Tanzania Forest Conservation Group
Shirika la Kuhifadhi Misitu ya Asili Tanzania

REDD: FOR COMMUNITIES AND FORESTS
MKUHUMI: KWA AJILI YA JAMII NA MISITU

MTANDAO WA JAMII WA USIMAMIZI WA MISITU TANZANIA
MJUMITA

Making REDD work for communities and forest conservation in Tanzania

TFCG Technical Report 27

Analysis of the drivers of deforestation and stakeholders in the Kilosa project site

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About the project 'Making REDD work for Communities and Forest Conservation in Tanzania'

The project 'Making REDD work for communities and forest conservation in Tanzania' aims to reduce greenhouse gas emissions from deforestation and degradation in Tanzania in ways that provide direct and equitable incentives to communities to conserve and manage forests sustainably. The project will achieve this by supporting the development of a Community Carbon Cooperative hosted within the existing Network of Tanzanian communities engaged in participatory forest management. The Cooperative will aggregate voluntary emission reductions from its members and market them according to internationally recognised standards. A proportion of project funds and carbon market revenue will be channelled directly to the communities on a results-based basis thereby maximising incentives to maintain forest cover and reduce deforestation. The project includes an evaluation and communication component designed to capture the lessons learnt in order to inform project implementation and share them with the national and international community including sharing lessons learnt during project inception at the UNFCCC meeting in Copenhagen. The project also focuses on building in-country capacity with regards to REDD at both local and national governmental levels. This is linked with a strategic advocacy component aimed at forging a smooth path for REDD in Tanzania by engaging in the formulation of REDD frameworks and processes at national and international level.

The project is a 5 year project that will run from September 2009 to August 2014. It is a partnership between TFCG and MJUMITA, (the Tanzanian Community Forest Network).

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Photos by Baraka Samweli

Executive summary

1. Introduction

TFCG in partnership with MJUMITA is implementing the project 'Making REDD work for communities and forest conservation in Tanzania'. The project aims to reduce greenhouse gas emissions from deforestation and forest degradation in Tanzania in ways that provide direct and equitable incentives to communities to conserve and manage forests sustainably. The project will achieve this by supporting the development of a Community Carbon Cooperative hosted within the existing network of Tanzanian communities engaged in participatory forest management. This study relates to an analysis of the deforestation drivers and stakeholders in the two districts, as set out under Activity 2.1 in the project document.

The objectives of the study are to:

- Identify and describe drivers of deforestation and forest degradation within the landscape.
- Identify and describe stakeholders within the two landscapes with a particular focus on their relationship to forests and their roles in causing or avoiding deforestation.
- Identify groups who might be vulnerable to REDD and to understand the nature of their vulnerability and ways to mitigate that vulnerability.
- Provide a description of the role of women within the landscapes with a particular focus on their relationship to forests and areas of vulnerability in relation to REDD.

2. Methodology

Six representative villages were selected for the study. In each village we met village government representatives and village elders and drew a map with them, which formed the basis of the discussions and helped us target our subsequent work, usually involving a trip to a subvillage and discussions with a group of women, or other important stakeholders. Interviews were also held in town with officials.

3. Findings of the study

3.1 Drivers of deforestation

Deforestation is taking place and the forests have deteriorated in comparison with the past. But in some steep, remote parts, the forests have not yet been degraded. The main drivers of deforestation are as follows:

Agriculture - Land is cleared for shambas as the populations of the villages increase. A few farmers also clear new shambas for sesame, but only once every 6-8 years. Most have permanent shambas now. Permanent crops may be planted on the abandoned shambas. When farmers clear shambas, the trees are usually made into charcoal. Sometimes farmers clear fell trees around shambas to prevent baboons from attacking the shamba.

Fire - Fire is a big problem in the forests of this area, occurring every year and causing great destruction in the forests. A range of people cause fires, including hunters, farmers, livestock keepers, honey gatherers, timber sawyers, etc. Drought exacerbates the situation. There are no laws about fires, no fines or penalties and no awareness raising, although people in several villages were keen to take steps.

Charcoal – in some villages charcoal is made, in others not. In some villages locals make it, in others outsiders come in. There are no limits or laws about where people can make charcoal – some make it in the forest, others make it as a by-product of shamba clearance. Most people make charcoal because there is no alternative, and because there is a good market in Kilosa town. In villages close to Kilosa, charcoal making is the main driver of deforestation.

Timber– Many timber species have almost disappeared through over harvesting in the past. A small number of people in the villages harvest timber and outsiders also come in. There is no control over timber harvesting, no levies are paid and the villages don't know the laws. Most timber goes to Kilosa. The villages were keen to be more proactive in protecting timber resources.

Poles – There are no laws about cutting poles and people cut them where it is most convenient, although nowadays it is more difficult to find them. Poles are mostly for domestic use and are for house building. Some people are now building houses with bricks.
Firewood – There is commercial exploitation of the forest for firewood in some villages, through sale to Kilosa and beer making, which takes much firewood.
Livestock - Livestock keepers drive their animals into some of the villages in this area, and burn the forests for new grass.
Geography – The geographical location of villages and forests is an important factor for their survival. Distant forests on difficult terrain are not exploited, while forests in villages close to Kilosa have already been heavily degraded.

3.2 Stakeholders
Farmers – Everyone farms and many different crops are grown, depending on the climate and altitude of the villages. People cultivate in the uplands, lowlands, and each village has an area of wetlands. Some farmers cultivate in the forests, others don't. The main cash crops cultivated are sesame, beans and sunflowers. Sesame is the preferred cash crop in many villages, in others it is not grown and people don't like it. It is easy to cultivate and doesn't need guarding against birds. Farmers cultivate 1-3 acres and can harvest up to 300kg from one shamba, but their yields are low due to lack of expertise and cash. Most sesame is sold in Kilosa but the price is low. In other villages beans are the most important cash crop. Farmers cultivate 1-2 acres and can sometimes harvest thrice per year, harvesting 2-4 sacks from one acre. Traders come to buy beans. The proceeds from one acre can be up to 216,000TSh. Sunflowers are also extensively cultivated in some villages, but they are much attacked by birds. Sunflowers are mixed with maize on one shamba, which reduces their yield, but from a shamba planted solely with sunflowers, 5-7 sacks can be harvested. Sunflowers can either be sold as seeds or as oil, which pays better, but if immediate cash is needed, the seeds are sold. Everyone cultivates maize, usually 1-2 acres, for domestic consumption.
Charcoal makers - There are two types of charcoal makers in this area – those who live in the villages and those who come from outside to make charcoal in the village. In some villages everyone makes charcoal, but no-one depends on it for a living – they do it when they have time and when they need some cash. If there were an alternative, they would prefer it. Many people come from Kilosa to make charcoal. People can make up to 20 sacks a month, selling at between 3000-5000TSh in the villages.
Timber harvesters – Most people in the village who harvest timber do so only when they need some extra income. Many people come from outside to harvest timber and most timber is destined for Kilosa.
Firewood collectors – A few people sell firewood in other villages or Kilosa and some people come from Kilosa to cut firewood to sell.
Mushroom collectors - Women collect mushrooms from the forest mostly for domestic use, although sometimes they can be sold, for 500TSh for a small bucketful. There are fewer mushrooms now than in the past
Beekeepers/honey collectors – In Kibasigwa, people keep bees. In other villages, small amounts of honey are collected from the forests for domestic consumption.
Hunters – There does not seem to be much hunting in this area, although some does occur.
Grass collectors - Everyone, both men and women, collects grasses for thatching their houses from areas near the villages.
Beer brewers – In two villages, 70-80% of women brew beer. One barrel can bring in 30,000TSh. Much firewood is used.
Pot makers – In Chabima, 6-8 women make clay pots for sale. They can make up to 5000TSh in one day.
Livestock keepers – There are local livestock keepers and those from outside. Local ones keep goats, cows, donkeys and pigs. Outsiders include Masai, Barabaig and Sukuma people. There have been conflicts with these people.
Village governments and VNRCs – VG representatives are not well informed about their roles and responsibilities and have a lack of knowledge about natural resources issues and legal issues connected to them, including revenue collection. The villages have been surveyed, but none have done any land use planning. In two villages there are VNRCs. Again, they are not aware what they should be doing since they have had no training.

Agricultural extension service – The villages are not visited by ward based extension officers and blame their lack of expertise on this. The district officers also never come. More staff have recently been taken on at ward level, however.
Forestry department – Forest officers also do not come to the villages. Contact with forest officers is only when illegal forest produce is confiscated. No PFM has been done in the area.
Outsiders – The outsiders in these villages are mostly traders on bicycles or motorbikes coming to buy crops or people coming in to exploit the forests (timber, charcoal, firewood).

The role of stakeholders in causing or avoiding deforestation
The main problems in these villages are fire and the lack of strategies at village level for preventing it, charcoal and timber production for extra income, cultivation in the forests and clear cutting around shambas to prevent attacks from baboons. But there are also instances of people avoiding deforestation, through activities or attitudes. In two villages, two forests are barely touched, one for spiritual reasons and the other because it is the sole source of water. In one village there is a law that people must not cut down timber trees when clearing shambas. There is also an awareness of how important forests are to livelihoods and especially to rain. People are thus generally in favour of forest conservation. Lack of land use planning has had a direct bearing on the amount of deforestation taking place. People are also beginning to resent outsiders coming into their villages to exploit their forests and wonder how they can conserve their forests with such outside pressure.

