

# MAGOROTO MLINGA COMMUNITY ECOTOURISM PROJECT (MAMCEP)

Phase 1 Final report



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## EXECUTIVE SUMMARY

Magoroto and Mlinga are among the most threatened forests in the East Usambara Mountains Biosphere Reserve, which belongs to the biologically rich Eastern Arc Mountain chain. These mountain forests host a high number of rare and endemic species, including the African violets (*Saintpaulia*) which are their conservation flagships. Magoroto and Mlinga are also an invaluable water catchment area for the Muheza District. These forests have undergone significant degradation due to selective extraction of timber trees, forest fires, agricultural encroachment and pole cutting, which are consequences of high population growth, lack of environmental education, and lack of alternative livelihood strategies. The aim of this project was to promote forest conservation and to explore the possibility of developing ecotourism in two forest-adjacent villages. The activities conducted in the villages included awareness raising about forest conservation, capacity building through different trainings and formulation of a village ecotourism committee, and documentation of potential tourism attractions in collaboration with the villagers. Moreover, collaboration was strengthened among the local stakeholders of forest conservation.

The important findings of the project were that the communities are willing to put effort on forest conservation and ecotourism development, and that local government authorities and other stakeholders are willing to work together to support these aims. The documented attractions and local culture demonstrate that Magoroto and Mlinga have significant tourism potential. However, in order to utilize that potential for economically viable tourism operations, and to firmly integrate tourism with forest conservation, the communities will need much more further assistance. A preliminary evaluation of the project impact, which was based on a nine-month monitoring of the forest disturbance, shows that forest exploitation has decreased after the initiation of the project. The project thus managed to build a good foundation for further conservation and development work in the area.

## ACKNOWLEDGEMENTS

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People of Mwembeni and Magula villages  
Amboni Sisal Properties Ltd. / Magrotto Estate  
Muheza District Authority  
Tanga Catchment Forest Authority



Cover illustration: Drawing by Fransisi Yohana from Magula Primary school describing the environment of the Mlinga Mountain.

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# 1. PROJECT BACKGROUND

## 1.1 Finnish *Saintpaulia* Society

Finnish *Saintpaulia* Society is a small NGO established in 2003 by a group of biology students and graduates from the University of Helsinki. The aim of the society is to promote the study and conservation of the wild African violets (genus *Saintpaulia*), which are threatened endemic plants and conservation symbols of the Eastern Arc Mountain forests in Tanzania and Kenya. Members of the society have conducted thesis studies on the ecology and conservation of *Saintpaulia* and raised awareness about the topic by e.g. writing articles and attending conferences. The society has also distributed information about its work in the annual World Village Festival in Helsinki since 2005. In 2003, the society conducted a field project in the East Usambara Mountains with a primary aim to document the distribution of *Saintpaulia* in the Amani Nature Reserve, Derema forest and Nilo Forest Reserve, and in the coastal lowlands of Tanga. A further aim was to explore the possibility of integrating *Saintpaulia* habitat conservation and ecotourism in the East Usambara Mountains (Kolehmainen et al. 2004). The current project therefore bases on the previous work of the society in the East Usambara Mountains.

## 1.2 Community-based ecotourism in Tanzania

Community-based ecotourism has become popular as a means of supporting biodiversity conservation all over developing countries. It is based on the idea that ecotourism can generate economic benefits to local people and therefore increase local appreciation of nature conservation. An enterprise-based approach to conservation has been proposed as a strategy for financial and operational self-sufficiency or sustainability of community-based ecotourism. The sustainability is expected to come from three sources: (i) an ongoing conservation incentive in the form of income dependent on biodiversity; (ii) reinvestment of some of the income to maintain the business and protect the biodiversity asset base; and (iii) once a basis has been established, the entry of the private sector to provide the capital for further development and expansion (Kiss 2004).

Tourism accounts for around 16% of Tanzania's GDP and nearly 25% of total export earnings (Emerging-Market.org 2008). Nature, especially wildlife, is the main asset of Tanzanian tourism and over 25% of Tanzania is set aside as protected areas such as national parks and game reserves. Since the 1990's, the tourism industry of Tanzania has been looking into possibilities of diversifying its offer as the national parks, the traditional tourist attractions, began to be congested. As a result, community-based ecotourism projects have sprung up, especially in northern Tanzania. Ecotourism's expansion into village lands through local agreements has provided an important means for the industry to continue to grow rather than getting boxed into increasingly crowded national parks. In addition, these trends have resulted in tourism becoming a significant economic activity at the local level in many rural parts of northern Tanzania (Nelson 2004, 2006). However, the impact of community-based ecotourism on conservation and community development has been questioned. Local communities adjacent to national parks and protected areas are not often involved in the planning and implementation of tourism activities or their involvement is not sufficient. As a result, benefits to the communities often remain marginal (Ofosu-Amaah 2007). On the other hand, communities are highly variable in their capacity to effectively manage tourism ventures, revenues and associated resources (Nelson 2004), due to which their full involvement will often require extensive training and capacity building efforts. As long as the tourism's contribution to the livelihood of the communities remains marginal, it cannot be expected that tourism would be an incentive for the communities to conserve natural resources (e.g. Kiss 2004 and references therein).

## 1.3 Ecotourism in the Eastern Arc Mountains

The Eastern Arc Mountains of Tanzania and Kenya host forests with globally important biodiversity values and are therefore an important target of the local and international conservation community. The main mechanism for conservation in the Eastern Arc Mountains has been the establishment of protected areas under the management authority of the national government, with some smaller-scale efforts by private enterprise and local populations (Burgess et al. 2007). Tourism in the Eastern Arc Mountains is a relatively recent phenomenon and community-based ecotourism is still quite marginal. The most important tourist destinations are the Amani Nature Reserve (ANR) and the Udzungwa

Mountains National Park, both gazetted in 1990s. The ANR is a government entity with a collaboration agreement with the forest-adjacent communities for cost and benefit sharing in the forest conservation and tourism (ANR Management Plan). In Udzungwa Mountains N.P., the Tanzania National Parks Authority (TANAPA) and the WWF have conducted development projects in the adjacent communities including the involvement of local people in some of the tourism activities (Aloyce 2005). Cultural tourism programmes operate in the Pare Mountains and the West Usambara Mountains (e.g. Amani Tours 2007). Also in the Uluguru Mountains there has been an initiative to develop cultural and ecotourism in the forest-adjacent communities (WCST 2000).

#### 1.4 Tourism in Tanga Region

Tanga Region has a diverse offer for tourists, but most of the attractions and services are yet to be fully developed. The Tanga City, the capital of the region, is rich in history and period architecture which is slowly being rehabilitated. Around Tanga City there are the Amboni limestone caves, Galanos sulphur springs and Tongoni ruins. South of Tanga City is the small Swahili town Pangani which was a prominent trading centre of the 19th century. Cultural tours in the town and cruises on Pangani River and to nearby islands are arranged from the town centre while beach resorts outside the town serve those who like to rest or enjoy beach activities. To further south is the little known Saadani National Park with beach and wild animals. West of Tanga in the East Usambara Mountains is the Amani Nature Reserve, a little exploited ecotourism destination with dense submontane rainforest and endemic Flora and Fauna. Near the Amani Nature Reserve, tourist services are also arranged by the butterfly farming project in Shebomeza village and the Tukae community development project in Emau Hill, which arranges volunteer job opportunities in local communities. To the northwest from the East Usambara is the Mkomazi Game Reserve which has recently been gazetted as a national park and which is known for its rhino sanctuary and other wildlife. West Usambara Mountains offer good quality lodge accommodation, cultural tours and hiking in the mountain rainforests (Fitzpatrick 2002, Amani Butterfly Project 2007, Tukae partners 2008).

#### 1.5 Project area

##### 1.5.1 Location and forest coverage

The Mlinga-Magoroto ridge (or Magoroto Hills) is an eastern outlier of the East Usambara Mountains. Administratively the area belongs to Muheza District in Tanga Region (Fig 1.). The hills have two areas of remnant natural forest, one is within the Magrotto oil palm estate (hereafter referred to as Magoroto forest) and the other one is Mlinga Forest Reserve (hereafter referred to as Mlinga forest).

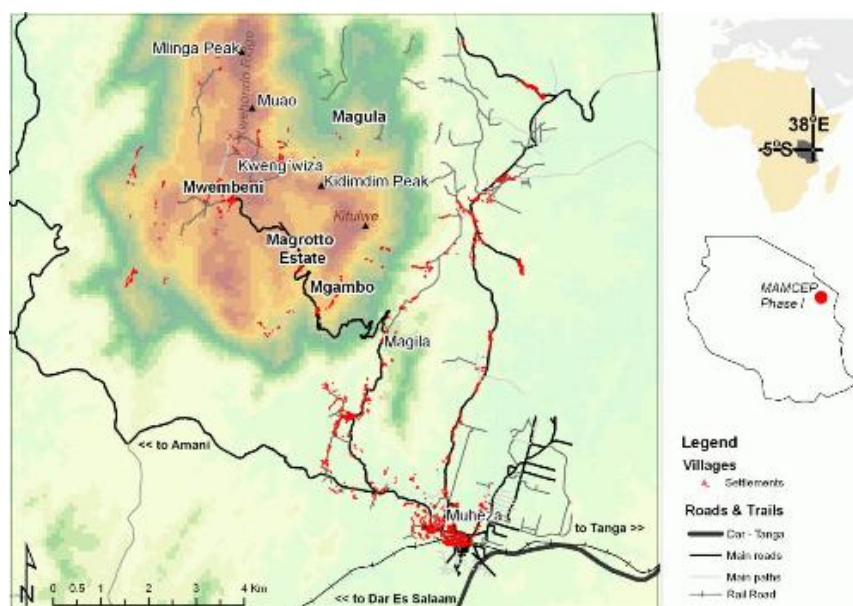


Figure 1. Map showing the location of the project area.

The Magoroto forest is owned by a private company, the Amboni Sisal Properties Ltd. In 1991, the area of the remaining natural forest within the estate was reported to be 215.5 ha (Amboni Limited 1991). Current figures of the forest coverage are not available. In Magoroto, forest is mainly found on the upper parts of the slopes and on the ridge tops between 700 and 880 m above sea level while the slopes are deforested. The vegetation in the central part of the estate consists of plantations of oil palm which are no longer managed allowing the regeneration of natural forest especially on the plantation edges. The natural forests in Magoroto are of indispensable value as a water catchment area for the surrounding villages and Muheza town (Cunneyworth & Stubblefield 1996). Over ten years ago, it was proposed that the estate forests would be protected as a nature reserve (Tye 1994), but was not materialized.

Mlinga Forest Reserve, located north of the Magoroto, is a catchment forest reserve under the management of Tanga Catchment Forest Authority. The reserve has an area of 890 ha of which 80 % is covered by forest. The reserve is characterized by steep rocky slopes and a mountain peak, the altitudes ranging from 220 to 1069 m above sea level (Johansson & Sandy 1996, Hall et al. 2002). Mlinga Forest Reserve was gazetted as a catchment forest reserve in 199 primarily to protect the headwaters of Mruka (a tributary of Sigi) and Mkulumuzi Rivers and to conserve the interesting forest and rocky summit surrounding Mlinga Peak (Hamilton 1989).

### 1.5.2 Biodiversity

Like other forests of the East Usambara, Magoroto and Mlinga are valuable in terms of biodiversity. Baseline biodiversity surveys were conducted in Magoroto in 1994 and in the Mlinga forest in 2001. Relative to other reserves surveyed in the East Usambara, Mlinga F.R. and Magoroto have average floral and faunal diversity. The most striking difference between Magoroto and Mlinga is the high diversity of birds in Magoroto in relation to its small area. Therefore, it is not surprising that the Wildlife Conservation Society of Tanzania and the BirdLife International has designated Magoroto as one of the important bird areas (IBA) in Tanzania (WCST brochure). Three species of *Saintpaulia*, *S. magungensis*, *S. grotei* and *S. diplotricha*, have been reported from the Magoroto and the Mlinga forests (Hall et al. 2002, S. Simiyu, pers. comm.). However, those species are now treated as subspecies of *S. ionantha* (Darbyshire 2006).

Table 1. Summary of the diversity of taxa surveyed from the Magoroto forest (Cunneyworth & Stubblefield 1996) and Mlinga Forest Reserve (Hall et al. 2002).

Taxon	Total no. of species	No. of endemics	No. of Near-endemics	No. of forest dependent endemics and near-endemics	% endemics	% near-endemics	% forest dependent endemics and near-endemics
<b>Magoroto:</b>							
Trees and shrubs	109	5	30	24	4,6	27,5	22,0
Mammals	27	0	3	0	0,0	11,1	0,0
Birds	82	0	6	4	0,0	7,3	4,9
Reptiles	29	0	8	8	0,0	27,6	27,6
Amphibians	30	1	12	14	3,3	40,0	46,7
<b>Total or average</b>	<b>227</b>	<b>6</b>	<b>59</b>	<b>50</b>	<b>1,6</b>	<b>22,7</b>	<b>20,2</b>
<b>Mlinga:</b>							
Trees and shrubs	269	9	26	21	3,3	9,7	7,8
Mammals	32	0	5	2	0,0	15,6	6,3
Birds	47	1	6	5	2,1	12,8	10,6
Reptiles	25	0	8	8	0,0	32,0	32,0
Amphibians	21	0	11	10	0,0	52,4	47,6
Butterflies	103	0	2	1	0,0	1,9	1,0
<b>Total or average (excluding butterflies)</b>	<b>394</b>	<b>10</b>	<b>58</b>	<b>47</b>	<b>1,1</b>	<b>24,5</b>	<b>20,9</b>

### 1.5.3 The communities

Villages bordering the Magoroto forest are Magila, Mgambo, Mwembeni and Magula. Mlinga Forest Reserve is surrounded by Misozwe, Magula, Mwembeni and Gare. According to the population census of 2002, the population surrounding these forests is 15,561 (Magoroto, Magila and Misozwe wards) (Tanzania National Website 2003). The target villages of the project, Mwembeni and Magula, have a population of 2,036 and 1,400, respectively (Magoroto Ward Office statistics, May 2007). Majority of the people belong to the Washambaa tribe, with minorities of Wabondei and Wapare. Generally the people lead a subsistence lifestyle and still rely heavily on forest products. Economic development within the area is limited and the overall standard of living is low. Cash crops, which are sold in the markets in the nearby towns Tanga and Muheza, are the main source of income (Cunneyworth & Stubblefield 1996).

### 1.5.4 Forest degradation

Illegal activities within protected forests have increased in the East Usambara Mountains after the East Usambara Conservation Area Management Programme (EUCAMP) phased out in 2002, Magoroto and Mlinga being no exceptions. Presently, the regional catchment forest authority is conducting patrolling and law enforcement in the Mlinga F.R. but due to the limited resources, the work is done at minimum level which is why illegal forest exploitation can continue in the reserve (R. Killenga, pers. comm.). Fire disturbance has also threatened the Mlinga forest annually and extensively in recent years. Pole cutting and animal hunting also continue on a small scale (Hall et al. 2002). In the Magoroto forest, high rates of pole and timber cutting were recorded in conjunction with the biodiversity surveys in 1994. According to the owner of the Magoroto Estate, illegal logging and encroachment continued in the estate forests in early 2006 (G. Hess, pers. comm., Feb 27, 2006).

