

IDENTIFICATION MISSION FOR NETHERLANDS SUPPORT TO THE AGRO-FORESTRY SECTOR IN TANZANIA

FINAL REPORT

DATE: 29/05/95

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FOREWORD

On behalf of ETC-K Consultants and the identification team, I would like to thank the Donor for giving us the opportunity to organise and execute this mission. The exercise was quite an "experience". Note that the report reflects the ideas (and is therefore the responsibility) of the mission members only.

The number of people we came across are too many to be thanked. But, to make some exceptions, we extend our sincere gratitude's to all the projects, DRDP's and programme co-ordinators. Transport, meetings, field trips, accommodation, all had, in fact, perfectly been arranged.

A last word of thanks, has to go to the identification team proper. Five very intensive weeks, but never have I felt that, somewhere, we were losing track, except of course for that one hypothesis, high up in Uluguru mountains... May we do it again!!

EXECUTIVE SUMMARY

1 INTRODUCTION

A five week agroforestry research and development identification mission took place in Tanzania from April 3 to May 5, 1995.

The mission was commissioned by the Royal Netherlands Embassy to ETC Kenya Consultants, who composed the following team of national and international consultants.

- Mr D.A. Hoekstra, mission leader.
- Mr J. Helsen, member.
- Mr. R.P. Yonazi, member.
- Prof. R.C. Ishengoma, member.

The Terms of Reference (ToR) requested the mission to review the Tanzania Forestry Action Plan (TFAP), including an inventory of on-going activities, earlier Dutch commitments towards TFAP and donor co-ordination.

The mission was also asked to assess the capacity of the Tanzania Forestry Research Institute (TAFORI) to implement the research master plan (1993 - 2002), and to identify the possibilities of Netherlands support for forestry research in relation to community forestry and natural forest management.

The main objective of the mission was to identify programmes and/or projects for Dutch support, in line with other on-going or planned activities and considering the development objectives and priorities of the Tanzanian and the Netherlands government. New activities should furthermore be of relevance to the management of protected natural forest areas (forest reserves, game reserves, national parks and watershed forests) within the framework of rural development, and be based on community participation.

The first leg of the mission focused on the Central and Eastern Arc cluster (Mbulu District, Pare and Uluguru mountains) which has forests with water catchment values of local, regional and (inter)national importance.

The second leg of the mission focused on the Kagera Region cluster (i.e. Kahama, Biharamulo, Bukoba, Ngara and Karagwe Districts). Forests in this region are rapidly being destroyed as a result of the influx of refugees and agricultural settlement.

2 TANZANIA FORESTRY ACTION PLAN

An assessment and updating of TFAP was conducted recently by the World Resources Institute (WRI). The mission therefore concentrated its efforts on assessing those aspects which were of specific relevance for the identification of projects and programmes.

(i) **Increased participation of local governments in the management of forest resources.**

Reservation for and administration of forests by local governments achieved limited success only. The mission came across several instances in which little or no response was received to requests for decentralising the management of forest areas to lower level government (i.e. village, district).

An effective decentralisation approach was also hampered by the fact that, at village/division/district level, staff had not increased. This was especially true for staff operational in the beekeeping sector, who suffered from the recent retrenchment exercises.

The mission noted that the opportunity to use funds generated from public forests for employment of additional staff at local government level are largely under-utilised. For example royalty fees for fuelwood harvested for refugee camps and tea factories is only Tsh 1000/- per truck load. Also, the effectiveness of revenue collection leaves a lot to be desired. Several, undocumented claims were made of government staff allowing illegal harvesting of valuable timber species in return for financial rewards.

Recommendations:

- Strengthen village and division and district staff in dealing with forestry/agroforestry.
- Accelerate reservation of forests for local governments.
- Prioritise central government forest and game reserves and release some forests for management to capable local governments.
- Increase fees for forest products (royalties and others) and improve supervision in harvesting activities. The increased revenues should be used to improve the quantity and quality of staff.

(ii) Increased participation of farmers/communities in the management of forest resources.

At regional and district levels, workshops for district staff were held to disseminate and encourage the use of TFAP principles. The objectives were to enhance integrated district level forestry related activities and adoption of a participatory approach towards planning, implementation, and follow-up of activities.

It is appreciated that the intended strategy to involve farmers and communities in the management of natural resources has just started on a pilot basis in game reserves and national parks. A similar start for the centrally managed forest reserves, has yet to begin officially.

Recommendation:

- Facilitation of Forest/Game Reserve Margins Integrated Community Development projects (FMICD's) in selected areas by the Ministry of Tourism, Natural Resources and Environment.

(iii) Agroforestry activities outside the forest.

Despite the fact that, in some districts, villagers show great enthusiasm to plant trees, support in the form of extension and research findings is either inadequate or totally lacking.

Some Non Governmental Organisations (NGO's) are trying to fill in these gaps but are hampered by lack of staff. To overcome this problem, some of the NGO's collaborate with government staff for the implementation of their programmes, others hire government staff, thus further depleting the already scarce human resource base.

It is encouraging to note, however, that co-operation in support of agroforestry at district level, between natural resource departments and other sectors, is much more than what it was a few years ago.

Recommendations:

- Increased inter-sectoral involvement in extension on forestry and agroforestry activities outside forested areas.

- Training of agricultural staff and NGO's in forestry/agroforestry.
- Increased recruitment of forestry graduates by NGO's.

(iv) Co-ordination

Donor co-ordination is required to avoid duplication and to work towards common development objectives and strategies. The basis for co-ordination is a plan in which the different activities have been identified. To be realistic, these plans have to originate from the villages/divisions and districts within an overall national planning framework. TFAP has recognised the need for such a "bottom up" approach and initiated the preparation of regional and district level plans, including village level consultation meetings.

As indicated in the recent review by the WRI, district level planning, based on village level Participatory Rural Appraisal (PRA) exercises and preparation of village land-use plans were initiated in some selected districts by the end of 1993. Although some of these studies are currently conducted by the District Rural Development Programmes (DRDP's), district wide plans are, as yet, to be developed. Therefore, one may observe in the districts, several donor driven agroforestry development activities, each with their own approach and objectives (see chapter 4). Duplication of efforts, however, has by and large been avoided through a strategy of allocating different geographical areas to different donor agencies. The synchronisation of the objectives and strategies still leaves considerable room for improvement.

With regards to national level steering committee co-ordination, the first year of TFAP's implementation experienced several inter-sectoral approaches to solving the country's environmental problems. They included the "National Conservation Strategy for Sustainable Development" and the "National Environmental Action Plan". Recently there have been other initiatives, such as the initiative to prepare a plan of action to combat desertification as well as a "National Environmental Policy". All these initiatives have derailed the attention of both, government and donors, from supporting TFAP implementation.

Recommendations:

- In order to make better use of local as well as international human resources, there is an urgent need for the development of district plans based on village PRA exercises.
- At national level, there is need to continue monitoring the activities (of development projects and research initiatives at district level). TFAP should play a crucial role by maintaining an inventory of donor funded projects. Such an inventory should be the basis for policy revisions and adoption of new strategies elsewhere in the country.
- The government should make concerted efforts to harmonise current initiatives in the field of environment so as to lessen confusion created by having too many plans dealing with environmental problems. Also, since TFAP deals with environmental problems, it should be incorporated as a component of environmental action plans and strategies.

3 TANZANIA FORESTRY RESEARCH INSTITUTE

To improve on the effectiveness of the Tanzania Forestry Research Master Plan (1993 - 2002) the following recommendations have been made:

- Update the Forestry Research Master Plan, as an in-house exercise, and concentrate on a few research priority areas as earlier recommended by FINNIDA.

- Prioritise and select specific projects for implementation, within each research area. Prioritisation of the projects should, preferably, be clustered geographically, based on on-going and/or planned (and funded) development projects.
- Identify for each cluster, potential candidates for collaboration. Considering the inadequate research capacity of TAFORI, collaboration should be sought with national (Sokoine University of Agriculture, University of Dar es Salaam, ARDHI, etc.) as well as international agencies (CIFOR, IUCN, etc.).
- Co-ordinate research and provide advise to government institutions and individuals and disseminate research findings. To that effect, funds will have to be availed for TAFORI to invest in a system of co-ordination, documentation and dissemination of research findings.
- The mission concurs to FINNIDA's recommendation that, in order to strengthen the institutional capacity of TAFORI, its staff should be encouraged to enrol for further studies.
- It is important that TAFORI is represented in the inter-institutional steering committee for the proposed FMICD programme.

4 IDENTIFICATION OF FMICD PROJECTS

To look into the potentials of FMICD projects, the following natural forests have been reviewed:

Kagera region cluster¹:

- Kahama: communal miombo woodlands.
- Biharamulo: Biharamulo Forest and Game Reserves.
- Bukoba: Minziro and Munene Forest Reserves.
- Ngara: Burigi Game Reserve and riverine forests.
- Karagwe: Burigi, Ibanda and Rumanyika Game Reserves.

Central and Eastern Arc cluster:

- Mbulu: Marang Forest Reserve and Northern Highlands Forests.
- Same: South Pare Mountain Forest Reserves.
- Morogoro: Uluguru Mountain Reserves.

To assess the potential for a FMICD project, the following aspects were considered:

- (i) The relationship between the reserves and the farming systems in the villages in the forest margins.
- (ii) On-going and/or planned (donor funded) projects in the forest margins.

The relationship between farming systems in the forest margins and the forest/game reserves varies considerably. This variation, in general, depends on land use intensity and available land resources per capita. The smaller the available land resource per capita, the higher the land use intensity and, most probably, the higher the need to use the neighbouring forest for agricultural and other uses.

¹ Note that the Kagera region cluster does not exactly refer to the administrative Kagera Region. The Kahama district has been included in the Kagera region cluster since the miombo woodlands, in Kahama, extend to Biharamulo and Ngara district respectively. Part of the forests are currently providing woodfuel for the refugees in neighbouring areas.

An exception to this rule are the large lease farms in the margin of the Northern Highland Forest Reserve.

For tropical wet land forests, a third factor may be added: land quality. Both Munene and Minziro forests in Bukoba District, are surrounded by semi-permanent glades and swamps, rendering the forests unsuitable for agricultural encroachment by the nearby communities.

The above defines the relationship between the farming systems and the forest reserves in terms of potential joint use of the resource by the forestry department and the surrounding community. A joint management of the forest resource can be envisaged also, if outsiders pose a serious threat on the forest, even if local communities do not seem to rely too much on these forests.

Central and Eastern Arc districts under review, are covered by several donor agencies (the NORAD funded 'Catchment Forest' projects in Mbulu, Pare and Morogoro and the FINNIDA, IUCN and GTZ funded projects). Interest in the central part and the Eastern Arc can partly be explained by the fact that many of these forests are classified as regional, national and internationally catchment areas.

Although Kagera is blessed with far more forest resources per capita, the region has in general received much less attention from the donor community. It is noted though that the World Bank recently launched a forestry resource assessment project in neighbouring regions (Tabora and Mwanza) with similar forest types (miombo).

Of late, several donor agencies (governmental as well as NGO's) have shown an interest in forestry related activities, in particular in Ngara and Karagwe Districts as a result of the environmental destruction caused by the influx of refugees from Rwanda and Burundi.

Based on these facts, the mission recommends FMICD projects to start on a pilot basis in communities/villages surrounding the following forests:

Kagera region

- Biharamulo Forest and Game Reserve in Biharamulo District.
- Rumanyika Game Reserve in Karagwe District.

Central and Eastern Arc region

- Marang Forest Reserve/Park in Mbulu District.

Rather than preparing a detailed list of activities to be considered for each of these projects, the mission prepared an outline for a community based programmatic approach for the development and implementation of such projects (please refer to chapter 3, section 3.3).

In addition to these FMICD projects, the mission recommends that:

- Dutch funded Traditional Irrigation Improvement Programme (TIP), at least in Same District, collaborates with the NORAD funded 'Catchment Forest' project to adopt the same approach for villages and water user groups in the margins of the forests reserves of the Pare mountains.
- Management plans for the Minziro and Munene Forest Reserves in Bukoba district, be developed in order to arrest the over-exploitation for timber extraction (Podocarpus) and fuelwood (Munene forest).

5 ASSESSMENT OF ON-GOING AND PLANNED AGROFORESTRY ACTIVITIES

The mission reviewed the planned and on-going agroforestry activities on non-reserved lands in the districts visited.

In general, the mission recommends that agroforestry activities should originate from district wide rural appraisals, which have to be based on the needs and potentials of the local communities.

They should include a forest resource inventory and an assessment of the use of these forests by the different users. Particular attention needs to be paid to the gender and social status of these users.

More specific recommendations for the planned and on-going agroforestry activities on non-reserved land deal with:

Kagera region cluster:

(i) Kahama and Biharamulo District:

To develop a conservation strategy for farms within the communal forest areas particularly in Ushirombo Ward (Kahama District), using the following strategy:

- Selective clearing of forests for agricultural lands.
- Regeneration of indigenous trees on agricultural lands already cleared in the past.
- Identification/allocation of private and/or village forests areas.

(ii) Ngara and Karagwe Districts:

- Institutional strengthening, at district level, and co-ordination of tree planting activities among the various donors and implementing NGO's.
- Rehabilitation of riverine forests along the Kagera and Ruvuvu river with the help of local communities.
- Increased support to individuals to establish individual/community seedling production units for donor funded afforestation programmes.
- Increased attention to sustainable tree propagation practices, including harvesting of indigenous seeds, establishment of private seed stands/orchards, low cost nursery techniques and use of vegetative material.
- Increased agroforestry extension to increase survival and production of planted trees.

(iii) Bukoba District:

- Integrate appropriate agroforestry activities in the PRA villages.
- Explore the productive use of the "rweya" lands for the production of poles, fuelwood, fodder and green manure.

Central and Eastern Arc cluster:

- Strengthen sustainability of tree planting activities by increased emphasis on private nurseries (women groups), local seed collection, establishment of seed stands/orchards, use of direct seeding/wildlings/cuttings, especially in Same and Mwanze Districts.

- Follow up extensions on specific agroforestry technologies, especially on fodder-soil and water conservation technologies in Mbulu and Same Districts and fallow based technologies in Same and Morogoro Districts.
- Integrate appropriate agroforestry activities in the PRA villages in Mbulu and Same Districts.
- Increased attention to the production and conservation of communally owned resources, especially woodlots in Mbulu District.

6 RESEARCH NEEDS IN SUPPORT OF THE IDENTIFIED PROJECTS AND RECOMMENDED AGROFORESTRY IMPROVEMENTS

In support of the FMICD programme the following research activities/topics were identified:

- Hydrological studies in selected watersheds of the catchment forest areas.
- Identification of factors influencing the joint management/use of forest/game reserves.
- Forest assessment studies, for the planning of (joint) use and management.

In support of the recommended agroforestry improvements, the following research activities/topics were identified:

Kagera region cluster:

(i) Kahama and Biharamulo District:

- Surveys to determine the interaction between indigenous trees and crops.
- Surveys to determine biomass potential and tree/crop interactions for regenerated indigenous trees.

(ii) Ngara and Karagwe District:

- Regular surveys on the survival of seedlings and adoption of agroforestry technologies.
- Identification of sustainable tree propagation methods.

(iii) Bukoba District:

- On farm testing of species for poles, fuelwood, fodder and green manure on rweya land.
- Testing of nitrogen rich green manure produced on rweya lands on the "kibanja" and "kikamba" plots.
- Regular surveys on the survival of seedlings and adoption of agroforestry technologies.

Central and Eastern Arc cluster region:

- Propagation methods for indigenous species.
- On-farm testing of species and agroforestry technologies for soil/water conservation/fodder production in Mbulu and Same District and fallow based technologies in Same and Morogoro Districts.
- Regular surveys on the survival of seedlings and adoption of agroforestry technologies.

7 IMPLEMENTATION

Implementation of the recommendations and identified activities can be subdivided into (i) development (ii) research and (iii) training activities.

(i) Development activities

Initiating FMICD projects in villages surrounding the selected forests, requires an inventory and mobilisation of human resources (government and NGO's) at different levels. Based on this assessment, additional staffing at the village level (e.g. village motivators) may have to be considered. Also, recruitment of a project leader for each FMICD project may be necessary when available staff at divisional/district level is insufficient.

To plan, initiate, monitor and evaluate activities for each selected forest, a task force comprised of the sector specialists at district/divisional level should be appointed.

Considering the new approach and given the complexity of the interactions in the forest margins, a competent external programme co-ordinator should be made available to co-ordinate and backstop the activities in the selected FMICD project sites.

Central guidance/backstopping to the overall FMICD programme should be provided through an inter-institutional steering committee.

Agroforestry activities on non-reserved lands, as well as the development of management plans for the sustainable use of the Munene and Minziro forests are an integral part of the district programmes.

(ii) Research activities

A project dealing with the identified research topics of the FMICD programme should be established. A research co-ordinator, recruited by TAFORI, should be attached to this project and, preferably, be based in the Kagera region cluster. The research co-ordinator should be responsible for the establishment, supervision and dissemination of research activities and results.

The FMICD research project should:

- Study the effectiveness of different FMICD approaches and,
- Carry out forest assessment studies for planning of joint management/use of forest reserves and communal forests.

To build up TAFORI's capacity in the field of FMICD projects, it is proposed to enrol TAFORI staff and, if possible, post graduate students in degree programmes related to social forestry. Such staff/students should be deployed at selected forest margin sites for the research component of their studies.

Most of the identified research topics in support of agroforestry activities on non-reserved lands, are short term in nature. It is therefore recommended that they are implemented on a contract basis. TAFORI can be contracted as one of the executing agencies.

For some of the longer term research topics identified (e.g. hydrological studies) more specialised agencies should be engaged/identified.

(iii) Training activities

Training activities in support of the FMICD projects as well as for agroforestry activities on non-reserved lands will be required. Most of the training will be relevant for all the districts and should therefore be centrally co-ordinated by the FMICD programme co-ordinator.

Training activities deal with PRA's, sustainable tree propagation methods, improved survival and productivity of trees and agroforestry technologies and social forestry practices and participatory management options.

ABBREVIATIONS

AF	Agroforestry
AFRENA	Agroforestry Research Network for the Highlands of East and Central Africa
CIFOR	Centre for International Forestry Research
DGIS	Directorate General for International Development Co-operation
DLUMP	Dodoma Land use Management Programme
DOVAP	Dodoma Village Afforestation Programme
DNRO	District Natural Resources Officer
DRDP	District Rural Development Programme
ETC	Education and Training Consultants
FEC	Farmer Extension Centre
FINNIDA	Finnish International Development Agency
FMICD	Forest Margin Integrated Community Development
FSR	Farming System Research
GoT	Government of Tanzania
GTZ	Gesellschaft für Technische Zusammenarbeit, Germany
Ha.	Hectare
HASHI	Hifadhi Ardhi Shinyanga
HeSaWa	Health Sanitation and Water
HIMA	Hifadhi Mazingira Iringa
HoD	Heads of Department
ICRAF	International Centre for Research on AgroForestry
IFAD	International Fund for Agricultural Development
IUCN	International Union for Conservation of Nature
JICA	Japanese International Development Agency
KALIDEP	Kagera Livestock Development Programme
KARADEA	Karagwe Development Association
MTNRE	Ministry of Tourism, Natural resources and Environment
MASL	Meters Above Sea Level
NALERP	National Agricultural and Livestock Extension/Research Programme
NGO	Non-governmental Organization
NORAD	Norwegian International Development Agency
PRA	Participatory Rural Appraisal
PTD	Participatory Technology Development
RNE	Royal Netherlands Embassy
SIDA	Swedish International Development Authority
SNV	Stichting Nederlandse Vrijwilligers
SUA	Sokoine University of Agriculture
TAFORI	Tanzania Forestry Research Institute
TANAPA	Tanzania National Parks
TFAP	Tanzania Forestry Action Plan
TIP	Traditional Irrigation Improvement Programme
ToR	Terms of Reference
Tsh	Tanzanian shilling
T&V	Training and Visit
UNHCR	United Nations High Commission for Refugees
USAID	United States Aid for International Development
VEW	Village Extension Worker
WRI	World Resources Institute

1 TFAP IN TANZANIA

1.1 Overview

Tanzania is endowed with vast forest resources which are important for the social-economic development of the country. The Tanzanian population is heavily dependent on forest products and services. In fact, more than 90% of the country's energy requirements depends on wood fuels. The forests provide, in addition, timber, poles and withies and fruits, medicines, herbs and nectar for honey and beeswax production as well as forages for livestock. Forests are a suitable habitat for wildlife and are renowned for their bio-diversity, which is the basis for the tourism industry. Forests protect water sources which are important for the provision of water for both, rural and urban populations. The protective functions become especially important during dry seasons, when rural populations depend heavily on forests for fodder and drinking water.