3.3 Groups vulnerable to REDD and ways that this might be mitigated
People in the villages admitted that in fact there would not be many people who would be seriously affected by REDD and protection of forests. Apart from a small number of charcoal makers or timber harvesters, who don't even depend on these activities for their livelihoods, it would mostly affect people coming in from outside. Local people say that if they had an alternative, they would not harvest timber or charcoal. Farmers also clear new shambas from the forests, especially for sesame. Mitigation measures could include:

- land use planning to identify areas for cultivation and areas for protection of the forests
- new techniques to intensify cultivation and enhance fertility
- conservation agriculture
- link with the Ilonga Agriculture Research Institute to identify cash crops suitable for the area
- specific rotated areas for coppicing for poles under managed forests
- brick houses
- improved stoves for beer brewers
- survey abundance of mushrooms and facilitate the institution of controlled harvesting
- tree planting for fast growing timber trees as an income generating opportunity

An extremely important factor is the demand for timber and charcoal in Kilosa town, which needs to be addressed, but which may be beyond the remit of the project?

- Improved stoves designed specifically for urban areas
- The introduction of gas stoves

3.4 Women in the landscape
Women have been identified as being particularly vulnerable to REDD. Women cultivate shambas with their husbands, but often the proceeds of cash crops are not shared with wives. Most women don't have the option of an independent income – only mushrooms and pot making – except in two villages where they brew beer. A big problem faced by women is the difficulty in getting water and its quality. Most women get water from springs which are distant, dry up during the dry season and are not safe during the wet season – many people suffer from intestinal diseases. Health is also a problem for women and many women said that health centres are far away and the service is often not good. In some villages there are health assistants and traditional midwives. The main illness in this area is malaria, but there are many other complaints too. Other problems included the fact that forests are getting more distant as they become degraded and this affects firewood and mushroom collection. They would welcome forest conservation because they are concerned about the lack of rainfall. Women say that their lives are getting more difficult because of the rainfall, and also they lack agricultural expertise.

4. Conclusions and recommendations

This area is characterised by small settlements in large village areas set amongst hills and forests. People are aware of the value of their forests, are concerned that they are being degraded and understand the link between forest degradation and decreasing rainfall. But forests are being exploited. There is no-one to advise people about their forests, no provision for PFM. VGs are unaware of the laws. Fire is a huge problem and there are no strategies for its control.

There is a variety of stakeholders in the area, most of whom are local, and most of whom engage in agriculture. But many outsiders come in to harvest timber and charcoal. Even if people in the villages are willing to protect their forests, it is hard to see how the Kilosa stakeholders will agree to stop doing what they have been doing unhindered for many years.

People say that poverty has increased, but with some exceptions, there are few places with food shortages. They are able to live reasonably, but they need some alternative sources of income so that they don't have to fall back on exploiting the forest.

Recommendations include:

- Research into alternative crops, markets for other crops, fast growing timber trees to supply the urban market, mushrooms
- Awareness raising about forest conservation
- Strategies to prevent and control fires
- Training for village governments and VNRCs on roles and responsibilities, governance , laws and law enforcement
- Land use planning – livestock keepers must be involved (Masai, Barabaig) to avoid conflicts.
- Identify forests for starting PFM
- Promote conservation agriculture
- Links with the Agriculture department and the Ilonga Agriculture Research Institute
- Improved stoves – for beer brewing and also for an urban setting (Kilosa)
- Alternative income generating activities, for people to make extra money

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List of acronyms

CCM	Chama cha Mapinduzi
CUF	Civic United Front
DALDO	District Agriculture and Livestock Development Officer
DANIDA	Danish International Development Agency
DNRO	District Natural Resources Officer
GHG	Greenhouse Gases
JFM	Joint Forest Management
MCH	Mother and Child Health
MJUMITA	Community Forest Conservation Network
PFM	Participatory Forest Management
REDD	Reducing Emissions from Deforestation and Forest Degradation
TFCG	Tanzania Forest Conservation Group
TSh	Tanzania Shillings
VEO	Village Executive Officer
VNRC	Village Natural Resources Committee

Additional notes

Most prices are listed in Tanzanian shillings. The exchange rate at the time of the survey was US$ 1 = TZS 1400.

1. Introduction

1.1 Background to the study

The Tanzania Forest Conservation Group in partnership with the Community Forest Conservation Network of Tanzania (MJUMITA) is implementing the project 'Making REDD work for communities and forest conservation in Tanzania'. The project aims to reduce greenhouse gas emissions from deforestation and forest degradation in Tanzania in ways that provide direct and equitable incentives to communities to conserve and manage forests sustainably. The project will achieve this by supporting the development of a Community Carbon Cooperative hosted within the existing network of Tanzanian communities engaged in participatory forest management.

The project includes a component aimed at addressing the underlying drivers of deforestation at the two pilot sites in Kilosa and Lindi Rural districts.

Output 2**:** *Replicable, equitable and cost-effective models developed that are designed to reduce leakage across project sites and provide additional livelihood benefits to participating rural communities.*

This study relates to an analysis of the deforestation drivers and stakeholders in the two districts. The project document describes this activity as follows:

Activity 2.1 Analyse drivers of deforestation and forest degradation.

How to avoid or reduce the leakage problem is one of the most critical challenges in ensuring that REDD projects are achieving real reductions in GHG emissions at a national and global scale. A first step in addressing leakage is to carry out a detailed analysis of the drivers of deforestation and forest degradation within a landscape. By understanding the drivers of deforestation it will be possible to determine the kinds of activities that may be displaced by improving forest conservation and management i.e. primary leakage. In Tanzania, key drivers include demand for agricultural land, timber, fuelwood, fodder, poles and charcoal. Wild fires are also a key threat. For each site, these drivers need to be further analysed to determine, for example, whether forests are being cleared for subsistence agriculture or for commercial agriculture such as for biofuel production. Whether timber is for local markets or for more distant markets such as China. For each site the project will analyse the drivers of deforestation and other threats to the forest and this analysis will help to determine the most likely leakage scenarios. The analysis will look not only at the pressures on the forests and the drivers behind those pressures but will also look into the reasons why response strategies to date have failed to prevent deforestation and forest degradation. This would include analysis of the shortcomings of participatory forest management in the respective forest areas. This will build upon the considerable work that TFCG and other institutions have already undertaken on participatory forest management which has already identified some of the key challenges in relation to costs vs revenues, communication and governance. In addition, as part of this analysis, the project will carry out a stakeholder analysis for each landscape with a particular focus on identifying forest user groups and those most dependent on resource extraction from natural forests.

1.2 Objective of the study

The objectives of the study are to:

- Identify and describe drivers of deforestation and forest degradation within the landscape.
- Identify and describe stakeholders within the two landscapes with a particular focus on their relationship to forests and their roles in causing or avoiding deforestation.
- Identify groups who might be vulnerable to REDD and to understand the nature of their vulnerability and ways to mitigate that vulnerability.
- Provide a description of the role of women within the landscapes with a particular focus on their relationship to forests and areas of vulnerability in relation to REDD.