During the biodiversity surveys, the environmental committees of the villages surrounding the Mlinga Forest Reserve identified the lack of environmental education and increasing population as the main reasons for declining of the forest (Oliver et al. 2002). Erosion of traditional forest conservation institutions (customary laws) in the communities (Kweka 2004) is a further factor that allows forest destruction to continue. There are few, if any, alternatives strategies available for income to replace the forest products (Cunneyworth & Stubblefield 1996).

### 1.5.5 Tourism potential

Magoroto and Mlinga area may have a good potential for diversification of the ecotourism offer of the East Usambara Mountains and Tanga region as a whole. The tourism potential of the Magoroto and Mlinga lies in its biodiversity, landscape and local culture. The Shambaa culture is well preserved compared to many other parts of the East Usambara, such as Amani, because the area has received relatively few immigrants (Kweka 2004). This offers a good starting point for development of cultural tourism. The area gives an opportunity to experience the East Usambara mountain forests at short distance (ca. 15 km) from the Muheza town. It could also be relatively easily linked with other tourist attractions of the region.

## 2. GOALS AND OBJECTIVES

The overall goal of this project is to improve conservation and sustainable use of the Magoroto and Mlinga forests for the benefit of the local and international community. Special focus is on the conservation of the endemic plant genus *Saintpaulia*, which has been promoted as a conservation flagship and a tourist attraction of the Eastern Arc mountain forests (e.g. Eastwood et al. 1998). The project examines the possibility of developing ecotourism as an alternative and sustainable way to use forest in partnership with the forest-adjacent communities and other stakeholders. The following specific objectives goals were set for the initial project phase:

- Raise awareness about the importance of forest conservation in the communities
- Train community members in forest conservation techniques
- Document the potential tourism attractions
- Build community members' capacity for ecotourism development
- Make young people more aware of traditional forest conservation methods and forest related cultural heritage

- Document the distribution and assess the viability of *Saintpaulia*, and develop a conservation plan for the genus
- Make an initial step in tourism marketing

### 3. INPUTS

#### 3.1 Allocation of time and human resources

Intensive project field work was conducted for six months from January to June 2007. To increase the impact of the project, some field activities were continued from July 2007 up to April 2008 (monthly monitoring of forest disturbance and one stakeholder meeting).

The management team of the project consisted of:

- Project Leader, Finnish Saintpaulia Society, Finland (PhD in Plant Biology), 30 field days in May-June 2007
- Field Coordinator, BSc student in International Business, Haaga-Helia University of Applied Sciences, Finland (Diploma in Agriculture), 181 field days from January to July 2007.
- Assistant Field Coordinator, Forest Research and Development Officer, Tanga Regional Catchment Forest Authority, Tanzania (MSc in Forest Biology), 123 days from January 2007 to April 2008.
- The following experts and volunteers were recruited for specific assignments in the field:
- GIS Expert, University of Helsinki, Finland (MSc in Environmental biology), 30 field days in May-June 2007
- Agricultural Extensionist, Muheza District Authority (BSc in Agriculture and Soil Conservation), 8 days
- Community Development Extensionist, Muheza District Authority, 1 day
- Project volunteer, BSc student in Forest Engineering, HAMK University of Applied Sciences, Finland, 45 days

Project supporting staff, which was recruited among the villagers, included a security guard (43 days) and a cook (143 days). Moreover, about 40 villagers from Mwembeni and Magula villages participated in the project field work and/or trainings. A tour guiding course in the Amani Nature Reserve was organized in collaboration with the staff of the Wildlife Conservation Society of Tanzania and Amani Nature Reserve.

#### 3.2 Equipment and facilities

A private four-wheel double cabin car was hired for transportation for about four and a half months. A laptop computer was purchased to conduct writing tasks in the field. Also miscellaneous smaller field equipments were bought for the project. Team members also used their own property such as GPS devices and cell phones for the project activities. Photocopying, printing, internet services and stationeries were bought from Muheza and Tanga. The Magrotto Estate manager's house served as head quarters for the field activities. Part of the project management tasks were conducted in project collaborators' premises (Muheza District Authority, Tanga Forest Office) and in project field coordinators' homes in Muheza and Tanga. When work was conducted outside of the project region, the team members accommodated in hotels and guest houses.

#### 3.3 Funding

The National Geographic Conservation Trust (USA) was the major funder of the project. Additional funding was provided by the Rufford Maurice Laing Foundation (UK), the African Violet Conservation Fund of the Cincinnati Zoo and Botanical Garden (USA), the Swedish Saintpaulia Society, the Finnish Saintpaulia Society. In addition, remaining funds from the Finnish Saintpaulia Society's previous field project were directed to the project.



## 4. ACTIVITIES AND OUTPUTS

### 4.1. Setting up the project and raising awareness

#### 4.1.1 Initial village meetings

Three different kinds of meetings were conducted in the project target villages Mwembeni and Magula in order to raise awareness about the project goals, to gain acceptance for the project in the villages and to conduct participatory planning of the project activities.

##### *Meetings with the village governments*

The project field work was initiated by conducting a meeting with village government representatives in both project villages. The project goals and the planned activities were introduced to the village leaders, and a schedule of the project activities and venues for further meetings and trainings were agreed. It was decided that the Mwembeni village would serve as an administrative base of the project due to its accessibility. The idea of formulating a village ecotourism committee was also introduced and accepted. As an output of the meetings, the project was highly approved by the village leaders.

##### *General meetings*

A village general meeting, targeting on the entire community, was conducted in each village. A total of 70 and 65 participants attended meetings in Mwembeni and Magula villages, respectively. The project objectives, the planned activities and expected benefits to community were explained and discussed in the meetings. Awareness was raised on forest conservation and on the potential of tourism in improvement the life standard of the communities. The option of using the forests in a sustainable way for ecotourism instead of destructive exploitation was stressed. The project gained acceptance in both villages and the villagers promised to collaborate with the project. However, they emphasized that ecotourism should provide tangible benefits for the communities.

At the end of the meeting, about 40 representatives from different groups (village chairpersons, village executive officers, sub-village leaders, elders, pit-sawyers, hunters, women groups, youth groups, medicinal healers, cultural groups, artisans etc.) were identified to participate in the project activities.

##### *Meeting with the group representatives*

A participatory planning meeting was arranged with the village leaders and the selected group representatives to assign them into different project activities. Seven persons per village were appointed as resource persons to work with the project (survey of potential tourism attractions) and to attend trainings. Moreover, the village chairpersons, village executive officers, sub-village leaders and ten additional people from Mwembeni and eight from Magula were selected to attend only the trainings. The additional people consisted of farmers cultivating near the forest and forest users (such as pit sawyers, hunters, traditional healers, honey gatherers and artisans).

The group representatives were also given their responsibilities. They were supposed to appear for the project activities to which they are appointed, share the knowledge they get in the project with other villagers and put the knowledge in practice so that they can work as examples to other villagers. The responsibility of the village leaders was to maintain discipline of the villagers who were appointed in the project work and to see that they conduct their duties as agreed. Moreover, practical arrangements and schedule of the work and the trainings were discussed and agreed upon.

#### 4.1.2 Community questionnaire

A questionnaire survey was carried out in the two project villages in order to obtain objective and structured information about villagers' opinion on development of tourism and the resources they have for tourism development. In addition, villagers' appreciation of natural resources was enquired in order to know how much there is need for raising conservation awareness. A total of 102 people were interviewed in such a way that approximately an equal number of people from each village, age group and sex were sampled (Table 2). Chi-square tests were conducted

using the Statistical Package for Social Sciences (SPSS) to test the effect of village, sex, age, and occupation on the respondents' answers.

Table 2. Sample sizes of the respondents according to village, sex, age and occupation

Village	Frequency	Percent
Mwembeni	43	422
Magula	59	578
<b>Sex</b>		
Male	53	520
Female	49	480
<b>Age</b>		
12 - 18 years	25	245
19 - 30 years	26	255
31 - 45 years	29	284
46 and above	22	216
<b>Occupation</b>		
Farmer	57	599
Employee	12	118
Entrepreneur	3	29
Other	30	294

The following charts present the results from the questionnaire:

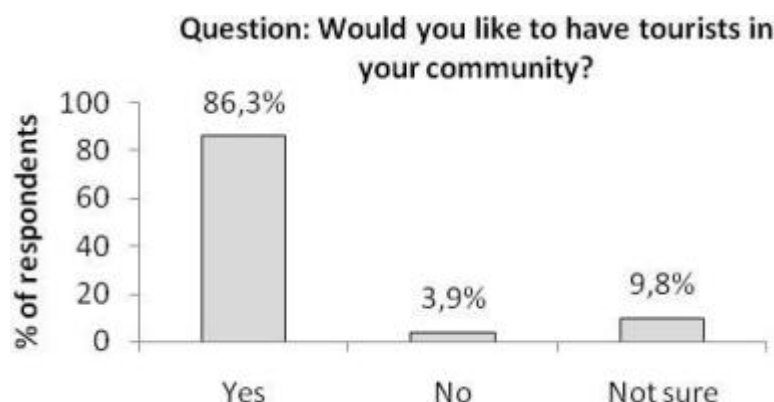


Figure 2. The respondents had a very positive attitude towards tourism development in their community. The village, sex, age or occupation of the respondent did not affect the willingness to have tourists in the community ( $P = 0.236$ ,  $P = 0.167$ ,  $P = 0.126$ ,  $P = 0.381$ , respectively).

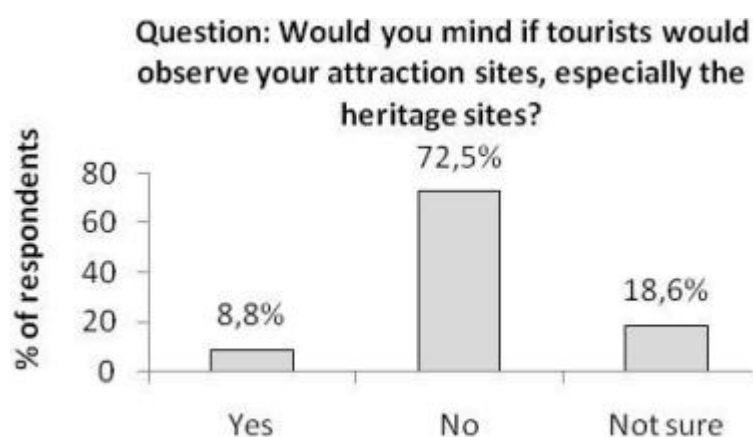


Figure 3. Majority of the respondents would allow visitors to observe their heritage sites. There was no difference between the villages ( $P = 0.450$ ), between males and females ( $P = 0.894$ ), or between respondents with different occupations ( $P = 0.233$ ), but age of the respondent had a significant effect on the response ( $P = 0.034$ ). **In the age group 46 years and above, a higher number of respondents had doubts about exposing heritage sites to tourists.**

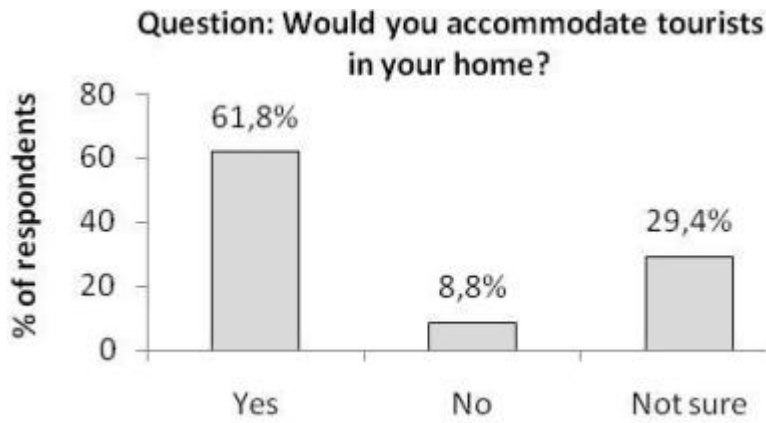


Figure 4. Most of the respondents were ready to accommodate tourists in their homes. Age of the respondent affected the willingness to accommodate tourists ( $P=0.000$ ). Respondents in the age groups 19 – 30 and 31 – 45 years were more ready to accommodate tourists than older respondents. The youngest respondents (12 – 18 years) were more uncertain about their opinion than the other age groups.

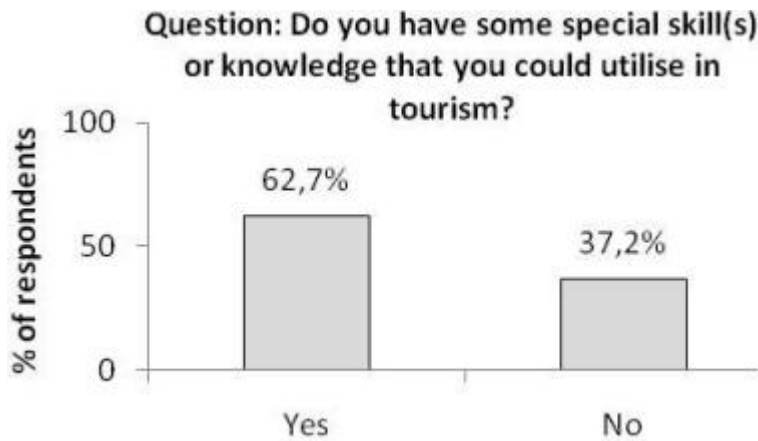


Figure 5. Over 60% of the respondents felt that they have some special skill(s) they could utilize in tourism. There was a significant difference between the villages ( $P=0.037$ ). More respondents from Mwembeni thought that they have a skill(s) than respondents from Magula. Age of the respondent also had a significant effect ( $P=0.009$ ). The youngest respondents (12 – 18 years) had fewer skills than respondents in the three older age groups.

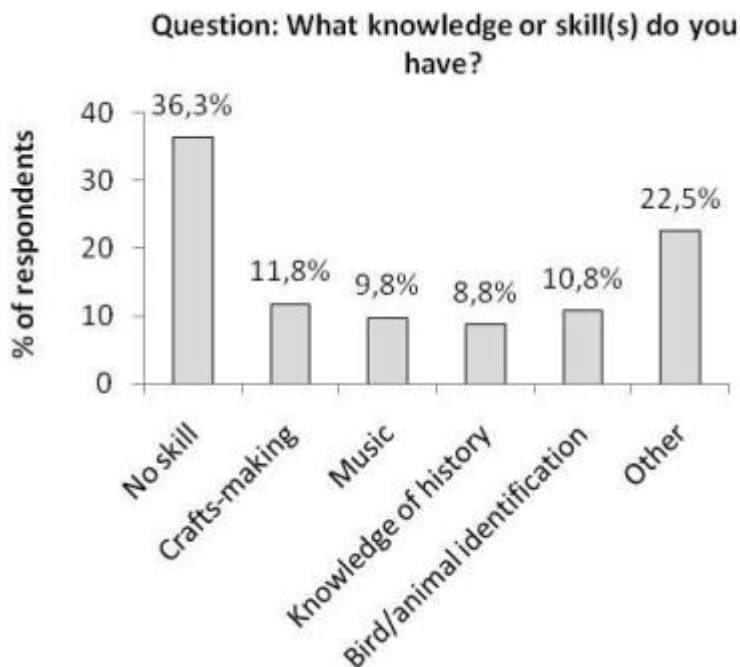


Figure 6. Handicrafts-making was mentioned by respondents especially in the age groups 31 – 45 and 46 and above, whereas music was commonly mentioned by the younger respondents. Historical knowledge of the area was mentioned especially by respondents in the oldest age group. Bird and animal identification was mentioned as a special skill especially in the age group 19 – 30 years.