Despite their importance, the country's forest resources are dwindling. A substantial decline in forest area is the result of high population pressure and subsequent expansion for land for agriculture and livestock keeping. The decline in quality of forest resources in terms of species, especially timber, and wildlife is caused by poor and inefficient management. The latter is, in part, the result of government's limited financial and human resources. A new strategy is therefore required to tackle this problem.

In the year 1985, a global initiative was launched to assist tropical countries in developing inter-sectoral programmes with the view to better manage forest resources and control deforestation. In 1987 Tanzania requested the assistance of the international community to prepare this programme. A plan was formulated by the end of the year 1989 and was updated four years later.

The main objectives of the plan, commonly known as the TFAP are:

- i) To review past policies and development efforts.
- ii) To formulate a long-term development strategy and to establish targets.
- iii) To prepare an action plan with development and institutional programmes.
- iv) To propose project profiles for the implementation of the plan.

An important part of TFAP's strategy is:

- To increase the participation by local governments and communities in the management of forest resources, and
- To include the development of trees outside the forests in their overall plan.

The TFAP was prepared in order to guide the development of forestry, wildlife and beekeeping sectors in the country. It was expected to be used by government institutions (at all levels), private bodies and individuals, as well as by NGO's involved in the management, development and utilisation of forest resources in the country. Preparation of, in particular, regional forestry action plans were attempted in all regions. Some district and regional officers attended special courses in project formulation.

The up-dated TFAP has the following development programmes:-

- Integrated district level forestry.
- Forest management.
- Bio-energy.
- Forest industry.
- Beekeeping.
- Wildlife management.
- Conservation of eco-systems and bio-diversity.

The plan is comprised of six institutional support programmes namely:-

- Policies and legislation.
- Forest administration.
- Human resources development.
- Forest and beekeeping research.
- Resource assessment, information and planning.
- Community participation and gender issues.

In addition, the plan is expected to enhance inter-sectoral and donor co-ordination. To enhance co-ordination, a multi-sectoral steering committee was formed under the chairmanship of the Principal Secretary of the Ministry of Tourism, Natural Resources and Environment (MTNRE). At regional level, a similar set-up was created under the chairmanship of the Regional Development Directors.

Donor co-ordination was realised by holding local donors' meetings to exchange views on the implementation of TFAP. The TFAP secretariat produced implementation reports for members of the national steering committee, government bodies, NGO's, private bodies, individuals, and the donor community at large.

1.1.1 Assessment of increased participation of local governments in the management of forest resources

Local governments include all organisational structures (including village governments) other than the central government.

Reservation for, and administration of forests by local governments, achieved so-far limited success. The mission observed several cases in which little or no response to requests from local governments to decentralise the management of forest areas was given. One reason for the in-effective decentralisation approach can be explained by the fact that, at village/division/district level, staff had not increased. This was especially true for staff operational in the beekeeping sector, that, in particular, suffered from the recent retrenchment exercises.

The mission noted that the opportunity to use funds, generated from public forests, for employment of additional staff at local government level are largely under-utilised. For example, royalty fees for fuelwood harvested for refugee camps and tea factories is only Tsh 1000- per truckload. Also, the effectiveness of revenue collection leaves a lot to be desired. Several, undocumented claims were made of government staff allowing illegal harvesting of valuable timber species in return for financial rewards.

It was noted that, to raise additional revenues from forest products, greater opportunities exists for forests which are under the management of local governments.

Recommendations:

- Strengthen village/division and district staff in dealing with forestry/agroforestry.
- Accelerate reservation of forests for local governments.
- Prioritise central government forest and game reserves and release some forests for management to capable local governments.
- Increase fees for forest products (royalties and others) and improve supervision in harvesting activities. The increased revenues should be used to improve the quantity and quality of staff at district, divisional and village levels.

1.1.2 Assessment of increased participation of farmers/communities in the management of forest resources

At regional and district levels, workshops for district staff were held to disseminate and encourage the use of TFAP principles. Their objectives were to enhance integrated district level forestry related activities and adoption of a participatory approach towards planning, implementation, and follow-up.

It is appreciated that the intended strategy, to involve farmers and communities in the management of natural resources, has just started in game reserves and national parks. A similar arrangement for the centrally managed forest reserves, has yet to begin officially.

Recommendation:

- Facilitation of FMICD projects in selected areas (on pilot basis) by the MTNRE (see chapter 3 for the development of such projects).

1.1.3 Assessment of forestry activities outside the forest

Despite the fact that, in some districts, villagers show great enthusiasm to plant trees, support in the form of extension and research findings is either inadequate or totally lacking.

Some NGO's are trying to fill in these gaps but are hampered by lack of staff. To overcome this problem, some of the NGO's collaborate with government staff for the implementation of their programmes, others hire government staff, thus depleting the already scarce human resource base.

Encouraging to note, however, is the fact that co-operation among natural resources' sectors and other sectors at district level in support of agroforestry is much more than what it was a few years ago.

Recommendations:

- Increased inter-sectoral involvement in extension on forestry and agroforestry activities outside forested areas.
- Training of agricultural staff and NGO's in forestry and agroforestry activities.
- Increased recruitment of new forestry graduates by NGO's.

1.1.4 Co-ordination assessment

Donor co-ordination is required to avoid duplication and to work towards common development objectives and strategies. The basis for co-ordination should be a plan in which the different activities are identified. To be realistic, these plans have to originate from the villages, divisions and districts within an overall national planning framework. TFAP has recognised the need for such a "bottom up" approach and initiated, to that effect, the preparation of regional and district level plans, including village level consultation meetings.

As indicated in the recent review by the WRI, district level planning, based on village level PRA exercises and village land-use plans were initiated in some selected districts by the end of 1993. Although some of these studies are currently conducted by the DRDP's, district wide plans are, as yet, to be developed. Therefore, one may observe in the districts, several donor driven agroforestry development activities, each with their own approach and objectives (see chapter 4).

Duplication of efforts, however, has by and large been avoided through a strategy of allocating different geographical areas to different donor agencies. Nevertheless, the synchronisation of the objectives and strategies still leaves considerable room for improvement.

With regards to forestry research, various donors support research components within on-going forestry and agroforestry projects. As a result, TAFORI has found itself receiving (minor) support from the International Development Research Centre, Oxford Forestry Institute, and NORAD. A substantial amount of forestry research money has been channelled through the Sokoine University of Agriculture (SUA).

Other institutions, such as the Institute of Resource Assessment, are involved in land use (farming systems) surveys and resource assessments. Although not part of the forestry sector, *per-sé*, the research findings do contribute substantially to the agroforestry sector on a whole. TAFORI will soon receive a substantial input from FINNIDA for starter activities.

With regards to the national level steering committee co-ordination, the first year of TFAP's implementation experienced several inter-sectoral approaches to solving the country's environmental problems. They included the "National Conservation Strategy for Sustainable Development" and the "National Environmental Action Plan". Recently, there have been other initiatives, such as the initiative to prepare a plan of action to combat desertification as well as a "National Environmental Policy". These initiatives have derailed the attention of both, the government and donors, from supporting TFAP implementation.

Recommendations:

- In order to make better use of local and international human resource base, there is an urgent need for the development of district plans based on village PRA's.
- At national level, there is need to continue monitoring the activities (of development projects and research initiatives at district level). TFAP should play in this a crucial role by maintaining an inventory of donor funded projects. Such an inventory should be the basis for policy revisions and adoption of new strategies elsewhere in the country.
- The government should make concerted efforts to harmonise current initiatives in the field of environment so as to lessen confusion created by having too many plans dealing with environmental problems. Also, since TFAP deals with environmental problems, it should be incorporated as a component of environmental action plans and strategies.

1.2 Inventory and assessment of agroforestry activities in Tanzania

An inventory of agroforestry activities has been prepared by the TFAP secretariat (see TFAP update 1994). In compliance with the ToR, the mission compares this inventory with earlier made Dutch commitments. Next, the relevance for TFAP of Dutch funded agroforestry projects and activities is briefly discussed. Finally, Dutch funded forestry projects in Dodoma are being reviewed. A description and review of the district based agroforestry activities is included in chapter 4 and 5.

1.2.1 On-going activities vis-à-vis earlier made Dutch pledges

In 1989, the Netherlands pledged US\$ one Million per year for five years. The initial interest of the Netherlands for support to the TFAP concentrated on the following areas:

- Land husbandry activities in the semi-arid areas (LH).
- Village woodfuel production for urban areas (CF7).
- Dissemination of efficient woodfuel conservation techniques (BE1).

- Wildlife management in Serengeti (WM6).
- Eastern Arc Forest Management.

These interest areas were drawn up more than six years ago. In the light of the updated TFAP, and because several of these profiles are being looked into by other donors, the Netherlands' pledge needs to be re-examined. Table 1 illustrates the initial interest of the Netherlands in supporting the TFAP vis-à-vis the situation of projects at the end of 1994.

Recommendations:

- Previous areas of interest should no longer be considered as a guide for future Dutch support to TFAP, instead
- Future Dutch funds should be channelled to districts in accordance with the recommendations made by this identification mission.

Table 1: Initial interest to the TFAP and "State of the Art" at the end of 1994.

INITIAL INTEREST	SITUATION AT THE END OF 1994
Land husbandry activities in semi-arid areas	A total of 10 on-going projects in land husbandry of which two are located in areas that can be classified as semi-arid, namely HASHI and HADO projects.
Village wood production for urban areas	There are no on-going project that fits this description. However, the Miombo Forest Development Projects in Iringa and Tabora, supported by DANIDA and the World bank respectively, have a fuel wood production component.
Dissemination of efficient woodfuel conservation techniques	Activity expansion to other urban centres than Dar es Salaam, such as in Coast, Kilimanjaro, Tabora, and Mwanza regions. Supported by DANIDA and World bank respectively.
Wildlife management Serengeti	Provision of equipment to Serengeti Ecological Monitoring unit for regular systematic information; supported by DANIDA and the Netherlands.
Eastern Arc Forest Management Programme	There is no single project specifically for this activity. However, activities do take place in North and South Pare supported by NORAD, JICA and GTZ in West Usambara, in Eastern Usambara, supported by FINNIDA and in Ngulu and Uluguru mountains supported by NORAD. All projects, contribute considerable to the objectives of the Eastern Arc Forest Programme.

1.2.2 Relevance of on-going and new activities for TFAP

The ongoing Netherlands supported agroforestry activities are incorporated in the district rural development plans, described in chapter 4 or specially formulated forestry projects, described in the para. 1.2.3.

While the Dutch funded activities, at the moment, are not considered an integral part of the TFAP by the Dutch Government (see ToR), the activities have, nevertheless, contributed substantially to the achievements of the TFAP objectives in general.

The TFAP secretariat has acknowledged this and included these activities in a recent (Nov., 1994) TFAP work programme for implementation of donor assisted projects. Specific mention has been made of the following Dutch funded projects in relation to the TFAP project and programme structure:

- i) Land husbandry programme:
 - Input in land husbandry activities in semi-arid regions.
- ii) Community and farm forestry programme:
 - District rural development projects in Mbulu, Maswa, Meatu and Bukoba.
 - Afforestation projects in Dodoma, Berekò and Kondoa.
 - Village woodfuel production for urban areas.
- iii) Bio-energy development programme:
 - Dissemination of woodfuel conservation techniques.
- iv) Wildlife management programme:
 - Serengeti ecological monitoring unit.
 - Wildlife utilisation schemes.

1.2.3 Assessment of Dutch funded forestry sector projects

Two projects, i.e. DOVAP and DLUMP are considered in this section. Both projects were reviewed and most of the observations and recommendations are based on the results of earlier made evaluations.

(i) DOVAP

Dodoma Village Afforestation Project, DOVAP phase II, is a four year project scheduled to end in December 1995. Its main objective is: "to develop sustainable and more productive land use systems at village level by introducing integrated agricultural and afforestation methods which can be managed by the villagers".

Conclusions on impact are, in principle, based on the contribution of DOVAP's activities to the long term objective. In respect of this, one might say that, despite initially a too high reliance on tree planting, DOVAP has broadened its scope and laid a "fragile" foundation to contribute to sustainable land use. The lack of data however, made impact assessment conclusions very preliminary.

Nevertheless, observations from the field indicate that, in aspects such as tree planting around homesteads and tree survival, some sustainability may have been achieved. In other aspects, such as seedling production, soil and water conservation and activities related to committees and their involvement in land use management, continued support will be required.

The opportunities for replication in the Dodoma region are ample, due to the similarity in agro-ecological and, socio-cultural and economic circumstances. However, before the DOVAP experiences can be considered replicable, serious fine tuning of, in particular, the approach (participation in land use planning) has to be considered.

Community participation in village land use planning must be considered as a "social laboratory", and one may not expect that sustainability and replicability can be guaranteed in a period of one year. The evaluation team therefore strongly recommended a follow-up project to DOVAP.

The magnitude and the institutional embedding of the proposed integrated land use development project would be based on the experiences gained in the last year of DOVAP phase II, and should duly consider the recommendations made vis-à-vis the organisation, approach and collaboration with other similar projects in the area.

To conform to the recommendations made by the evaluation team, SNV currently suggests to re-formulate the next phase as a broad based environmental support programme called Dodoma Village Environmental Programme. Such a programme will contribute substantially to the objective of the first TFAP development programme i.e. Integrated District Level Forestry.

(ii) DLUMP

Dodoma Land use Management Programme (DLUMP) is implemented within ARDHI-Dodoma and aims at preventing further environmental degradation via land use planning and management to enable people to improve their soil and water conservation practices and to optimise the use of the natural resources in a sustainable way.

The last objective: "to assist villagers in optimising the use of the natural resources in a sustainable way" was actually added after an evaluation on their part. Despite the fact that DOVAP and DLUMP, indeed, share similar objectives both projects have a distinct point of entree. Whilst DOVAP advocates the techniques for sustainable land use, DLUMP concentrates much more on the aspects of village (and land) demarcation and individual title deeds.

The latter are considered as pre-conditions to arrive at sustainable land use. It is our opinion that, both projects can learn from each other's experiences in survey methods, participatory approaches and support to the village committees.

2 AGROFORESTRY RESEARCH IN TANZANIA

2.1 Overview of the Tanzania Forestry Research Institute and Forestry Research Master Plan

2.1.1 History of TAFORI

Forestry research activities in Tanzania were initiated at Amani in 1902 by the Germans. In 1928, the British renamed the Amani research institute, the 'East African Agricultural Research Station, Amani'. In 1948 the Amani station was moved to Muguga - Kenya, to form the 'East African Agricultural and Forestry Research Organisation'. The organisation catered for research activities common to Tanzania, Uganda and Kenya. Research problems, unique to the individual countries, were attended to on a national basis. This led to the establishment of the 'Silvicultural Research Station' at Lushoto and the 'Timber Utilisation Research Station' at Moshi in 1951.

Following the collapse of the 'East African Community' in 1977, an immediate need to fill the vacuum became apparent, as the two stations established in the early 1950's were not well placed. Hence, the establishment of TAFORI by an Act of parliament in January 1980. In the first decade (1980 - 1990) TAFORI experienced serious weaknesses. Financial constraints, shifting of TAFORI headquarters from Lushoto to Kibaha and eventually to Morogoro, and delays in appointment of a Director General among other reasons contributed to such weaknesses.

2.1.2 Functions of TAFORI

Legally, TAFORI has the following functions:

- To set up forestry experiments relating to the planting, growth, development and conservation, and use of local and exotic tree species. To investigate causes and to suggest ways of controlling and preventing the occurrence of forest diseases and pests.
- To co-ordinate research and to provide advice to the government, public institutions and other persons on the practical applications of modern techniques suitable for development and conservation of the landscape, soil, fauna and flora.
- To provide advice on the establishment, and the development of wood industries.
- To co-operate with the government and any person or group of persons in providing facilities for the training of researchers.
- To establish a system of documentation and dissemination of research results, by placing inquiries and/or collecting prepared and/or published statistics relating to forestry.
- To encourage the development of forestry through the protection of forestry industry, provision of consultancy services, and increasing the supply, sale, utilisation and conversion of timber.

2.1.3 Research programmes

TFAP identified nine research programmes which consist of over 42 research projects. The nine research projects have been merged into five major research programmes, reducing the number of research programmes from 42 to 35 in the National Forestry Research Master Plan (1993 - 2002).

Titles for research project profiles in (i) community and farm forestry and (ii) ecology, conservation of natural forests and bio-diversity programmes are of particular interest to this mission, and therefore highlighted.

(i) Community and farm forestry

This programme aims at conserving the country's natural resources, ameliorating the environment and contributing to sustainable production of food, fodder, and fuelwood by the economically disadvantaged rural and peri-urban communities. The programme also aims at surveying different ecological zones to identify biologically and economically viable farm forestry practices based on sustainability of food and wood production and on-farm research, emphasising the use of indigenous species.

Three main research areas are identified in this programme:

- Field surveys in different ecological zones to identify biologically and economically viable farm forestry systems with farmer participation.
- On-farm research with emphasis on the use of indigenous species.
- Evaluation and monitoring of farming systems with special emphasis on increasing sustainable food and wood production.

Within the main areas of priority, three specific project profiles are presented:

- Farmers' needs and community and farm forestry.
- Propagation, establishment and management techniques of different tree species.
- Performance of tree species in different agroforestry and forest management practices.

(ii) Ecology, conservation of natural forests and bio-diversity

This programme aims at conserving the unique genetic resources of the natural forests by increasing the knowledge of the existing resources and the means to conserve them. Four ecological systems namely montane forests, the miombo woodlands, mangroves and riverine forests have been earmarked.

In this programme seven research profiles are presented:

- Botanical surveys in Tanzania.
- Pharmaceutical studies of selected indigenous tree species.
- Conservation and propagation methods of selected plant species.
- Characterisation and management planning of potential catchment areas.
- Reforestation techniques in degraded lands.
- Maintenance of bio-diversity in natural ecosystems.
- Survey of browse plants for wild game.

Apart from the activities presented above, TAFORI has also interests in the tree improvement, plantation forestry and the harvesting, utilisation and marketing programmes.

2.2 General assessment of TAFORI's capacity to implement the master plan

In October 1994 FINNIDA, through Indufor Oy, appraised the TAFORI Master Plan. They were of the opinion that the plan was sound and well prepared, however very ambitious, considering present resources and research capacity. The manpower of TAFORI as of March 1995 is shown in Table 2.

Table 2: Manpower acquisition as of 28/03/95.

PRESENT STRENGTH	MANPOWER
PhD	nil
MSc	13
BSc	13
Technicians: Diploma	17
Technicians: Certificate	17
Laboratory Assistants	17
Administration Staff	2
Accountants	5
Accounts Assistants	?
Personal Secretaries	4
Registry Assistant	nil
Telephone operators	1
Office attendants	3
Drivers	10
Security Guards	18
Field Attendants	109
TOTAL	232

TAFORI has a total of 232 staff, most of whom belong to the support cadre. TAFORI has, at the moment, no PhD's, 13 MSc's and 13 BSc's.

Despite the very weak institutional structure, and considering the fact that too frequent major planning exercises undermine credibility and may lead to "planning fatigue", TAFORI was advised to implement the present master plan for an initial period of at least five years. It was also recommended to update the master plan as an in-house exercise towards the end of 1998. In the updating process, TAFORI should concentrate on a few research priorities only, so that research results would be substantial and meaningful.