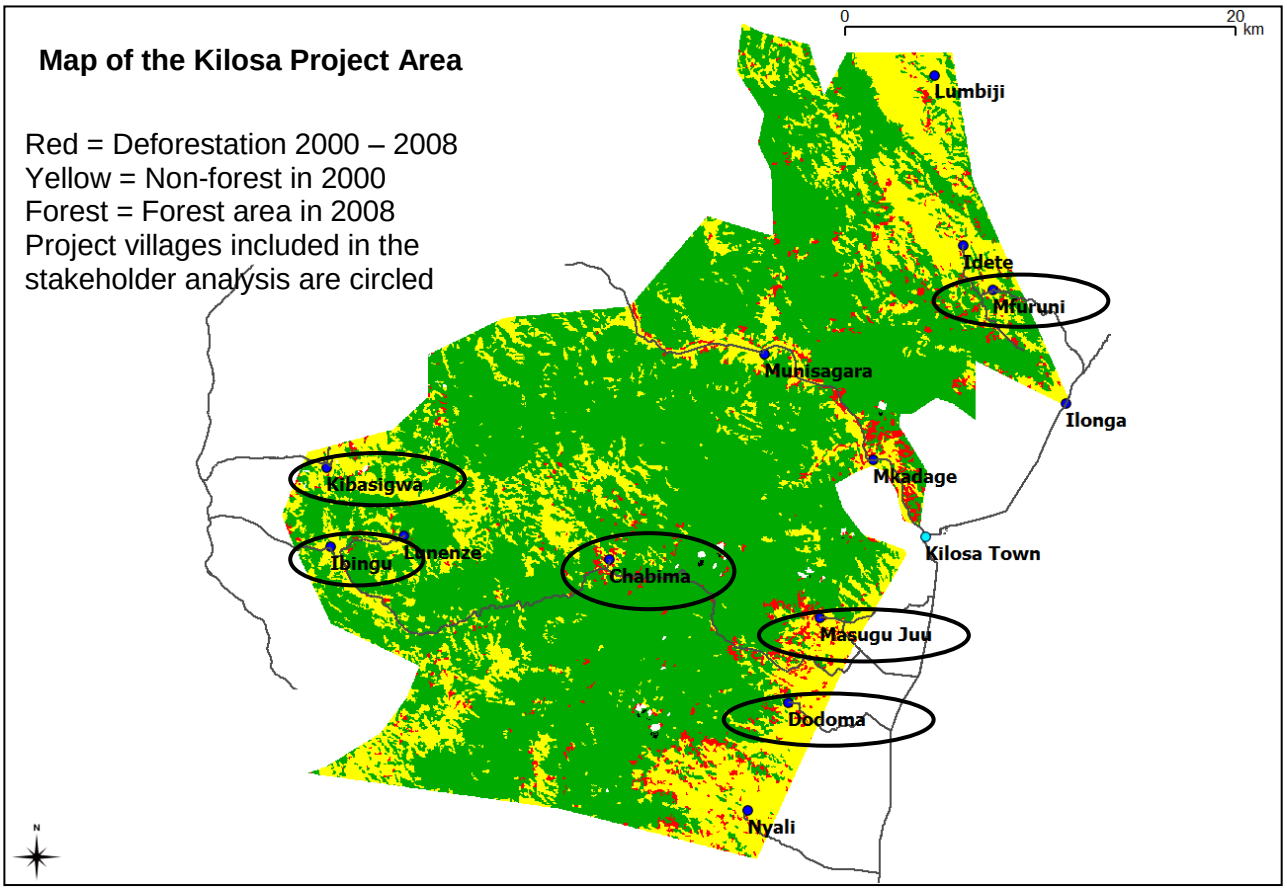
1.3 Organisation of the report

The report begins by describing the methodology used to gain the information which follows. It then discusses the drivers of deforestation, summarised from all the villages. This is followed by a description of the stakeholders present in the area, an analysis of their role in causing deforestation, or preserving the forests, and their importance for the project. This is followed by an overview of groups vulnerable to REDD and ways in which this vulnerability might be mitigated and in particular an examination of women in the landscape. Recommendations for additional research come at the end, and profiles of the individual villages appear in the appendix.

2. Methodology

Six villages were selected for the study. A representative sample was chosen, e.g. villages in different geographical areas (from the south, from the east, from the west and from the northern parts of the project area), villages near to Kilosa town, villages with different characteristics – different crops, the lack of a good road, a different climate, etc. The villages included in the study are: Chabima, Masugu Juu, Dodoma Isanga, Kibasigwa, Ibingu and Mfuruni.

In each village, we began by meeting with a mixed group of village government representatives and village elders, both male and female. This meeting had been set up in advance. In this meeting the discussions centred around a map, drawn by the participants, which helped us to understand the layout of the village and in particular the location of the forests and the relation between the forests and the people's activities. During these meetings much information was produced, and as a result we were able to target our subsequent activities, e.g. a walk to a well with a group of women, a drive through the forest to a distant sub-village, a walk or a drive up the escarpment to the forest on the plateau. These walks and drives provided us with an opportunity to observe the state of the forest, the extent of forest degradation through shifting cultivation, fire, charcoal, etc, and any other issues which might not have come out through discussion alone. In every village we talked to a group of women, usually in one of the subvillages, and often also talked to other people whom we encountered in the forest. These meetings were more informal – there was no prior notice and often we arrived in a subvillage and talked to those who we found there, or found people to talk to while walking in the forest.



3. Findings of the study

3.1 Drivers of deforestation

Deforestation is taking place in this area. People in the villages compare their forests with how they were in the past and say that their condition has deteriorated, they are more distant from the villages, forest products which they used to gather have become more difficult to find and there is less rain and water than in the past. Officials from Kilosa town agree with this, saying that the forests have become degraded in recent years. However, they also say that because of the nature of the terrain, e.g. the height, steepness and remoteness of some of the mountains, many of the areas of forest have not yet been significantly touched.

The main drivers of deforestation of these forests are described in the section below. The main threats to the forest were identified in discussions as clearing forests for agriculture, fires, charcoal burning and timber harvesting. There are also other more minor pressures on the forest.

3.1.1 Agriculture

Clearing land for shambas is an important cause of deforestation. In this area, there is the natural expansion of agricultural land and also some shifting cultivation. In Masugu Juu, as in the other villages, people told us how, as the population increases, so does the demand for agricultural land. One man explained, 'every year at least ten young people graduate from school and they all clear new shambas because they have no other way of earning money.'

Some farmers practise a sort of shifting cultivation. However, it is longer term shifting cultivation than is generally understood by the expression, in that farmers clear a shamba, and farm it for 6-8 years before moving on. In Chabima it was estimated that fewer than a quarter of the farmers practise this sort of agriculture and in Dodoma Isanga, the village government group estimated that only around 10% of

farmers clear shambas in the forests, mostly in Bogoyi forest, very few in Mvuashati. In Mfuruni, some farmers go to Iselo forest where there is much land which is suitable for irrigation. Shifting cultivation seems mostly to be driven by the cultivation of sesame. Farmers clear a shamba and farm it for 6-8 years, until the fertility begins to decrease, then move on to clear another shamba, or extend the current shamba. Often they plant cassava on the original shamba, which can tolerate less fertile soils. The shambas are then left but the farmers generally return after a few years, to cultivate again, leaving the shamba to recover its fertility. But in most villages we heard that people prefer to cultivate the same shamba nowadays. In Mfuruni we heard that shifting cultivation is not practised as much as it was in the past. Most people now cultivate on the same area, although some may move into the forests in search of areas with moisture for dry season cultivation. One older man told us, 'I have cultivated the same shamba for 25 years now and I haven't moved once,' while in Ibingu another man pointed out to us that he has farmed the same shamba since 1997. And in Chabima, one of the reasons given for farmers not wanting to cultivate sesame was that a freshly cleared shamba is required for the crop, and nowadays people don't like clearing new shambas.

People told us that if a shamba has been abandoned, it will take around 7-8 years to recover, but it will not be as dense as it was previously. However, we saw an area in Dodoma Isanga village which had been left for about seven years, and there were only bushes and small trees growing on it, and certainly no large trees.

In some cases we were told that when farmers clear shambas, they are sometimes used for another purpose. In many villages, the trees from the cleared shambas are made into charcoal. In Chabima, many people plant permanent crops such as oranges on the shambas which have been abandoned for annual crops. In Chabima people also say that after a shamba has been abandoned, no-one else is allowed to cultivate there – it is considered to belong to the farmer who originally cleared it and the shamba can be rented out for 10,000TSh. One person complained, 'if you rent a shamba, the owner demands it back after a year because the shamba is now cleared again and easier for him to continue farming.'

In Masugu Juu and Dodoma Isanga we heard that there is the practice of clear felling trees in a 30m strip around a shamba in order to prevent baboons and monkeys from attacking the shamba. This area will be used for cultivation the following year. Farmers also maintained that such clearance not only protected against crop-raiding animals, but also ensured that there would be enough light for the crops to grow properly.

3.1.2 Fire

Fire is a big problem in the forests of this area, occurring every year and causing great destruction in the forests, killing trees and seedlings, as well as everything in the understorey. In every village they provided us with a range of causes of fires:

- They are started by hunters to flush out animals.
- Some farmers may cause them inadvertently while clearing and burning their shambas.
- Livestock keepers (mostly Masai, but also Barabaig in Ibingu) burn the forests to stimulate the growth of new grass for their livestock.
- Honey hunters light fires to smoke out bees.
- Timber sawyers start fires so that they can see the trees more easily.
- Farmers said that sometimes they burn off upupu (a vine with pods which cause a violently itchy rash if touched) and the fire might accidentally spread to the forest. 'There is so much upupu, that we have to burn to get rid of it,' explained one farmer in Chabima. Timber harvesters also burn off upupu.

- In Mfuruni and Chabima, we heard that some young people light fires deliberately – they make fire traps out of old cloth and matches which explode when the perpetrators are far away. The fire then may spread.
- In Chabima a man said that some people light fires to predict how long they will live according to how long the fire burns.
- In Masugu Juu and Chabima, some claim that the fires start at the DC's office in Kilosa town and spread to the village, rather than starting in the village itself. In Mfuruni, they say the fires come from Ilonga and Chanzulu village.

Drought was also mentioned as an exacerbating factor in the spread of fires – there are more droughts nowadays and the temperatures are hotter, which means that the grasses in the forests are drier and so fires will burn more easily. This is particularly the case in Kibasigwa where fire occurs every year. They are particularly destructive at the moment because everything is so dry as a result of the three year drought. No-one indicated who starts the fires or any reasons for them starting, saying they only see them once the flames appear from the forests.

One group which insisted that it is not involved in causing forest fires was charcoal makers in Dodoma Isanga. They require grass to thatch their kilns, so the destruction of the grasses in the forests affects their work – 'if the forest burns after I have arranged the logs for charcoal making, I have to wait until the following season when the grass has grown sufficiently to thatch the kiln,' explained one charcoal burner. He added that they always clear the area around their kilns before they light them, for this very reason. However, in Mfuruni, a group of men told us that sometimes charcoal burners start fires by accident.