Figure 7. The respondents were willing to receive training in skills that could be utilized in tourism. There was a significant association between age and willingness to receive training ( $P = 0.023$ ). **Respondents in the age group 19 – 30 years were the most interested in receiving training** while the older respondents (age group 46 years and above) were the least interested.

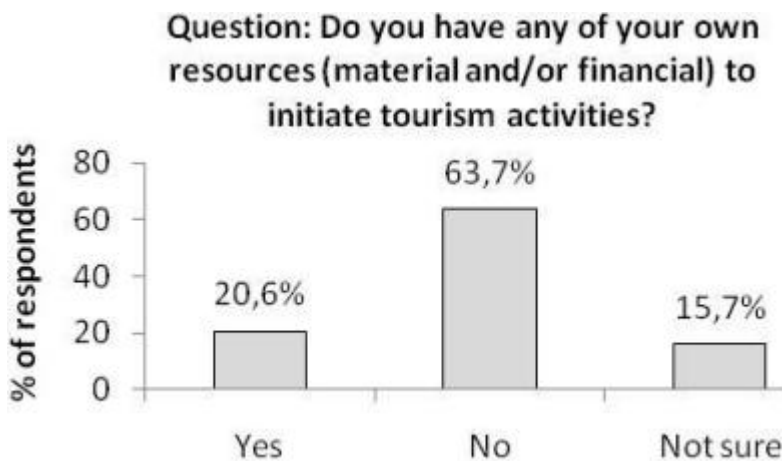


Figure 8. Only about 20% of the respondents stated that they possess resources (material and/or financial) to initiate tourism activities. Age had a significant effect on the availability of the resources ( $P = 0.021$ ). Older people (age groups 31 – 45, 46 and above) had more resources than the younger ones (12 – 18, 19 – 30 years).

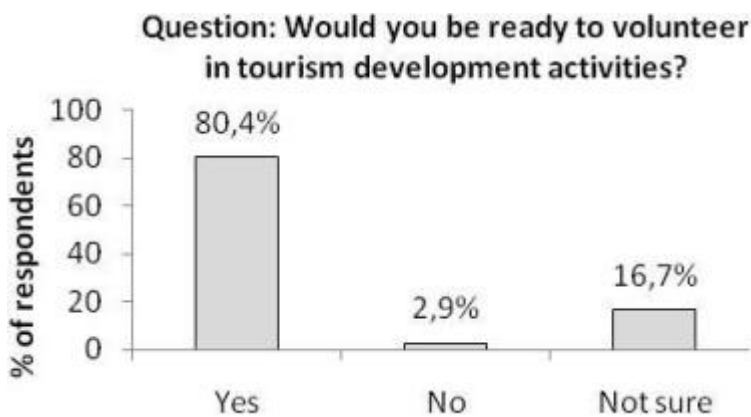


Figure 9. A majority of the respondents were ready to volunteer in tourism development activities. There was no effect of respondent's village, sex, age or occupation on the willingness to volunteer in tourism development.

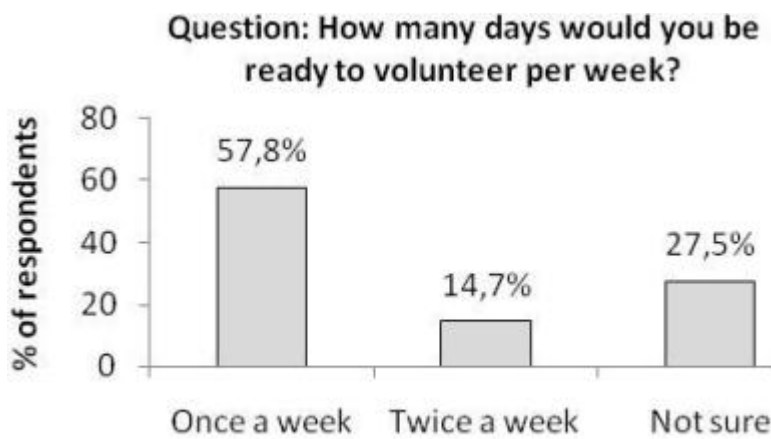


Figure 10. Most of the respondents (57.8%) said that they could volunteer in tourism development work once a week. The villages differed in the amount of time the respondents felt they could volunteer in tourism development ( $P=0.025$ ). Respondents in Magula felt that they have less time and they were also less sure about the availability of time for volunteering than respondents in Mwembeni.

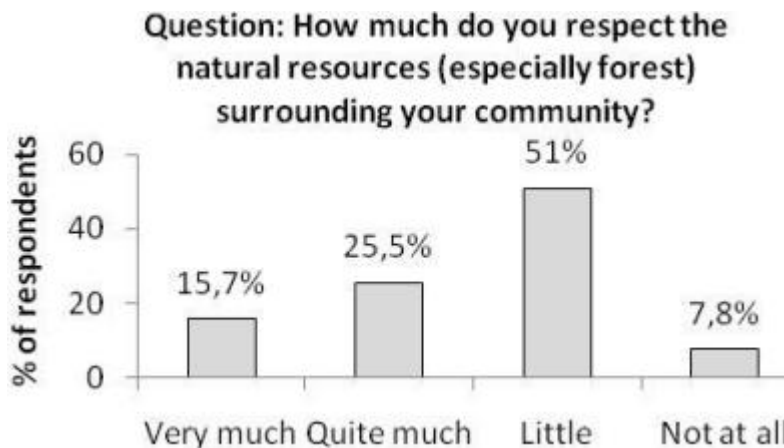


Figure 11. More than half of the respondents stated that they respect the natural resources only little or not at all. **This indicates the need for extensive awareness-raising in the forest-adjacent communities.** Some of the respondents were aware that plant species are disappearing and that some animals and birds have already disappeared because of the degradation of the environment.

#### 4.1.3. Drawing competition in primary schools

To increase awareness of the primary school pupils and their teachers about the importance of environmental conservation, a drawing competition was organized in Mwembeni and Magula primary schools. The project was introduced and the importance of environmental conservation explained to the pupils. Thereafter, the pupils were requested to show their knowledge about



Figure 12. Drawing competition winners from Mwembeni primary school.

the surrounding resources, especially the forest, by drawing them. Two hundred pupils participated in the competition. Ten drawings from Magula and nine from Mwembeni were shortlisted and sent to the Finnish Saintpaulia Society for selection of the winners. The winner drawings were used to design an illustration for the project t-shirt. The drawing competition winners were awarded prizes in a specific ceremony where the pupils were gathered on the school yard to hear feedback from the project team and the teachers. A football was given as a common gift for each school. Each of the three best drawers in each school were awarded stationeries and the project t-shirt.

## 4.2 Building local capacity in forest conservation and ecotourism development

### 4.2.1 Training

Eight different training modules were offered for selected community members. A total of 18 villagers from Mwembeni and 16 from Magula attended the trainings. The duration of the training modules ranged from two hours to five days and they were conducted in the Mwembeni village except the excursion and the tour guiding course which was organised in the Amani Nature Reserve. Classroom sessions were held in Mwembeni either at the hall of the dispensary or at the primary school.

#### 4.2.1.1 Conservation and sustainable use of the forest

This five day training consisted of classroom lectures with printed handouts as learning materials and field excursions to sites where unsustainable and sustainable forest use could be observed and where some of the forest protection techniques could be demonstrated. The contents of the training were:

- Introduction and key concepts, i.e. the meaning of forest, a catchment forest and sustainable forest use
- Forest conservation techniques
  - Involvement of communities in forest management and conservation
- The meaning of participatory forest management
- Reasons for community involvement
- Benefits of community involvement
  - Traditional forest conservation methods
  - Planting of trees
- Techniques of establishing and maintaining tree seedling nurseries
- Techniques of planting trees in farms and establishment of woodlots
- Management of the planted trees
  - Alternative uses of forest: ecotourism and beekeeping
  - Use of alternative materials for house construction and energy
- Use of mud bricks for house construction in order to reduce the cutting of building poles from the forest
- Use of energy saving stoves to minimize firewood consumption
  - Forest laws
- Activities that are not allowed in the catchment forest without permission
- Permissions and licences that can be issued for the use of catchment forest
- Activities that threaten sustainable forest management
  - Fire in the forest
- Methods to prevent and extinguish forest fires
  - Careless cutting of trees
  - Mining of gemstones in the forest
  - Over-stocking of cattle in a small area
  - Cultivation on steep slopes
- Benefits of conservation and sustainable use of the forest
  - Sustainability of the forest products
  - Water catchment and soil conservation function of the forest
  - Climate stabilization
  - Forest biodiversity as a resource base of ecotourism.

#### *Lessons learned from the training:*

The trainees declared that the forest use in the area is not sustainable due to destruction through logging and mining, and the fact that there are no tree planting programmes operating in the area. Generally, the training was very useful for the villagers as a step forward to conservation and sustainable use of the forest, and to promotion of forest-based. However, time and resources were limited to train many people. Further support is needed to train more villagers and to put in place some of the things that were trained. Especially, establishment of tree nurseries and tree planting are highly needed.

#### 4.2.1.2 Sustainable agriculture

Training on sustainable agriculture was conducted for five days. The aim of the training was to teach community members how to prevent soil erosion and increase productivity of the existing farmlands. The training consisted of classroom lectures with printed handouts and field demonstrations on the following topics:

- Soil and water conservation
  - Structures used to prevent soil erosion (planting of macro- and micro contour lines, terraces, trash lines, mulching and ditches)
- Proper agricultural land use

- Crop-spacing
- Agro-forestry
- Increasing soil fertility and harvest
  - Types and application of biological manures
  - Biological pest and disease control measures
- Agricultural laws and regulations
  - Cultivation is not allowed on slopes with inclination exceeding 40°
  - Soil conservation structures should be applied on slopes with inclination 5 – 40°
  - Slash and burn on fallows and use of pesticides are not allowed without a permission from the district agricultural authority
- Crop storage and processing
  - Correct harvesting time and proper storage to increase quality
  - Processing and packing to increase crop value
- Formulation of farmers' primary societies in Ward level to defend farmers' interests
  - Determining crop prices
  - Marketing of products
- Agriculture as a tourism attraction in rural areas
  - Traditional agro-forestry
  - Indigenous crops and landraces

*Lessons learned from the training:*

It was found out that the trainees had very little if any knowledge of sustainable farming methods. For example, soil conservation measures are not practised at all on the slope areas and little attention is paid to land productivity. The trainees were very much interested in the training and requested a long term and in depth training on the topic.

*4.2.1.3 Introduction to tourism*

The aim of this five-day training was to give the community members a basic understanding of the different aspects of tourism business with emphasis on tourism's impacts and benefits to local communities. The training topics were as follows:

- Meaning of tourism
- Tourism as an economic sector in Tanzania
- Tourism in Tanga Region
- Positive and negative impacts of tourism (economic, environmental, socio-cultural)
- Sustainable and unsustainable tourism
- Role of tourism in development
- Tourism planning
- Tourism attractions
- Networking in tourism
- Marketing of community based ecotourism
- Tourism investors - possibility of encouraging investors for various investments such as hotels and other infrastructures.



As a course assignment, a total of 35 attractions were identified by from the project area by the trainees. The trainees from each of the two villages drew a map showing the attractions around their village. Most of the attractions identified in the training were later surveyed in the field and included in the proposed trails.

*Figure 13. Participants of the tourism course drawing a map showing the location of the attractions in their village.*

A discussion conducted after the training produced the flowing feedback from the trainees:



- Ecotourism as a source of income for the communities can help prevent environmental destruction in the area
- Ecotourism can help to revive community traditions, promote cultural creativity such as handicrafts-making, rituals and dances, and encourage innovative agro ecotourism projects like growing and packing of spices
- Ecotourism can provide job opportunities and promote diversification of family income through micro-businesses such as organic agro production, crafts-making and services
- Ecotourism can encourage the participation of women in income generation activities
- Ecotourism offers possibilities to build and strengthen ties between individuals and institutions in local, national and global scale
- Tourism operators that will work in the area (such as tour operators) must work to protect the natural resources and contribute to the livelihood of the communities
- The tourism institutions must have proper agreements with the communities in order to make sure that the communities will not lose any benefits that they are entitled to get from the activity
- In addition to ecotourism, it is important to find also other supplemental methods to reduce environmental destruction in the area
- A marketing strategy needs to be put in place to increase visitation to Magoroto
- Tourism investors should be given areas to establish tourism services such as lodges
- A plan for tourism training for the communities that meets their needs and concerns should be created
- MAMCEP should seek resources to capacitate the community in tourism development

#### 4.2.1.4 Excursion to Amani Nature Reserve

After the introductory course on tourism, a total of 16 project resource persons/trainees from the communities attended a one day study excursion to Amani Nature Reserve (ANR). The aim of the excursion was to give the community members an opportunity to gain experiences from an already established ecotourism destination in the region.

The excursion programme started with a visit to the Sigi Information Centre at the entrance of the ANR where the Information Centre in-charge gave a short presentation of the place. Thereafter, the group visited the Information centres the permanent exhibition which presents the biodiversity, daily life and culture of the people, conservation activities, environmentally friendly livelihoods in the communities bordering with the ANR.

The excursion continued to the reserve headquarters in Amani, where the ANR conservator gave a general presentation of the reserve. After this, the excursion group met the chairman of the ANR Tour Guides Association who explained about the work of guiding the tourists and why guiding is needed to prevent negative effects of tourism on the ecosystem of the reserve.

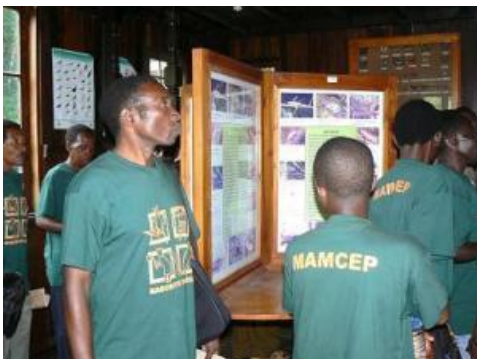


Figure 14. Excursion group visiting the exhibition at the Sigi Information Centre in the Amani Nature Reserve.

Thereafter, the group moved to Shebomeza village, where the office of the butterfly farming project is located. It was learned from the presentations of the butterfly project in-charge and the chairman of the Shebomeza village that the project provides an alternative source of livelihood for communities surrounding the Amani Nature Reserve by purchasing butterflies raised by individual farmers and by selling them to external markets. The project also contributes to conservation of some rare butterfly species which are raised and released to their habitats.

After the butterfly project, the group visited one the ANR trails, the Kwamkoro Trail, guided by the ANR tourism officer. Along the trail some



attractions such as *Saintpaulia*, interesting tree species and a viewpoint were observed. Finally, the group returned to the ANR headquarters for a feedback discussion that was also participated by the ANR conservator, the tourism officer and the rest house staff.

#### *Lessons learned:*

The trainees were very much impressed with the excursion. In the feedback discussion, the participants noted that ecotourism is much developed in the ANR and that the communities in Magoroto and Mlinga have much to learn from it. However, they also suspected, based on the presentation of the Shebomeza village chairman, that the communities could benefit much more from the tourism in Amani.