Recommendations towards TAFORI (1993 - 2002):

- Update the Research Master Plan, as an in-house exercise, and concentrate on a few research priority areas as earlier recommended by FINNIDA.
- Prioritise and select specific projects for implementation, within each research area. Prioritisation of the projects should, preferably, be clustered geographically, based on on-going and/or planned (donor funded) projects. Additional clusters may be identified in areas that were not covered by this mission.
- Identify for each cluster, potential candidates for collaboration. Considering the inadequate research capacity of TAFORI, collaboration should be sought with national (SUA, University of Dar es Salaam, ARDHI Institute, etc.) as well as international agencies (CIFOR, IUCN, etc.).
- Co-ordinate research and provide advise to government institutions and individuals and disseminate research findings. To that effect, TAFORI will have to invest in a system of co-ordination, documentation and dissemination of research findings. Funds, to enable TAFORI to organise seminars and workshops will have to be made available.

- The mission concurs to FINNIDA's recommendation that, in order to strengthen the institutional capacity of TAFORI, its staff should be encouraged to enrol for further studies.
- It is important that TAFORI is represented in the inter-institutional steering committee for the forest margin integrated community development programme.

More specific recommendations for potential Dutch support are included in chapter 5 and 6.

3 DEVELOPMENT VISION/STRATEGY FOR A FMICD PROGRAMME

3.1 Introduction

Forest areas in Tanzania, irrespective of their status and value, are being used for different purposes. Some of these purposes are intended for local consumption (provision of water, livestock feed, food), others may have national (production of timber, watershed functions, etc.) and even international values (bio-diversity, eco-tourism).

Partly as a result of the ineffectiveness of the present management strategy of the forest and the game departments, partly as a result of the ever increasing demand for agricultural land and forest products, over-exploitation of forest resources by outsiders as well surrounding communities pose a serious threat on the natural resource base.

A change in the management and use of the forests is therefore called for.

3.2 Design considerations

In Eastern Africa, as elsewhere in the world, natural resource management is in a process of change. Described below are some of these changes.

Community participation

Tanzanians perceive community participation as a process geared towards empowerment based on local (individual) priorities and needs. This concept has come about, partly as a result of the country's political ideology of socialism and self-reliance, partly as a result of the fact that communities now generally accept that, for projects to succeed, "user" groups must participate in the planning and implementation of their own development. It should be understood however that, in this context, "user" groups can either refer to private and/or to communal organisations.

Projects that try to link bio-diversity conservation and forest management to the daily needs and aspirations of the local communities living near the forests, should be approached in the same way.

For such participation to be successful, long term projects are required, in which the various activities and socio-economic options evolve over time as a result of the increased participation at grass root level.

An integrated approach

The second aspect that has changed over the years, deals with the principle of integration of disciplines as a prerequisite to development.

One of the major trusts in the DGIS development package in Tanzania, are the DRDP's. The long term objective of the DRDP's is to: "enhance the level of well-being of the rural population in a sustainable way by improving the food security situation and the living conditions in the area, allowing active participation of the local authorities and population, both man and women, in the planning, decision making, financing and implementation of the activities".

DRDP activities are characterised and determined by (i) the capacity of the district for a quick absorption of starter activities, (ii) the physical or agricultural development potential (including conservation of the environment), and (iii) the development potential of rural small holders.

Although initially, many of these activities were sectorally guided, - district Heads of Departments (HoD's) want improvement for their specific sectors - DRDP's have started integrating several of these components in the development plans for villages, which were recently selected for PRA studies.

Sustainability and impact

Thirdly, one has to consider the aspect of sustainability and impact.

The green revolution that started in the early sixties, has been relatively successful in parts of Asia. The green revolution was based on the premise of crop intensification and commodity based, on-station research recommendations. Large fields were cultivated with one crop that heavily relied on high external inputs (such as fertiliser, pesticides, etc.) in order to obtain maximum crop yields and sustain soil fertility. In sub-Saharan Africa however, many farmers have actually been by-passed by this revolution. One of the main reasons is probably the fact that these farms are small in size, mostly use intercropping and have little or no access to external inputs. Most farmers have therefore adopted a low external input type of farming.

Improving these farming systems is possible through a process of Participatory Technology Development (PTD). That process can be defined as a set of activities that aim at a *change of the existing situation* in a direction which is considered desirable by the different users of that technology. Special consideration is given to making agriculture and natural resource management more sustainable.

Impact of technology development can be increased by involvement of the non-governmental sector, including village level structures such as women groups, water user groups, etc.

Farmers as conservators and producers of environment

Last but not least, it should be recognised that farmers/communities surrounding forests do not only undertake activities for their own direct benefit, but also create benefits for the larger, regional, national or international community. These off-site benefits should be rewarded by society (internalising external benefits). This is of particular importance when the direct benefits from land-use practices beneficial to society at large, are only marginally viable to the farmer. To recognise farmers as conservators and producers of environmental products, one may consider different options.

One such option is to design reward schemes for the villages' involvement in the management of forests. For an investment in environmental products on their own land, subsidies from national and international governing bodies may be considered.

3.3 Approach to the development of FMICD projects

Based on the design considerations described earlier, a FMICD project will be proposed. The overall objective of the project is to improve the use of the forest and game reserves as well as the well being of the communities surrounding the forests. To achieve this overall objective, consideration has been given to the integration of the forest resources in the development of the communities surrounding the forest areas. Such integration can take the form of communities assisting in the management and use of forests for their own and society's benefit.

Components of the programme may include activities related to training and the implementation and monitoring of some of the starter activities. The approach for the development of a FMICD project can be used for a variety of forest areas, and also serve as a tool to instil community participation.

The approach is therefore universally applicable, the outcome however, will depend on the specifics of each margin (e.g. forest status, system interactions, available human resources, etc.).

Step 1: Inventory of selected forests

Objective:

- To determine potential future uses of the selected forest by surrounding communities as well as others.

Activities:

- Review of secondary data (maps, land use plans, aerial photographs, projects, reports...).
- Ethno-botanical survey.
- Zonation of the forests into different "use zones" based on vegetation cover, wildlife presence, terrain, water sources, etc.

Manpower:

- District professional staff of the forestry and the natural resource department in collaboration with TAFORI.

Time frame:

- Two months per forest.

Step 2: Training in PRA's for community development and planning

Objective:

- Task force and district staff capable of executing PRA's.

Activity:

- Study tour to FMICD projects with similar forest and land use characteristics.
- Training in participatory appraisal methodologies and concepts for natural resource inventory. Emphasis will be on tools, and local circumstances.
- Training in gender integrated, objective oriented project planning.

Manpower:

- Outside agency.

Time frame:

- One month.

Step 3: Participatory Rural Appraisal in selected FMICD projects

Objective:

- Sensitised villagers and village governments.
- Identification of problems, potentials and solutions in selected forest margin.

Activity:

- PRA in villages in selected sites. Activities geared at data collection on: forest uses, users, land use, farming systems, agroforestry, forest indigenous knowledge, interaction with other villages, taboos, village government (strengths and weaknesses), operating department, local structures and importance of bye-laws, problems and opportunities, etc.

Manpower:

- Implementing task force plus outside agency for first village.

Time frame:

- Two months.

Step 4: FMICD project formulation

Objectives:

- Identification of key actors (government as well as NGO's) identified at village, ward and district level to execute and monitor the forest margin integrated community development projects.
- Planning matrix (logical frame work) with prioritised activities.
- Programme document, including staff requirements, research and training needs.

Activities:

- Human resource assessment (at village/ward and divisional level).
- Project planning workshop.

Manpower:

- Implementing task force and DRDP co-ordinator.

Time frame:

- Two weeks.

Step 5: Implementation of the FMICD project

Objective:

- To gradual develop a forest margin integrated community development programme.

Activities:

- i) Institutional strengthening at village level (village governments) through training and joint planning workshops (identification of activities, training in monitoring and evaluation, community bye-laws/enforcement structures, extension techniques, etc.).
- ii) Training of extensionists (district, NGO, village motivators) to make "social foresters" to facilitate the process of FMICD in:
 - Agroforestry and land use principles.
 - Range land management.
 - Sustainable lumbering (for local use).
 - Extraction of honey.

- Training of trainers.
 - Extension techniques.
 - Participatory monitoring and evaluation.
 - Gender integration.
- iii) Training of villagers in technical aspects related to sustainable forest margin use:
- Special hazards to environment (fires, land clearing, forest encroachments for agriculture, grazing, mining, lumbering, erosion control, etc.).
 - Agroforestry as a tool to lessen the pressure on the forests. Emphasis on indigenous species and technologies.
 - Agroforestry as a tool for improving the water catchment properties of the forest area.
 - Management of earlier established woodlots. To improve the use of these woodlots for the supply of fuelwood/poles and timber.
 - Introduction and/or improvement of fallows and grazing areas. Introduction to alternative feeding systems for cattle.
 - Fuel efficient stoves.
 - Appropriate and environment friendly techniques to collect honey from the forests.
- iv) Participatory selection and implementation of starter activities with selected communities.
- v) Monitoring and evaluation of activities and design of management options. The experiences, gained during the implementation phase of the project, must be well monitored and adapted in consultation with the villagers. Management plans will evolve as a result of the monitoring of interactions between the different users.
- vi) Identification of research, in order to understand specific circumstances and interactions related to the FMICD projects, in:
- Research in land and tenure-ship.
 - Who has rights of use and access to woodland resources?
 - How do patterns of use differ according to gender?
 - What would be the gender-related implications for a devolved management?
 - Identification of appropriate community based structures for the management of such resources.
 - Identification of appropriate management/use practices for the resources, including privatisation, lease arrangements, limited user rights, controlled grazing, afforestation, enrichment planting, permit system, etc.
 - Design and/or strengthening of community based by-laws or enforcement structures.
 - Non-forest land resources and their uses by different communities/members.

Manpower

- Village based teams, supported by district and divisional level task force (see also chapter 6 on implementation).

4 DISTRICT DESCRIPTIONS

4.1 Mbulu district

4.1.1 General

Mbulu District is situated in the western part of Arusha Region. The district is 7,652 km² and characterised administratively by four townships, four divisions, 29 wards and 98 villages. The total population is estimated at 356,377 inhabitants (1988 census). Growth rate amounts to 3.5%.

The average topographic elevation ranges from 1,000 m to 2,256 masl. The physiography of the district shows a large variety, as it is situated between the escarpments at lake Manyara and lake Eyasi, with low-lying arid plains on the eastern and western side. The district borders the fertile, high rainfall highlands in the northern part of the district.

Four agro-ecological zones can be recognised. The first zone is the high to medium altitude, high rainfall zone, which includes the central highlands south-east of Mbulu township, and the wheat growing areas of northern Karatu Division, adjacent to the Ngorongoro Conservation Area. Annual rainfall here, averages 900 mm. A second ecological zone is the medium rainfall/field crops zone, which includes the central divisions north and south of Mbulu townships. Average rainfall is 700 mm per year. The third zone is the semi-arid Dongobesh division in the southern part of the district. Rainfall averages here between 500 and 700 mm per year. The last zone is the semi-arid to arid savannah area in the western part of the district. Rainfall is erratic and normally less than 500 mm per year.

Of a total land area, 475,700 ha have been set aside for grazing. Livestock herding is hence an important component of the farming system. Farms are, in general, of the mixed type. Major food crops are maize, beans, sorghum, Irish potatoes and, to a lesser extent, sweet potatoes, onions, and finger millet. Cash crops, depending on the agro-ecological zone, include coffee, sunflower, pyrethrum and pigeon peas.

4.1.2 Forest areas

The total forest area is 72,000 ha. This does not include the Northern Highland Forest Reserve, which is neighbouring Mbulu District. Apart from these forest reserves, agroforestry (with exotic as well as indigenous tree species) is commonly practised. As a result of a tsé-tsé eradication programme during colonial times, much of the area bordering the Northern Highlands Forest Reserve is, to a large extent, devoid of trees. The mission paid, in particular attention to (i) the Marang Forest Reserve and (ii) the Ngorongoro Forest Reserve.

(i) Marang Forest Reserve

The forest in Marang is located 15 km from Mbulu town and is accessible to the western side from the town to the Karatu road, and to the eastern side from Maji Moto in Manyara National Park. The reserve covers the plateau and escarpment on the western side of Lake Manyara, starting near the lake shore from an altitude of 975 to 2,040 masl. Most of the reserve lies between 1,500 and 1,900 masl. The estimated rainfall is 1,200-1,500 mm/year. The gazetted area is 35,400 ha.

Marang forest has the status of reserve, but a change of status to national park under the new management of Tanzania National Parks (TANAPA) seems imminent.

In the reserve, dry montane forest as well as semi-evergreen montane forests cover the ridge tops and the valleys in the central part. Natural glades, valley grass lands and swamps occur in the deeper depressions.

Marang forest serves as a water catchment for a part of Mbulu and Monduli Districts. Some streams, originating from the forest, flow into Lake Manyara which is part of the Lake Manyara National Park. Very few streams from the forest empty their water into Lake Eyasi. The forest supplies water to surrounding villages, which include Getamo, Endaro, Endamarariet, Bugeru and Daudi (Moringa). The forest also serves as a habitat for wild animals (including buffaloes, elephants and dik-diks) migrating between Lake Manyara National Park and the western part of the Marang Forest Reserve.

A substantial amount of lumbering is taking place in the forest. Most of the timber is being extracted through Bugeru village. Heavy encroachment for lumbering and mining is actually caused by business people from Arusha town. The local communities profit from the lumbering, only in terms of labour, and renting out their houses as temporary storage facilities.

Some villages depend on the forest as a source of drinking water, both for livestock as for human consumption. The villages also rely on the forest for grass, poles and withies for simple house construction. In other villages, such as in Moringa, the community depends on the forest as their sole source of fuelwood or to harvest wild fruits (such as *Vitex kenyaensis*, *Dovialis cafra* and wild berries), medicinal plants, honey, and game meat (bush bucks, dik-diks and wild pigs). The forest is also, for many, a short-cut to near-by villages.

(ii) Ngorongoro Forest Reserve

The Ngorongoro Forest Reserve, or more specifically, the Northern Highland Forest Reserve, is situated in the north of the district, where it borders the fertile, large scale lease farms in Karatu Division.

The overall area is managed by the Ngorongoro Conservation Area Authority, a Tanzanian parastatal.

The reserve is situated about 80 km from Mbulu town. The altitude ranges from 1,600 masl in Karatu town up to 2,200 meter near the rim of the crater. The vegetation is comprised of dry montane forests with grassy glades. Trees include: *Cassipourea maosana*, *Olea africana* and *Prunus africana*. The estimated rainfall may exceed 1000 mm/year.

The forest is of international importance as a biosphere reserve. Although not well researched biologically, the reserve is likely to compose widespread species. The Ngorongoro Conservation Area Authority is, in fact, responsible for undertaking or commissioning studies on rainfall, soil erosion, vegetation, wild-life, and human and livestock numbers within the area.

Tourists, both local and foreign, visit the area annually. In addition, the forest provides most of Karatu Division and the western part of Monduli District with water and serves as grazing grounds for cattle of neighbouring villages.

4.1.3 Farming systems

The farming systems near the Marang Forest Reserve are characterised by small to medium scale mixed enterprises (between three to five ha). Unlike the Marang Forest Reserve, the Northern Highland Forest Reserve is, to a certain extent, surrounded by large scale lease farms. Inside these lease farms, labourers have been given small plots to grow some of their daily subsistence food. These labourers are, as far as woodfuel is concerned, depending on woodlots and coffee prunings from the large scale farms.

In the eastern part, the reserve is bordered by medium scale farms (Ayalabe and beyond). Other farms, further away from the forest and beyond the "buffer" of the large scale lease farms, rely for their woodfuel needs on the area near lake Eyasi (Mang'ola village). Pressure on the Ngorongoro Forest Reserve for, in this case, woodfuel, seems here less of an issue.

Most of the land is prepared through drought power except for the larger farms in the north, where the use of tractors is common. One harvest per year (two harvests for beans) may be expected. Farm sizes vary and range from 4 to 8 ha. Lease farms, however, are large and cultivate one crop mainly (wheat and, to a lesser extent, coffee).

The number of cattle per household averages at 25 heads. The total estimated number of cattle in the district amounts to 365,000. More than 3,000 cattle are kept for milk production. Apart from providing drought power, hides and manure, livestock also plays a major role in social functions, such as provision of dowry, prestige, etc.

4.1.4 Agroforestry activities and projects

Agroforestry has been supported, initially by the USAID funded 'Regional Integrated Development Programme' (1972 -1982) and later, by the SIDA funded 'Tree Planting in Villages' programme (1982 -1993). The early approach aimed at the provision of woodfuel, and, more important, at the conservation of soils in two divisions (Dongobesch division in the south and Karatu Division in the north). In Karatu Division, in particular, the problem of erosion was tackled, since it related to floods, caused by the Ngorongoro water catchment area. Eucalyptus, Black Wattle and Grevillea were some of the tree species propagated and planted. Propagation was centrally managed and seedlings distributed free of charge. All in all, survival rates were discouraging. Moreover, most of the trees, so it seems, found their way to the homestead, rather than to the farm.

From 1988, the Mbulu DRDP started to support agroforestry activities. Until 1992, seedlings were centrally produced and distributed free of charge. The agroforestry emphasis changed, from a specific end-use to a multi-purpose one. The production of seedlings became decentralised and the policy of free hand-outs discontinued.

From 1993, agroforestry activities became part of a more intensive approach towards village-based land and water management. The change in development philosophy - from a sectoral, district wide coverage to a more intensive focus area approach - became apparent, since no appropriate (land and water management) recommendations were available for the diverse agro-ecological situations observed in Mbulu District.

As part of the 'Mbulu District Land and Water Management' programme, five villages have been selected. Two villages are in the vicinity of the Marang Forest Reserve and the Ngorongoro Conservation Area (Morenga and Ayalabe village respectively).

From 1994, forestry seedling production became co-ordinated by the natural resource department only. Agroforestry now focuses on:

- Raising of fruit tree seedlings in nurseries.
- Establishment of demonstrations of agroforestry farms.
- Training on raising, plantation and on management of fruit trees for forestry staff, village extension workers and farmers.

Support is still provided in form of poly-tubes, insecticides, seeds, and technical advise from a village extension worker. The idea for 1995 is to make the nurseries self-sustainable and to discontinue, apart from some technical advise, material support.

As it stands now, a total of 57 village nurseries, 58 primary school nurseries, 21 NGO nurseries and 101 individual nurseries have been established.

4.2 Pare Mountains

4.2.1 General

Same and Mwanga Districts are two adjacent political entities that, until July 1979, were administered under the defunct Pare District. Same District covers 5,150 km² and is divided in 6 divisions, 23 wards, and 65 villages. The total population amounts to 200,000. 70% of this population lives in the highlands. Same District covers the southern and central Pare mountains. Mwanga District is sub-divided into four divisions, 21 wards and 49 villages. The district covers an area of 3,497 km² and is situated in the northern Pare mountain range.

The Pare mountains can be divided into three distinctive mountain ranges. The southern range, that runs for a distance of 60 km culminating into Mt. Shengena, the middle range, which are much smaller and dryer and the northern range that extends 40 km and reaches to a maximum height of 2,113 metres above sea level.

The foothill area, dividing the highlands and the lowlands of both mountain ranges, is more extensive on the eastern side. It receives a greater amount of rainfall because of the predominant easterly wind during the rain season. On the western side of the mountain range, the slope is very steep and much drier. The highlands receive an annual rainfall ranging from 700 to 1,000 mm/year, whilst the lowlands generally receive rainfall below 700 mm per year.

The vegetation cover of the area varies according to the geographical spread of the mountain range. The vegetation includes mountain forests situated at Mt. Shengena and Mt. Kindoroko, and miombo woodlands and scattered trees and shrubs on the slopes and lowlands. A large part of the area is covered by exotic trees and agricultural vegetation.

