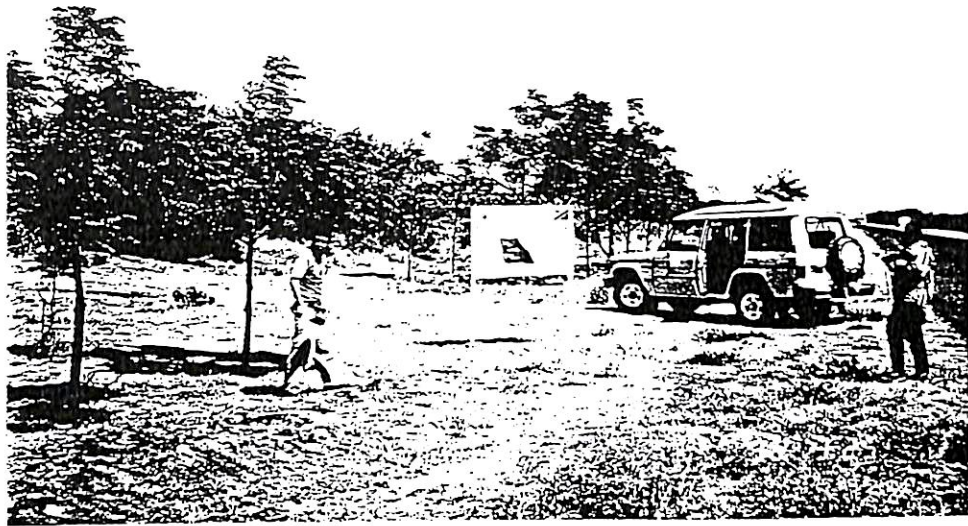


K.V.F.P



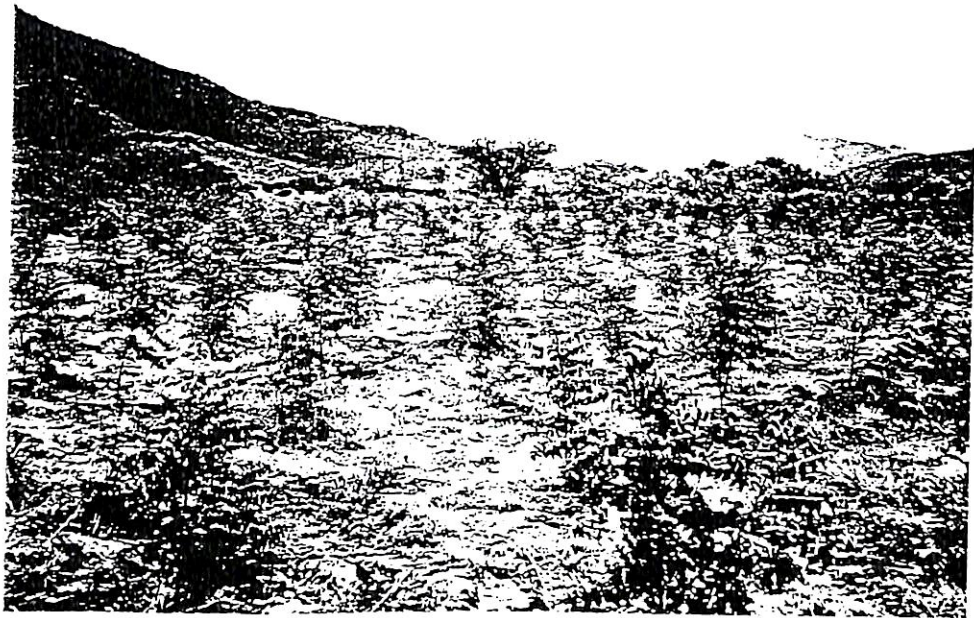
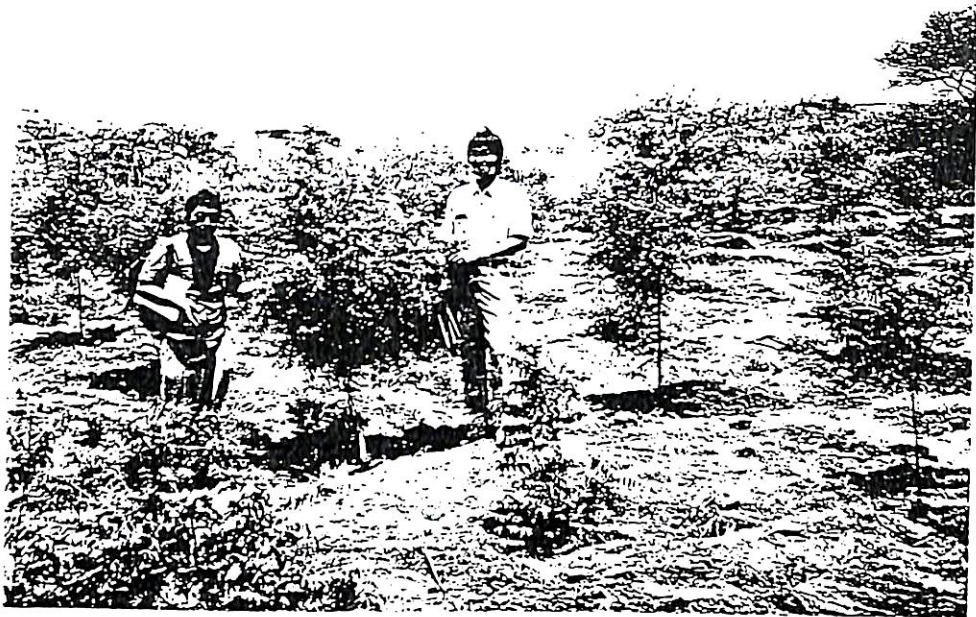