#### *4.2.1.5 Financing mechanisms for microenterprises*

The Community Development officer from Muheza District Council offered a one day presentation on how to obtain loans for microenterprises. The session was started with an introduction of the National Strategy for Growth and Reduction of Poverty (MKUKUTA) and how it seeks to improve the economy of individual people and communities. Thereafter, different types of micro loans and criteria of obtaining them were presented:

- Women Development Fund (Ministry of Community Development, Gender and Children)
- Youth Development Fund (Ministry of Labour and Youth Development)
- Loan from the Ministry of Finance for 'active poor people'
- Loans from member based micro credit entities (Rural Financial Support Program). The Rural Financial Support Program promotes the establishment of member based microcredit entities at Division level. These micro credit entities are owned by groups of people and supervised by the central bank of Tanzania. Members can obtain loans from the entity or from banks through the entity. Savings and credit co-operative societies (SACCOS) are one type of such entity. Several savings and credit co-operative societies are operating in the Muheza District. The community development officers in the district office can facilitate the establishment of the societies.

#### *Feedback from the presentation:*

The presentation increased the awareness of the community members about the possibilities for funding small businesses. However, it was concluded that in order benefit from the funding mechanisms, the communities will first need basic training on entrepreneurial skills.

#### *4.2.1.6 Tour guiding course*

A five day training of local tour guides was organised in the Amani Nature Reserve in collaboration with the Wildlife Conservation Society of Tanzania (WCST). Instructors of the training were from the WCST, ANR and MAMCEP. Four proposed tour guides from Magula and six from Mwembeni attended the training. Two of them were women, one from each village. The trainees were selected based on their education level (secondary school level required), knowledge of the local environment and culture, and ability to learn and to express him/herself. The training included both class room learning and field excursions/site visits. Emphasis of the training was on the guiding of bird watchers because birds are a major attraction of the East Usambara Mountains. The themes of the training were:

- Introduction to tourism
- Tour guiding and interpretation
- Avitourism and introduction to bird monitoring techniques
- Forest ecology
- Potentials for tourism in the Amani Nature Reserve Full contents of the training are presented in the training handout produced by the WCST (John 2007).

#### *4.2.1.7 Saintpaulia conservation*

A half day training session on the conservation of the flagship plant *Saintpaulia* was conducted for a group of 19 resource persons, including the tour guides trained by the project. An education leaflet in Kiswahilli language about the *Saintpaulia* was distributed to the participants. The following topics covered by the leaflet were discussed:

- Distribution and biology of *Saintpaulia*
- Ornamental use of *Saintpaulia*
- The importance of *Saintpaulia* for the communities of the East Usambara Mountains and Tanzania as a whole (an ecotourism attraction and a flagship of forest conservation)
- Reasons for *Saintpaulia* being threatened
- Introduction of the Finnish Saintpaulia Society
- How the villagers can protect the habitats of *Saintpaulia*

The training session was ended by showing pictures of *Saintpaulia* and their habitats in the forests adjacent to the villages. The education leaflets were also distributed to Mwembeni and Magula primary schools and village governments, Amani Nature Reserve, Tanga Catchment Forest Office and forest department of the Muheza District Authority.

*Lessons learned from the training:*

Most of the trainees had seen *Saintpaulia* growing in the forest, but they did not know that the plant could be used for any purpose. Because of the project, the plant and its global importance as an ornamental plant, national importance as a flagship of the conservation of the Eastern Arc forests, and potential future benefits to communities through ecotourism, are now known by many of the people in the project area. This awareness is likely to create positive attitudes towards conservation of the *Saintpaulia* habitats.

*4.2.1.8 Mwembeni bird walk*

A short training was offered for the trained tour guides by a Finnish project volunteer, who is also a bird enthusiast. The training was arranged in a form of a two-hour bird walk on a proposed bird trail starting from Mwembeni village (See 4.2.1). The training consisted of bird identification using binoculars and guide books and discussions on different topics related to bird biology, bird watching and bird tourism.

*Lessons learned and recommendations:*



*Figure 15. Tour guides practising bird identification on a bird walk with the project volunteer Tapio Kaisla.*

The participants were very motivated and presented many questions. During the bird walk it was learned that the tour guides need more training on bird identification and guiding of bird tourists, so this training should be continued by the project. The binoculars donated for the project by a bird enthusiasts' shop in Finland (Lintuvaruste) will be handed over for the tour guides as soon as the village tourism committee's office in Mwembeni will be renovated to such condition that equipment can be stored there. The tour guides will then be able to study birds on their own.

*4.2.2 Meeting of the elders and the young*

Some village elders and young people were brought together in a meeting held at the Mwembeni

Primary School. Eleven elders (4 women, 7 men) and ten youngsters (2 women, 8 men) participated in the meeting. The aims of the meeting were to obtain information about the traditional forest conservation methods and forest-related traditions from the elders, to pass that information to the young, and to discuss the current status of the traditions and possible ways of preserving them. A further aim was to hear elders' opinion on the idea of exposing some of the ritual sites and traditions to tourists.

### *Lessons learned:*

It was learned that the elders still have a great amount of knowledge about the forest-related traditions and that some of the traditions are still practised. The traditional forest conservation methods and forest-related traditions described by the elders and other informants are discussed in more detail in chapter 4.3.2.

According to the elders, the current state of the forests is very different from what it was earlier. Nowadays there are frequent forest fires up to the Mlinga mountain peak. When the elders were young, fire incidences were very rare, and if they occurred, they were soon extinguished by rain. Rain making was a common practise on the Mlinga Mountain, but it is not continued anymore. Traditional rules and taboos controlled the use of the forest resources but those rules are no longer followed. The fast growing population is seen as a big threat to the forests because more and more farmland is needed to feed the population.

Initiation rites which were conducted in specific sites in the forest (See 4.3.2 for a description) have stopped completely. Lack of this training has led to erosion of the culture and behaviour of the teenagers has become careless and irresponsible. For example, pregnancies of very young girls have become common. There is no any training system that has replaced the initiation rites.



*Figure 16. Female elders sharing their knowledge with the young.*

When the elders were asked whether they would be willing to show some of the ritual sites to visitors and interpret the traditions for them, they had no objections, but they stressed that the visitors would have to respect the sites and the associated culture.

There are different reasons for the erosion of the traditions. Christianity and Islam, which have condemned local traditions, have had a major effect. Another reason is the modernization of the society. Transfer of traditional knowledge from the elders to the young has almost totally stopped because the young people simply do not

spend so much time with the elders as they did before. This is because young people are busy to earning their living, often outside of the home village. Elders no longer have arrangements to pass their knowledge to the young. The young people who attended the meeting stated that they are willing to be close to the elders and learn about the traditions but that it is quite difficult due to the time constraint and the effect of religion.

The meeting ended with the following conclusions and recommendations:

- There should be an arrangement to bring the elders and the young together in order to pass traditions to the younger generations. That could be, for example, in the form of meetings
- The elders should resume their role in stopping the young from destroying the environment
- The community should be more involved in conserving of the environment
- Measures should be sought to slow down the population growth

#### 4.2.3 Formulation of the village ecotourism committee

One village ecotourism committee was formed to serve both of project villages (Magula and Mwembeni). The committee operates under the village governments and its primary aim is to provide institutional capacity for tourism development and environmental conservation activities in the two villages. Ten members (five from each village) were elected for the committee:

- Mussa Shaaban - Chair person (Mwembeni)
- Ali Selemani - Vice chairperson (Magula)

- Francis Sezua - Secretary (Magula)
- Salima Salim - Treasurer (Magula)
- Francis Simon - Member (Magula)
- Magreth Vicent - Member (Magula)
- Mwanaisha Hamisi - Member (Mwembeni)
- Mariam Mussa - Member (Mwembeni)
- Rogers Mndolwa - Member (Mwembeni)
- Idd Selemani - Member (Mwembeni)

The following responsibilities were assigned to the committee:

- To plan, supervise and implement tourism development and environmental conservation activities in Mwembeni and Magula villages in collaboration with other stakeholders
- To keep record of the number of tourists visiting the village area (the tourists will report at the committee's office in Mwembeni).
- To advice tourists arriving to Magoroto and/or Mlinga about the available attractions and arrange guides to take the visitors to attractions of their choice
- To collect entry fees and guiding fees from tourists
- To monitor and report illegal activities in the forest and help arrest the persons conducting the activities

A room adjacent to the Mwembeni village government office was identified as the office of the committee, but renovation and furnishing is needed before it can be taken to use. The revenues from tourism will be used to cover the cost of running the committee (allowances, stationary etc.) and to improve the tourism attractions and services. Part of the revenues will be channelled to the village governments to be used in community development activities. Due to the small number of tourists, the operation of the committee is first supported by the MAMCEP but it will later run self sufficiently with the revenues from tourism. The chairperson, vice-chairperson, secretary and treasurer were instructed on how to keep the committee's financial records. The income from the tourism activities will be collected by the treasurer, who will forward the funds to the treasurer of the village government. It was decided that the entry fees for tourist will be as follows (per head per day): foreigners TZS 3000, Tanzanians (adult) TZS 1500, Tanzanians children above 5 yrs but below 18 yrs TZS 500, and Tanzanian students TZS 500.

### 4.3 Documentation of tourism potential

#### 4.3.1 Proposed trails and attractions

The most important attractions identified during tourism training were visited and documented in the field. The attractions were named, their key features were written down, and location coordinates recorded with a GPS on specific forms. Development needs for the attractions were also assessed and written down when appropriate. Proposed trails were designed based on the existing roads, footpaths and the identified attractions. The maps in Annex 2 show the location of the trails and the attractions along each trail. The attractions along the trails are numbered on the maps and their descriptions are provided below:

#### **Mlinga Trail**

This trail is shown in blue colour in Annex 2. It takes about six hours and is for fit people who can walk about 12 km in variable terrain.

1. Starting point of the trail at Mwembeni village centre which can be accessed by car.

#### *2. Kigali Viewpoint*

This is a viewpoint where Mlinga peak can be observed clearly just after coming out from the oil palm plantation. On the way there is a big tree (*Aphelia quanzensis*) that produces water from its branches during dry season. The seeds, which are red and black, are used to make necklaces in some African countries. There is a very nice view to Muuka valley, the forested

Segoma Hills, Indian Ocean, and Tanga City. The place is good for bird watching as it has lots of birds of different species.

### 3. *Treasure Cave*

This is a big rock on the Kwehondo ridge with a man made cave under it. The cave was dug because it is believed that Germans hid a treasure under the rock after losing Tanzania to Britain in 1945. The place of the suspected treasure was indicated recently by a witchdoctor and people started to dig for the treasure. However, no treasure has been found up to date.



Figure 17. *Treasure Cave.*

### 4. *Vikioi ritual site*

This is a stone situated at the edge of a natural intact forest along the footpath to the Mlinga Mountain. People of the nearby villages respect the place because it is used for ritual services. It is common to see coins on a plate placed by the stone as many people still visit the place for their traditional prays. The small intact forest has been left undisturbed for ritual purposes, reflecting how ritual beliefs can promote forest conservation. Many blue monkeys and birds



were observed in the forest. The place is very cool and has a nice view to Tanga City and Indian Ocean. Developments suggested include putting a live fence to protect the site, installing a signboard with a text 'Vikioi ritual area' and marking the trail leading to the place.

Figure 18. *Members of the project team at the Vikioi ritual site.*

### 5. *Entry to the Mlinga Forest Reserve*

At the entry point to the forest reserve, forest is seen ahead of the trail and open rock faces on the right mountain slope. The border of the forest reserve is marked with a line of planted teak trees.

Figure 19. *Mlinga peak seen from the trail.*



### 6. *The spiritual Mountain of Mlinga*

During the steep climb in the forest different species trees, shrubs, herbs and animals (e.g. snakes, baboon, blue monkey, black-and-white colobus), birds (e.g. Fisher's Turaco) and



Figure 20. *Tour guide Rodgers and Spiritual flags on the Mlinga peak.*

insects can be observed. Tree bark has been collected by medicinal healers from trees along the footpath. When approaching the peak, which is 1060 m above sea level, trees disappear and vegetation consists of grassland and scattered bushes. Wind can be strong and during strong wind it is not safe to climb to the peak or even enter the forest because of the danger of tree falls. On the top, magnificent views open to the surrounding lowland areas, the other East Usambara Mountains, Tanga City, the Indian Ocean, and the Shimba Hills in Kenya. Different birds flying around the peak can be observed.



There are spiritual healers' flags with different colours placed on the peak.

Mlinga Mountain is believed to have the greatest spiritual power of all mountains in the East Usambara and it hosts rare medicinal herbs. Traditional healers even from other parts of Tanzania travel to Mlinga to collect medicinal plants that are rare elsewhere.

*Figure 21. A flowering Saintpaulia and seedlings near the Mlinga Peak.*



#### 8. Mabejani subvillage



On the way back from Mlinga, the trail passes through Mabejani, a subvillage of Mwembeni where tourists can meet with the villagers and observe domestic animals, fruit trees, different kinds of crops and crop processing.

*Figure 22. Happy faces in Mabejani subvillage.*

#### 9. Paint hole (Shimo la rangi)

This is a wetland area about 10 m aside of the trail where villagers dig pink coloured soil for painting of their houses. Recommended development includes putting a signboard showing

'Paint hole' and slashing the trail to the hole so that people can easily access it.

#### 10. Kwesimba subvillage

In this subvillage, spice cultivations and crop processing can be demonstrated by the villagers. The name of the village means 'the place of lion'. That is because many years ago a lion (or lions) lived in the area of the village. There are no longer lions in the East Usambara Mountains.

*Figure 23. Kwesimba villager demonstrating an apparatus used for squeezing of sugarcane juice.*



*Other attractions in the vicinity of Mlinga trail:*

#### *Kwemahusa subvillage*

A spice farm with black pepper, clover, cinnamon etc.

#### *Muaao peak*

A hill top formed of rocks, and covered by little trees and many shrubs. Lots of bird calls can be heard and various plant species are available around the area. Animal species such as rock hyrax, blue monkey and chameleons can also be observed. Indian Ocean and Tanga City can easily be observed from the peak. The hill would be nice for rock climbers. Suggested development is the improvement of the trail towards the peak.

#### *Kerosene water (Maji ya mafuta ya taa)*

This is a spring with kerosene smelling water. It is located along the Mlinga trail between Mabejani and Kwesimba sub-villages. However, this attraction is seasonal because the kerosene smell can be sensed only during dry season.

### *Hyrax and bat caves (Mapango ya pelele na popo)*

These are series of caves situated along Mabejani - Misozwe footpath in Mlinga Forest Reserve. The caves are under very big rocks. To see the hyraxes one has to stay still and spend some time in the place. The caves are also a home of many bats, which can be seen hanging on the cave's walls during day time. Many indigenous and endemic submontane tree species such as *Allanblackia stuhlmannii*, *Isoberlinia scheffleri* and *Tabanaemontana* species can be observed around the caves. Developments recommended include putting a signboard showing 'Hyrax and bat caves'. This area is also suitable for camping. Previous researchers in the Mlinga Forest Reserve, such as Frontier Tanzania, camped there. Water is available a few meters from the recommended camping site. If camping site will be established, then a pit latrine should be built.

### *Satanic cave (Pango la Mizimu)*

This is a small cave in Mwembeni village where spiritual service is offered by a traditional healer called Dr. Jumanne. Several working tools for traditional healing can be observed. Development recommended is to interview Dr. Jumanne, to document his work.

## **Magula Trail**

This trail is shown in green colour in Annex 2. This is a round trip starting from the road that passes through the Magrotto Estate and returns back to the same road near the entry point of the trail. The trail is for people with good condition as it is almost 10 km long with several hundred meters descent to Magula village and a climb back to the Magrotto Estate. The first kilometre of the trail passes through oil palm cultivations and then climbs up to a ridge in natural forest.