4.2.2 Forest areas

Forest vegetation cover of Mwanga and Same Districts varies according to geographical features of the Pare mountains. The vegetation includes mountain forests situated at Mt. Shengena and Mt. Kindoroko, while the miombo woodlands and scattered trees and shrubs are seen on the slopes and in lowlands. A large part of the area is used of the non-forested land is used for agriculture.

The two districts has a total of 35,497 ha. of forests which are either reserved or are in the process of being reserved. Out of the total, 79% is in Same District while the rest is in Mwanga District. Of the total forests in the two districts 79% is classified as protective forests while the rest is classified as protection forest reserves. Catchment forest reserves in the districts amount to more that 28,208 ha. where 20,880 ha. are found in Same District.

Mwanga District has a total of 7,486 ha. of forest reserves or 0.07 ha. per capita. Mramba Forest Reserve which has an area of 3355 ha., is the largest of all catchment forests in the district. It is followed by the proposed Kiverenge Forest Reserve with a total of 2,155 ha. The total hectarage of the two reserves amount to about 74% of the district's forest reserves.

Same District has a total of 28,011 ha. where 80% of the area is controlled by the central government and the rest by the district council. Also, 75% of the total is classified as protective forest reserves and the rest is for productive purposes. There are two main catchment forest reserves namely Chome Forest Reserve (14,283 ha.) and Chambogo Forest Reserve (5,467 ha.). The two forest reserves make 95% of the total forest reserves in the district.

Same District is unique in that it has a total of 2,184 ha. of catchment forests which are under local authority. The forests include Chongweni, Kiranga Hengae and Vumari Forest Reserves.

In the same district, Mkomazi Game Reserve (100,000 ha.) is found on the southern part. Its vegetation is mainly bush and grassland. It is managed by the Wildlife Division within the MTNRE. It suffers from encroachment from the surrounding villages. The major problem stems from huge herds of livestock which graze in the reserve particularly during dry season. The per capita area of forest and game reserves in Same District is 0.75 ha.

Catchment forest reserves in the two districts are important water catchments, not only for the local people, but also for the nation as a whole because of its water supply to 'Mkomazi' rice project and the Pangani river. The catchment forests produce, in addition, valuable hardwoods important for the economy of the local populations and beyond. The forests are also used for medicines, honey hunting, fuelwood, poles and withies, grazing and worshipping. Occasionally some forest soil and litter are extracted and used to increase fertility in farmlands.

Local government forest reserves in the districts are mainly managed for productive purposes. They supply fuelwood, poles, withies, timber, and honey. The forests are used for grazing purposes particularly during dry seasons (September to November).

Non-reserved woods and bush lands are normally of low grade and found between forest reserves on the higher side of the mountains and the villages below. The woods and bush lands are utilised communally without any management. They are normally used for fuelwood, grazing, beekeeping and for withies and small poles.

In some areas in the district, there are forests which are owned and protected and utilised by a clan. Such forests are normally small in size (at most 2 hectares) and they are protected and used by clans for worshipping and collection of dry wood for fuel and humus for the farms.

In village farmlands, trees are grown together with agricultural crops. Indigenous tree species, such as *Albizia* spp., are left to grow in farm lands to provide shade for coffee and other agricultural crops as well as for provision of support to some climber crops (Makweme). In addition, exotic tree species, such as *Grevillea* and *Cedrela* spp., are grown in farm lands for similar purposes.

It has also been noted that some individuals own small woodlots of exotic species (mainly black wattle) for fuelwood purposes.

4.2.3 Farming systems

The farming systems in the Pare mountains are influenced by the physical features of the area and by the availability of water for irrigation.

On the eastern side, topography is very steep and rainfall is less abundant. Here, farming requires conservation structures and depends, to a large extent, on a traditional irrigation system, commonly referred to as the "Ndiva" or night water storage reservoirs. The farming system may be summarised as a small scale fallow/irrigated crop-intensive livestock system.

On the windward side, rains are more frequent, and topography less steep. Farming here is characterised by small scale irrigated crop-intensive livestock systems. The population is very dense and fallowing, as part of the traditional shifting cultivation, is no longer possible. Water for irrigation is derived from river intake points. On both sides, farm plots are small with farm size ranging from one to three ha. Crops include coffee, maize, bananas, and vegetables. Bench terracing, especially on the leeward side has given the communities an opportunity to increase income by growing vegetables such as onions, tomatoes and potatoes.

The farmers' use of the *ndiva* system can be traced back to the 1880's. The irrigation system, apparently a farmer's invention, went hand in hand with traditional forms of organisation. For instance, activities such as the construction of furrows and maintenance of the irrigation system used to take place through clan and village elders. Water rights and, for that matter, proper distribution of water, were arranged through a system of rules and fines. Catchment protection was guaranteed through a mixture of traditional beliefs and (external) land tenure systems.

After independence, the Chief doms were abolished and replaced administratively by divisions, wards and villages. Land, that was earlier held under customary law, was being replaced by village control. Chief dom laws were no longer respected and farmers started to cut trees in the catchment areas and to graze cattle near the water sources. The problem of un-sustainable use of the natural resources (land and forests) was aggravated by an increase of the population.

All these changes have led to problems in land and water use and reduced the customary and social traditions. This has led, in its turn, to deforestation, reduced soil fertility and accelerated erosion.

4.2.4 Agroforestry activities and projects

(i) The Traditional Irrigation Improvement Programme

To cater for the problems related to the higher demand for land, water and crops and in order to look into the quality and the availability of land and water, SNV decided to support the TIP. The project started in 1988 (pilot phase) and went into a second phase after 1993. The project is operational in six districts; Arumeru, Mwangi, Same, Lushoto, Kilosa and Iringa. The overall objectives of the second phase of the project are to:

- 1) Create awareness among farmers and local authorities in districts with traditional irrigation about the factors influencing traditional irrigation projects: irrigation systems, afforestation, soil conservation and organisation.
- 2) Increase the acreage of irrigated land in areas of traditional irrigation, through a more efficient use of available water.
- 3) Establish more efficient use of land and water resources in irrigated agriculture through:
 - Introducing better methods for irrigated agriculture.
 - Improving systems used for traditional irrigation.
 - Introducing soil and water conservation measures.
 - Introducing tree nurseries and afforestation.
 - Improving organisation of water user groups and water distribution.
- 4) Reverse the trend of declining water availability and soil erosion by introducing tree nurseries, afforestation campaigns and soil conservation measures in catchment areas of traditional irrigation schemes.
- 5) Create a sustainable district capacity for improvement of traditional projects, and
- 6) Assist local government authorities on all levels, but especially on village level, in creating land use plans that will lead to sustainable and equitable land use.

Important for the objective of the identification mission is the fact that, although the TIP still very much focuses on the traditional irrigation system, the project gradually has moved its overall objective from water supply to a more holistic integrated development.

Activities related to tree planting, soil and water conservation and protection of the forests are introduced through an informal extension system (contact farmers and water users groups) alongside similar extension initiatives from the government.

(ii) Other projects

Apart from the TIP, GTZ supports AF in Mwanga and Lushoto and SIDA supports SCAPA in Arumeru. JICA is involved in research (for afforestation activities) in the low lands of Same and Mwanga Districts.

NORAD supports activities related to protection of catchment forests. The activities deal with:

- Surveying and tree planting of forest boundaries.
- Gap or enrichment plantings in encroached forest areas.
- Law enforcement for the protection of the forest reserves.
- Production and distribution of seedlings (free of charge) for agroforestry purposes in the forest margins.
- Training and extension services (seminars on tree planting, principles of soil and water conservation).

4.3 Uluguru Mountains

4.3.1 General

Morogoro Region is one of the 25 Tanzanian Regions with a population of 1,222,737 (1988 census) and a growth rate of 2.6%. Morogoro District is administratively divided into Morogoro Municipality and Morogoro Rural with a population of 117,760 and 431,795 people respectively (1988 census).

The Uluguru mountains is one of the oldest African massif in eastern Africa. Due to this fact and to the favourable climatic conditions, its flora and vegetation are very rich. The number of endemic species is more than 50 among the wood plants only.

The mountains form a relative high continuous range, roughly NE/SW oriented. This range is divided into two parts by the Mgeta-Bunduki depression. The distribution of the vegetation types is highly controlled by the direction of the rain-carrying winds as the main ridge lies almost perpendicular to this wind direction, the vegetation distribution shows a very asymmetric pattern.

4.3.2 Forest areas

Morogoro District is rich in forest resources. It has a total of 163,270 ha. of forest reserves out of which 157,213 ha. comprises of central government forest reserves and the rest owned by the local government. Most of central government forest reserves are protected for catchment values. They mainly comprise of miombo vegetation. Local authority forest areas are covered partly by miombo woodland, partly by plantations (teak mainly) and woodlots. Local authority forest reserves are supposed to be managed for productive purposes mainly.

Fifteen of the 22 forest reserves, managed as water catchment forests, are along the Uluguru mountain ranges while the other seven are on, or near, the Nguru mountains. The North and South Uluguru Forest Reserves are of particular importance due to their water catchment value to villages surrounding the forests. The forest reserves are also important as a catchment for Ruvu river and many smaller rivers which supply water to Morogoro town and the city of Dar es Salaam.

The Uluguru Forest Reserves are the largest in the district and they cover a total of 25,649 ha. They are rich in bio-diversity and form part of the Eastern Arc mountains.

The Uluguru Forest Reserves are used for extracting building poles, firewood, charcoal, timber and for ruby mining. Most of the illegal charcoal making is conducted along the Morogoro/Dar es Salaam road. Of particular importance is Mindu Forest Reserve, since it is a water catchment for the Mindu dam that supplies water to Morogoro town.

Some forests are being encroached by surrounding villagers for cultivation of agricultural crops. Cultivation is often extended inside the boundaries of the forest reserves. Morogoro District is, in particular, also notorious for its annual wild fires which are set for pleasure, hunting purposes or as a tool for clearing farms.

Within village lands there are areas which are forested. Some of such lands are farm lands which were left fallow by shifting cultivators.

4.3.3 Farming systems

Farm plots are small. Farm sizes range from one to three ha. Crops include maize, cassava, bananas, fruit trees and, higher up in the mountains, vegetables. Traditionally, people in the Uluguru mountains keep few cattle. If cattle is kept, then feeding is possible only by zero-grazing. Land preparation as well as other farm management activities are, in principle, done by hand. Communal land is available and land is fallowed for a number of years. To summarise, farming is characterised by the small scale fallow-based cropping system.

In the past, colonial powers introduced soil and water conservation techniques. Remnants of the contour lines can still be observed. In present years, farmers, under the influence of donor supported development programmes, seem to have taken up some of these techniques again. Contour bunds, grass strips and the use of grasses and agroforestry seem to be the most preferred methods.

Trees on farms are used mainly for construction. *Grevillea* and *Eucalyptus* species are the most preferred tree species. Tree tops and branches from these trees serve the women with woodfuel.

4.3.4 Agroforestry activities and projects

(i) Forest Catchment Project

The 'Forest Catchment' project is a NORAD funded programme that started in 1988 with activities in forest reserves related to catchment protection. The principle objectives are to manage catchment forests in order to:

- Maximise and retain the water harvesting capacity.
- Maximise the environmental balancing capacity.
- Sustain the supply of forest products.

The main activities undertaken by the project include:

- Re-surveying and demarcation of forest boundaries.
- Planting in, and maintaining of, forest boundaries.
- Planting of gaps inside the forest reserves (enrichment planting).
- Running tree-nurseries.
- Patrolling activities.
- Training of field staff.
- Extension work in villages adjacent to the reserves.

The extension work, in particular, includes the raising and distribution of seedlings for villagers and the execution of village based seminars with the emphasis on protection of communal forests. Other extension activities include:

- Preparing management plans for the forest reserves.
- Involving the local communities around the forest reserves in the management of the reserves (The Community Participation Programme).

In performing these activities, villagers have been involved through the formation of '*Environment Committees*'. As part of the programme, villages, individuals and schools were encouraged to establish nurseries. Support was provided in materials such as seeds and polythene tubes. Also, villages play a role of arresting illegal timber harvesters and the villages are given 10% of the catch.

(ii) Domestic Water Supply Programme

DHV implements the domestic water supply programme, that operates in Morogoro and Shinyanga Regions. The aim is to supply clean water, to at least 500,000 people. The water is provided piped or through shallow wells. Agroforestry and/or catchment forestry related activities are not (yet) part of the programme.

Considering the fact that, in recent years, the water supply decreased, the project intends to support an environmental impact assessment study. It is generally assumed that, considering the value of the forest reserves as water catchments, activities related to agroforestry and protection of water catchments will have to be embarked upon. The involvement of the water supply programme in forestry related activities would strongly suggest collaboration with the already on-going activities in the area (for instance the NORAD funded catchment forestry project).

(iii) Uluguru Mountain Integrated Soil Conservation Project

The 'Uluguru Mountain Integrated Soil Conservation' project is a SUA initiative (involving 8 scientists) and funded by NORAD.

The project is the result of the university community's concern to naked neighbouring Uluguru mountains. The objectives of the project include to stop or, at least, reduce soil erosion and increase soil productivity, to encourage tree planting so as to support local wood requirements, to improve nutritional status of the people, and to rehabilitate the SUA immediate environment.

The activities of this project mainly works through a nucleus group of 10 farmers. The nucleus group is used to train other farmers and they are paid a modest honorarium each of Tsh. 500 per working day spent teaching other farmers.

Related to this project, are the collaborative initiatives between SUA and TAFORI in assessing and monitoring water flow in Uluguru mountains.

4.4 Kahama District

4.4.1 General

Kahama is located on the central plateau in Tanzania. It is one of the five districts in Shinyanga Region, south of Lake Victoria and covers a total area of 19,949 Km². A new tarmac road that cuts through the district from west to east and links up with Rwanda and Burundi opens up the area.

Administratively, the district is divided in eight divisions, 48 wards and 317 villages of which about 278 have been registered officially. The current population amounts to 622,425. A large part of the population is concentrated in the east. Average population density for the inhabited area is 58 persons per square km. The population in the east and the south is mainly of the Sukuma related Nyamwezi. In the west, the Wasukuma are the dominant tribe. Of recent, considerable numbers of Wasukuma are settling down in the east and the central parts.

Kahama is to a large extent a flat country, with an altitude of approx. 1,300 masl. Hill-tops, in general, are not higher than 1,450 masl. The district drains in south-westerly direction where large swamps are present in the Nikonga Game Reserve.

Rainfall averages around 900 mm per year. There is a long rainy season from March to May, a very dry period from June to September and a short rainy season from October to December.

Two major soil types are found. In the whole of the southern, central and western part sandy loam's are predominant. These soils drain well, but have low soil fertility. In the east and north-east, large stretches of black cotton soils are present. These soils are characterised by a high natural vegetation, a high water retention capacity but with low workability.

Based on the climate and soil types, three agro-ecological zones can be observed: i.e. the north-eastern zone, the central zone and the western zone.

4.2.2 Forest areas

Kahama District has a total of 938,000 ha. of forest and game areas which is 47% of the district's total area. Most of the forest vegetation is miombo woodland. Denser vegetation is found in the western part which has more than 70% of the district's forest vegetation cover. In contrast, most of the forest vegetation cover in the eastern part of the district has disappeared due to heavy grazing and human settlement. The district has a total of 699,900 ha. of forest reserves, of which, 20% is managed under the district council and the rest by the central government. All the forest reserves in the district are managed for non-catchment purposes. Nikonga River Forest Reserve forms 70% of the district's forest reserves. There is also Kigosi Game Reserve which extends to Kibondo District in Kigoma Region.

The district's per capita forest reserve area is 1.1 hectares, but the figure is far much less in the eastern part of the district which has far much high population density and far much less area with forest reserve status.

In addition to forest reserves, there are substantial amounts of non-reserved natural forested lands mainly in the western part of the district (Ushirombo Ward). Such areas are being cleared very fast for agricultural expansion. On the western part of the district the situation is aggravated by cultivation of food crops which are in high demand for refugees camps in neighbouring Ngara District, while on the eastern part there is clearing for settlement, grazing and charcoal burning. The latter is done mainly to supply the fuel for Shinyanga town. It was also noted that there are some villagers who specialise in clearing of forested lands and sell the cleared plots to permanent cultivators.

Most of the forests are used for grazing of cattle, lumbering, collection of other construction materials (mainly poles and posts), collection of herbs and medicinal plants, collection of fuelwood, charcoal production, game hunting, and for cultivation. Some beekeeping is being undertaken in Kigosi Game Reserve. Tobacco is grown in the southern part of the district. Major tree species are of the *Brachystegia* spp, *Albizia* spp and *Combretum* spp etc.

Forest covers are also reduced by activities other than settlements. These include: pit sawing, debarking, provision of wood for building, household fuels and re-enforcement's of mine pits.

Not much tree planting is done in farm lands except for areas where the HASHI (see para. 4.4.4) has been involved (mainly on the eastern part of the district). The main species planted is *Eucalyptus*, but *Gmelina arborea* seems to be the most demanded exotic tree species. Efforts to plant fruit trees are being frustrated by termite attack and the existence of a hard pan. It has been observed, that some natural indigenous species regenerate in farm lands by coppicing.

4.4.3 Farming systems

The main productive activity in the district is farming. It is estimated that about 90% of the population is dependent upon agriculture for their source of livelihood, both for food and cash (note that, because of the refugees, many food crops become cash crops.)

The sector is characterised by small holder farming and the main technology used is the hand hoe. In some parts of Kahama, oxen ploughs have been introduced, be it on an experimental basis. Major cash crops are cotton and tobacco, whereas paddy, cassava, maize and beans are the most important food crops. Paddy is being traded as much as ground nuts, maize and millet.

Pastoralism, fishing, beekeeping, mining and exploitation of the forest products are supplementary activities to farming. The extent of these activities in terms of their contribution to the overall economy of the household or the district is not exactly known. Efforts to develop the livestock sector in the district have not been substantial and only a few individuals in Kahama town own dairy cattle.

Mining has emerged as a potential employment activity. There are five known gold and one diamond deposit in the north-west and the north-east of the district. The mining activities may form a serious threat to the remaining forest areas.

4.4.4 Agroforestry activities and projects

(i) Kahama District Rural Development Programme

Kahama DRDP was initiated in 1993. Its long term objective is to improve the well being of the people on a sustainable basis, so that, in the long run the district will be able to finance the social sector. Most of the activities are as yet in their birth stage.

To reverse the current trend of environmental degradation, Kahama DRDP has planned activities in the field of conservation, afforestation and land use management. More specifically, the activities include:

- Strengthening of public awareness on the importance of preserving the natural resources.
- Participatory rural appraisals and farming systems diagnostic surveys.
- Implementation of projects resulting from the PRA's.
- Initiating a study into alternative energy sources.

The approach will be participatory, gender specific and inter sectoral/inter agency. The DRDP in Kahama strongly seeks to work through the existing NGO's in (or outside) the area, in view of the inadequate institutional capacity at district level.

At the time of our visit, one PRA had been conducted in Ushiroombo Ward by a team of experts from forestry, land use planning, agriculture, and participating NGOs. After the PRA, a planning workshop, in consultation with the villagers, was organised. The report of this workshop is still under press.

Natural resource management projects are also executed by HASHI, World Vision and CARITAS.

(ii) Hifadhi Ya Ardhi Shinyanga Programme (HASHI)

HASHI was established under the MTNRE in 1986 and became operational in 1988. HASHI operates in all districts of Shinyanga Region, including Kahama District.

The broad objective of the programme is to restore and conserve land. For this purpose, HASHI uses an approach of tree planting and indigenous tree conservation and focuses on core problems such as overgrazing, over exploitation, bush fires and wood fuel.

In Kahama District, HASHI concentrates on the eastern part. This area is much dryer and depleted than anywhere else in the district. An important aspect of their approach is the use of contact farmers as well as the activities dealing with village woodlots, women groups, schools and children. Farmers are advised to plant trees along their boundaries, particularly on smaller plots. Another important strategy used by the project is the regeneration of cleared trees in the farmers' fields.