We asked in all the villages whether there are any strategies in place for preventing fires. In all the villages, people told us that putting fires out is not an option since they burn so fiercely, especially if the wind is fanning the flames. In Kibasigwa they told us that all they can do is run from the fires. Steps have been taken in the past - in Dodoma Isanga, one person was caught in the 1990s for starting a fire and he was jailed for several months, in Mfuruni, three people were caught and fined 5000TSh each for starting a fire and in Chabima, four people were arrested in the village in 1995 when the fire they had lit to burn their shamba spread. They were given a warning and released. But there are no coherent strategies for dealing with fire. However, the village government groups in all villages said they would be prepared to enact bye-laws, and that it would be a good thing to do, since fires are so destructive. In Ibingu, they have set up a VNRC since the project began and say that it will be now prepared to stop fires, but they urged the project to assist them. Several suggestions were made – in Chabima the village government group thought it would be a good idea to involve the people in the village in keeping a watch out for fires, and also suggested that farmers should make firebreaks before burning their shambas. In Mfuruni, the village government group said that to stop fire effectively it would be necessary to start in Ilonga, Chanzulu or even Kilosa town, since this is where many fires originate from. In Dodoma Isanga however, they insisted that it is difficult to identify who has started the fire, since by the time it has spread and thus been noticed, the person who caused it is likely to be far away.

3.1.3 Charcoal

Each village was different where charcoal was concerned – in some villages such as Masugu Juu and Dodoma Isanga, much charcoal is made, whereas in other villages, such as Kibasigwa, people say they don't make charcoal at all. In addition, in some villages, outsiders come in to make charcoal, e.g. Mfuruni, whereas in others it is only the inhabitants of the village who make it, as in Chabima.

It seems that charcoal can be made anywhere – there are no limits, nor laws regulating its production. In Masugu Juu, charcoal is made in all the forests in the village – Masugu Juu, Mzizimila and Mdukwi, and in Chabima a group of men told us that everyone is free to make charcoal, although most do it on the edges of the forest, rather than inside. In Dodoma Isanga, we were told that charcoal can be made anywhere in the forest where the favoured species are found but in recent years the trees needed for

charcoal production have become increasingly distant, so that nowadays it is necessary to walk three hours even to begin to make charcoal.

People also make charcoal as a by-product of clearing new shambas – in Dodoma Isanga, the felled trees are made into charcoal, which boosts the income of those making it. In addition many farmers cut down trees all around their shambas to prevent attacks by baboons. When we visited the forests in Masugu Juu, we saw many areas where charcoal had been made, and many more trees which had been cut down and arranged in piles to begin making charcoal.

The best species for making charcoal are mtalula, miombo, msani, mrama, mtondoo and muyombo, although msani is favoured above all the others.

In the 1970s-1980s in Dodoma Isanga, when the sisal and sugar plantations and industries were in operation, there was employment and people were not forced to make charcoal to survive. The forests were much denser than they are today as a result. People told us that they only make charcoal because they have no alternative source of income. But the demand from Kilosa town would remain and if the people in the villages stopped making charcoal, it is probable that more people from Kilosa town would simply come to the forests in the villages and make it themselves, as some already do now.

In villages that are close to Kilosa town – Masugu Juu and Dodoma Isanga - charcoal is the main driver of deforestation, as many large areas of forest are cleared for the production of charcoal. Charcoal is a greater threat to the forest than timber harvesting, because it is not so necessary to select trees according to size or species. And often the areas cleared for charcoal are not left to regenerate, but taken over by farmers for new shambas.

3.1.4 Timber harvesting

In the past there were many timber trees in the forest, and in colonial times, there was a company based in Kilosa called SINGA, which harvested mitondoo trees for timber from Masugu Juu forest and transported them to Kilosa town for sawing. This went on until 1980 by which time they had finished the timber trees from the accessible parts of the forest. They are now harvesting in Zombo and Ulaya (close to Nyali, one of the REDD project villages). The favoured species for timber include mninga, mvule, msungwi (also called mpilipili), mninga maji, mpululu (mkulingo), mwembeti, msolo, mtoloti, mkangazi, msani, mkole, mkalati and mhembeti but in all villages we heard that many species have virtually disappeared through overharvesting, in particular mninga and mvule.

A small number of people in each village (around 15-20) harvest and saw timber, apart from in Kibasigwa and Ibingu, where they say no-one engages in timber harvesting. In addition, as is the case with charcoal, people come in from outside to harvest timber, especially from Kilosa town.

Despite the numbers involved being small, there is almost no control over the harvesting of timber. In some villages we were told that there are legal procedures in place for harvesting timber, e.g. in Dodoma Isanga, but in fact all timber is harvested and sawn illegally in all the villages and generally no duty is charged. In Masugu Juu, there are no laws that govern timber harvesting in the village and anyone can come to harvest timber at any time and they will not be bothered by anyone. In Ibingu the village receives no levies from timber harvesters, because it is all carried out illegally. One man explained, 'When we ask them why they go straight to our forests without reporting first to the village office, they say that they don't know what procedures to follow.' In Chabima and Mfuruni, there doesn't appear to be any system for obtaining permission at village level for harvesting timber, and no-one attempts to seek permission. In Mfuruni, while walking through the village we saw a pit beside the

footpath, which indicates that the sawyers have no reason to believe that anyone is going to arrest them for illegal pit sawing.

In Chabima, the village government claim that they do patrols in the forests, once a month, until the situation improves, and then they stop. Often they will observe that there is too much illegal timber coming out of the forest, and then they will start up the patrols again. If sawyers are found in the forest, they generally run away and the patrols are able to confiscate their timber and tools. In 2008 two people were arrested, one of which had 60 pieces of timber. He paid a fine of 100,000TSh. A saw was taken from another person and he was charged 10,000TSh to reclaim it. They say that if they find people transporting timber on bicycles, they charge them a duty of 200TSh per timber, but this does not fit with other stories of timber flowing out of the forest on bicycles destined for Kilosa.

In Dodoma Isanga, the village government explained that they have a system of payment for timber – for every 100 pieces of timber harvested, the sawyer leaves twenty pieces in the village. The village government then decides what to do with the timber – whether to sell it, or to give it to the school, village office, etc. However, it seems unlikely that this is regularly put into practice. We heard of a similar plan in Ibingu - in 2008, two people from Lumuma asked permission to harvest timber. The permission was granted on the condition that for every ten pieces of timber, they pay two pieces to the village. He added, 'we preferred timber to a levy because it is easy for money to be swindled by a revenue collector, but the timber was used for the school and therefore benefitted everyone.' Now that the Ibingu village have established a VNRC, they say that they will be more proactive in protecting their forests and will be able to ensure that no-one goes in without permission.

3.1.5 Poles

In some of the villages, people go to the forests to harvest poles, while in others they just cut what is close at hand. In Mfuruni, people told us that there are no laws about cutting poles – anyone can collect poles from anywhere. This is the case in the other villages too. The main species favoured for poles include mrama, miyombo, mkenge, mpingo, mfumbili (mkunguga), mwalaka, muhungu, mkambaa, muwangaa, mlunduha, misolo, mihamvi, mimanga, dumilangumbi, mikole, mikunju, mrama, mwisa, mguhu (for some species they split wider trunks into lengths to use as poles) and bamboo.

In most villages the poles are purely for domestic use – poles have little commercial value. In Kibasigwa, a few people sell poles in Lumuma village and in Dodoma Isanga some bamboo may be sold within the village, for 200TSh per pole. Poles are used for house building. There were various estimates of how many poles it takes to build a family house – in the various villages we heard 300, 400, 500 and 600. But people were unanimous in saying that an average house will last for 5-6 years before it has to be rebuilt – the main agents of their destruction are rain and termites. There was some indication of more modern attitudes – in Mfuruni, they told us that in the past they used to shift around a lot more and build a new house every year, but these days they are more settled. In Masugu Juu people are now building with bricks - 'We are becoming more aware and so are building brick houses which last much longer,' said a young man.

Everyone complained that nowadays it takes much longer to collect enough poles for a house, e.g. in Dodoma Isanga, in the past it took 1-2 hours to collect a load of poles, but now it takes five hours, since the forests have become more distant due to high demand for poles and an increase in population - in Masugu Juu people said that all the young men who finish school rush to the forest for poles to build a

house with. It may take around a month to collect enough poles to build a house, although this depends on family size and the willingness to make an effort.

3.1.6 Firewood

Although the collection of firewood was not mentioned as a threat to the forest by anyone, in some villages, there is some commercial exploitation of firewood, which exerts more pressure on a forest than purely domestic consumption:

- In Chabima and Ibingu, around 70-80% of the women make beer. Keeping a barrel of beer bubbling involves large pieces of firewood – women told us that one barrel needs four logs, and that women who brew beer have to go to the forest once every two days, rather than once every four days. In Ibingu, some men collect firewood as a business to sell to women for making beer.
- In Masugu Juu, firewood is collected from Masugu Juu forest by women from the village, but in addition, people come from Kilosa town and from Magomeni to this forest for firewood. Women told us that they go directly to the forest without consulting village leadership, and no-one asks them where they are going, or attempts to exact a levy. Those who come from Kilosa town mainly collect firewood for business.
- In Mfuruni, a few people come from Kilosa to collect firewood from forests on the edge of the village.
- In Kibasigwa, some women take bundles of firewood to sell in the neighbouring village of Lumuma. A few people from Lumuma also come to collect firewood in Kibasigwa.