### *1. Proposed Mkungu camping site*

After coming out from the forest on the east facing slope, the trail leads to a nice open area suitable for establishment of a camping site. Water is available from a spring approximately 150 m from the site. The proposed Mkungu camping site has a very good view to the Mlinga peak, Segoma Hills, and Mabayani dam located in the Tanga Municipality. Tanga City and Indian Ocean are also visible. Slow moving ocean breeze from the Indian Ocean creates a cool climate for the place. Recommended developments include removing some bushes from the site, planting indigenous trees to provide shade, building a pit-latrines and a hut with tables and benches. Some common plants could be labelled and waste bins should be put in place. The place belongs to one of the villagers who could be supported to develop it as a camping site. Many birds can be observed (more than 60 bird calls can be heard in a minute) so the place would be a nice camping site especially for bird watchers.

### *2. Mkungu subvillage*

Mkungu subvillage is located on a ridge leading to the drumming place. Visitors can observe and participate in the village life. The village has nice views to the surrounding lowlands and hills. One of the tour guides trained in the project lives in Mkungu and can arrange tours in the village.

*Figure 24. Mkungu village on the ridge leading to the drumming place.*

### *3. Drumming place (Toeo ja ngoma)*

This is a beautiful land formation and an excellent view point. On this ridge top, drum was beaten or trumpet played by a special person in the village to warn the villagers of a danger during tribal wars or to invite people to a meeting. Different drum beats had a different message. Mlinga Mountain can be seen clearly from the place. Also the Indian Ocean, Tanga City lowland plains and Shimba Hills in Kenya can be





observed. This is a nice point for viewing sun rise early in the morning. Various butterfly and bird species can be observed. Also many plant species, domestic animals can be seen on the way while walking towards the ridge peak.

Developments suggested include slashing the trail going to the place and installing a signboard with the text 'Toeo ja ngoma'. Common and interesting plants along the trail could be labelled.

Figure 25. The drumming place.

#### 4. Seluka subvillage

Seluka is the administrative centre of Magula village. In the village centre there is a primary school and some small kiosks. Three of the tour guides trained by the project live in Seluka.

#### 5. Magrotto estate lake

This is a very beautiful small lake situated in the Magrotto Estate, a few meters from the estate headquarters. The lake is surrounded by oil palm trees and some natural trees that form attractive scenery. The lake has also several water fauna mainly fish and snakes. The place serves as a nice picnic site, and there is a small hut with a table and benches. The banks are very well slashed so it is easy to walk around the lake. Recommended developments include building some more huts, a small boat for boating, investigation on the possibility of using the lake for swimming, and a signboard at the entry point showing 'Magoroto lake'.



Figures 26 and 27. Views from Magrotto Estate lake.

*Other attractions that could be connected with Magula trail:*

#### *Porcupine cave (Mpanga ja nungunungu)*

This cave, situated east of Mlinga peak, is a home of porcupines, which are rodents with a coat of sharp spines. The porcupines are strange animals which can attack by throwing spikes from their body. Local people eat them and say that the meat is delicious. Many spines can be observed around the caves.

#### *Pacha waterfalls*

These are beautiful waterfalls (15m high) situated along Muuka river north of the Seluka subvillage. This is a suitable area for establishment of a picnic site. Many birds, blue monkeys and plant species can be seen around the site. The place is very cool. Development recommended includes opening a trail to the waterfall.

#### *Female stone (Jiwe la kike)*

This is a strange rock with a shape of female sexual parts (vagina) formed naturally. It is situated just a few meters from the estate lake so visitors to the lake also have an opportunity to



see the rock. Shambaa women hate the rock. Recommended development is reopening the path which passes from the dam to the stone.

### *Kisiwani subvillage*

This subvillage is known for its lively dancing traditions.

### *Other minor attractions:*

Mambomsije viewpoint, sharpening stones, a huge strangler fig at Mvumoni, and an area of traditional hunting traps.

## **Kitulwe Trail**

This trail shown in red colour in Appendix 2 gives an opportunity to observe forest biodiversity at a short distance from the Magrotto Estate headquarters. Many things can be observed on the way to the Kitulwe Peak such as endemic tree species, different species of bamboo, birds, butterflies and other insects, chameleons, lizards, monkeys and sometimes snakes.



*Figure 28. Cardamom plantation along Kitulwe trail.*

### *1. Cardamom plantation*

A cardamom plantation maintained by the Magrotto Estate under the shade of natural forest.

### *2. Saintpaulia site and a proposed picnic site*



On the Kitulwe ridge, *Saintpaulias* are flourishing in the humid climate provided by the moist winds from the Indian Ocean. They can be found growing on the ground, on rocks and on trunks of the screw pines (*Pandanus*), *Ficus* and *Myrianthus* trees. A picnic site could be established on the ridge in a place with good a view to Tanga City, Indian Ocean, Muheza town, Pangani and the lowland plains. Developments recommended include benches for visitors, or a traditional hut with a table and benches.

*Figure 29. Saintpaulia growing as an epiphyte on a tree on Kitulwe ridge.*

### *3. Kitulwe Peak*

This is the highest point of the Magoroto forest. *Saintpaulia* is also growing at the peak and there is a view to lowlands in southeast. The peak is an optional site for establishing a picnic site.

## **Mgambo Trail**

The proposed trail to a viewpoint in Mgambo village was documented. This trail (shown with yellow in Annex 2) can be entered either from the Magrotto Estate HQ or from the Mgambo village office located in the centre of the village along the Mwembeni-Muheza road.

*Figure 30. Cocoa trees and bananas seen from the Mgambo village office.*

From the village office, the trail climbs up the road to





The primary school. On the way to the school there is a Stream where women wash clothes. At the primary school there is a nice view to Muheza town and the surrounding lowlands.

*Figure 31. A view to Muheza from the Mgambo primary school.*

From the school, the trail continues through home yards where one can see villages in their daily routines, gardens with different kinds of tropical crops like jackfruit, mango, banana, okra, cassava, sweet potato etc., and domestic animals (chicken, goats, pigs, ducks). On the way to the viewpoint, there is also a site where palm oil is extracted in a traditional way.



*Figure 32. Palm oil production site in Mgambo village.*

*1 a. Mgambo viewpoint (locals call the place Jitegeni).* This is the highest point in Mgambo with a nice scenery to southern parts of the Amani Nature Reserve (Southwest), the Muheza town (South-Southwest), the Tongwe Mountain (South), the Tanga city and Indian Ocean (East), and Kitulwe Peak (East-Northeast) with the *Saintpaulias*. At the viewpoint many dragonflies and different species of butterflies were seen. There is a small kiosk at the viewpoint.

*Development suggestions:*

The trail to the viewpoint should be marked. Some trees could be planted to provide shade at the viewpoint and infrastructure, e.g. a traditional hut with benches and a table, built. The kiosk owner could be supported to increase the variety of items in the kiosk and trained to provide services for tourists (e.g. refreshments served to the hut). Basic education on how to encounter tourists should be given to people living along the trail.



*Figure 33. Mgambo resident Mr. Mhando with his pig.*

**Manga Trail**

This short trail (shown in orange colour in Annex 2) starts from the Muheza-Mwembeni road, where it has two optional entry points. One is only about 200 m south of the Estate headquarters, and the second one is about 400 m further down the road. The trail first passes through natural forest and then comes to Manga (subvillage of Mgambo).

*1 b. Stream crossing and dam*

When using the second entry point, the trail descends from the road to a valley with a stream and a dam. Some years back, hydroelectric power was generated here for the Magrotto Estate. The stream is a tributary of Mkulumuzi River. The water intake for Muheza town is located less than a kilometre down the stream. This is a good place to educate people about the importance of the surrounding natural forest as a water



catchment area on which thousands of people in the lowland villages and Muheza town depend.

From the stream the trail climbs up the slope in natural forest. Many submontane trees can be observed (*Cephalosphaera usambarensis*, *Allanblackia stuhlmannii*, *Isobertia scheffleri*, *Albizia* sp., *Leptonychia* sp. etc.), as well as shrubs and herbs (e.g. *Costus*, *Piper*). There is a view to Muheza before entering the Manga subvillage.

### 2. Stream / proposed picnic site

At the entry to the Manga subvillage there is another stream with nice cliffs to sit down and have lunch. People wash clothes in the stream. Fish and crabs are also caught from the stream (fish traps can be seen in the village). Some benches and/or a traditional hut could be built in the site.

Figure 34. Cliffs along the stream would serve as a nice picnic site.



### 3. Manga village and viewpoint

After the stream, the trail passes through the Manga subvillage where visitors can observe and participate in village life. The viewpoint in the village (Fig. 35) is a nice end point for the trail.



Figure 35. Manga viewpoint



Figure 36. Manga village view.

### Development suggestions:

Signboards to the entry points of the trail, labelling of the most common trees in the natural forest, training some villagers to serve refreshments for visitors and identifying activities the villagers could show or do with the visitors.

### Mwembeni Bird Trail

This is a short and easy walk from the Mwembeni village with good possibilities of observing birds. The trail mostly passes through shrub vegetation with scattered trees, and through settlements and farms. The possibility of seeing birds along the trail depends on the season. The best season is likely to be in the hot season from September to March, which is the breeding season of most birds.

#### 1. Big mango tree

The starting point of the trail is the big mango tree in the centre of the Mwembeni village.

Figure 37. The mango tree in Mwembeni village centre.



## 2. Pond

The trail passes a pond where women come to wash clothes with their children.

## 3. Stream crossing.

### Headquarters of the Magrotto Estate

The buildings of the Magrotto Estate are located in the centre of the estate on a hill top. Due to its central location and facilities, the estate headquarters would provide the most suitable base for ecotourism activities in the area.

#### *Proposed rest house built by Germans in 1940s*

This used to be the estate manager's house. The building



Figure 39. View from the estate manager's house.

#### *Garden with view*

Behind the estate manager's house there is a nice view to the lowlands. Sitting benches could be installed in places with the best views. The back yard of the house is a very good location for bird viewing. Birds are abundant in numbers and different species can be observed, e.g. sunbirds and hornbills.

The old garden surrounding the house has many ornamental and economic plants such as Traveller's tree (Ravelana), cycads, citrus trees, old araucarias, and palms. The plants could be labelled for educational purposes and some additional plant species could be planted.

#### *Factory, offices and stores*

Palm oil was produced in the Magrotto Estate factory until 1993. The factory with the machinery is still in place and in a relatively good condition. Offices and stores are well maintained and in use. A small museum exhibiting the history of the estate could be established in the factory building. One of the offices could serve as a tourist information centre providing information on trails, attractions and guiding services. Souvenirs produced by the local people could also be sold there.

Figure 41. The factory building behind which there are estate workers' houses. A papaya plant is in the foreground.



Figure 38. Estate manager's house.

has three self-contained big rooms, which can accommodate up to about 10 visitors at a time. It has also a good big sitting room and a dining room with a fire place, which is used for heating the house during cold seasons. Additional furnishing would be needed in the rooms. The house has a reliable water supply from a nearby spring and electric power is supplied by a diesel generator. The building is surrounded by a nice flat area that could be used as camping site, which can accommodate many tents. Simple toilets and showers would need to be built for the campers, and waste disposal arranged.



Figure 40. A cycad in the estate garden.





#### 4.3.2 Traditional forest conservation methods and forest related cultural heritage

The elders explained how customary laws, which passed orally from one generation to another, protected the forest from unsustainable use. The most important rules were:

- If someone goes to the forest for a specific purpose, she/he is not allowed to do anything else except what aimed. For example, if one goes to forest to collect ropes, he cannot take building poles
- Permission from the elders is needed for extraction of any forest products

Moreover, it was not allowed to:

- Enter water sources within the forest with dirty pots
- Cut all trees from the farms (large trees were always left growing)
- Cultivate in the sacred forests (*shokhoa*) which were used for initiation rites.

There was a belief that if someone takes more than one product from the forest, he/she would be lost on the way back. Because of this belief, offences to the rule were very uncommon. In case of an offence, the person had to sacrifice a goat to seek for forgiveness.

Rain-making was a common practice in the historical times. Once the dry season exceeded normal, elders (the rain makers) went to the peak of the Mlinga Mountain to sacrifice a goat and thereafter the rain started.

Along the footpath to the Mlinga peak, there is a ritual site called *Vikioi*. According to the project resource persons, the small patch of forest adjacent to the site is traditionally protected because of the ritual function of the place. The place was used by the community to thank the ancestors for the good things the society had faced or to request discontinuation of disasters such as prolonged droughts or outbreaks of diseases. Nowadays, the *Vikioi* is no longer used by groups but individual people who are facing problems for example women who are not able to become pregnant. The person kneels down by the stone, puts both hands on the stone and requests help from the ancestors. He/she leaves gifts such as coins and food on a plate which is placed sideways of the stone to please the ancestors. After the problem has been solved, the person will come back with a goat, cow or chicken which is slaughtered, roasted and eaten at the place. The value of the gifts depends on the wealth of the person and the problem which needs to be solved. The activity continues because some people say they have succeeded to solve their problems at *Vikioi*.



Figure 42. Bananas and a coin left as offerings for ancestral spirits at *Vikioi*.

The forest near the Mlinga Peak is visited by spiritual healers and people who believe that they are obsessed by evil spirits (*shetani*). Specific rituals to free a person from the power of evil spirits take place on the mountain peak and in places with large trees or caves.

Rituals training of girls and boys to adulthood (initiation rites) were conducted in the forest in specific and highly respected places called *pungi*. These trainings were important events for the community and they were planned carefully. The training for girls before maturation was called *oza* and the training after maturation was called *kimbizi*. In *kimbizi*, general skills and knowledge of life, such as pregnancy and taking care of the home, were taught to the girls by female elders. Marriage was not allowed before *kimbizi*. The adulthood training for boys was called *gao*. The boys were taken to the ritual site in the forest (*pungi*) where they stayed for a few days receiving training from respected male elders. They were taught how to take care of the family and how to treat wife. Like girls, the boys were not allowed to marry before *gao*. There was a big ceremony after the *gao* and *kimbizi* which included eating, drinking and dancing.

*Suggestions:*

Knowledge of the traditional forest conservation methods and forest related cultural heritage should be thoroughly documented for future generations. Educational materials about the traditions should be printed and distributed to local schools. Because the elders have expressed willingness to expose traditions and ritual sites to tourists, the tour guides should be trained to interpret the heritage to visitors.

4.3.3 Crafts-making

A meeting was held with artisans in order to get information about the handicrafts produced in the area and to assess the possibility of developing the activity for tourism purposes. A total of ten artisans, who had been asked to bring samples of their handicrafts, participated the meeting. Each of them were interviewed individually to ask the following information: name, village, subvillage, handicraft(s) they produce, material(s) used, source of materials, the steps of making their product, time needed for production, current market, the price of the product(s) and contribution of the activity to individual or household income. Moreover, they were asked how they learned the skill and whether they have already passed the skill to other people such as their children.