Of particular interest to the aspect of natural resource management is the re-introduction of the traditional "Ngitiri" system. One example is HASHI's support to the re-generation of trees on an abandoned sisal estate. A HASHI supported management plan will allow the villagers to use the crooked stems, for the first time after eight years, as firewood, and intends to hand over the management of the woodlot to the neighbouring community after 10 years.

Research, is undertaken in collaboration with ICRAF, TAFORI and SUA. The activities of the HASHI programme are funded by NORAD through the MTNRE.

(iii) World.Vision

World vision in Kahama is funded by an Australian NGO. Initially, the programme aimed at child survival improvement by addressing the malnutrition status. Later, activities expanded to include community and water development.

The community development programme has two main components, i.e. food production and land use husbandry. The activities of land use husbandry are concerned with tree planting and tree conservation. PRA's for data collection have been scheduled in at least five villages in Busangi zone. This will be followed by the formation of focus groups and the establishment of village committees. Tree nurseries will be established in two villages.

Given the resources, World Vision is very much willing to expand its programme. It already has attracted funds from the World Health Organisation to combat AIDS.

(iv) CARITAS Kahama

CARITAS, a Roman Catholic Church NGO works through the church structure of parishes. Apart from a project dealing with appropriate building technology, CARITAS lacks funds and specialised skills to initiate activities in the field of agroforestry. A feasibility study on forestry related activities is currently being studied by the Bishop.

4.5 Biharamulo district

4.5.1 General

Biharamulo is one of the five districts from Kagera Region in north-west Tanzania. The district shares boundaries with Muleba and Karagwe District in the north and Geita in the east. Kahama District adjoins it on the south, whereas Kibondo and Ngara Districts are on the west.

Biharamulo District has an area of 9,199 km². Out of the district's total area about 100 km² is water, whilst the remaining area is plain settled land. The district is divided into five divisions. The five divisions are divided into two wards with a total of 89 villages. According to the 1988 census, the population amounts to more than 209,000 people.

The distribution of the rainfall in the district is bi-modal and precipitation varies with the area. Long rains fall between mid-February and June and short rains become due around September and December. The total annual rainfall is in the range of 800 - 1,000 mm per year. Eastern Biharamulo, where forests have been cleared, gets the lowest rains and are erratic in nature. The western part receives a reasonable reliable minimum of 900 mm. As a result of forest clearing in the eastern part of the district, wind speed over there is much higher than anywhere else.

The altitude ranges between 1,135 and 1,500 masl. Land formation is in the order of flat, undulating rolling landscapes and hilly. A big part of this land comprises the Burigi Game Reserve, a very famous wild life treasure in Kagera Region. The central part of Biharamulo District is hilly.

Based on climate and soil types, two main agro-ecological zones can be discerned: the eastern zone and the western zone. The western zone is largely covered by forests. In the eastern zone, natural vegetation has been destroyed by man through illicit cultivation, overgrazing and uncontrolled bush fires. Thickets and sterile land with short, little grass - apart from some remaining scattered trees- is all what is left. Here cotton farming and intensive grazing are two major activities. The Biharamulo Game Reserve, which extends from the shores of the lake towards the hinterland, forms the only green belt of natural vegetation on that side of the district.

4.5.2 Forest areas

Forest land in Biharamulo District amounts to about 500,000 hectares which is more than 50% of the district's total land area. About 60% of the forested land is gazetted as forest reserves and game reserves while the rest is unreserved. Two forest reserves are of particular interest, i.e. (i) Biharamulo Game Reserve and (ii) Biharamulo Forest Reserve.

It was noted that the population in the eastern part of the district depends heavily on forest resources of both Biharamulo Game Reserve and Biharamulo Forest Reserve. Per capita area of the reserves for the eastern population is 1.0 hectares while the corresponding figure for the western population is 4.6 hectares. The overall district figure for the district population is 1.3 hectares per capita.

(i) Biharamulo Game Reserve

Biharamulo Game Reserve which amounts to 120,000 hectares is currently managed by the central government for tourist hunting. Despite the fact that, a well written management plan for the reserve does not exist, the objectives, as far as the management of the reserve is concerned, are clear: to conserve the wild life (plan to which # stake holders must adhere to) and to improve the reserve's infrastructure through construction of dams, opening of roads and utilisation of the reserve's potential.

The reserve seems to have too low a concentration of animals for it to attract a meaningful tourist hunting. In addition, the area is seriously infested with tse-tse flies. Lack of requisite infrastructure to allow easy access into the reserve, have kept the tourists away. As a result, revenue from game fees over the last few years are negligible.

Since 1992, the central government placed 14 people in four game posts around the reserve to curb illegal activities in and around the reserve. Despite these efforts, illegal activities have continued. Charcoal production is undertaken by nearby villagers mainly for Chato town. Collection of various forest products such as firewood, honey, medicinal plants, poles, posts, and withies for local consumption by nearby villagers is a usual phenomenon. Also game hunting mainly for meat, and lumbering, are common in the reserve. Grazing, particularly during dry seasons, is normal. A total of four villages are neighbouring the game reserve, namely Kasenga, Ichwinkima, Igarala and Katete.

(ii) Biharamulo Forest Reserve

Biharamulo Forest Reserve, which extends to Kahama District, is located in the southern part of the district. The portion which is in Biharamulo District, amounts to 90,600 ha. The forest is owned by the central government for productive purposes and is managed by the forest department in Kagera Region.

The surrounding villages use the Biharamulo Forest Reserve in a similar fashion as the Biharamulo Game Reserve except that, for the Biharamulo Forest Reserve shambas and some semi-permanent settlements are situated within the forest reserve boundaries. Further, charcoal and timber extracted from the forest is transported to Geita town and beyond. The mission observed massive destruction of valuable trees to give way for agriculture. Girdling of many trees as well as debarking of valuable timber species for bark hives was a common phenomenon.

It was claimed that encroachers came from neighbouring Kahama District and that nothing could be done by at district level to curb the situation since the forest falls under the jurisdiction of the regional forest office. The latter is supposed to be given resources to carry out protection activities for the forest. It was also claimed by the regional forest office, that the MTNRE was requested to provide some 700,000/- shillings for the Region to launch an operation to remove the encroachers from the area. The funds had not been received by the region as at 25 April.

4.5.3 Farming systems

The farming systems are determined by the agro-ecological zones (climate and soils). In the eastern zone crops include: cassava, maize, beans ground nuts, millets and sorghum. Major cash crops are cotton and rice. The zone keeps more than 90% of the district's total livestock herd. It is also the only zone in which fishing does take place. The soil in this zone is sandy with reduced and low soil fertility.

In the western zone, crops include coffee and tobacco as cash crops which are grown on a small scale. Apart from coffee, there are bananas, cassava, sweet potatoes, sorghum, and leguminous crops. The area keeps less than 10% of the herds population.

Farm size varies from 0,5 to 4 ha. Land is prepared by oxen or by hand. Fertilisers are hardly used, however a system of crop rotation is being practised. Fallowing for fertility restoration is no longer applied.

4.5.4 AF activities and projects

(i) Biharamulo District Rural Development Programme

Biharamulo DRDP started its activities in 1994. The main objective of the DRDP is to improve the standard of living of the local population by enhancing peoples capacity to increase food production through improved crops and animal husbandry.

Since major problems may be observed in the eastern part of the district, as a result of incorrect and resource-mining land use practices, the district council will focus its attention to the intensification and diversification of agricultural production systems. Natural resource management related activities will deal, for 1995, with land use planning, the establishment of tree nurseries and the conservation of natural forests.

The five-year development plan is yet to be prepared. It is assumed that the plan will be more explicit as far as methodology and anticipated activities is concerned.

(ii) Other projects

Two other NGO's are operating in the district, CARITAS under the Rulenge Diocese and ACORD, a British NGO. CARITAS did show interest in afforestation activities, however not in villages bordering the game and/or forest reserves. It seems likely that the CARITAS, Rulenge division will soon start off activities related to beekeeping in Biharamulo. The team however was not in the position to obtain more information on the issue.

4.6 Ngara District

4.6.1 General

Ngara District has an area of 3,744 km² and an estimated population of 180,000 (1988 census). Ngara District borders Biharamulo and Kibondo Districts to the east, Karagwe District to the north, the republic of Burundi to the south-west and the republic of Rwanda to the north-west.

Seventy percent of the population lives in the north-western part called Bugufi, which makes up roughly 30% of the district surface area. The remaining 30% of the population lives in the south-western part called Bushubi, an area which is sparsely populated (35-45 people per km²) as compared to Bugufi whose density is 90 persons per km². The people living in Bugufi are mainly Wahangaza tribe who are originally related to the livestock keepers in Rwanda while in Bushubi area, the Washubi are mainly subsistence crop farmers.

Ngara District is characterised by a dramatic influx of refugees (more than 600,000!) from neighbouring Rwanda and Burundi. The refugees, en-route to designated camps, temporarily settle in school compounds and health centres and over-utilise these social infrastructures. The district is faced by regular food shortages (farmers, in stead of storing their surplus harvests, sell their crops to the refugees) and by serious price hikings, making Ngara town one of the most expensive in the country.

4.6.2 Forest areas

Ngara district is characterised by the presence of riverine forests along river Mwiruzi, river Ruvuvu and river Kagera.

Another forest type is the dry miombo which has been the major source of fuelwood and construction material for refugees. Land surrounding the refugee camps, formally stocked with trees, are now bare. Refugees have an alarming impact on the surrounding environment. Trees are disappearing at an alarming rate of 500 m³ of wood daily. Water sources are quickly drying up.

Despite the importance of these forests in supplying fuelwood and maintaining the ecological and hydrological balance of the district, not much is known about their extent. It was observed that, despite previous attempts by the district to gazette 2,522 ha. of Goyagoya forest as a local authority entity, the district has in fact no forest reserves (except for a small portion of Burigi Game Reserve that extends into the district from neighbouring Biharamulo District).

Some studies, to assess supply demand trends of forest products, have been initiated earlier, mainly in, and around refugee camps.

It was also observed that, due to the involvement of many local and international organisations in forestry and environmental activities in the district, there is an urgent need of increasing the co-ordination capacity of the district administration. National authorities should be requested to give this issue its due attention.

4.6.3 Farming systems

The farming systems in Ngara District depend on physical as well as on socio-cultural circumstances. In the higher altitudes of the district, where rainfall is abundant, the farming system is characterised by banana/coffee cultivation. Plots are, in general, small and most of the farm management practices are done by hand. Other crops include; i.e. maize, beans, cassava, sweet potatoes and vegetables. Many of these crops are sold to the refugees. Livestock, although present, is not very important.

In the lower parts of the district (1,200 masl) rainfall is less abundant. Bananas and cassave become the major food crops.

Since most of the population are descendants from Burundi pastoralists, range herding is much more frequent. Large herds of cattle, migrating from one area to another can be observed. Farms are much bigger in size and fallow, as a means for the restoration of the fertility, can still be observed.

4.6.4 AF activities and projects

(i) Ngara District Rural Development Programme

Ngara DRDP started its activities during the second half of 1994. The long term objective of the NDRDP is to improve the standard of living of the rural populations by enhancing peoples capacity to increase food production through improved crops and animal husbandry. Participation will be promoted through involving people in project planning, identification, formulation, appraisal and implementation. Overall, the Ngara DRDP should contribute to sustain the natural resource management base through development.

Activities related to the sector of natural resource management, focus on:

- Raising of seedlings and afforestation.
- Bush fire control.
- Protection of water sources.
- Training and awareness raising.

An activity that does not yet feature in the Ngara DRDP annual plan, but that is nevertheless foreseen in the coming years, are the protection of riverine forests and the planting of 10 ha annually along Ruvuvu and Kagera rivers. Bye-laws, which demand that no cultivation will be allowed in a 15 to 30 meter buffer, will be enforced.

Apart from the Ngara DRDP, forestry related activities are being implemented by several other NGO's. UNHCR, through an environmental task force, co-ordinates most of these activities.

(ii) Other projects

NGO's involved in tree planting are: the Ngara District Development Organisation, Kakindo Wakulima, Christian Council of Tanzania, Folk Development College, CARE and CARITAS. All these organisations receive funds from IFAD for a common purpose: the production and planting of seedlings in the affected areas.

CARE, apart from their tree seedling strategy, is involved in the supply of fuel wood (from further away areas) to the refugees (an activity they have taken over from GTZ at the end of 1994) and in the introduction of fuel efficient cooking stoves. The latter, in particular, seems to have had a high adoption rate (more than 80%). CARE contracts forest guards to mark and protect trees from illegal cutting.

GTZ recently carried out an identification mission, both for Karagwe and Ngara districts. It is expected that, if funds can be assured, a forestry programme will take off at the end of 1995. The programme is characterised by an initial phase of planning (two years) and an implementation period (three years). The implementation period entails the introduction of "social forestry" activities in the villages surrounding the major refugee camps. Apart from the raising of seedlings in central nurseries, the establishment of private nurseries will be encouraged.

It should be noted that, despite the various efforts and many thousands of seedlings raised and planted to-date (an estimated of 500,000 seedling of various tree species have been planted so far), survival rates are very discouraging. Most of the NGO's - including the Ngara DRDP - lack the technical capabilities and the manpower to adequately monitor the activities.

Other problems are related to:

- Termite attack.
- Free range grazing of animals.
- Fire outbreaks.
- Shortage of qualified forestry staff. The district has only five trained foresters.

Reforestation by vegetative means have not yet been attempted.

It was noted that the district administration is still relying heavily on paid labour for forestry activities. Some tree seedlings are still issued free of charge. Participatory approaches are yet to be applied.

4.7 Karagwe District

4.7.1 General

Karagwe District covers an area of 6,734 km². Most of the district is hilly and mountainous. The district has four divisions, 16 wards and 96 registered villages. The population is estimated at more than 300,000 people (1988 census). Growth rate is about 2,7% per annum.

The district's altitude ranges from 1,500 to 1,835 masl. The central part, in particular, is very mountainous. Rainfall ranges from 580 to 1,000 mm per year. Based on the rainfall and the topography, the district can be divided into three agro-ecological zones; i.e. the northern zone, the central zone which comprises the mountainous part, running from north to south and the eastern zone. Three quarters of the area is arable. Out of a total of 610,000 ha, 201,000 ha. are used for agriculture and livestock.

4.7.2 Forest areas

A total of 93.000 ha. of the district is covered by forests while 120.000 ha. is classified as bushland. Total forests and bushland amount to 32% of the district's total land or a per capita forest area of 0.6 ha. Karagwe District has a substantial amount of forested area gazzetted as game reserves. The forest vegetation is mainly dry miombo which is infested with tse-tse flies. The largest game reserve is the Burigi Game Reserve which has a total of 220.000 ha. on the south, followed by Rumanyika Game Reserve with an area of 80.000 ha. on the northern part of the district, and Ibanda Game Reserve which has a total of 20.000 ha. on the north western corner of the district. Burigi Game Reserve extends to Biharamulo District while Ibanda Game Reserve extends to the neighbouring Rwanda. On the south, there is Kimisi Game Controlled Area with a total of 150.000 ha. There are plans to upgrade the game controlled area into a game reserve because of its importance to animals migrating from the neighbouring Buligi Game Reserve.

Ibanda Game Reserve is used as range land for grazing by semi-nomadic people from both Rwanda and Uganda. There are some illegal settlements in the reserve. Both Ibanda and Buligi Game Reserves have enough animals to attract tourist hunting, but Rumanyike Game Reserve does not. Worse still, the reserve is threatened by population pressure from the surrounding villages. In particular, there is illegal timber harvesting. The same happens in Kimisi Game Controlled Area.

Most of the riverine area along Kagera river in the western part of the district which borders Rwanda is either part of a game reserve or game controlled area. Hence the riverine forests are inhabited and therefore they face any major threat from human activities.

Like in Ngara District, Karagwe has had refugees settlements mainly in the forested areas. The total number of refugees is 160.000 people. Chabalisa in the centre of the district is the largest refugees camp with 105.000 people followed by Omukariro camp on the south with 30.000 refugees. Demand for fuelwood and construction material for the refugees has had an adverse effect not only on the forest areas but also on the wildlife population.

Nevertheless, the amount of devastation is less compared to that one in Ngara District. Efforts have been made to switch to alternative sources of energy by using peat mainly from decomposed papyrus for Kagenyi refugee camp. Of particular importance in Karagwe is the problem of illegal hunting mainly by refugees.

Although there is no direct involvement of local populations in the management of wildlife resources in game reserves, there is a pan-territorial revenue-sharing arrangement for earnings from tourist hunting where 10% of the revenue is returned to the district council to be used for the development of villages bordering the game reserves. In addition there is an arrangement where the tourist hunter (Africa Expedition) sells game meat to villagers once a week and the earnings are deposited in the village bank account.

A major forestry activity in the district is the production of tree seedlings for planting in areas devastated by refugees. Due to the high demand for tree seedlings most of them are sold. The most demanded species are Eucalyptus, Maesopsis, Cedrela odorata and Grevillea. Several international organisations are involved in production and purchase of tree seedlings. In addition some of the district's farm extension centres have attempted to raise tree seedlings.

Major problems affecting afforestation activities in the district are destruction of young trees by:-

- Termite attack.
- Free range grazing.
- Fire outbreak.
- Shortage of qualified forestry staff. The district council has only one diploma holder and four certificate holders.

Although bye-laws have been enacted to prevent destruction by fire and free range grazing, not much progress has been made in implementing the bye-laws.

Lastly, as for Ngara, it was observed that, due to the involvement of many local and international organisations in forestry and environmental activities in the district, there is an urgent need of increasing the co-ordination capacity of the district administration. It was also noted that there are some NGO's which would like to undertake beekeeping development activities, but the only district beekeeping officer was retired as a result of the current retrenchment exercise in the country. National authorities should be requested to give this issue its due attention.

4.7.3 Farming systems

Farming is for subsistence purposes and characterised by low productivity. Three different land use systems may be observed: the 'Kibanja', the 'Kikamba' and the 'Rweya'.

The kibanja, literally meaning permanent cultivation of perennial crops, are found on relatively fertile patches. Main crops in the kibanja are bananas and coffee. Beans form an important annual crop and is grown by almost all farmers. Minor kibanja crops include maize, root crops and a variety of fruits and vegetables. This system is very intensive and based on man-made humic-soils.

The kikamba is usually smaller than the kibanja and is planted with annual crops like sweet potatoes, groundnuts, cassava, beans and sorghum. The kikamba can be transformed into a kibanja, the kibanja can revert into kikamba.

The rweya is the open grassland, mainly used for grazing cattle; cultivation of annual crops is hardly possible in this area where mulch, carpet grass and brewing grass is obtained. The nutritive value of grass for cattle found on this land use type is very low.

Although few households actually own cattle, livestock is considered an important component of the farming system.

The cattle are known to have contributed substantially to the fertility status of both the kibanja and the kikamba. Present soil fertility problems may be associated with the decrease in cattle population (note that, in the north of the district large cattle herds are migrating back to neighbouring Rwanda).

4.7.4 AF activities and projects

(i) The Karagwe District Rural Development Programme

Karagwe DRDP started its operations in 1994. The programme has as overall objective to rehabilitate and adequately maintain the existing social and supportive infrastructural facilities at district level. In so-doing, the DRDP focuses its development activities on the major problems and constraints observed in the district. These are:

- Soil erosion (large herds of free ranging cattle, especially in the north accelerate this process).
- Uncontrollable bush fires, instigated by local people for purposes of improving the grazing grounds, facilitating beekeeping activities, hunting and farming.
- Clear tree felling for agricultural expansion, charcoal burning and brick laying and the destruction of the water sources.
- Since recent Rwandan refugees who exploit the natural resource base for woodfuel purposes mainly.

In order to cope with these problems, Karagwe DRDP defined its natural resource management programme with activities aiming at:

- Protection of natural water sources by demarcating respective areas, planting of suitable tree species through schools and NGO's and control against all possible uses for agricultural cultivation or cattle herding.
- Control and surveillance of bush fires by conscientising the rural communities.

The strategy will include the introduction of appropriate wood energy conservation devices as well as appropriate extension and training services.