K.V.F.P





K.V.F.P



K.V.F.P



AGROFORESTRY PLOT AF13  
AREA 1.48 Ha  
TREE SPP PLANTED: *Albizia*  
*leobockii*  
SPACING: 2m x 10m  
AGRICULTURAL CROPS PLANTED:  
YEAR 1995



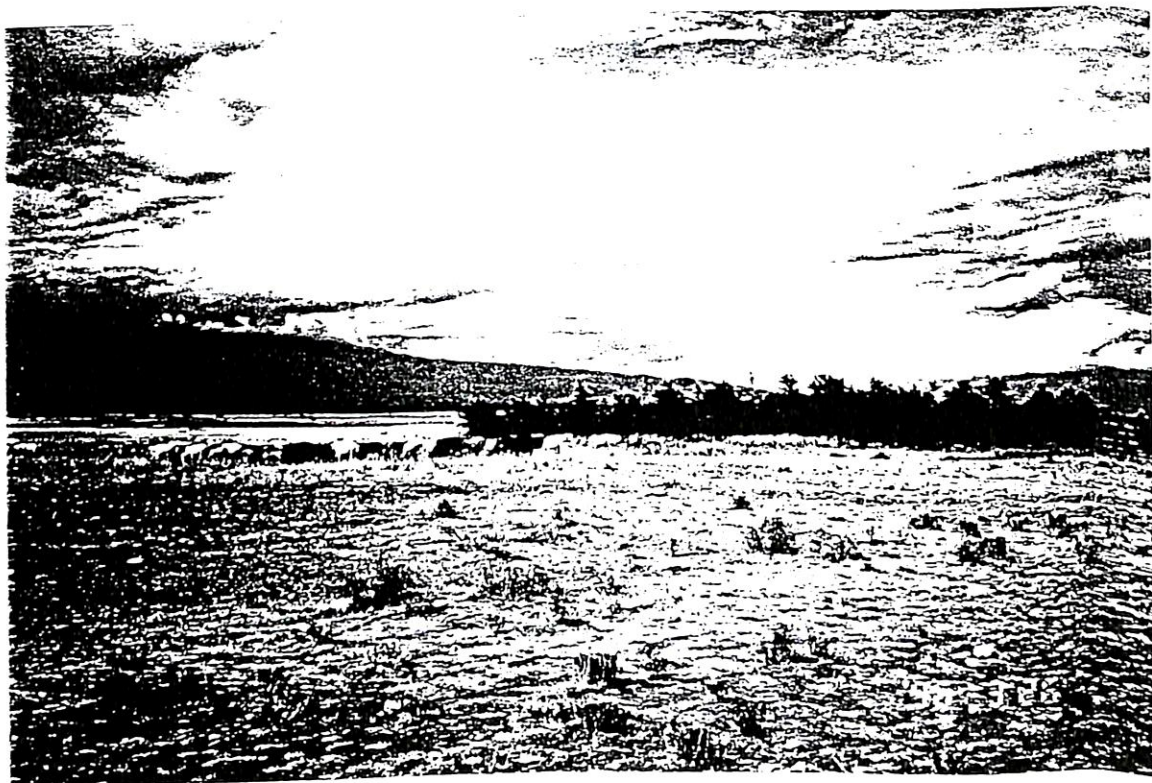


HAI P.





HAI. P.







Lower Moshi Natural Forest