Figure 43. An artisan with his traditional tray (ungo)

It was found out that the artisans produce a variety of handicrafts Such as mortars, wooden spoons and plates, tool handles, bows, arrows, trays, hats and mats. They use leaves of two different palm species, *mnyaa* (scientific name?) and *mkindu* (*Phoenix reclinata*) for weaving of mats (*mkeka* and *jamvi*) and hats. These materials are mainly bought from the nearby town Muheza because they have become rare in the forest. Trays (*ungo*) are woven using bamboo and the edge of the tray is obtained from a tree called *zengamkuku* (scientific name?). Various tree species are used for making of plates, spoons and mortars (e.g. *Synsepalum msolo* and *Markhamia* sp.) and the trees are obtained both from the farmlands and from the forest. The male artisans have been taught their skills by their fathers or grandfathers and female artisans by their mothers. Many of the artisans had already passed the skill to their children.

*Conclusions and suggestions:*

The studied two villages seem to have rich traditions of making handicrafts and the traditions continue to be viable. Because not all artisans were able to come with their products, it was difficult to thoroughly assess the quality of the products. However, based on the presented samples, there appears to be good potential for developing the artisanal activity for tourism purposes. Training would be needed in order to improve the product quality and to make them suitable as souvenirs (portable and attractive items). New products could also be developed.

4.3.4 Traditional dances



Figure 44. Women from the Kisiwani subvillage dancing *donga* on the way to greet a new baby born.

Magoroto area is famous for traditional dances of the Shambaa tribe and dancers from Magoroto are often hired to perform in ceremonies in different parts of the East Usambara Mountains.

*Tukulanga* is an energetic dance of children and the youth, while *mdumange* is a slow dance also danced by the old people. These two dances can be performed by both men and women in various occasions. Drums, metal containers and marimba are used as instruments.

*Donga* is a women's dance which is performed in different occasions such celebration of a new baby, sending of dowry, wedding, confirmation, and as entertainment after harvest. Very simple instruments like

plastic buckets are used when dancing *donga*.

*Pungwa* (ngoma ya mashetani) is danced by traditional healers. The aim of the dance is to chase out evil spirits from a person and it is usually associated with sacrificing of an animal (goat or sheep). *Pungwa* is also performed when new healers are being trained for their profession.

#### 4.4 Project promotion

About hundred t-shirts were printed in Dar es Salaam and distributed to project team members, resource persons, collaborators, and members of the stakeholder institutions. The t-shirt helped to raise outsiders' awareness about the project, build a nice image of the project and strengthen the feeling of team work amongst the project participants. Illustration for the t-shirt was designed by a designing specialist of the Finnish Saintpaulia Society based on the winner drawings of the drawing competition organized in the primary schools.

The project was also promoted in Finland through an information leaflet distributed at the Botanical Garden of the University of Helsinki and in the World Village festival in Helsinki in May 2007. A short project description was also posted on the website of the Finnish Saintpaulia Society ([www.saintpaulia.fi](http://www.saintpaulia.fi)).

#### 4.5 Status report and conservation plan for the flagship plant *Saintpaulia*

##### 4.5.1 Distribution and taxa

Intensive explorations were conducted in the natural forests within the project area in May and June 2007 in order to locate sites of *Saintpaulia*. Earlier reports of the occurrence of *Saintpaulia* in the area (Tye 1994, Hall et al. 2002) and experiences gained from earlier *Saintpaulia* surveys elsewhere in the East Usambara Mountains (Kolehmainen et al. 2004) were utilised to locate the sites. In some parts of the area, exploration was done systematically along study transects. The located sites were geo-referenced with a GPS and placed on a computer-based map of the area (Annex 3).

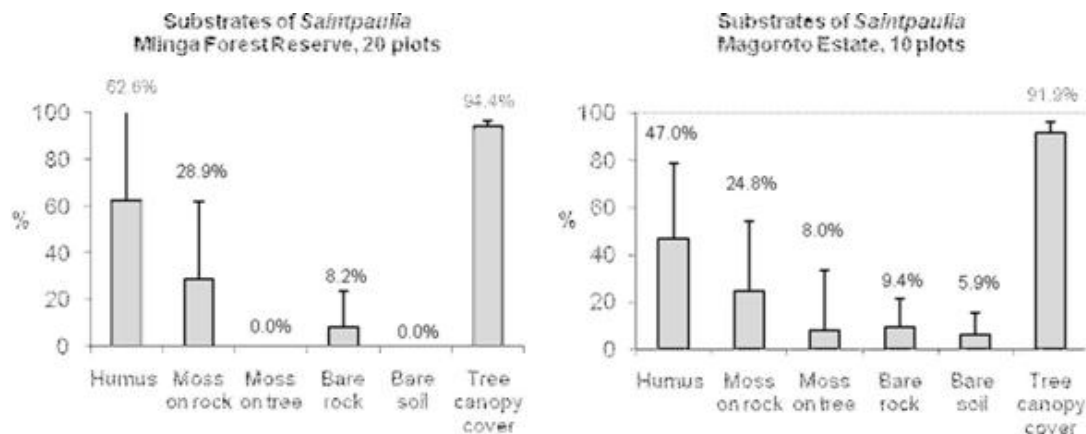
The distribution of *Saintpaulia* is concentrated to the eastern ridges and hill peaks: the Kitulwe Ridge and Peak, the Kidimdim Peak, Kwehondo Ridge, Muao Peak and surroundings of the Mlinga Peak (Annex 3). This distribution pattern is obviously explained by the moist ocean winds that create a humid climate on the eastern ridges and hill tops. In Kitulwe, in the easternmost part of the hills, there are more epiphytes on trees than any other part of the area indicating the immediate influence of the ocean. *Saintpaulia* was not found from the western forest patches, apparently because they are in a rain shadow and thus the conditions are likely to be less favourable for *Saintpaulia*.

Identification of the *Saintpaulia* taxa from the East Usambara Mountains is difficult due to the high morphological variation within taxa. This variability is thought to be due to genetic divergence of the isolated populations (Lindqvist & Albert 1999, Kolehmainen & Korpelainen, in press). Different taxa and morphotypes can also cross freely and intermediate forms occur in areas where taxa or morphotype ranges overlap. Following the current taxonomy of *Saintpaulia* (Darbyshire 2006), only one species, *S. ionantha*, grows in Magoroto and Mlinga. *S. ionantha* is a highly variable species consisting of several subspecies and varieties many of which are difficult to identify. The plants in the project area are of rosulate or subtrailing form and mainly have characteristics of *Saintpaulia ionantha* ssp. *grotei* (Engl.) I. Darbysh. except in Kitulwe, where the plants tend to have characteristics towards *S. ionantha* ssp. *ionantha* var. *diplotricha*.

##### 4.5.2 Conservation status and condition of the habitats

All *Saintpaulia* localities on the Mlinga Mountain are located within the Mlinga Forest Reserve. The population in the small forest patch on the nearby Muao Peak is not under legal protection. Nearly all of the localities on Kitulwe Ridge and around Kidimdim Peak are protected within the Magrotto Estate. Some of the Kitulwe sites, however, extend to the village lands.

To assess the ecological conditions in the *Saintpaulia* habitats, data on tree canopy cover and quality of the substrates on which *Saintpaulia* grows were collected from a total of 30 sample plots with a size of 1m<sup>2</sup> (20 plots in Mlinga and 10 Magoroto). In both Mlinga and Magoroto, the *Saintpaulias* were confined to habitats with an average tree canopy cover of over 90% (Figures 45 and 46). Most of the *Saintpaulia* plants were growing on rock substrates covered by humus and mosses. The *Saintpaulias* growing on these substrates have been shown to have higher survival than those growing on bare rock surfaces (Kolehmainen & Mutikainen 2006a). The high proportion of humus and moss covered substrates and the high tree canopy covers suggest that the habitats are healthy providing a good environment for the *Saintpaulias*. Very little, if any, disturbance was observed in the *Saintpaulia* habitats with the exception of one pit-sawing site which was close to a *Saintpaulia* locality on Kitulwe Ridge. Forest disturbance in the project area is discussed in more detail in chapter 4.6.



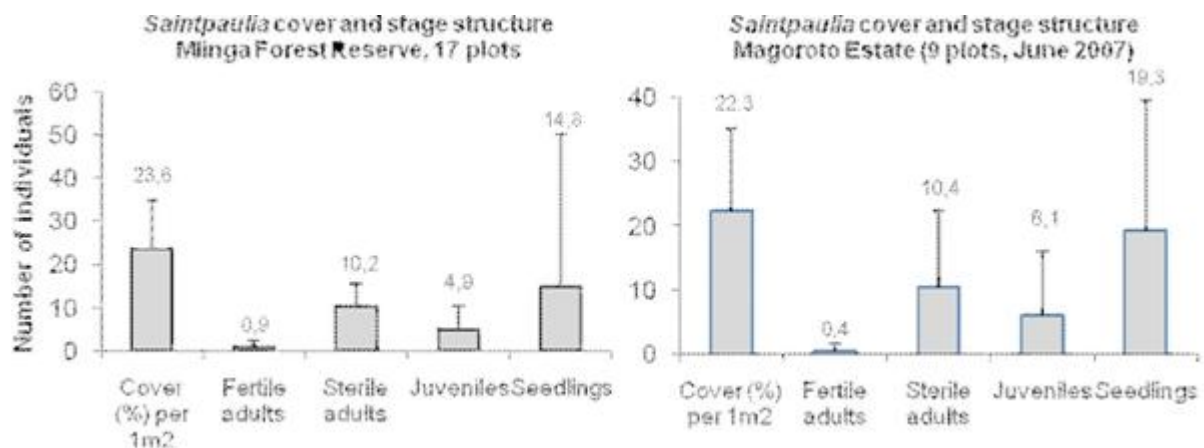
Figures 45 and 46. Substrates of *Saintpaulia* and tree canopy covers (%) based on the data from 1m<sup>2</sup> sample plots in Mlinga Forest Reserve and in Magoroto Estate in June 2007 (means of the plots and standard deviations).

#### 4.5.3 Viability of the populations

The assessment of *Saintpaulia* viability was based on the appearance of the plants, the occurrence of seedlings and the population stage structures (frequency of different life-cycle stages). The population stage structure can be used as a simple tool of assessment of the demographic viability of threatened species by distinguishing three different types of populations: dynamic (large proportion of juveniles and seedlings), stable (higher proportion of adult plants than young plants) and regressive populations (adult plants dominate, recruitment of new individuals impeded) (e.g. Oostermeier et al. 1994). The population stage structures were assessed from a total of 26 1m<sup>2</sup> sample plots (17 plots in Mlinga and 9 Magoroto).

In all localities, the plants were green and healthy. Few flowers and seedpods were seen because the study was not conducted in the reproductive season, which is in October-February (Kolehmainen & Mutikainen 2006b). The abundance of seedlings varied from locality to another, but they were generally abundant, which indicates good pollination success and seed set. The population stage structures were of dynamic type (i.e. large proportion of juveniles and seedling), which indicates good regeneration. However, this data should be treated with precaution because the population stage structures change with the seasons of the year. This data only describes the situation after the annual long rains when the number of seedlings is generally high (Kolehmainen & Mutikainen 2006a).





Figures 47 and 48. Average cover (%) of *Saintpaulia* and population stage structures (with standard deviations) based on the data from the 1m<sup>2</sup> sample plots in Mlinga Forest Reserve and in Magoroto Estate in June 2007.

#### 4.5.4 Conclusions and conservation recommendations

Currently the populations show no loss of viability in terms of stage structure. Majority of the populations are also within protected forest where conditions are favourable for *Saintpaulia*. Therefore, immediate population management or habitat restoration measures do not seem necessary. However, the viability of the populations should be monitored because they are small and confined to small forest remnants, which increases the risk of extinction due to inbreeding, edge effects and unpredictable catastrophic events such as forest fires. Moreover, there is often a time lag before habitat fragmentation drives plant populations into extinction. Furthermore, the Muao Peak forest is not protected and therefore the Muao population of *Saintpaulia* is threatened by gradual degradation of the habitat due to forest exploitation. Successful conservation of the remaining *Saintpaulia* populations in Magoroto and Mlinga requires an integration of various measures to strengthen the protection of the remaining forest habitats:

- Efficient patrolling of the Magoroto Estate forests and firm follow-up and conviction of illegalities as a collaborative effort of the estate, the communities, and Muheza District
- Improving the protection of the Mlinga F.R. through collaboration between the catchment forest authorities and the communities (especially fire prevention)
- Awareness raising about the benefits of forest conservation and facilitation of conservation friendly livelihoods in the communities adjacent to *Saintpaulia* habitats
- On Kitulwe ridge, *Saintpaulias* were partly growing on the village land (cardamom farm) and are thus in a very big disadvantage as they may go extinct due to the ongoing disturbance. The Magoroto Estate could negotiate with the owner of the farm about the possibility of purchasing the land which has *Saintpaulia* to be include in the estate
- If possible, restore parts of the degraded natural forest adjacent to the *Saintpaulia* localities to enhance expansion of *Saintpaulia* populations Integration of *Saintpaulia* conservation and ecotourism by developing selected *Saintpaulia* localities as tourist attractions and linking them with conservation activities such as monitoring of the *Saintpaulia* viability by tourists, volunteers, students, village environmental committees or other interested groups. The villagers could also propagate the plants and sell them for tourists. By giving the *Saintpaulia* economic value through tourism, it is expected that conservation of their habitats will be increasingly appreciated by the local people.

#### 4.6 Observations on forest disturbance

Forest degradation due to different types of disturbance was observed throughout the project area. In the Magoroto Estate forest, tree cutting through pit sawing, farm encroachment and gold mining were observed in several sites during the intensive project field work from January to June 2007 (Figures 49-50). Opportunistic observations of disturbance sites in the area in May/June 2007 are shown in Annex 3.



Figures 49 - 50. Forest disturbance in Magrotto Estate in May 2007. Left: A streambed excavated by gold miners in the oil palm dominated forest near the estate lake. Right: A fresh pit sawing site at Kitulwe Ridge.

In Mlinga Forest Reserve, agricultural encroachment was not observed and only one tree was observed to be cut and sliced into building poles. Forest fires, which occur almost annually, have significantly reduced the area of forest in the Mlinga F.R. Moreover, debarking of trees for medicine appears to exceed sustainable levels in the Mlinga forest as many debarked trees were observed along the footpath to the Mlinga Peak (Figure 51). This activity is likely to be a threat to populations of some tree species such as *Anthocleista grandiflora* and *Juniperus procera*. *Juniperus procera* is classified to be at lower risk or near threatened on the IUCN Red List of threatened plants (IUCN 2007).



Fig 51. *Juniperus procera* (African pencil cedar) affected by bark collectors along the footpath to Mlinga peak.

Pole cutting is more or less common throughout the area, and one incidence of charcoal-making was also observed. Moreover, illegal collecting of chameleons, beetles and snakes was reported by the villagers.

The observed disturbances threaten the biodiversity of the forest and water source of the surrounding area, including the densely populated Muheza town. Gold

mining destroys stream fauna and pollutes rivers, especially if mercury is used in the extraction process. If the disturbance continue in the scale observed, it is also likely to decrease the value of the area in terms of ecotourism.