The collection of firewood by or for people from Kilosa could increase as the population of the town increases.

3.1.7 Livestock

Livestock keepers drive their animals into some of the villages in this area, including Dodoma Isanga, Chabima and Masugu Juu. They often burn the forest to encourage new grasses to grow for their livestock. The DNRO also told us that Sukuma livestock keepers have begun to enter this area – not only do they have big herds of animals, but they also clear much larger shambas in the forests for the cultivation of crops than local people do.

3.1.8 Geography

The geographical location of villages and forests is an important factor for their survival. In some villages we heard that there are forests, but they are so far away that people don't go there on a regular basis, e.g. Mvuashati forest in Dodoma Isanga, Mzizimila and Mdukwi forests in Masugu Juu, Sele, Ikamba and Kaleo forests in Chabima. Other forests are nearer to centres of habitation and so are more exploited, especially for agriculture. Many of the forests are located on mountainous terrain, with steep rocky slopes, and are thus inaccessible to all but the most determined, a factor which has ensured their survival so far.

The other geographical factor which is critical for these forests is their proximity to Kilosa town which has a high demand for timber and charcoal. In some villages, the people make charcoal and harvest timber to take down to Kilosa, but it seems that there are many people who come from Kilosa to exploit the forests in the village unhindered by any laws or taxes. This is particularly the case in the villages in the eastern side of the project area – Masugu Juu, Dodoma Isanga and Mfuruni. Even if people in the villages believe that they need to protect their forests, it will be difficult to prevent people from outside from continuing with their activities in the forests.

3.2 Stakeholders

This section provides a description of the stakeholders present in the area and a detailed examination of what they do and how they do it, together with an indication of their role in causing or avoiding deforestation.

3.2.1. Farmers

The largest group of stakeholders in this area are farmers, since everyone farms. A wide variety of crops are grown, and not all the same crops are grown in all the villages, since there are differences in

climate, altitude and traditions. The main food crops are maize, rice, sorghum, beans, pigeon peas, cassava, cowpeas, sweet potatoes, yams, sorghum, bananas and mung beans (choroko). The main cash crops are beans, sesame and sunflower and sometimes cassava, maize, pigeon peas and groundnuts are sold if there is a surplus, and also in some villages vegetables such as tomatoes, Chinese cabbage, cabbage, peppers, nyanya chungu are sold. There are also orange, papaya and tangerine trees and coconut palms and sugar cane. In Mfuruni, they attempted to cultivate coffee in the 1990s, but stopped in 1998 because the market was so poor – 'We would harvest 40 litres from half an acre,' explained one man. 'The price per litre was 300TSh which means we worked very hard and only made 12,000TSh.' In Chabima they cultivate rice, but only small amounts purely for domestic consumption. In the past Kibasigwa was well known for maize cultivation – 'lorries used to come to the village to transport the maize,' one older man told us. However, the village has been afflicted by drought for three seasons now, so there have been no harvests for three consecutive years. When the project team visited the village in April, their maize was drying up with the lack of rain, and never recovered.

The basic seasonal calendar for this area is as follows, although there are variations according to type of crop and location:

Oct-Dec	Preparation of shambas
Dec-Jan	Planting (depending on rain)
Jan-Feb	Weeding – two days after planting, weeding done twice
May-June	Harvesting
Jun-Aug	A few people prepare their shambas for maize

Most villages have upland and lowland areas which are cultivated, as well as areas of wetlands where a limited amount of cultivation can be done, e.g. in Ibingu only a quarter of farmers have access to wetlands. Some shifting cultivation is practised in forested areas, particularly for the cultivation of sesame, but many people remain in the same place year after year. However, the populations of these villages are growing and many new shambas are cleared every year. In Kibasigwa the main area for farming is in the lowlands within the village, and people don't go to the forest for cultivation. In Dodoma Isanga the farming system is very different - most of the people in the village hire land from the land holder who owns a large area of land, previously a sisal plantation, which is close to the village. The system of payment for one acre of land is in kind

The main cash crops cultivated are sesame, beans and sunflowers, as follows:

Sesame

In some villages sesame is the preferred cash crop, while in others it is not grown at all. In Dodoma Isanga, and also in Masugu Juu, sesame is becoming the main cash crop in the village and it was estimated by the village government group that over 80% of the people in the village now cultivate it. In Chabima, fewer than a quarter of the people cultivate sesame, in Ibingu, it is cultivated by fewer than a third of farmers – most say that they prefer beans and are more used to it – and in Mfuruni, sesame was attempted but no-one now cultivates it in the village. The selling price was not good, 'and anyway,' explained one man, 'farming sesame isn't in our blood, so that's why we don't cultivate it – it's just beans for us.'

In Masugu Juu farmers explained the calendar for cultivating sesame:

Preparation of shamba	October-January
Planting	February
Weeding	Two weeks after germination
Harvesting	April-May

Various reasons were given for why farmers like cultivating sesame, or decide not to cultivate it. In Dodoma Isanga, farmers say that they like cultivating it because less time is spent on looking after it while it is growing – there are no problems from birds, although sometimes it may be attacked by baboons, and in Masugu Juu farmers agreed with this, saying that their best option was sesame, since it

is rarely eaten by birds. Sunflower is easy to cultivate, but it is attacked by birds (quelea quelea) and so much time has to be spent in scaring birds away as it is ripening.

In Chabima people told us why they don't cultivate sesame:

- A freshly cleared shamba is required (or a shamba which was abandoned over four years ago), and most people in the village don't like clearing new shambas.
- There isn't enough rain
- There are insects which attack sesame.
- One woman told us 'crops these days always need pesticides, and without pesticides you don't harvest anything.' – most people can't afford any inputs.

However another man disagreed, saying, 'people in this village don't understand the importance of cultivating sesame. They are quite happy to spend 2000TSh on local beer instead of buying Karate, which for that price would be enough for a whole acre.'

In Dodoma Isanga and Masugu Juu people cultivate between 1-3 acres of sesame, although there are a few who farm up to 5 acres. In Masugu Juu they farm sesame on the same shamba for about five years, then move on to clear another shamba, or extend the original shamba.

In general, farmers say they can harvest 270-300kg, or 2-3 sacks (one sack weighs around 90kg) from one acre depending on the amount of rainfall that year. However, people said that their yields are generally low and this is for several reasons – partly because there has not been enough rain in recent years, and partly because of disease which afflicts the sesame plants. There is a disease, which they think is a fungus, which causes the leaves to fold near to the flowering period, which affects the growth of the plant and the flowers. In Masugu Juu, farmers explained that there is a type of insect which attacks the crop three days after it has germinated and which means that it has to be planted again. Very few farmers use pesticides or treatment for fungus on their sesame, and so the yields remain low. In addition no-one uses fertiliser. In Chabima, people also complained that they don't have improved seeds, so if they plant late they might only end up with 30kg. With modern seeds, even if they are planted late, a certain amount will be harvested. Another reason given for low yields is that farmers don't thin their crop – sometimes seven seedlings can be found in one hole. Farmers claim that at the time that thinning needs to be done, they have many other agricultural tasks, including weeding other crops.

In most of the villages, traders from Kilosa town come on motorbikes or bicycles to buy sesame. From Kilosa it is taken to Dar es Salaam and sold. In the villages such as Dodoma Isanga and Masugu Juu where much sesame is cultivated, it is sold by the sackful. The price paid is 70,000TSh for a sack of 90kg, but in Kilosa town this is sold on for between 150,000-200,000TSh. Farmers complained about the low prices and said that they have no power to fix the price – it is set by the buyers without any involvement of the farmers – but they understand that they have no alternative, so are forced to sell at that price. In Masugu Juu they told us that the price of sesame fluctuates – early in the season, just after harvesting, the price of a 85-90kg sack may be only 40,000TSh, but this may rise to 120,000TSh later on. In other villages, sesame is sold per litre for 750-800TSh, in 4kg containers for 3500TSh, or 20kg buckets for 15,000-16,000TSh. 'They don't bring lorries because we harvest so little!' explained a woman in Chabima. In Ibingu a group of farmers explained that sometimes traders provide an advance payment of 50,000TSh before the crop is harvested, with the rest payable after harvest. They don't like taking the advance payment but it is often unavoidable, because of urgent needs for cash.

Beans

While sesame is the most important cash crop in some villages, in others it is beans, particularly Mfuruni, Chabima and Ibingu, where everyone cultivates beans. Most families are not able to cultivate more than two acres, although if capital is available to hire labour, it is possible to cultivate up to five acres. Beans are cultivated in upland and lowland areas, and also in the wetlands. In Mfuruni, around a quarter of farmers have access to wetlands, and in Chabima too there are areas of wetlands. With irrigation, farmers can cultivate beans three times a year, if they depend on rain, only twice. In Mfuruni, the calendar for the farming of beans over three seasons is as follows:

	Preparing shambas	**Planting**	**Weeding**	**Harvesting**
1st season	October-November	December	Two weeks after planting	February
2nd season	February	March	Two weeks after planting	June
3rd season (irrigated)	June-July	July-August	Two weeks after planting	October

In Chabima, farmers say that some can harvest three crops, although fungal diseases and insects attack the dry season crop and the leaves turn yellow before the beans are mature. A summary of yields and price is as follows:

1st season December-February low yields because of heavy rains, high price
2nd season April-June high yields, low price
3rd season August-November low yield, high price

In Ibingu, beans are only cultivated twice. The first season begins in March and the beans are harvested in June, and the second time, the beans are planted in August and harvested in November. No fertilisers or pesticides are ever used on beans. Farmers say that they can harvest between 2-4 sacks (120 litres) of beans from one acre.