As a result of the vast influx of the refugees, agroforestry activities will feature more prominent in the coming five-year development plan. The approach will be one of establishment of tree nurseries, environmental rehabilitation in 14 villages affected by the refugees and range improvement in at least four villages.

Karagwe will use a multi-disciplinary, multi-sectoral approach, in which major NGO's can participate.

(ii) Karagwe Development Agency (KARADEA)

KARADEA is a young NGO that started its operations in 1987. It receives its funds mainly from Sweden. The main objective of KARADEA is to unite people in their endeavours to improve the standard of living in the district with, in particular, a development emphasis on women. The NGO has a diverse package of development activities, some of which cover nutrition, rain water harvesting, introduction of appropriate technologies (for instance wheel barrows, and donkey cards), education and research, rural electrification (through solar energy) and youth and orphan development.

An important aspect of the programme is related to afforestation. In order to combat the problem of erosion in the district, trees are being planted on-farm as well as on school compounds. The programme supports the villagers with seeds, poly-tubes, watering cans and technical advice. Part of this advice is being delivered by the district forest officer. The programme also supports the establishment of a village woodlot (120 acre near Mkwenda village) and tree planting activities near by Mwiswa river.

The main problems observed by the NGO are the predominant bush fires (these destroy many of the planted seedling on-farm), an inherent inadequate monitoring capacity and the lack of technical capacity in natural resource management.

(iii) CARITAS

CARITAS, Rulenge Diocese, started its afforestation activities in 1991. The main objective of the programme was to cater for woodfuel. To that effect, the programme established a total of 11 (centrally organised) tree nurseries (one per parish).

Since 1993, fruit and ornamental trees, fodder trees and trees for water catchment purposes were included. From last year, CARITAS observed a high demand for tree seedlings from the local communities, probably as a result of the large influx of refugees from neighbouring Rwanda.

In order to cater for this demand, CARITAS now encourages the establishment of private nurseries. To that effect, the programme initially supports the farmers with poly-tubes, seeds and advise and guaranties itself to purchase the seedlings at fixed prises.

CARITAS could be assisted in training on aspects related to agroforestry extension and bushfire control.

4.8 Bukoba District

4.8.1 General

Bukoba district is one of the six administrative districts in the Kagera Region. It is situated on the west of Lake Victoria. On the northern side it is bordered by the Uganda republic, on the south it is bordered by Muleba District and on the western side there is Karagwe District.

Bukoba has an area of 528,200 ha with a human population of 343,956 which is growing at 3.1% per year (1988 census). The district is administratively divided into six divisions, 41 wards and 168 registered villages.

Rainfall is bi-modal with an average from 600 to 2,000 mm per year. Average temperature is around 20^o C. Bukoba district is, especially in the central part, hilly. To the north it becomes flat land.

4.8.2 Forest areas

Bukoba District has a total of 38,098 ha. of forest reserves which is 7% of the district's total area. Most of the forest vegetation is in the reserved land and the forested area per capita is 0.1 hectare.

Minziro Forest Reserve has a total area of 24,841 hectares and is the largest, followed by Munene and Kikuru Forest Reserves which both have an area of 5,998 hectares. Other smaller forest reserves are Ruchwezi and Rubare. The latter is mainly a forest plantation of mainly Pine species which is harvested for timber by residents of Bukoba town. All the forest reserves are owned by the central government.

Minziro Forest Reserve is a lowland high forest on the lower part of Kagera river. It extends across the international boundary with Uganda where it is known as Malamagambo/Sango Bay forest reserve. Minziro Forest Reserve is of particular importance to the inhabitants of Misenye Division. About 70,000 people of the division are, in one way or the other, making use of the forest. The forest can be used as:-

- A source of wood for domestic energy. Much of firewood collection is done during dry season.
- A source of water during dry season. About 20,000 people of Minziro Ward depend on the forest by making boreholes along forest margins.
- A source of timber, poles and withies for construction and other forest products for homecraft. Most demanded timber species for commercial purposes is Podo.
- A source of game meat. Antelopes, hyraxes, dik-diks and bufaloes and other animals are hunted by neighbouring villagers.
- Honey source.

At regional and national levels, Minziro Forest Reserve is of importance due to its vital function of maintaining hydrological cycles and stabilisation of micro-climate of the area. Also the forest has an international fame of maintaining biological diversity. Over 500 species of butterflies are found in the forest as well as 15 new bird species which have been spotted in the area. Some of such species have a high degree of endemism. The forest also has a diversity in plant species which include fungi, algae, mosses, lichens, ferns, lianas, shrubs and trees. The most common tree species in the western part of the forest is *Acacia polycantha*.

Munene Forest Reserve is located in the southern part of the district. It is harvested for:-

- Fuelwood for domestic use mainly for cooking and heating.
- Fuelwood for tea drying by tea factory, fish drying, and brick baking by villagers.
- Source of construction wood for use by villagers.
- Source of material for homecraft.
- The forest margins are used as source of water during dry season.

Of special importance are the large quantities of fuelwood consumed by the tea industry. If efforts are not made to curb this situation, much of the forest resource will be depleted in a few years.

Village settlements around both forests are separated from the forests by big chunks of glades which provide grazing grounds for livestock during dry season. Also, both forests are characterised by high water table and swampy conditions. As such, villagers do not exert much pressure to the forests for either settlement or cultivation. Also due to the swampy conditions of the forests fire outbreaks are rare.

In some village lands there are a few forested areas which act as water catchments for streams. Such areas are managed by the village governments with assistance of the Bukoba DRDP.

In farm lands, trees are grown to provide shade for coffee crop. Major species for shade are *Maesopsis eminii* and *Grevillea*. In rweya lands *Eucalyptus* spp. and *Pinus caribaea* are grown to provide the villagers with fuelwood and timber. *Ficus* species which used to be an important species for the Haya tribe, seems to be losing ground. Unlike many other districts, tree seedlings in Bukoba District are sold to customers. Some schools and churches do produce tree seedlings for sale.

Major problems in raising tree seedlings are:-

- Termite attack mainly on *Eucalyptus*.
- Acute shortage of manure and forest soil for nursery operations.
- Shortage of seed material for some species such as *Caliandra* and *Pinus caribaea*.

4.8.3 Farming systems

In the whole of Bukoba, land is the most valuable resource. For the majority of the population, agriculture is the main occupation. Rapid population growth, especially during recent years, has led to a shortage of productive land. The unoccupied grassland area is too infertile to be transformed into a productive entity, i.e. permanently cropped land.

As is the case with Karagwe, three major land use types may be discerned: the 'Kibanja', the 'Kikamba', and the 'Rweya' open grassland, used mainly for grazing cattle. Since recent, major fertility problems have been observed mainly under bananas.

4.8.4 AF Activities and projects

(i) Bukoba District Rural Development Programme

Bukoba DRDP started in 1988 with the aim of improving the living standard of the rural people. The programme is multi-sectoral and it aims for sustainability. Its activities, executed through the regular system of the district council, focus on:

- Intensification and diversification of agricultural production systems.
- Conservation of natural resources.
- Organisation of local communities.
- Strengthening of primary health care.
- Support to primary education.
- Rehabilitation of roads.
- Strengthening of planning and implementation capacity.

The identification and diversification of the agricultural production systems, is a programme of the District Agriculture and Livestock Development Office, in collaboration with the Farmers' Extension Centres (FEC's). Despite the fact that there seems to be little scope for the introduction of AF tree species in the Bukoba farming system, FEC's are being used for demonstration and research purposes to, among others, introduce fruit trees and agroforestry tree species.

The second trust: "Conservation of Natural Resources" consists mainly of activities to protect the forest and water resources of the district and to make the population aware of the need to exploit the natural resources in a sustainable way. The following activities are undertaken:

- Tree nurseries and distribution of seedlings.
- Demarcation and protection of natural and planted forests.
- Village forests (for brick making).
- Improved cooking stoves.
- Training of the population and training of the staff.

The important aspect that deserves attention within the natural resource management programme, is the demarcation and protection of natural and planted forests to avoid further encroachment. These forests are, in general, very small but do play a substantial part in providing the surrounding communities with fresh water. The methodology used was participatory and consisted of village meetings and physical demarcations. The process may eventually lead to the preparation of contracts between the village governments and the forest department.

A potential threat to the environment is the west ward migration from the Bukoba lake zone to the drier western parts of the district. Present signs are forest encroachment and soil erosion. A better understanding of the district resources and the uses is required to enable policy makers to anticipate on present and potential problems. The present availability of the district soil map and the preparation of the land use map are considered as first steps in arriving at district land use planning.

(ii) Other projects

National Agriculture/Livestock Extension and Research Programme (NALERP)

The NALERP started in 1987 as a pilot project. Now, the project is implemented in 57 districts in 13 regions. The second phase will start in 1996 and will take another 7 years.

The adopted extension methodology is the T&V system. Research and extension officers meet bi-monthly at regional level to formulate impact points. Monthly meetings, at the division, are conducted to instruct the divisional and the village extension workers for the messages to be disseminated, among the 48 contact farmers or groups in each village. The village extension worker is to visit 6 contact farmers/groups per day during 4 days of the week. This implies, in principle, that he has no time left for other activities. It appears that, in practice, the T&V system hardly functions at the village level.

The NALERP has always been implemented in isolation from the other district structures. Nowadays, however NALERP activities are increasingly tuned to other on-going district development programmes (as for instance the DRDP).

In practice it must be possible, at the district level, to further influence the NALERP programme. The Bukoba DRDP has taken up the initiative in a few villages in participatory R&E linkages. This is a first step in the direction of better integration of the DRDP activities and the centrally managed programmes.

5 IDENTIFICATION AND ASSESSMENT OF AGROFORESTRY RESEARCH AND DEVELOPMENT ACTIVITIES

In this chapter the potential for FMICD projects for different forest and game reserves is assessed. Two main geographical clusters were identified, i.e. one containing the catchment forests in the central and eastern part of the country, and one containing the production/game reserves in the western part (Kagera region cluster).

Most districts clustered have been stipulated in the ToR and are included in the Dutch funded DRDP programme, some have a substantial Dutch funded sectorial project. Within each cluster, the mission assessed on-going as well as planned agroforestry activities on non-reserved forest lands and identified potential research topics/activities in support of the FMICD projects as well as agroforestry in general.

5.1 Central and Eastern Arc cluster

The districts considered in this cluster are Mbulu, Same and Morogoro. For a description of the forests, farming systems and on-going or planned agroforestry activities the reader is referred to the chapter 4, sections 4.1, 4.2 and 4.3.

5.1.1 Assessment of margins of forests and game reserves

The catchment forests included in this assessment, are: (i) the Marang and Northern Highland Forest Reserves in or neighbouring Mbulu District, (ii) the South Pare Mountain Forest Reserves in Same District and (iii) the Uluguru Mountain Forest Reserves in Morogoro District. The Pare and Uluguru Mountain ranges are part of the Eastern Arc mountains. Catchment forests have in common that they serve the lower lying areas with water for different purposes. The water supply function will, among other factors, be determined by the prevailing land use systems (such as agriculture, grazing, woodlots, communal forests, etc.) within or around these designated area. As such, the whole area can be of regional and/or national importance.

Despite the fact that, in many reports and discussions, water catchment areas have been linked to regional/national interests, very little is actually known on the impact of deforestation and encroachment. Whilst SUA, and in the past, the Ministry of Water initiated some hydrological studies to that effect, little quantitative information is available. Such information is necessary to enable policy makers to re-allocate funds and other resources for proper management.

Research recommendations:

- Catchment area impact studies.

Water flow/sediment data for selected catchment areas in different districts can be determined through hydrological studies in selected catchments.

Some of these studies have been conducted in the Iringa Region by the Danish funded HIMA project. Although TAFORI has shown an interest in these studies, they are better suited for more specialised institutions.

Farming systems around the forest differ in their dependency on them. It was observed that, in general, dependency on the forest reserves is positively correlated with land use intensity and negatively correlated with land resources per capita.

Dependency by the neighbouring farms on the forest reserve, is highest around the Marang Forest Reserve and on the eastern side of the south Pare mountains because farms are small and land use intensity is high.

Research recommendations:

- **Study on the joint management of forest reserves and communal forest resources.**

In the NORAD funded catchment forestry project in the Eastern Arc mountains, as well as the proposed Marang FMICD project, different plans and management options are/will be considered. Some of these plans will be successful, others will/have failed. It is therefore important to monitor these activities across different locations, so as to identify factors which effect these plans and to identify new technical and social options.

- **Inventory of the Marang Forest Reserve**

It is proposed that the PRA's, suggested for the Marang FMICD project include an inventory of the forest resources, including species and uses by different stake holders.

5.1.2 Assessment of agroforestry activities on non-reserved lands

Planting and conservation of trees outside forest reserves can be seen on the non-reserved lands inside the forest margins as well as further away. The land uses observed on these non-reserved lands include, privately owned farm land (rainfed, irrigated, homestead, permanent and fallow), woodlots (private or communal), grazing areas and bush/woodlands.

Based on field observations and discussions in Mbulu, Same and Morogoro District, the mission identified the following strategies for enhancing the agroforestry activities on such non-reserved lands:

Development recommendations:

- **Increased sustainability of on-going tree planting activities (in Same and Morogoro District).**

While several projects have initiated activities to achieve this objective, especially in Mbulu District, the following should receive more attention:

- Collection of seeds and wildlings by villagers.
- Establishment of seed stands/orchards by villagers for commercial purposes as well as own use.
- Use of low cost propagation methods such as direct seeding, cuttings and bare root seedlings.
- Use of low cost nursery methods, including the use of Swaziland beds and replacement of polythene tubes with locally available materials, e.g. banana fibers.

- **Enhanced impact of agroforestry technologies on private-owned farmland.**

Most projects have concentrated their efforts on tree planting on privately owned land. This is a good strategy, since experience throughout Africa has shown that impact as a result of agroforestry is greatest on such lands. Survival rate and performance of the trees planted in some cases was found to be poor and may be improved with the following activities:

- Increased technology specific extension, especially for shrubs managed for fodder production and soil conservation in Mbulu and Same Districts.
- Increased choice of species (exotic and indigenous) for fodder (*Calliandra calothyrsus*, *Leucaena diversifolia*, *Sesbania sesban*) and poles/timber (*Grevillea robusta*, *Cedrella odorata*, *Markhamia lutea*, *Olea africana*).
- Introduction of tree based cropping systems on fallow land, especially in the western Pare and Uluguru mountain systems.
- Use of community approved village bye-laws to restrict free grazing in fields with newly planted trees especially in Mbulu District.

These forests are classified as wet and dry miombo woodlands, riverine forests and tropical wetland forests (the latter in Bukoba District only). Part of the forests have been gazetted for production purposes others as game reserves. None of them have regional catchment functions. Some forests though may have local catchment values.

An important function of the miombo forest areas is their potential for agricultural production. These forests are not only targeted by the nearby villagers, but also by migrants from other parts of the regions. This trend is rather obvious in Kahama and Biharamulo, where migrants from different districts have moved into the forest. A special encroachment situation occurs in the forests in Karagwe and Ngara District as a result of the refugee influx from neighbouring Rwanda and Burundi.

In many parts of the region, miombo woodlands are disappearing. It is therefore important to design a strategy that will take into account the needs of the growing population as well as to consider the various functions of the miombo forests.

Biharamulo and Kahama District

In Kahama District, the mission focused on the communal miombo woodlands. The recommendations are therefore included in section 5.2.2.

The two forests in Biharamulo District are intensively used by the adjoining community for various legal (and illegal) uses, especially wildlife hunting. The mission noted however that the intended use of the Game Reserve for tourist hunting had so far not yet materialised. Instead, a certain amount of poaching by outsiders is going on. Due to the fact that the terrain of this game reserve is rather hilly, development and maintenance of a road network is costly and sheds doubt on whether sufficient government funds can be made available to develop an economically viable system.

Because of the high degree of interaction/dependency between both forests and the surrounding community, an FMICD project is proposed.

Development project:

- Biharamulo (Game and) Forest (Reserve) Margin Integrated Community Development project.

To develop this project, refer to the guidelines proposed in chapter 3.

It is suggested to start off activities on a pilot basis in one of the two reserves. Activities in the second reserve may be embarked upon, depending on the results obtained in the pilot scheme.

The mission also suggests that the GoT reviews the present status of the Biharamulo Game Reserve, in order to identify its potential as game reserve. If no clear potential is there, one should consider to convert the area to forest reserve status. Since both, forest and game reserves are under the same parent ministry, a change in status should not pose too many problems. Because of greater flexibility, a forest reserve will enhance the potential for an integrated forest conservation and community development approach.

The Burigi Game Reserve in Biharamulo is used for tourist hunting by a commercial company. The influence of the local population on this reserve is rather limited since most of the surrounding areas are still covered with unreserved miombo woodlands, in which little or no agriculture takes place. More-over, the area is heavily infested with Tse-Tse flies, making encroachment a rather risky business. Therefore, the mission does not consider the Burigi Game Reserve a priority for a forest margin integrated community development project.

Bukoba District

The Munene and Minziro Forest Reserves in Bukoba District are classified as lowland high forests. The pressure on these reserves by the surrounding villages is limited at the moment, since most villages are separated from the forests by swampy areas which are used by pastoralists during the dry season. This overgrazing, combined with occasional bushfires has done considerable damage to the margins of Munene forest. In the last year, the pressure by these migrants has reduced significantly, because many Tutsi pastoralists returned to Rwanda.

Also noted was the fact that, the Munene Forest Reserve is degraded substantially as result of lumbering intended for a nearby tea factory and Bukoba town. The Minziro Forest Reserve is mainly used for timber (*Podocarpus*) extraction and some fuelwood collection (dead wood) by the surrounding villages. With the exception of some small areas, there seems to be little pressure on these forest areas for agricultural purposes by the surrounding communities, mainly because of the unsuitability of the forest land (too wet) for the banana/coffee based system. Because of the limited interaction/dependency of the surrounding villages, there is no need for a community based forest conservation strategy. Instead, a proper forestry management plan needs to be developed by the forestry department. Possibilities for involving local communities in enforcing the management of these forests may be explored.

Development recommendation:

- **To develop a management plan for Munene and Minziro Forest Reserves.**

In order to develop a management plan, both forests will have to be inventoried. Particular attention needs to be paid to presence and regeneration of valuable timber species, such as *Podocarpus*.

Enrichment planting and/or regeneration potentials should be examined. Possibilities for linking the licensing of timber or fuel wood extraction to replanting by the private licensees and the tea factory should be considered.

The damage to the forest margins caused by the migrant pastoralists should be considered. Mutually acceptable agreements should be derived at, through consultations.

Ngara and Karagwe Districts

The pressure on the Burigj Forest Reserve in Ngara and Karagwe District by the nearby villages is limited because of the surrounding woodlands and low population densities. The need for a FMICD project is therefore not of high priority. The mission noted that, in fact, an arrangement between the commercial tourist hunting company and the local people had already been made in Karagwe District.

Similarly, the Ibanda Game Reserve, in the northern part of Karagwe District, is not much under pressure by the local community. The area surrounding the forests are mainly used by migrating pastoralists. The need for a forest margin integrated community development project is therefore not of a high priority.

In Karagwe, considerable pressure is exerted on the Rumanyika Game Reserve, since it is surrounded by an intensive land use banana/coffee based farming system. Despite the fact that the reserve is hardly exploited by commercial tourist hunting (the hilly nature of the terrain does not permit easy access), the elephant population is nevertheless been reduced drastically, mainly as a result of the Uganda/Tanzania war. Because of the imminent threat to this reserve and the high degree of dependency by the local population, the mission recommends a special forest margin integrated community development project.

Development project:

- **Rumanyika Game Reserve Margin Integrated Community Development Project.**

To develop this project, please refer to the guidelines proposed in chapter 3.

As for the Biharamulo Game Reserve, the GoT should first of all examine the present status of the reserve. A change in status from game to forest reserve would not only increase the possibilities for shared use/management by the surrounding communities, but also increase the possibilities for raising revenues through sustainable forest product extraction.