#### 4.7 Project workshop

A one day workshop was organised in June 2007 after completing the intensive field work. The aim of the workshop was to summarise the project findings and to obtain feedback from the communities. A further aim was to share information about the project findings with representatives from the Magoroto Ward and Muheza District Authority. The workshop participants included three MAMCEP staff, 14 project resource persons, 5 tour guides, 6 village government representatives from Mwembeni, Magula and Mgambo villages, head teacher of Mwembeni primary school, Councillor of the Magoroto Ward, Muheza District Natural Resources Officer and a representative of the District Executive Director. The workshop was opened by the Magoroto Ward Councillor followed by presentations by the project field coordinators on effects of forest disturbance including its impact on tourism development in the project area (assistant field coordinator Killenga) and project outputs in the development of ecotourism and conservation (field coordinator Mtango). After the presentations, the participants were divided into four groups to discuss nine different questions pertaining to forest conservation and tourism development. All groups discussed all questions. The conclusions from the discussions are presented below:

*Question 1:*

*It is well known that environmental destruction can cause the extinction of birds in Magoroto Mlinga, which is a potential area for ecotourism. What should be done to avoid forest destruction in order to have sustainable tourism?*

- Communities adjacent to Magoroto Mlinga should be educated on how to conserve the forest.
- Posters showing the importance of the area in terms of birds should be made and displayed in all areas with high concentration of people like in schools, churches and mosques
- Also the stakeholders should be educated on the biological importance of the area and its potential for tourism development
- Adjacent communities should be involved in forest conservation and tourism development
- By-laws should be developed and used for the conservation of forests in order to prohibit tree cutting, mining, hunting, grazing and other illegal activities in the forest

*Question 2:*

*What should be done to improve the relationship between the stake holder institutions, i.e. the communities, the Magrotto Estate and the Muheza District so as to enhance ecotourism development?*

- All stakeholders for Magoroto Mlinga should be involved in the development of tourism and in the decision making concerning the tourism development
- Communication between the levels of administration should be improved i.e. the community members, the village governments, the Ward and the District Council
- A meeting/workshop should be arranged to develop strategies for the stakeholders to participate in tourism development in the area. The meeting should include representatives from the communities, the Muheza District Council, the Magoroto Estate and other institutions which are interested in the area.

*Question 3:*

*What are participants' opinions about the contents of tourism training required for sustainable ecotourism in the area (what training packages should be made available in the future)?*

- The workshop members expressed that there is a high need for training of tourism skills. They pointed out that they were happy with the training conducted by the project but because time was so limited they could not get in-depth knowledge of the trained topics
- Training on environmental conservation should be given priority starting from primary schools up to the elders
- Training on birds was insisted by the tour guides
- *Saintpaulia* propagation and selling to get income from the selling of *Saintpaulia*
- Financial management and record keeping
- Establishment of tree nurseries and tree planting (including indigenous trees with medicinal properties) in order to reduce pressure on the natural forest
- Tour guiding techniques

*Question 4:*

*Mlinga Forest Reserve experiences forest fires every year. What should be done to reduce forest fires in the Mlinga Forest Reserve in order to have a nice forest for tourism?*

- Communities adjacent to the forest should be educated on fire hazards and fire prevention measures (a list of all farmers bordering the forest should be prepared for this purpose)
- By-laws should be developed to punish those who will cause forest fires purposely
- People should be educated on how to farm without using fire especially during farm preparations
- Video shows on fire hazards were recommended for education purposes
- Study tour should be organized so that representatives from the area could learn from other areas in Tanzania where fire control has been successful
- During dry seasons, village leaders should create awareness through meetings where people are reminded about fire hazards
- Fire lines should be made in all areas which are prone to fire
- Animal hunting in the forest should be completely banned and MAMCEP should assist the community to have alternative sources of meat such as fishponds (good water availability in the area would enable fish farming)
- All forest boundaries should be cleaned regularly to prevent fires from escaping into the forest

*Question 5:*

*Debarking of trees for medicine was observed in the Mlinga Forest Reserve in such a way that some of the trees were completely dry due to the activity. What should be done to reduce the activity?*

- Forest laws should be enforced to protect the trees
- Community should be educated on how traditional medicine can be taken from the forest in a sustainable way
- Only few people should be allowed to enter the forest for collection of medicine
- Traditional healers should seek a permission from the village and the Forest Department before entering the forest for collection of medicine and they should go with sub-village or village leaders to ensure sustainable harvesting of the medicine
- Traditional healers should be given special days to enter the forest (twice a month) for medicinal purposes and during that time they should be under supervision
- MAMCEP was requested to organize the traditional healers and support them to plant the medicinal trees in their farms

*Question 6:*

*Illegal pit-sawing of endemic and endangered tree species was revealed in the Magrotto Estate forests. What should be done to eradicate the problem?*

- Strong collaboration between the Magrotto estate management and Muheza District authorities is needed to combat the illegalities (it is also the interest of the District Authority to conserve the forest because it is the water catchment area for a large part of the district including the Muheza town)
- It was revealed that the relationship between the estate management and the adjacent communities is not very good. The estate management and the village governments should sit down and discuss how to improve the relationship and how work together to protect the estate forest. Village governments can provide valuable assistance in catching of the culprits because they are familiar with their community and may thus have information on the persons who are involved in the illegal activities
- Community members should participate fully in stopping illegal activities by helping to arrest people who are involved in the activity

*Question 7:*

*Serious destruction of ecosystem through gold mining was observed along the river banks in the Magrotto Estate forest. What should be done to stop the activity?*

- Fighting against illegal mining in the forest should be done in collaboration with all stakeholders. Awareness creation should be done in all communities adjacent to the area so that they give assistance by informing the leaders once illegal miners enter the forest
- It was suggested that community should not accommodate illegal miners in their premises
- The management of the Magrotto Estate should take strong actions to combat the mining problem by requesting also assistance from the Muheza District Security Committee.

*Question 8:*

*Serious pole cutting was observed in the Magrotto Estate forest. What should be done to reduce the activity?*

- Community should use mud bricks in construction of their houses instead of building with poles and mud.
- MAMCEP was requested to support the community in purchasing brick making moulds and also few people in the village should be trained on how to make houses using mud bricks
- Mlinga Forest Reserve should be under Joint Forest Management and a management plan should be prepared to stipulate legal procedures for those who need poles from the forest
- MAMCEP was requested to support the community on tree planting techniques and supply of seeds and nursery equipment so that local people could plant trees on their farms in order to get poles and timber from their farms in the future

*Question 9:*

*Illegal cultivation of yams, cassava and maize was revealed in the Magrotto Estate forest. What should be done to correct the situation so that the forest could regenerate and be used for sustainable tourism development?*

- Participants suggested that the estate management, by appealing to the land law, should remove the farmers from the forest and leave the forest to regenerate
- Agreement should be made between the village leaders, the estate management and the farmers who have farms in the estate to compromise on the best ways of removing all crops from the forest. However, it was suggested that the farmers should be given time to harvest their crops

#### 4.8 Collaboration meeting of the stakeholders

It was observed throughout the project, and also confirmed in the workshop feedback discussions, that insufficient collaboration between the stakeholders prevents proper actions to be taken to combat illegalities in the protected forests, especially the forest owned by the Magrotto Estate. In order to promote collaboration, an additional meeting was arranged with the stakeholders in April 2008. The meeting was held in Mwembeni village and it was attended by the Village Tourism Committee and representatives from the Magrotto Estate, Muheza District Authority and Tanga Regional Catchment Forest Authority.

The following resolutions were the outcome of the meeting:

- Members of the Village Tourism Committee are allowed to enter the estate forest for patrolling purposes but they should inform the estate management and one of the estate staff should accompany them for the patrol trips
- The estate manager promised to give cooperation to the committee in arresting any illegal activity in the estate when such happens
- District catchment forest manager and his assistant promised to give collaboration and to work closely with the estate management and the tourism committee to arrest illegal activities both in the estate and in the village areas. Telephone numbers for district forest officers and estate management were given to all members of the tourism committee for communication about illegalities
- The estate management should have a representative in tourism committee's monthly meetings
- Ward secretary will also be attending the monthly meetings and if he fails to attend he will send a representative or he should get a copy of the meeting minutes in order to participate in the arresting of illegal tree cutting
- It was also proposed that the Magoroto forester in charge should attend some of the meetings in order to get feedback about the illegal activities taking place in the area and to participate in all plans aimed at forest conservation in Magoroto
- The estate management should continue to work closely with the adjacent villages and continue to support development activities for example providing trees for building of schools, palm oil, fire wood etc. This is to motivate villagers to assist in combating illegal activities in the forest
- It was proposed that the estate management should build a road barrier at the estate exit in order to ensure that no illegal timbers are transported from the estate
- A plan is underway to arrange a meeting that will involve all Magoroto Mlinga village leaders, ward secretary and forest officers in Muheza to discuss strategies of reducing illegal tree cutting in the area.

#### 5. PRELIMINARY EVALUATION OF THE PROJECT IMPACTS

The project operated intensively in the area for six months (January – June 2007). During this period, activities were targeted on two of the five forest-adjacent villages. From July 2007 to March 2008 project activities were continued at low intensity through the work of the formulated village tourism committee and assistant field coordinator's field visits each after two months. Materialization of the expected results stated in the project plan are evaluated here:

- **Increased number of community members give high priority to forest conservation and apply conservation friendly working techniques**

*Indicator:* Incidence of forest disturbance events.

*Evaluation method:*

In order to evaluate the impact of the project on forest disturbance trends, monitoring of disturbance was initiated in July 2007 immediately after completion of the intensive project field work. Collection of the data was assigned to the village tourism committee. The committee members investigated the forest once a week to record any new disturbance. Monitoring was done in pairs so that each pair was given an area of forest which is close to their home. The information which was collected included the disturbance type, species (if a plant), quantity removed, area where disturbance took place (Mlinga Forest Reserve, Magrotto Estate or village land), and action taken by the village government, forestry department or the estate management.

*Disturbance trend:*

Monitoring data from July 2007 to March 2008 shows that illegal pit sawing continues in the village lands but has reduced in the Magrotto Estate (Figure 52). Gold mining ceased during the project and there have been no new agricultural encroachments since the project initiated. Moreover, forest fires, which used to occur annually and which are normally caused by the use of fire in land preparation in during the dry season, have not occurred in 2007 and 2008. Debarking of trees in Mlinga F.R. has not been observed to continue, and only one incidence of pole cutting has been reported although there may have been some incidences that have not been noticed. Based on these data, it therefore seems that the overall level of forest disturbance has decreased after initiation of the project.

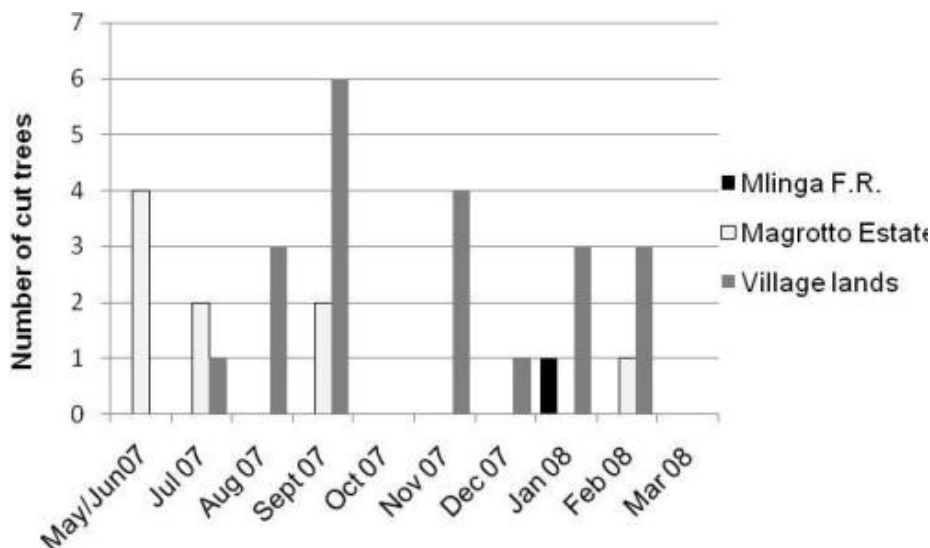


Fig 52. Number of trees cut in the project area based on records of the village tourism committee.

Although a decreasing trend in forest disturbance has been observed, it is far too early to assess the conservation impact of the project based on the monitoring of only nine months. It would be unrealistic to think that the communities would permanently give up the activities that harm the natural forests only as a consequence of a project of short duration. Alternative income generation strategies will have to be developed and new livelihood methods trained and facilitated before the project will have a long lasting conservation impact.

- **Young people are more aware of and respect traditional forest conservation practices and forest-related cultural heritage**

*Indicators:* 1) Incidence of forest disturbances, 2) Attitude of the young people towards traditional forest conservation methods and forest-related cultural heritage.

This issue was addressed in the meeting of the elders and the young, in the trainings and also in conjunction with the attraction surveys. The attitudes of the young people



were not systematically evaluated, but it was observed that they are interested in learning about the forest-related traditions. Further effort will be needed to facilitate this, and tourism would provide an incentive for the young to learn about the traditions.

- **Communities have increased capacity for ecotourism development**

*Indicators:* Ongoing or planned tourism development activities by community members and the number of local people involved in tourism activities.

This result was reasonably achieved. As a result of the training and participation in the documentation of tourist attractions, the community members have significantly more capacity for tourism development than what they had before the project. Moreover, ten community members are regularly participating in the work of the tourism committee.

However, significantly more capacity building and external resources will be needed in order to initiate viable income generation activities in the communities.

- **Tour operators and tourists include Magoroto and Mlinga in their tour programmes**

*Indicators:* Number of visitors to the area and revenue accrued from tourism for the communities.

This result was not achieved because it was realised during the project that it would have been too early to initiate tourism marketing when tourist facilities are largely lacking. Moreover, the communities expressed that they wish to have more capacity building in tourism before they are confident to receive tourists.

- **Status report and conservation plan for the African violet, including guidelines for the use of African violets and their habitats in ecotourism.**

This result was achieved as planned. A status report and conservation recommendations are provided and of some of the *Saintpaulia* localities are linked with the proposed tourist trails.

## 6. PROJECT SUSTAINABILITY

### 6.1 Participation of local stakeholders

The villagers participated in the project work with great motivation. This was undoubtedly enhanced by the fact that good partnership with the communities was regarded a priority from the beginning of the project. The village chairmen gave their full support to the project and mobilized the villagers to different activities with great diligence. Although the compensation for attending the project work was nominal, the participation was high. The project raised much attention and interest in all age groups. Even elders with physical weaknesses managed to appear in meetings and workshops from remote sub-villages. After the intensive field work was completed, the persons who were trained by the project requested further resources to proceed with some of the recommended activities such as tree nursery establishment.

The important stakeholder institutions, the Magrotto Estate, the Muheza District Authority and Tanga Catchment Forest Authority also showed good collaboration with the project. However, the relationship between the stakeholders themselves could be improved. Illegalities within the Magrotto Estate forests have caused distrust among the villagers, the estate and the authorities of the Muheza District. MAMCEP assumed a mediator role between the parties by encouraging them to solve problems which appear to have existed for many years. Better collaboration between the stakeholders is fundamental for sustainable conservation and ecotourism development in the area.

### 6.2 Participation of men and women

In all project activities, women were included as much as possible. It was sometimes difficult to have the desired quota of women because the Shambaa women are traditionally not as active as men outside of the home. Women also have lower education level than men. For example, when selecting

participants for tour guide training, persons with sufficient education level had to be selected and only few women qualified. Attention on the gender issue should be increased by looking into different possibilities of involving more women in the project.

### **6.3 Development of local Institutional capacity**

The establishment of the village ecotourism committee contributes to the local institutional capacity but the committee needs to be officially registered, its constitution developed and the members given further training to operate the committee successfully. Such committees should be established to all forest-adjacent villages.