From Mfuruni, farmers take their beans to sell in the monthly market at Ilonga. The price ranges from 750-1000TSh per litre. The highest price can be commanded by the beans which are cultivated in irrigated areas during the dry season, since they are relatively scarce. In Chabima and Ibingu, traders come to the villages to buy the beans – from Kilosa to Chabima, and from Kilosa, Mpwapwa and Dodoma to Ibingu. Traders usually come by bicycle or motorbike, but sometimes with vehicles when the amount to be transported is sufficient (3-4 tons). Occasionally farmers take their own beans to town, but they say that they mostly let the traders come to the village, since the price is better than trying to sell them in town. One litre generally sells for 600-700TSh, so one sack sells for around 72,000TSh. The proceeds of one acre can therefore be 216,000TSh. Some farmers complained that the traders use litre measures which actually measure 1.25 litres.

In Kibasigwa, beans are also cultivated, although it was estimated that less than a quarter of the people in the village cultivate them. Before the drought, farmers used to cultivate two acres of beans, and would harvest four sacks from one acre. One sack is sold for 90,000TSh and traders come from Kilosa and Mpwapwa on bicycles or with donkeys, and even in the past with small lorries. In Kibasigwa, the shamba is cleared in February, the crop planted in March and the weeding is done in March and April. The beans are harvested in May and June.

Sunflowers

The third most important cash crop in this area is sunflowers. It is cultivated in all villages, to varying degrees, however – in Dodoma Isanga, Mfuruni and Masugu Juu it is well established, and most farmers cultivate 1-2 acres. In Chabima it is a new crop, brought in, in 2009, in Kibasigwa only around a quarter of farmers cultivate it and they say it hasn't really taken hold as a cash crop, and in Ibingu only around ten people in the whole village cultivate sunflowers, because they say there are too many destructive birds (quelea quelea) and too much time has to be devoted to scaring birds when the crop is ripening.

Sunflowers are generally cultivated in the uplands and the lowlands, although in Masugu Juu, farmers told us that more is harvested in the lowlands – people say that the number of seeds in a sunflower is

less in the uplands than in the lowlands, but there isn't enough space in the lowland areas for everyone to cultivate enough sunflowers. Farmers generally mix the sunflowers with maize on the same shamba, although they are aware that this can contribute to low yield - 'from one acre we harvest ten sacks if the sunflowers are planted separately on a shamba, but if they are mixed with maize, we only harvest around three sacks,' said the VEO of Chabima. Another factor contributing to low yield may be the seeds – farmers in Chabima get their seeds from Kipekenya, a subvillage of Dodoma Isanga, and are not sure of their quality, although the VEO assured them that the seeds come from the Agriculture Research Institute at Ilonga. No fertiliser or pesticides are used and farmers don't see that this is necessary – there are no diseases and the only problem is attacks by birds and some rodents.

From one acre planted only with sunflowers, a farmer can harvest 5-7 sacks, each sack weighing between 75-80kg. In Masugu Juu farmers say that the harvest in the uplands is less – 3-4 sacks. From a shamba planted with both sunflowers and maize, 2-3 sacks can be harvested. One sack is 30 four litre containers. A four litre container sells for 800TSh. Therefore, one sack sells for 24,000TSh and from an acre around 120,000TSh can be made.

There are various places where sunflowers can be sold – from Mfuruni they sell in Ilonga at the monthly markets, from Kibasigwa, they sell in Lumuma, or buyers come from Mpwapwa and in the other villages all transactions are done with people from Kilosa. There are two ways of selling sunflowers – either as seeds or as oil after processing it:

- Seeds – a sack of seeds sells for 20000-25000TSh. Buyers come from Kilosa and can sell the sack on in town for 28,500TSh.
- Oil – oil is extracted in Kilosa at the pressing machine. From one sack they can get 24 litres of oil if the seeds are fully ripe, otherwise they will get 17 litres. They can sell the oil in town for 1600TSh per litre (38400TSh per sack) or return to the village with it, where they will get 2000TSh per litre (48000TSh per sack).

The maximum a farmer may get from one acre (7 sacks) is therefore 336,000TSh (selling oil in the village), and the minimum is 140,000TSh (selling seeds for 20,000TSh).

In Masugu Juu people told us that they prefer to press the oil first then sell, rather than selling plain seeds, and they prefer to sell in the village rather than in town where the price isn't so high. But there are other factors:

- If they sell the oil at the machine, just after pressing, they get the money immediately rather than selling the oil in small quantities in the village. It is also less trouble and so many farmers prefer to do this, therefore making 268,800TSh from one acre.
- There is only one machine in Kilosa town. After harvest it is possible to find huge queues of more than 200 sacks waiting to be processed, which may take as long as three days. For this reason, if farmers need money immediately, they may opt to sell it as seeds rather than waiting to process it.

But farmers complain that this price is low. When asked to compare sunflowers and sesame, they say that even though the price of sesame seems low, it is better than the price of sunflowers.

Maize

In all villages, maize is cultivated in the highlands and lowlands by everyone in the village. In Chabima and Masugu Juu it is often planted on newly cleared shambas, for three or four years, until the fertility begins to decline. The maximum area one farmer cultivates is around two acres. From one acre, farmers in Chabima harvest three sacks of maize, while in Masugu Juu they get 6-7 sacks, depending on the rain. People agreed that this is low, but put it down to bad rains, lack of expertise and lack of capital with which to buy fertilisers. If the rains are good, farmers can harvest two or even three crops of maize, but one is more usual. Maize is normally not sold, unless there is a surplus.

In Kibasigwa, when there is rain, farmers cultivate 3-8 acres of maize. A small number of farmers cultivate using oxen or donkeys. In the past they used to harvest 8-10 sacks of maize from one acre, but at the moment they are harvesting nothing due to the drought. Buyers used to come in lorries from

Mpwapwa and Kilosa but nowadays people in the village have to go to Lumuma to buy maize, paying 5000TSh for one bucket. Both men and women cultivate, but it is the man who sells the maize – 'sometimes a man goes to drink beer and they come to the house and take maize in exchange for what he has drunk in the bar,' one woman complained.

3.2.2 Charcoal makers

There are two types of charcoal makers in this area – those who live in the villages and those who come from outside to make charcoal in the village. Each village had its own story, ranging from Kibasigwa where people told us that no-one makes charcoal, to Masugu Juu where everyone knows how to make it, and often does. In Kibasigwa, one woman explained, 'Our men don't make charcoal because they don't know how to,' adding that it is not allowed by the forest officer who is based in Lumuma so there is less incentive to learn how to make it. However, it seems that people in Lumuma make charcoal. In Masugu Juu, everyone is an expert at making charcoal. However, although it is widely made, no-one depends on charcoal for their livelihood, since everyone cultivates crops – instead people see it as a survival strategy when times are hard and they need a quick source of cash. In Chabima, a few people make charcoal and it is certainly not a full time occupation – those who make it do it as an additional extra to their normal farming activities. And in Mfuruni there are only about five people who ever make charcoal, and it is mostly made when times are very hard – a group of men explained, 'people from Mfuruni don't make charcoal because we are too busy with our crops – we don't have time.'

In several villages we heard that outsiders come in to make charcoal – in Masugu Juu a few people come from Kilosa town, but it is a small number in comparison with the locals who are making charcoal, whereas in Mfuruni we were told that most of the people making charcoal in the village come from Ilonga and Kilosa, and for this reason most of the charcoal is made in the area of the village closer to Ilonga for ease of transport. In Ibingu, people come to make charcoal from Lumuma village. A group of men said that no-one was aware that there was anything wrong with making charcoal, and it wouldn't occur to the charcoal makers to ask permission to do something they have always done unhindered. In Chabima, the village government members explained that a few years ago a group of people from Winza-Reling'ombe area came to the forest near Muhuzizi searching for minerals, but when they couldn't find any, they made charcoal instead, from trees felled by someone from the village. They were arrested and had to pay 1000TSh per sack of charcoal to the village government. A story was told in Masugu Juu by the subvillage secretary of a woman from Kilosa town who came to the forest to make charcoal in order to provide herself with the initial capital to start a business in town. She has not come again to make charcoal, but is running her business in Kilosa.

In Masugu Juu we heard that one person can make twenty sacks of charcoal in a month, depending on how committed they are to the task. In Dodoma Isanga they told us that one person can make ten sacks of charcoal in two or three weeks. Charcoal is mostly destined for Kilosa town. In Chabima, so little is produced that it is all absorbed by the village, but the charcoal produced in Masugu Juu and Dodoma Isanga goes to Kilosa. In the rainy season, a sack of charcoal fetches 5000TSh in the village, sold to traders coming in, and 12000-15000TSh in town. In the dry season, or during times of hunger, the price drops to 3000TSh in the village and 8000TSh in town. The reason for the discrepancy is that people are busy with agriculture and have no time for charcoal production during the rains. The demand remains the same, but the supply dwindles. In Dodoma Isanga, the charcoal makers say they don't mind the large profit the traders make, because it often happens that the sacks are confiscated in town by forest officers, and then the trader loses everything. We asked why the charcoal makers don't go to town themselves to sell the charcoal, if the returns are so good. They admitted that they are afraid of the forest officers and are not conversant with the ways of negotiating with the officers to convince them to let them keep the charcoal. Older men in Masugu Juu echoed this, saying that they don't go to town to sell it since they are afraid of being caught by forest officers. They sell in the village to people who come from Kilosa, or to young men who will take it to town.