Research recommendations:

- **Study on the joint management of forest reserves and communal forest resources.**

To support policy makers in the legislation for shared use of forests by local communities and the forestry department, factors which influence the design of the shared management should be identified.

The prime target areas are the FMICD projects identified in the Kagera Region. However, collaboration with the World Bank funded forestry resource assessment programme for the miombo woodlands in Tabora (and Mwanza) should be considered.

- **Forest inventory studies for selected forests**

For all forests targeted for the FMICD projects and the Minziro and Munena forests (also see para. 5.1.1).

5.2.2 Assessment of agroforestry activities on non-reserved lands

The mission observed considerable differences among the districts in on-going and potential agroforestry activities. Such differences may in part be explained by the different macro and micro problems and opportunities observed at district level.

It was noted that district wide farming systems studies have been completed for Bukoba and Kahama District, while studies have been planned for Biharamulo, Ngara and Karagwe Districts. For Bukoba and Kahama Districts, ward/village PRA's were conducted in the past year to determine community based development and research activities.

General recommendations:

- The planned district-wide farming system surveys for Biharamulo, Ngara and Karagwe should include a forest resource assessment.
- The PRA studies in selected villages should consider potential agroforestry solutions to diagnosed problems and opportunities.

Based on the observations made in the different districts the mission suggests the DRDP's to consider the following:

(i) Kahama and Biharamulo District

The communal miombo woodlands in these districts are increasingly targeted by "outsiders" for agricultural activities. Deforestation therefore is most serious in such areas.

A similar development took place in the eastern part of Kahama District in the early seventies as a result of the villagenisation programme.

Most of these areas are now deforested and only a few centrally managed forest reserves are left. The mission did observe however that these reserves were heavily encroached upon and are also likely to disappear.

In order to maintain some of the forest functions in these newly opened woodlands, there is a need for a strategy to open up these areas in a more environmental friendly manner. The Kahama DRDP conducted a PRA in the Ushiroombo Ward, to address this problem.

Development recommendations:

- **To develop a conservation strategy for farms within the communal forest areas in Ushiroombo Ward (Kahama District).**

Based on the experiences in the eastern part of Kahama District and the strategies presently used by the HASHI project, the mission suggests:

- Selective clearing of forests for agricultural lands.
- Regeneration of indigenous trees on agricultural lands already cleared in the past.
- Identification/allocation of private and/or village forests areas.

It will be necessary to pay attention to the selection of permanent forest locations and the management of such forests. Selection of areas should take place in consultation with villagers. Criteria may include soil suitability, potential role of forest in terms of micro catchments.

The mission notes that, it will not be easy to introduce this strategy, because there is hardly any effective community structure in these villages. Careful selection of villages and, institutional strengthening of some of these villages should be considered. Particular attention therefore needs to be paid to the development of a community structure.

A similar activity may be considered in Biharamulo District.

Research recommendations:

- **Interaction between indigenous trees and crops.**

To advise farmers properly, information will be required on the interaction between different tree species and crops. This information may be obtained from special surveys or monitoring in farmers fields.

- **Biomass potential and tree/crop interactions for regenerated indigenous trees.**

To advise farmers on the potential role of regenerated indigenous trees, information is required on the production (time) of different tree products (poles, fuelwood, timber), management practices and the influence on crops. This information can be obtained from special surveys in farmers fields.

TAFORI may conduct such studies on a contract basis.

(ii) **Ngara and Karagwe Districts**

Both districts are greatly affected by the recent influx of refugees from Rwanda and Burundi. Because of the differences in the number of refugees settled, the effects are most serious in the Ngara District, where more than 600.000 people have been settled. The most obvious effect on the environment is the cutting of trees for fire wood. Although several commendable efforts have been made by the various aid organisations, the sheer magnitude of the number of refugees involved, requires new strategic thinking and co-ordination to safeguard the forest/tree resources.

A serious constraint may be the lack of the monitoring capacity of the agencies involved in tree planting. Survival rates of seedlings is all in all very disappointing. The UNHCR environmental co-ordinator, in collaboration with the district natural resource officer have taken the initiative to better co-ordinate and support the on-going activities. To that effect, an environmental task force has been established.

To reduce the devastation of the environment, one might think of increasing the “price” of wood energy so as to intensify the search for alternative energy sources. Also, because of the lower transport cost per calorie, the conversion of fuelwood to charcoal, will facilitate access to a wider forest area for wood extraction.

The DRDP's in both districts included the rehabilitation of the riverine forest along the Kagera and Ruvuvu rivers. Sections had been destroyed by the local community and/or refugees in transit to permanent camps.

It has been noted that as a result of the demand for fuelwood several projects have been initiated to raise and plant seedlings. Farmers who had planted trees in the past have greatly benefited from the sale of timber for construction purposes. So-far the capacity for raising seedlings has been limited by available nursery capacity. Survival of seedlings in the past has been effected by termites, grazing and bushfires.

Development recommendations:

- Institutional strengthening, at district level, and co-ordination of tree planting activities among the various donors and implementing NGO's.
- Rehabilitation of riverine forests along the Kagera and Ruvuvu river with the help of local communities.
- Increased involvement of individuals/communities in the production of seedlings.
- Increased attention to sustainable tree propagation practices, including harvesting of indigenous seeds, establishment of private seed stands/orchards, low cost nursery techniques, use of vegetative material.
- Increased agroforestry extension to increase survival and production of planted trees.

Research recommendations:

- **Regular surveys on the survival of seedlings and adoption of agroforestry technologies.**

These surveys are aimed at identifying factors causing low survival rates and adoption of agroforestry technologies.

Synthesis of these research findings across different districts is also recommended (see also recommendations made in para. 5.1.2).

- **Identification of sustainable tree propagation methods**

This research may include improved germination of local species, identification of local materials to replace polythene tubes, identification of vegetative propagation methods for indigenous species, etc.

This research could be conducted by TAFORI on a contract basis.

(iii) Bukoba District

The Bukoba AF programme is well established and has paid attention to agricultural as well as forest resource lands. Most of the activities aim to have a district wide coverage. A more concentrated holistic approach might be considered in the villages covered by the recent PRA.

Particular attention should be paid to the role of trees to supplement fodder production in combination with soil conservation.

Also the use of rweya lands for the production for wood and fuelwood production should be increased. Species which have proven to be successful on acid highland soils include *Acacia melanoxylon*, *Acacia koa*, and *Mimosa scabrella*.

The potential use of the rweya lands for increased fodder production should be explored. Some of the promising species which have been tested elsewhere in the region include *Chamaecytisus palmensis* and *Calliandra calothyrsus*.

Development recommendations:

- **Integrate appropriate AF activities in the PRA villages.**
- **Explore the productive use of the rweya lands for the production of poles, fuelwood, fodder and green manure**

Research recommendations:

- **Testing of species for poles, fuelwood, fodder and green manure on rweya land.**

This research can be conducted on-farm or on FEC's. Monitoring of these adaptive trials should be integral part of the DRDP/FSR activities in the selected PRA villages.

- **Testing of nitrogen rich green manure produced on rweya lands on the kibanja and kikamba plots.**

Once green manure species have been identified, testing of the effects of green manure obtained from these species on the production of bananas in the kibanjas and kikamba plots could be undertaken by the FSR project in the selected villages.

- **Regular surveys to determine survival rates of seedlings and adoption of agroforestry technologies.**

See same recommendations for Ngara and Karawe Districts.

6 IMPLEMENTATION

6.1 Development activities

6.1.1 FMICD Programme

Three FMICD projects have been identified:

- Marang Forest Reserve.
- Biharamulo Forest and Game Reserve (2 locations).
- Rumanyika Game Reserve (in Karagwe District).

Staff operating in communities surrounding the selected projects include "bwana shambas", divisional forest staff, village executive officers, game wardens, forestry guards and park staff (around Marang Forest). NGO staff include various formal and informal groups, among others, women groups, church groups and water user groups. Availability and capability of staff for the implementation of these projects at community level will have to be assessed as an integral part of the project development process (see chapter 3).

Based on the assessment of both government and non-government human resources at forest margin level, recruitment of additional staff (e.g. village motivators) should be considered in each district.

Recommendations:

- i) Determine the need for additional staff at the level of the forest/game reserve margin through an assessment of the existing governmental and non-governmental capacity.
- ii) Improve the capacity of the forest margin human resources through training (see guidelines in chapter 3).

To plan, initiate, monitor and evaluate activities at each selected forest site, a task force comprised of the sector specialists at district/divisional level should be appointed.

The task force's capacity to implement this project should be reviewed in relation to their commitment to other activities, especially the implementation of activities outside the selected forest zones. The mission envisages that recruitment of a project leader for each project site may be necessary to support the task forces in the selected districts.

To improve the capacity of the task forces, training in PRA's and different aspects of social forestry is required (see chapter 3). Training in PRA's for forest margin assessments should be integrated in the already on-going community based rapid rural appraisal training activities in the different districts.

Recommendations:

- i) Establish an inter-sectorial task force at district and divisional level to plan, initiate, monitor and evaluate the projects.
- ii) Assess the need for project leaders for each FMICD site to assist the task force in their activities.
- iii) Train task force members in PRA's and social forestry.

To initiate the projects in the different districts, the task forces should be supported by an external programme co-ordinator. The programme co-ordinator will be attached to the Regional Development Directorate in Bukoba, but also have responsibility in Marang.

Recommendation:

- i) Appoint an external programme co-ordinator to manage the FMICD programme. In view of the identified projects, the programme co-ordinator should be stationed in Bukoba.

National guidance/backstopping to the overall forest margin community development programme should be provided through an inter-institutional steering committee. Such a steering committee should not be established specifically for the purposes of the Dutch funded forest margin projects, but also include other, similar projects (e.g. NORAD funded catchment forestry project). In view of the proposed research linkages, TAFORI should be appointed as a member to this committee.

Recommendation:

- (i) An inter-institutional steering committee should be established to co-ordinate and monitor activities related to the forest margin integrated community development programme at central level and to look into the identification of specific other forest margin projects.

6.1.2 Forest/Game Reserve conservation and development management plans

Although the identification of projects for the management of forestry and/or game reserves, without participation of local communities, was not part of the ToR, the mission is of the opinion that a management plan should be developed for some of these forests. Of particular importance are the wet, high forests of Minziro and Munune in Bukoba District. Both forests are characterised by a unique nature and are deteriorating as a result of over-exploitation. The recommendations made for their conservation and development may be funded through DRDP's and implemented by the forest or game departments at district level.

6.1.3 Agroforestry on non-reserved lands

The proposed recommendations should be implemented as regular DRDP activities. To increase impact, such activities should be integrated in the villages targeted by the DRDP's community based PRA approach. The mission is not certain whether DRDP's have made adequate provision to allow for follow-up activities, once the PRA's have been implemented. It seems useful to assess capacity at village and district level (similar as for the proposed forest margin projects) before such follow-up activities are implemented.

6.2 Research activities

6.2.1 Research in support of FMICD projects

Because of TAFORI's present lack of expertise in the field of forest margin integrated projects, a special research co-ordinator should be engaged. Dutch funds should be made available to finance his/her operational costs.

For TAFORI, it will be essential to collaborate with other national and/or international institutions specialised in this field (IUCN, CIFOR, SUA, etc.).

Recommendations:

- i) Establish a research project dealing with the aspect of forest margin integrated community development. A research co-ordinator, recruited by TAFORI, should be attached to this projects and based in Bukoba.
- ii) The research co-ordinator should be responsible for the establishment, supervision and dissemination of research activities and results.

iii) The FMICD research project should:

- Study the effectiveness of different FMICDP approaches and,
- Carry out forest assessment studies for planning of (joint) management/use of forest reserves and communal forests.

iv) Technical assistance and/or funds should be made available to enable project implementation and collaboration with national or international agencies specialised in this field.

To build up TAFORI's in-house capacity in the field of FMICD, it is proposed to engage TAFORI staff and, if possible, post graduate students in degree programmes related to social forestry. Such staff/students should then be deployed to the selected FMICD sites to conduct their research on the different aspects of community forest management. External donor funds may be made available to finance staff/students for such degree programmes. The student post-graduate fees at SUA may serve as an example: a total of US\$ 17,000 for a two years MSc programme and US\$ 48,000 for a four year PhD programme per student would be required.

Recommendations:

- i) TAFORI should be provided with fellowship funds to enrol staff in social forestry degree programmes.
- ii) Such staff/students should conduct their research part on different aspects of community forest management at selected FMICD sites.

For the proposed catchment area impact studies, it is recommended that the services of more specialised agencies are engaged.

6.2.2 Research in support of agroforestry on non-reserved lands

Most of the identified research topics for agroforestry activities are short term in nature and can therefore be implemented on a contract basis (see chapter 5).

TAFORI can be contracted as one of the executing agencies. The contracts should be for a fixed period and with specific outputs. Contracts can be funded directly from the individual DRDP's budgets or through direct Dutch funding.

Recommendations:

- i) TAFORI should be considered for conducting short term research for the DRDP's on contract basis.
- ii) When necessary, provision should be made in district contracts to allow for a synthesis of research results across districts.

For some of the longer term research topics identified for the Central/Eastern Arc cluster and the Kagera region cluster other, more specialised agencies should be engaged/identified.

Recommendations:

- i) Testing of species for poles, fuelwood, fodder and green manure on rweya land, should be conducted on farmer's fields as an integral part of the FSR programme.
- ii) Testing of nitrogen rich green manure, produced on rweya lands on the kibanja and kikamba plots should be conducted on farmer's fields as an integral part of the FSR program in Bukoba.

6.3 Training activities

Training activities in support of the forest margin projects as well as agroforestry activities on non-reserved lands will be required.

Most of these training activities are relevant for all the districts and should, for consistency purposes, be centrally co-ordinated. One of the responsibilities of the co-ordinator of the FMICDP's could be to co-ordinate these training activities.

Recommendations:

- i) Development/identification of training materials for the following topics:
 - Participatory (rapid) rural appraisal techniques and methods. Attention should be paid to the use and potential role of tree and forest resources in such appraisals.
 - Sustainable tree propagation methods, including tree seed collection, establishment of seed stands/orchards, use of vegetative propagation materials/wildlings, low cost nursery techniques.
 - Improved survival and productivity of trees and agroforestry technologies, including free grazing and bush fire control, fodder shrub management, erosion control arrangements, fruit tree establishment and management.
 - Social forestry practices and participatory management options.
- ii) District based training on PRA's for district and divisional staff by specialised agencies.
- iii) District based training on sustainable tree propagation methods for divisional and village level staff by specialised agencies.
- iv) District based training on improved survival and production of trees and agroforestry technologies for divisional and village level staff by specialised agencies.

6.4 Programme implementation

To initiate the proposed development, research and training activities, districts will first of all have to agree on the recommendations made by this mission. However, even if general agreement is reached on these activities, implementation will not be ensured. Districts may in fact not consider forest margin development and the increased integration of agroforestry activities in the village based programmes as their priority. It is understandable that scarce human resources, required for the initiation of these activities, can be used for other priority problems. In most districts it may therefore only be possible to initiate the proposed activities with the help of outside assistance. The mission therefore suggests that the recruitment of the overall programme co-ordinator is a crucial first step for the programme development (see previous section). The co-ordinator, should initiate the formulation of the proposed FMICD projects in those districts, which are in general agreement with the recommendations made by this mission.

The first step in each district would then be the assessment of the human resource capacity at divisional/district level as suggested in section 6.1. Recruitment of a project leader (one for each site), if necessary, should take place before the actual formulation of the project. From then on the co-ordinator should follow the proposed guidelines as suggested in chapter 3, starting with the inventory of the selected forests. Simultaneously, the co-ordinator can initiate, in collaboration with the DRDP's development and training activities in support of the agroforestry activities on non-reserved lands. The recruitment of the research co-ordinator is subject to TAFORI's acceptance to launch a FMICD project within their overall structure.

The mission recommends that this may be possible by broadening the scope of the already proposed "characterisation and management planning of potential catchment areas" to include non catchment forests and community participation in the management and use of forest and game reserves. Recruitment of this co-ordinator should be finalised at the time the forest inventory studies for the FMICD projects commences. It is envisaged that the research co-ordinator can also be involved in the implementation of the short term research activities in support of agroforestry activities on-non reserved lands.

ANNEXES

ANNEX I: LIST OF PEOPLE MET

Royal Netherlands Embassy

Mr B. Hensen, Second Secretary

Stichting Nederlands Vrijwilligers (SNV)

Mr Johan van der Kamp, Deputy Director

Ministry of Tourism, Natural Resources and Environment

Division of Forestry and Beekeeping

Mr M.C.P. Mtuy, Director

Mr P.E. Kimaryo, Head of Training and Research

Division of Wildlife

Mr. M. Ndolanga, Director

Mr. Kayera, Project Leader, PAWM

Tanzania National Parks (TANAPA)

Mr. G. Bigurube, Ag. Director General

Mr. V. Mgina, Community Conservation Warden, Manyara National Park

Ngorongoro Conservation Area Authority

Mr. E. Chausi, Conservator

Mr. S. Makacha, Head of Dept. of Natural Resources

Mbulu District Council

Mr. R.K. Laswai, District Exec. Director

Mr. Rashid, District Planning Officer

Mr. Gerhard van't Land, Programme Coordinator, DRDP

Mrs. G.P. Mboya, Ag. District Natural Resources Officer

Mr. J.B. Kessy, Agro-forester

Mr. P.E. Lyimo, Divisional Forester, Daudi Division

Mr. B. Hango, Divisional Catchment Forester, Daudi

Mr. M. Lohay, Ward Forester, Moringa, Daudi

Mr. S.O. Mruma, Divisional Forester, Karatu Division

Traditional Irrigation Improvement Programme (TIP)

Mr. R. Burra, National Coordinator

Mr. P. Zontewelle, Project Engineer, Same

Mr. G. Kisima, Landuse officer, Same

Mr. J. L. M. Msaki, Forester, Same

Same District

Mr. P. Kangwa, District Commissioner

Mr. Shirima, District Executive Director

Mr. S. E. Chawewe, Administrative Officer

Mr. Mdee, District Forest Officer

Morogoro Catchment Forest Project in Morogoro District

Mr. A. Kalebi, District Catchment Forest Officer

Mr. Kitindi, Forest Attendant, District Council

Mr. M. B. Mbuya, Forest Attendant, Catchment Forestry

Tanzania Forestry Research Institute (TAFORI)

Mr. K. Murira, Director General

Mr. T. H. Msangi

Mr. G. A. Kitambi

Sokoine University of Agriculture (SUA)
Dr. L. L. Lulandala, Project leader, Uluguru Mountain Intergrated Soil Conservation Project.
Mr. M. Mpindule, CCM Ward Secretary, Mlimani Ward

DHV Consultants (Domestic Water Supply Programme in Morogoro)
Mr Frans van der Laak, Regional Programme Consultant

Forest Resource Management Project, Mwanza
Mrs Z. Maagi, Project Manager
Mr. B. Kaale, Community Development Specialist

Kahama District
Mr. Halinga, District Commisioner
Mr. Sabasaba, District Executive Director

Kahama District Council
Ms M. Maas, Co-ordinator, DRDP
Mr. Mulanzi, District Planning officer
Dr. Maziku, Veterinary Officer
Mr. Kisa, Planning Officer
Mr. Masigara, Agricultural Officer
Mr. Kushoka, District Natural Resources Officer
Mr. Mpangala, Land Planning Officer
Mr. Ileta, Forestry Officer

HASHI (Hifadhi ya Ardhi Shinyanga) in Kahama District
Mr Minja, District Project Officer

Sungamila Village, Kahama
Mzee Nchongoma, farmer

World Vision Kahama
Mr. I. Sengasenga, Project Manager, Child Survival
Mr. D. Rwegoshora, Project Manager, Community Dev.