### **6.4 Financial sustainability**

The project will depend on external grants until some income generation activities will be put in place. To materialize such activities, rigorous capacity building which should largely base on the existing skills and traditions, will be needed in the communities, together with building of partnerships with tour operators who will connect the area with the tourism market. Of the project stakeholders, the government institutions, i.e. the Muheza District and Tanga Catchment Forest Authority do not have financial resources for the project but they can advice on the local funding possibilities (e.g. micro-loans). The owner of the Magrotto Estate could invest on tourism infrastructure on its land and perhaps even in the surrounding villages, which would strengthen the collaboration between the estate and the communities.

## **7. CONCLUSIONS AND WAYS FORWARD**

In order to attract more visitors, the emerging tourism industry of Tanga region needs new and creative initiatives to supplement and diversity its tourism offer. Experiences from this project show that Magoroto and Mlinga have potential to become an interesting destination for tourists who search for authentic and alternative experiences outside of the already established tourist routes. The main project output was that tourism development is a feasible option from the point of view of community acceptance and availability of potential attractions. Community mobilization to forest conservation and tourism development was successful in the target communities, to such an extent that the level of disturbance in the forests appears to have decreased as a consequence of the project. However, in order to achieve permanent impacts, work will have to be expanded to all forest adjacent communities and in-depth capacity building provided. In minimum, the following assistance will be needed in order to establish viable tourism operations and forest conservation in the area:

Collaboration networks and institutional capacity for forest conservation and tourism development

- Strengthening collaboration between the local stakeholders, i.e. the forest-adjacent communities, the Magrotto Estate, and Muheza District Authority
- Village tourism committees to be established and capacitated in all forest surrounding villages

Forest conservation

- Raising awareness on forest conservation in all forest-adjacent villages
- Advanced and extended training programme on sustainable agriculture and forest conservation techniques
- Establishment of tree nurseries and tree planting
- Tree bark collectors educated about the consequences of debarking and trained to plant medicinal trees on their farms
- By-laws created to enforce conservation and sustainable forest use

Tourism development

- Tourism training and capacity building
  - Further training for the tour guides (English language, tour guiding and interpretation techniques)
  - Training of artisans (techniques and product development)
  - Training on accommodation and catering services for certain households
  - Basic business skills for candidate entrepreneurs



- Assistance on the use of microfinance
- Documentation of cultural heritage by e.g. local tour guides in collaboration of a university student/researcher
- Documentation of the best bird tourism sites
- Building of basic tourism infrastructure
  - Tourism committee's office renovated and furnished
  - Marking of the proposed trails and attractions
  - Simple home accommodation and catering services developed
- Building partnership with reliable and responsible tour operators and tourism marketing institutions in order to attract visitors

## LITERATURE AND ELECTRONIC SOURCES CITED

Aloyce, Z.M. 2005. Integrated conservation and development in Udzungwa, Tanzania. EFNews, April-October 2005. <http://www.worldwildlife.org/efn/pdfs/EFN%20News%20April%202005.pdf>

Amani Butterfly Project 2007. Visits. <http://www.amanibutterflyproject.org/visit.htm> (Accessed 23.03.2008).

Amani Tours 2007. Cultural & Ecotourism Programmes. [http://www.amani-tours.com/cultural\\_tours.htm](http://www.amani-tours.com/cultural_tours.htm) (Accessed 20.03.2008).

Amboni Limited 1991: Magrotto Estate. Field Position and Land Plan, Sept. 1991.

Burgess, N.D., Butynski, T.M., Cordeiro, N.J., Daggart, N.H., Fjelds , J., Howell, K.M., Kilahama, F.B., Loader, S.P., Lovett, J.C., Mbilinyi, B., Menegon, M., Moyer, D.C., Nashanda, E., Perkin, A., Rovero, F., Stanley, W.T. & Stuart, S.N. 2007. The biological importance of the Eastern Arc Mountains of Tanzania and Kenya. – *Biological Conservation* 134: 209–231.

Cunneyworth, P. and Stubblefield L. (eds.) 1996: Magoroto Forest – A biodiversity survey. East Usambara Catchment Forest Project Technical Paper 30. Ministry of Natural Resources and Tourism, Tanzania, Forestry and Beekeeping Division. Department of International Development Co-operation, Finland, Finnish Forest and Park Service, Frontier-Tanzania, University of Dar es Salaam, Society for Environmental Exploration.

Darbyshire, I. 2006. Flora of Tropical East Africa. Gesneriaceae. Royal Botanic Gardens, Kew.

Eastwood, A., Bytebier, B., Tye, H., Tye, A., Robertson, A. & Maunder, M. 1998. The conservation status of Saintpaulia. – *Curtis's Botanical Magazine* 15: 49–62. Emerging -Market.org. 2008. Tanzania Tourism Sector Report. <http://www.emergingmarket.org/tanzania/tanzania-reports/tanzania-tourism-sector-report/> (Accessed 24.03.2008)

EUCAMP 2002: Completion report of the phase III (1999-2002). East Usambara Conservation Area Management Programme Administrative Report No. 40.

Fitzpatrick, M. 2002. Lonely Planet Tanzania. Lonely Planet Publishing Pty Ltd, Australia.

Hall, S.M., Fanning, E., Howell, K.M., and Pohjonen, V. (eds.) 2002: Mlinga Forest Reserve – A biodiversity survey. East Usambara Conservation Area Management Programme Technical Paper 56. Ministry of Natural Resources and Tourism, Tanzania, Forestry and Beekeeping Division. Ministry for Foreign Affairs, Finland., Indufor/Mets hallitus Group, Finland., Frontier-Tanzania, University of Dar es Salaam, Society for Environmental Exploration.

Hamilton, A.C. 1989. The place and the problem. A survey of forest types on the East Usambara Mountains using variable-area tree plot method. In: A.C. Hamilton & R. Benstedt-Smith (eds.) *Forest conservation in the East Usambara Mounains Tanzania*. IUCN, Gland. pp. 213-226.

IUCN 2007. 2007 Red list of threatened species. IUCN – The World Conservation Union. <http://www.iucnredlist.org/> (Accessed 24.03.2008).

John, J. R. M. (ed.) 2007. Training materials for tour guides: a case of avitourism in Eastern Arc Mountains. Wildlife Conservation Society of Tanzania, Dar es Salaam, Tanzania, 47 p.

Johansson, S. & Sandy, R. 1996. Updated forest area information in the East Usambara mountains. East Usambara Catchment Forest Project, working paper 19

Kiss, A. 2004. Is community-based ecotourism a good use of biodiversity conservation funds? - *Trends in Ecology and Evolution* 19: 232-237.

Kolehmainen, J., Nieminen, J., Killenga, R., Hahkala, V. & Koponen, P. 2004. Saintpaulia Conservation Project Phase I, Final Report. The Finnish Saintpaulia Society in collaboration with the Botanic Garden of the University of Helsinki, Tanga Regional Catchment Forest Office and Amani Nature Reserve. [http://www.saintpaulia.fi/Toiminta/SCP\\_final\\_report.pdf](http://www.saintpaulia.fi/Toiminta/SCP_final_report.pdf)

Kolehmainen, J. & Korpelainen, H. Morphotypes, varieties or subspecies? – Genetic diversity and differentiation of four *Saintpaulia* morphotypes from the East Usambara Mountains. – in press (Botanical Journal of the Linnean Society).

Kolehmainen, J. & Mutikainen, P. 2006a. Population stage structure, survival and recruitment in the endangered East African forest herb *Saintpaulia*. – *Plant Ecology* 192: 85-95.

Kolehmainen, J. & Mutikainen, P. 2006b. Reproductive ecology of three endangered African violet (*Saintpaulia* H. Wendl.) species in the East Usambara Mountains, Tanzania. – *African Journal of Ecology* 44: 219–227.

Kweka, D. 2004. The role of local knowledge and institutions in the conservation of forest resources in the East Usambara. A report submitted to UNESCO-Man and Biosphere Young Scientist Programme. 36 p. + 2 appendices. <http://www.unesco.org/mab/bursaries/mysrept/2003/kweka/finalRep.pdf>

Lindqvist, C. & Albert, V.A. 1999. Phylogeny and conservation of African violets (*Saintpaulia*: Gesneriaceae): new findings based on nuclear ribosomal 5S non-transcribed spacer sequences. – *Kew Bulletin* 54: 363–377.

Nelson, F. 2004. The evolution of community-based ecotourism in northern Tanzania. Drylands Programme, International Institute for Environment and Development, Issue Paper No. 131, 40 p. <http://www.iied.org/pubs/pdfs/9507IIED.pdf>

Nelson, F. 2006. The opportunities and challenges of ecotourism in Tanzania. A PowerPoint presentation. <http://www.janegoodall.org/africaprograms/programs/pdf/The%20Opportunities%20and%20Challenges%20of%20Ecotourism%20in%20Tanzania.pdf> (Accessed 20.03.2007).

Oforu-Amaah, N.G. 2007. Conservation for sustainable development? Ecotourism in Tanzania. BSc thesis, Harvard College, Cambridge, Massachusetts. [http://www.cid.harvard.edu/cidstudents/thesis\\_prize/ofosuamaah\\_srthesis07.pdf](http://www.cid.harvard.edu/cidstudents/thesis_prize/ofosuamaah_srthesis07.pdf)

Oliver, S., Bracebridge, C.E., Fanning, E. & Muruke, M. (eds.) 2002: Environmental Education Programme: Environmental Activities within local communities. East Usambara Conservation Area Management Programme Working Paper 47. 112 p.

Oostermeier, J.G.B., Van't Veer, R. & Den Nijs, J.C.M. 1994. Population structure of rare, long-lived perennial *Gentiana pneumonanthe* in relation to vegetation and management in the Netherlands. *Journal of Applied Ecology* 31: 428–438.

Tanzania National Website 2003. Population and housing census. General report. Population by sex, number of households and average household size. <http://www.tanzania.go.tz/census/census/districts/muheza.htm>. (Accessed 01.10.2006).

Tukae partners 2008. Volunteering with Tukae Partners. <http://www.tukaepartners.com/Volunteering.htm> (Accessed 23.03.2008).

Tye, A. 1994. Magoroto rainforest conservation – Proposal for establishment of a new reserve. EUCDP, IUCN, Amani, Tanzania (unpublished).

Wildlife Conservation Society of Tanzania 2000. Tourist Information for the Uluguru Mountains WCST Mmorogoro, 2000. <http://www.africanconservation.org/uluguru/downloads.html>. (Accessed 20.03.2008)

Wildlife Conservation Society of Tanzania. Important Bird Areas (IBA) Programme in Tanzania. (A brochure).

## Annex 1. Budgeted and actual expenditures

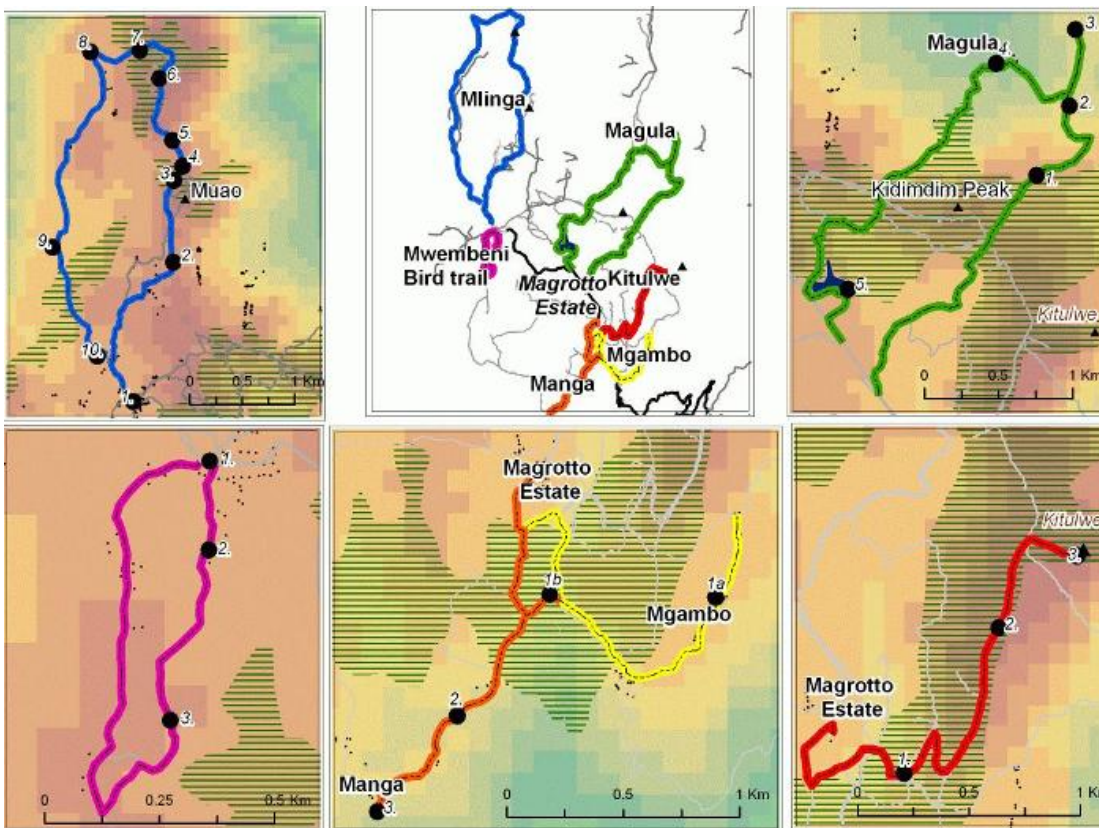
The realized expenditures indicated below have occurred from September 2006 to April 2008. The expenses have been paid in two currencies, euro and TZ shillings. The expenses paid in Tanzania have been converted to euro and totalled up with expenses paid in Finland in euro. The obtained euro totals have been converted to GB pounds using the rate 0,705965 which was the rate of the grant transfer from the Rufford Maurice Laing Foundation in 7th of July 2006.

Itemized expenditures	Planned budget	Actual expenditure	Difference
International travel	2 541,48	2 761,10	-219,63
Permits	1 023,92	550,68	473,24
In-country transport	1 724,93	3 426,98	-1 702,05
Accommodation	238,42	273,40	-34,98
Per diems	7 738,97	6 487,40	1 251,57
Fuel	796,12	897,93	-101,81
Consumables	530,75	747,77	-217,02
Excursion	192,81	263,25	-70,44
Equipment	1 115,43	1 550,70	-435,28
Workshop	441,60	178,05	263,54
Communications	401,74	324,13	77,61
Copying, printing & stationeries	109,88	314,15	-204,27
Administration	105,89	165,53	-59,63
Promotion & marketing	559,77	303,08	256,69
Consultancies	360,85	477,19	-116,34
Medical	257,08	49,30	207,78
*Project evaluation	503,80	0,00	503,80
Contingency	340,88	213,66	127,22
<b>Total (£)</b>	<b>18 984,31</b>	<b>18 984,31</b>	

Funding sources:	Secured funding:
National Geographic Conservation Trust	8 614,71
Rufford Maurice Laing Foundation	4 992,94
Funds remaining from a previous project	2 639,34
Cincinnati Zoo & Botanical Garden	1 557,15
African Violet Conservation Fund	
Swedish Saintpaulia Society	763,83
Finnish Saintpaulia Society	423,58
<b>Total (£)</b>	<b>18 991,56</b>
Balance (12th of May, 2008)	7,25

\*Expenditures of the project evaluation (ca. 650 £) are included within the other itemized expenses.

Annex 2. Map of the proposed trails and attractions



Annex 3. Map of *Saintpaulia* distribution and forest disturbance (situation in May/June 2007).