People insisted that they only make charcoal because they have no alternative source of income – 'if a person has harvested sesame, or pigeon peas, he has no need of making charcoal – it involves such

hard work,' commented one man. It seems that many people share this attitude – that it is much easier to do something else than to make charcoal, and charcoal making is only a last resort.

3.2.3 Timber harvesters

No-one in the villages does it as their main source of income – most do it in the dry season when they are not busy with farming and need some extra income. In Masugu Juu they told us that the driving force behind timber harvesting is hunger. However, people also come to the villages from outside, particularly Kilosa, to harvest timber. In Mfuruni, most of the timber harvesters are from Kilosa and Ilonga - a man explained 'the timber harvesters talk to the ones in the business in Ilonga village and then they come and cut timber in our village.' In Masugu Juu, people come from Kilosa and Magomeni - one person from Kilosa is now harvesting timber (misufi and migude) - and in Dodoma Isanga sawyers come in from Chabima village and Kilosa. People come into Ibingu from Lumuma, a neighbouring village. They are generally from the Hehe tribe, traditionally a tribe which works with timber.

In many of the villages they told us that the timber is mostly destined for Kilosa – e.g. traders come to Dodoma Isanga by bicycle, people from Masugu Juu transport their timber to Kilosa by bicycle. From Mfuruni, the timber is sold to Ilonga. In Chabima, traders come to the village – people told us that they can't take timber to Kilosa because they don't know how to avoid being caught by forest officers – 'If you go to Kilosa with timber,' explained one man, 'you will be played around with until you are caught.' Another group told us that if you go out at night and wait at Mdukwi, on the boundary between Chabima and Dodoma Isanga, it is possible to see ten bicycles transporting 4-8 planks of timber to Kilosa every day.

In Kilosa the price is higher, as much as 6000TSh for a plank.

In Dodoma Isanga, if people in the village need timber for house building or furniture, they buy it from the timber harvesters, for 3000TSh per piece. In Chabima, a 6ft plank is sold for 2000TSh, a 10ft plank for 3000TSh in the village. Roofing timber, usually mnyenye and mhembeti, is sold for 1000TSh for one piece. In Masugu Juu, timber is bought for house construction at 1500-2000TSh per plank. In Kibasigwa, timber is bought from Manyomvi, a subvillage of neighbouring Lunenzi. In Kilosa, a piece of timber is sold for 6000TSh. But in Ibingu, people complained that it is difficult to buy timber nowadays - one man complained that it is almost impossible to get a 10ft piece of timber – all that is available is 6-7ft pieces.

3.2.4 Firewood collectors

In most of the villages, some people collect firewood as a commercial activity. In Masugu Juu and Mfuruni, people from Kilosa come to collect firewood to sell back in town. In Kibasigwa, some women take bundles of firewood to sell in the neighbouring village of Lumuma. A few people from Lumuma also come to collect firewood in Kibasigwa. And in Ibingu, some men collect firewood as a business to sell to women for making beer. Many women also collect firewood specifically for beer making – large amounts are needed to brew beer in barrels. The collection of firewood by outsiders is completely unregulated by the villages.

3.2.5 Mushroom collectors

Women collect mushrooms from the forest mostly for domestic use, and sometimes trips to the forest are arranged for the purpose of mushroom collection. Men will also pick them if they come across them, but would not make a point of collecting them.

Mushrooms are available in November and December, depending on rainfall. In Dodoma Isanga, women explained that the type they look for is ulelema, a fast growing edible species. They avoid kitofu, which has white sap and is poisonous. Not everyone is expert at identifying the right mushrooms to eat, and there was one occasion when a village family almost died through eating poisonous mushrooms – it was during a time of hunger and the whole family fainted. They were saved through being given a local remedy from the forest.

Mushrooms can also be sold. In Dodoma Isanga, women said that they sell them in the village for 500TSh for a small bucketful. In Mfuruni, one fungu (a small pile of about four mushrooms) sells for 200TSh at Ilonga market and a day's selling can bring in up to 8000TSh. In Chabima, it was estimated that about a quarter of the women in the village pick mushrooms and then sell them in the village – they say they can't take them to Kilosa because they rot so quickly. One fungu sells for 100TSh.

Nowadays there are fewer mushrooms than in the past, which women put down to less rainfall, more fires and drought. In addition, it used to take around half an hour to reach places where mushrooms grew, but now it takes much longer, up to six hours, women in Chabima reported - 'places where there were forests aren't forests any more, which is why it is so much more difficult to find mushrooms nowadays,' commented one woman. In Masugu Juu women said that they used to collect mushrooms from their shambas 'but now we can go a whole year without eating a mushroom!' In Dodoma Isanga there is also fierce competition for mushrooms with baboons.

3.2.6 Beekeepers/honey hunters

There are sixteen people in Kibasigwa who keep bees. One man we spoke to has 16 beehives. The hives are made from mikongoro and are sited close to the house. He says that no-one puts their beehives in the forest, since they prefer to keep their hives nearby. He gets ten litres of honey from one beehive – this is less than it should be because of the drought and the consequent lack of flowers. One litre can be sold for 2000TSh in the village. In Mfuruni and Chabima we heard that a few people harvest small amounts of honey from the forest using smoke, for domestic consumption. This is also done in Kibasigwa.

3.2.7 Hunters

There does not seem to be much hunting in this area. In Mfuruni there are around twenty people in the village who hunt wild pigs, using dogs. They consume the meat at home and sell it in the village, charging 3000TSh per fungu (about four pieces of meat). We didn't hear of anyone else selling meat, but some hunting does occur. In Masugu Juu and Dodoma Isanga people said that in the past there were many wild pigs, but they are not many left now due to hunting. Dikdiks are hunted. In Kibasigwa they told us that no-one ate bush meat, but it seems that people were worried that we might be from the game department – later another person said 'it is not possible to live here without eating bush meat,' suggesting that everyone, from time to time, does eat hunted meat.

3.2.8 Grass collectors

Everyone, both men and women, collects grasses for thatching their houses from areas near the villages. However in Ibingu, a few people, women and men, also collect grass as a business. One bundle of grass sells for 500TSh, but when the forests burn, the price goes up to around 800TSh.

3.2.9 Beer brewers

In the villages of Chabima and Ibingu, around 70-80% of the women brew local beer (mkorogo), using maize, sorghum and finger millet. There is a rota – each woman makes one barrel of beer a month and sells it at the beer clubs in the village. Each day three barrels of beer are made and sold, but on Saturdays and Sundays this goes up to five barrels, since most of the village spend most of those days drinking. Brewing beer takes up much firewood – women told us that for one barrel they use four logs, which means four trips to the forest to find the logs, since they are heavy. One barrel brings in 30,000TSh, and out of this they have to pay duty of 5000TSh to the village.

In Ibingu, men collect firewood, but as a business, to sell to women who make local beer. The price of a bundle of firewood ranges from 700-1000TSh. Both women and men say that supplies of firewood are being depleted because of increases in population and also because of the amounts of beer which are made, which use much firewood.

3.2.10 Pot makers

In Chabima, about 6-8 women make clay pots for business, selling each pot for 500TSh. Clay is collected locally. We spoke to one woman who says she can make up to ten pots per day. Buyers come to her house in Ikamba subvillage, or she takes them to the village centre to sell them. She learnt the skill from her mother and she is training her daughters. The money she receives is her own, but she says that she discusses its use with her husband. At the moment they have two children at Masanze secondary school, so most of her earnings go on this, combined with some of her husband's money.

3.2.11 Livestock keepers

There is a variety of livestock keepers in this area, both those in the villages, and those who come in from outside. In Kibasigwa, there are many Wagogo people, who are traditional livestock keepers. More than a quarter of the Wagogo keep cattle, ranging from a herd of ten to 100. Around 20% of them have donkeys, which they hire out to people from Mpwapwa and Mbuga at the time of harvest, for 15000-20000TSh per donkey per month. In Mfuruni, there is no tradition of keeping livestock, but around fifteen people keep pigs as a business. They sell the meat in the village. One man said that since there is a high demand for pork in the village, there is no need to take the meat to Ilonga or Kilosa, although people from Kilosa town or Ilonga occasionally come to buy pigs in the village.

In Chabima, Dodoma Isanga and Masugu Juu, Masai and Barabaig livestock keepers bring their cattle to the forests. They come from Mbamba, Tindiga and Kivungu, all of which are villages in Kilosa district. One herder can have up to 2000 cattle. There have been conflicts between livestock keepers (mostly Masai) and farmers over the perceived damage that cattle do. Some cases have even been taken to court in Kilosa. The DNRO also mentioned that Sukuma people are coming into Kilosa with large herds of cattle.