CARITAS Kahama
Bishop M. Shija
F. H. J. Kubezya, Diocesan Caritas Co-ordinator

Katome Village, Ushirambo Kahama
Mr. M. Padre, Village Executive Officer

Biharamulo District Council
Mr. Jan Hendrik Mulder, Coordinator DRDP
Mr. Mhina, District Natural Resources Officer
Mr. Mwendabantu, Assit. Manager, Biharamulo/Burigi Game Reserve

Biharamulo Forest Reserve
Mr. P. Tibaijuka, Forester

Caritas Biharamulo
Mr. C. Byamungu, Coordinator
Mr. A. Nzigize, Afforestation Officer

Kagera Region
Mr. Masongo, Regional Natural Resources Officer

Bukoba District Council

Mr. Frits Raijmakers, Co-ordinator DRDP
Mr. Lukosi, District Planning Officer
Mrs. Pamba, District Forestry Officer
Mrs. Muyaga, Ag. District Crops Officer
Mr. Kaiza, Agricultural Extensionist, NALREP
Mrs. Ngaiza, Liason Officer, Farming Systems Research
Mr. Musombe, FEC Manager, Kyakairabwa
Mr. Rushatuka, Teacher, Maiga Primary School

Minziro Ward

Mr. D. Selestin, Livestock Officer, Minziro Ward
Mr. I. Almasi, Village Chairman, Minziro Village

Agricultural Research Institute - Maruku

Mr. Aloys Lorkeers, Soil Scientist

Ngara District Council

Mr. Mugarula, Ag. District Executive Director
Mr. Madiyalo, District Natural Resources Officer
Mr. Musa, District Agricultural Officer
Mr. Ntamalengelo, District Forestry Officer

UNHCR Ngara

Mr. W. Magerman, Environmental Co-ordinator

Karagwe District Council

Mr. H. Kateka, Ag. District Executive Director
Mr. Tibashengwa, District Planning Officer
Mr. Dotto, District Natural Resources Officer
Dr. Matandala, DALDO

KARADEA (Karagwe Development Association)

Mr. O. Kasaizi, Executive Secretary

CARITAS Karagwe

Mr. A. Buyamba, Coordinator, Afforestation Programme

Catchment Forest Project (Dar es Salaam)

Mr. Hakon Fottland, Coordinator

ANNEX 2: ITINERARY

Monday 3/4/1995

- Meeting of team members
- Briefing at the Royal Netherlands Embassy with Mr. B. Hensen

Tuesday 4/4/1995

- Visit to the Ministry of Tourism and Natural Resources
Wildlife Division
Mr. Ndolonga and Mr. Kayera
Forestry and Beekeeping Division
Messrs M. C. P. Mtuy and P. E. Kimariyo
- Visit to SNV Headquarters and TIP Headquarters
Mr. Johan van der Kamp (SNV)
Mr. R. Burra (TIP)

Wednesday 5/4/1995

- Travel to Arusha. Stop at Same to make appointments

Thursday 6/4/1995

- Visit TANAPA Headquarters
Mr. G. Bigurube
- Travel to Mbulu via Lake Manyara National Park Headquarters
Mr. Mgina, discussion on Marang Forest
- Visit Ngorongoro Conservation Area Authority
Messrs Chausi and Makacha

Friday 7/4/1995

- Discussion with Mbulu District officials
Messrs Laswai, Rashid, Kessy and Mrs Mboya
- Field trip to Daudi Division and Moringa village bordering Marang
Messrs Lyimo, Lohay and Hango
- Field trip to Ayalabe village in Karatu Division
Mr. S. O. Mruma

Saturday 8/4/1995

- In Mbulu, report writing

Sunday 9/4/1995

- Report writing
- Discussion with Gerhard van 't Land
- Travel to Arusha

Monday 10/4/1995

- Travel to Same
- Discussion with District and TIP officials
Messrs Kangwa, Zontowelle, Kisima, Msaki,
- Field trip to Chome mountain village

Tuesday 11/4/1995

- Report writing
- Final discussion with TIP officials
- Travel to Morogoro

Wednesday 12/4/1995

- Discussion with DFO Catchment Mr. Kalebi
- Discussion with TAFORI officials Messrs Murira, Msangi, Kitambi
- Visit DHV water project; Mr. Frans Van der Laak
- Discussion with Dr. Lulandala project leader, SUA, Uluguru Soil Conservation Project and Integrated Project

Thursday 13/4/1995

- Field trip to Bigwa area for Catchment Forestry activities
- Field trip to Towelo village for SUA Uluguru Soil Conservation and Integrated Project

Friday 14/4/1995

- Report writing

Saturday 15/4/1995

- Report writing
- Travel to Dar es Salaam

Sunday 16/4/1995

- Report writing

Monday 17/4/1995

- Report writing

Tuesday 18/4/1995

- Travel to Mwanza (Delays in Mwanza)

Wednesday 19/4/1995

- Visit Mwanza Natural Resources office
- Travel to Kahama
- Discussion with Kahama DRDP Co-ordinator Ms M. Maas

Thursday 20/4/1995

- Courtesy call to Kahama D.C. Mr Halinga
- Discussion with District officials
Messrs Sabasaba, Mulanzi, Kushoka, Maziku, Kisa, Masigara, Minja, Ilcta, Mpangala
- Tour HASHI activities
- Visit to World Vision office
Messrs Sengasenga and Rwegoshora
- Visit to Caritas Kahama
Bishop M. Shija and Rev. F.Kubezya
- Field trip to Katome village (Ushirambo) with District officials
Mr. M. Padre
- Discussion with District officials
- Travel to Biharamulo

Friday 21/4/1995

- Discussion with District officials
Messrs Mhina and Mwendabantu
- Field trip to Biharamulo Game Reserve and neighbouring Malabapina village together with District officials
- Field trip to Biharamulo Forest Reserve
Messrs Mhina, Mwendabantu and Tibajjuka

Saturday 22/4/1995

- Discussion with Biharamulo DRDP Coordinator Mr Mulder
- Travel to Bukoba
- Discussion with Regional Natural Resources Officer
Mr Masongo

Sunday 23/4/1995

- Report writing

Monday 24/4/1995

- Discussion with Bukoba District Council officials
Messrs Frits and Lukosi, and Mrs. Pamba
- Discussion with district agricultural officials
Ms Muyaga and Ngaiza, and Mr Kaiza
- Visit to Maiga Primary School tree nursery
Mr. Rushatuka
- Field trip to Munene forest reserve
Mrs. Pamba and Mr. Frits
- Visit to Kyakairabwa Farmers Extension Centre
Mr. Musombe

Tuesday 25/4/1995

- Field trip to Minziro forest reserve
Messrs Frits, Selestin, Almasi

Wednesday 26/4/1995

- Travel to Ngara (via Biharamulo)

Thursday 27/4/1995

- Discussion with Ngara District Council officials
Messrs Mugarula, Ntamalengelo, Madiyalo and Musa
- Discussion with UNHCR official
Mr. Magerman
- Field trip to Benaco refugee camp
Messrs Mugarula, Ntamalengelo, Musa and Madiyalo
- Travel to Karagwe

Friday 28/4/1995

- Discussion with Karagwe District Council officials
Messrs Kateka, Tibashengwa, Dotto and Dr Matandala
- Discussion with KARADEA official
Mr. Kasaizi
- Discussion with Caritas official in Karagwe
Mr. Buyamba
- Travel to Bukoba

Saturday 29/4/1995

- Report writing

Sunday 30/4/1995

- Report writing
- Discussion with
Mr. A. Lorkeers, Soil scientist

Monday 1/5/1995

- Report writing
- Travel to Mwanza

Tuesday 2/5/1995

- Travel to Dar es Salaam
- Report writing

Wednesday 3/5/1995

- Report writing

Thursday 4/5/1995

- Report writing

Friday 5/5/1995

- Debriefing Embassy with donor community and GOT representatives.

ANNEX 3: STATUS OF FOREST AND WILDLIFE AREAS IN TANZANIA

1 Forest Reserves

A Forest Reserve is owned and protected by either a Central Government or a local government. No one is allowed to enter, cultivate, settle, graze, hunt, harvest or perform any activity without a formal permission of the appropriate authority.

The central government forest reserves are managed by the central government (represented by forest division and the regional forestry office) while the local authority ones are managed by the local authorities. The latter could be district councils, municipality councils, city councils, or village governments.

There are two groups of forest reserves:

- Protective forest reserves, and
- Productive forest reserves.

Protective forest reserves are managed basically for their protective functions such as water catchments, protection against soil erosion, bio-diversity and environmental protection. Harvesting of forest products is (expected) to be minimal in such forests.

Productive forests reserves are basically managed for production of forest products such as timber, woodfuel and poles. Such forests may have protective function but the primary aim is production of forest products.

Due to their national importance, most of protective forest reserves are owned by the central government.

2 Community forests

Community forests are those owned by a village community. Such forests could be composed of natural vegetation or exotic planted trees. Most of communal forests have natural vegetation. They are utilised communally without proper management. As a result they are highly degraded due to over-use by the community members. Such areas are found in areas neighbouring forest reserves. Most of community forest lands do not have legal status.

3 Clan forests

In some cases a forest can be owned by a clan. There is a customary recognition by the village community that a clan could own a forest for various purposes including worshipping and collection of dry wood, humus, medicinal plants and honey. Clan forests are normally open for use by the clan and are governed by procedures and regulations set by the clan. Such forests are usually small with an area not exceeding 2 hectares.

4 Private forests

These are forests which are owned by individuals, or private companies or institutions. They could be in a form of woodlots or plantations. Such ownership could be by customary or by statutory procedures.

5 Public land forests

Some forests fall under no man's land. They do not fall under the four categories mentioned above. Such forests are susceptible to much abuse due to lack of clear ownership of the land.

6 National Parks

National Parks are the highest legal wildlife entity managed for wildlife conservation. The parks are managed for tourism purposes. Therefore residing, grazing, or removal of any live or dead material from national parks is prohibited. Neither hunting nor harvesting of any material is allowed in the national park. Entrance into national parks is restricted to leisure tourism and photographing. Most of the national parks are managed by Tanzania National Parks authority (TANAPA) which is a parastatal under the ministry responsible for tourism.

7 Game Reserves

Such reserves are managed by the central government for sustainable production of wildlife resources. In game reserves various activities are restricted including cultivation, settlement, grazing and harvesting of resources from such a reserve save for licensed tourist hunting and some tourism. Game reserves are managed by the Directorate of Wildlife of the Ministry responsible for natural resources.

8 Game Controlled Areas

Unlike in Game Reserves, Game Controlled Areas (G.C.A.s) have less restrictions in that cultivation, settlement, grazing and tree felling are allowed. Tourist hunting and hunting for game meat are allowed as well.

TERMS OF REFERENCE

Identification of Netherlands support to TANZANIA (AGRO)FORESTRY SECTOR

BACKGROUND

Introduction

Deforestation is one of the most serious environmental hazards the world is faced with both on global and local levels. The role of forests in the carbon cycle, climate change, conservation of soil and water, maintenance of biodiversity and natural ecosystems, and as a source of wood and non-wood products is now being fully recognised. The problems of forest conservation and development are also serious in Tanzania where deforestation and land degradation are common. In 1988 the Government embarked on a long-term sectoral planning effort under the conceptual framework of Tropical Forestry Action Plan (TFAP) which is now being applied in more than 80 countries in the developing world. This framework provides a holistic approach to address key issues in forestry development as most of the reasons for deforestation are socio-economic by nature, or are related to unsustainable land-use practice in agriculture and animal husbandry.

2. Tanzanian TFAP

A sectoral forestry development plan was prepared in 1988 -89 with the assistance of fifteen donor agencies. The plan was adopted by the Government and it has now been implemented for the last four years. The modus operandi includes project work, inter-sectoral and donor coordination, popular participation, private sector investment, NGO activities, policy reforms and country capacity building.

3. Progress

TFAP is broken down into programme areas covering sustainable land husbandry, community and farm forestry, forest management, bio-energy, forest industries, beekeeping, wildlife management, ecosystem conservation, and institutional strengthening. In the October 1994 update it was made clear that progress in implementation has not been entirely satisfactory and some key areas are still awaiting core financing such as forest research. Furthermore, some regions are left without comprehensive support. Preparatory work on revision of policies, legislation and institutional framework have been carried out but legal procedures are still to be completed.

4. Donor support

Only a part of the planned external resources have been made available. Upto October 1994, the annual contribution of donors amounted to about US\$ 25 million, while the contribution from the central government had been much lower than anticipated. The

major, active donor agencies in the sector are FINNIDA (Core Support Agency), SIDA, NORAD, The World Bank, Germany, DANIDA, the EC and Japan. Donor inputs have been coordinated through pledging roundtable conferences, periodic local donors' meetings, and regular dissemination of information on project work. A number of problems have been identified in the TFAP implementation including lack of clear priorities, important gaps in programme implementation, and inadequate coordination due to large number of projects. Concentration is needed to enhance effectiveness of project work and to reduce administrative burden. Many donor assisted projects tend to be small and cover only part of the local needs without achieving an integrated approach.

Although at an early stage (1989) The Netherlands had pledged 1 Million US\$ per year for 5 years, the Tanzania - Netherlands cooperation within the TFAP framework never materialised. The Netherlands is financing a number of activities in the forestry sector, mostly on district level, which presently do not fall under the TFAP. The initial interest of The Netherlands for support of the TFAP concentrated on the following project profiles:

- land husbandry activities in semi-arid areas (LH);
- village woodfuel production for urban areas (CF7);
- dissemination of efficient woodfuel conservation techniques (BEI);
- wildlife management Serengeti (WM6);
- Eastern Arc Forest Management Programme (EC1).

These profiles were drawn up more than 6 years ago. The Netherlands' pledge needs to be reexamined in the light of the updated TFAP and because several profiles are being looked into by other donors.

5. Present situation

Major changes have taken place in the political and economic situation since TFAP was prepared. The Programme is therefore being updated. A report commissioned by GOT and FINNIDA shows that donors are generally critical about the TFAP process: in particular the GOT commitment and contributions are questioned.

In view of this criticism, a major task of the mission must be to judge if (and to what extent) The Netherlands' support to the (agro)forestry sector in Tanzania needs to be imbedded within the TFAP framework, or can be done outside it.

II. OBJECTIVES

- a. Assess the achievements of the TFAP, including the ongoing updating process, and its relevance for ongoing and new Netherlands' supported activities in the (agro)forestry sector. Particular attention should be paid to the outcome of the W.R.I. review report on "Building capacity to the management of forest resources: TFAP and the TFAP updating process".
- b. Make inventory of and assess activities of GOT, NGO's, private sector and

- c. Field visits to selected areas, projects and programmes. Preferably, but not exclusively, the attention of the mission should focus on areas (districts) where DGIS already supports activities, for example in the Northwestern part of the country around Lake Victoria. The mission must examine whether new activities could be undertaken in conjunction with ongoing activities: not necessarily by integrating new into old, but by at least establishing a link.
- d. Briefing at Netherlands Ministry of Foreign Affairs (Technical Advice Section), Royal Netherlands Embassy, Dar es Salaam, debriefing at Royal Netherlands Embassy with participation of GOT and interested donors.
- e. The mission should pay special attention to the environmental impact and to gender issues of proposed activities.
- f. Production of a report with recommendations for activities and outlines of proposals with tentative budgets. Proposals could take the shape of new activities as components of ongoing projects, one or more new and independent projects, or one programme as an umbrella for various sub-projects.

IV. EXECUTION

- a. Adoption of Terms of Reference.
- b. Selection of consultants with relevant professional background, experience in tropical forestry, knowledge/experience with TFAP (Tropical Forestry Action Plan), knowledge of Netherlands Development Cooperation and (preferably) experience in Tanzania. Required expertise should relate to natural forest research and management in the context of rural development.
- c. Timing of mission with duration of six weeks in Tanzania. The number of members to the mission should not exceed four.

various donors in the forestry sector: update of the TFAP (October 1994) gives an overview. The 1989 pledges by The Netherlands should be reassessed in this light.

- c. Assess current donor coordination in the forestry sector.
- d. Assess current activities supported by the Netherlands in the forestry sector: projects like DOVAP and components in District Rural Development Projects.
- e. Identify possible programmes or projects for support, considering the Netherlands' development objectives and priorities. In view of these, the mission must pay attention particularly to locations of relevance to ongoing Netherlands' supported projects. Some suggested locations are:
 - Biharamulo District: Biharamulo Game Reserve, woodland
 - Mbulu District: Marang Forest, Ngorongoro Forest
 - Kahama District: miombo woodland
 - Bukoba District: Minziro Forest and other natural forests
 - Pare Mountains
 - Uluguru Mountains
- f. Assess the Forestry Research Master Plan 1993 - 2002, the capacity of the Tanzania Forestry Research Institute (TAFORI) to execute and identify the possibilities of Netherlands support for forestry research in relation to community forestry and natural forest management.
- g. Newly identified forestry activities should be of relevance to the management of protected natural forest areas (forest reserves, game reserves, National parks, watershed forests) within the framework of rural development. Activities should be aimed at strengthening of forest management with the involvement of local communities, e.g. besides forest management also agroforestry in bufferzones, limited use zones, awareness raising, fuelwood plantations, introduction of fuel efficient stoves, regulation of livestock grazing etc...
- h. In order to avoid overlap, and to maximise efficiency of support, the mission must make sure that new activities are identified in consultation with Tanzanian authorities (at different levels) and are in line with other ongoing or planned activities, if any.

III. METHODOLOGY

- a. Deskstudy of relevant documents, reports, publications etc.
- b. Discussions at various levels with GOT, relevant donors, UN-organizations and relevant Tanzania NGO's.

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- h. In order to avoid overlap, and to maximise efficiency of support, the mission must make sure that new activities are identified in consultation with Tanzanian authorities (at different levels) and are in line with other ongoing or planned activities, if any.

III. METHODOLOGY

- a. Deskstudy of relevant documents, reports, publications etc.
- b. Discussions at various levels with GOT, relevant donors, UN-organizations and relevant Tanzania NGO's.

As is the case with Karagwe, three major land use types may be discerned: the 'Kibanja', the 'Kikamba', and the 'Rweya' open grassland, used mainly for grazing cattle. Since recent, major fertility problems have been observed mainly under bananas.

4.8.4 AF Activities and projects

(i) Bukoba District Rural Development Programme

Bukoba DRDP started in 1988 with the aim of improving the living standard of the rural people. The programme is multi-sectoral and it aims for sustainability. Its activities, executed through the regular system of the district council, focus on:

- Intensification and diversification of agricultural production systems.
- Conservation of natural resources.
- Organisation of local communities.
- Strengthening of primary health care.
- Support to primary education.
- Rehabilitation of roads.
- Strengthening of planning and implementation capacity.

The identification and diversification of the agricultural production systems, is a programme of the District Agriculture and Livestock Development Office, in collaboration with the Farmers' Extension Centres (FEC's). Despite the fact that there seems to be little scope for the introduction of AF tree species in the Bukoba farming system, FEC's are being used for demonstration and research purposes to, among others, introduce fruit trees and agroforestry tree species.

The second trust: "Conservation of Natural Resources" consists mainly of activities to protect the forest and water resources of the district and to make the population aware of the need to exploit the natural resources in a sustainable way. The following activities are undertaken:

- Tree nurseries and distribution of seedlings.
- Demarcation and protection of natural and planted forests.
- Village forests (for brick making).
- Improved cooking stoves.
- Training of the population and training of the staff.

The important aspect that deserves attention within the natural resource management programme, is the demarcation and protection of natural and planted forests to avoid further encroachment. These forests are, in general, very small but do play a substantial part in providing the surrounding communities with fresh water. The methodology used was participatory and consisted of village meetings and physical demarcations. The process may eventually lead to the preparation of contracts between the village governments and the forest department.

A potential threat to the environment is the west ward migration from the Bukoba lake zone to the drier western parts of the district. Present signs are forest encroachment and soil erosion. A better understanding of the district resources and the uses is required to enable policy makers to anticipate on present and potential problems. The present availability of the district soil map and the preparation of the land use map are considered as first steps in arriving at district land use planning.

(ii) Other projects

National Agriculture/Livestock Extension and Research Programme (NALERP)

The NALERP started in 1987 as a pilot project. Now, the project is implemented in 57 districts in 13 regions. The second phase will start in 1996 and will take another 7 years.