3.2.12 Village governments and VNRCs

We met many representatives of all the village governments in the study villages. They were able to tell us about their villages, but it was clear that most of them are not well informed about their roles and responsibilities. The village governments of Chabima and Dodoma Isanga appeared to be more competent than those of Mfuruni, Kibasigwa, Ibingu and Masugu Juu. There is a lack of knowledge about natural resources issues, e.g. most members of the village governments don't know what they should do when they see someone making charcoal or harvesting timber (e.g. we observed a saw pit next to the footpath in Mfuruni), and are not aware that there are any steps to take when the person is from outside the village. Even where crops are concerned there is little awareness of the correct procedures, and ways of gaining revenue for the village, e.g. in Ibingu, the VEO told us that they have just received a receipt book so that they can collect the levy from crop buyers, which they have never done before, but the VEO was not sure what percentage of the levy should stay in the village and how much should go to the district council. In addition, although the villages have all been surveyed by the government, many of the village governments didn't know whether they had the land certificate or not, or where it was, and none had done any land use planning. There are no bye-laws about preventing fires.

In two villages we heard that there are VNRCs. In Dodoma Isanga there is an environment committee, consisting of members selected from the village government. The committee was formed at the time of the last local government election in October 2009. This committee provides harvesting licences for the few people who apply to harvest timber in the village. They have some idea of their roles and responsibilities, e.g. they were able to say that they have the authority to take steps against those who cut down protected tree species, such as mninga or mvule. In Ibingu, a VNRC has recently been set up (since the TFCG/MJUMITA project has been launched) and they are enthusiastic to begin to protect their forests, but have little knowledge of what that actually involves. Neither of the VNRCs have had any training and are therefore not likely to be effective institutions.

3.2.13 Agriculture extension service

The people in the villages were fairly unanimous that they are not visited by agricultural extension officers, although they are present at ward level. Many people were prepared to blame their lack of

expertise in farming on the agriculture extension officers. Comments we heard from the villages were as follows:

- In Chabima, they say that there is one agricultural extension officer for the division of 16 villages. He never visits, and if he does, it is when all the crops have already been destroyed.
- In Ibingu, there is ward agricultural extension officer who lives in Lumuma, the ward centre, 10km from Ibingu. However, he doesn't come to the village to give advice to farmers. We heard that he would come only if he were given money to pay for his fuel.
- In Masugu Juu, there is an agricultural extension officer assigned to the ward, but she never comes to the village – 'these agriculture people, they don't even know that Masugu Juu exists!' cried one man. When farmers were complaining that they don't have any expertise, one young man added, 'we have an agricultural extension worker in the ward, but even she doesn't farm using any expertise and this year she didn't harvest a thing, so how is she supposed to help us?'

However, others admitted that perhaps they were not open enough for new ideas:

- In Dodoma Isanga, there is a ward extension officer who only comes to the village rarely. A group of women admitted, 'when he gives us technical advice on how to cultivate our crops better, we don't follow his instructions,' explaining that they only have small shambas and there doesn't seem to be any point in farming them in an expert way.
- In Kibasigwa, they said that there is an agricultural extension officer in Lumuma, but he never visits the village to train them in new practices – 'we don't know him!' cried one woman. Another man said, 'we have got used to farming in our traditional way and so we have not got round to asking him to come.'

One young man who cultivates sesame and sunflowers mentioned the district agriculture department, saying, 'when you go to the district to inform them that there are insects attacking your crops, they just give you instructions – 'spray this and that!' – and don't even come to check what the problem might be.'

The divisional agricultural officer from Kidete division (the division which Kibasigwa and Ibingu are in) who is based in Lumuma village says that he does go to visit farmers when necessary, but he says that the area is very large and it is difficult to get around. But recently two new supporting staff have been employed by the government, and also the district has given them a format to design a schedule for village visits, so he feels that he will have increased possibilities to spend more time in the villages. He has plans to establish demonstration plots in all villages. He says that the main challenge facing farmers is the lack of modern seeds, even though the Agriculture Research Institute of Ilonga is so close by.

3.2.14 Forestry department

The forestry department do not maintain a high profile in this area. People told us that officers never come to the villages, despite there being some ward forest officers. There are two central forest reserves bordering on the project area – Kihirihiri FR which is close to Kilosa town and which is adjacent to Masugu Juu village, and Ukwiva FR which borders Chabima and Nyali villages – but the officers don't come to the villages. The only contact people in the villages have with forest officers is when they are caught bringing forest products to Kilosa town. Several examples were given:

- In Chabima, people told us that they can't take their timber to Kilosa because they don't know how to avoid being caught by forest officers – 'If you go to Kilosa with timber,' explained one man, 'you will be played around with until you are caught.'
- In Masugu Juu, the old men who make charcoal don't go to town to sell it since they are afraid of being caught by forest officers. They sell in the village to people who come from Kilosa, or to young men who will take it to town.
- In Dodoma Isanga, the charcoal makers say they don't mind the large profit the traders make when they sell the charcoal in Kilosa, because it often happens that the sacks are confiscated in town by forest officers, and then the trader loses everything. Charcoal makers don't go to town themselves to sell the charcoal, even though the returns are so good, because they don't know how to prevent the charcoal from being confiscated.

- People in Kibasigwa claim there is no incentive for them to learn how to make charcoal because they are scared of the forest officer based in Lumuma. (but people in Lumuma make charcoal…)

The DNRO says that there has been a range of JFM projects, with support from DANIDA, in Kilosa, but no PFM interventions have taken place in the project villages. DANIDA supported JFM from 2004-8, but left before the process was completed.

3.2.15 Outsiders

Very few outsiders come into these villages. Generally, they are traders on bicycles or motorbikes, occasionally pickups, coming to buy crops at the end of the season, or people coming in to exploit the forests, e.g. harvesting timber, making charcoal or collecting firewood. Most come from Kilosa, some from Ilonga and some from Mpwapwa, to the villages in the west. In the case of crops, some traders give money to young men to collect the crops in a central place and when there is a sufficient quantity, the traders come to collect them. Almost no-one comes from government departments (e.g. agricultural extension worker, forestry officials), nor from any projects or organisations. Some livestock keepers come into the villages in search of pasture for their cattle. A summary of the outsiders coming into the villages is as follows:

Village	**Crops**	**Forests**	**Other**
Dodoma Isanga	Sesame, sunflowers, cassava, maize – traders from Kilosa	Harvest timber – Kilosa and Ilonga Buy charcoal – Kilosa	Look for minerals Pastoralists
Mfuruni	Beans – traders from Kilosa (rarely)	Harvest timber and charcoal – Kilosa and Ilonga Collect firewood – Kilosa	
Chabima	Sesame, beans – Kilosa	Harvest and buy timber – Kilosa	Look for minerals Pastoralists Beer making – from D. Isanga
Masugu Juu	Sesame, sunflowers, chickens – Kilosa	Collect firewood, harvest timber, make charcoal – Kilosa and Magomeni	Pastoralists
Kibasigwa	Maize – Mpwapwa and Kilosa		Hire donkeys – from Mpwapwa and Mbuga
Ibingu	Sesame and beans – Lumuma, Mpwapwa, Kilosa	Harvest timber, make charcoal – Lumuma, Mpwapwa	

3.2.16 Role of stakeholders in causing or avoiding deforestation

In all of the villages we heard many examples of the ways that people in this area are causing deforestation. The main problems are fire and the lack of any strategies at village level for preventing its starting and spread; charcoal and timber production for extra income when times are hard; cultivation in the forests (although it seems that extreme forms of shifting cultivation are not practised) and clear cutting areas of the forest around shambas to prevent attacks from baboons and monkeys, all of which are explored above. However, there are also many instances where we found people, either through their activities or their attitudes, avoiding deforestation.

The most obvious examples of stakeholders avoiding deforestation are in two villages – Mfuruni and Kibasigwa, both of which have forests which, the people claim, are barely touched, for various reasons. In Mfuruni, Iboya forest is an important catchment forest and it is from here that many of the village's many clean and clear streams and springs emerge. People in the village believe that this forest is guarded by Kaguru spirits. It is said that one person, many years ago, tried to clear an area for cultivation in the forest. The next day he saw a hen on the cleared shamba, just where he had stopped

clearing. He instantly fell sick and since that time, no-one has dared to cultivate near or in Iboya forest. Everyone from all tribes fear the spirits and wouldn't dare to bring harm to the forest. In Kibasigwa, there is only one forest, Memengwa forest, which is only around 3km from the village centre. The forest is a catchment for the water they depend on, particularly during the current drought, and for this reason everyone we spoke to emphasised very strongly that they don't disturb the forest in any way. In addition, there is plenty of flat lowland areas suitable for cultivation, and the forest is on steep rocky ground, so there is little incentive to clear shambas in the forest – one man told us, 'we don't bother to cultivate in the forest as we have plenty of areas close to the village'.

In Kibasigwa, there has been a drought for the past three years, and people have hardly harvested anything, but from what they say, they do not appear to be turning to their forest for survival strategies – instead some move to Lunenzi village to cultivate, where the rainfall is adequate, some hire out donkeys to people from other villages at harvest time, in the past small amounts of food aid has been received, and some collect firewood from the bushes and lowland woodland to sell in Lumuma.

In Dodoma Isanga, we heard that when farmers clear a shamba, they cut down all the trees to make charcoal, but timber trees, like mkongo, mvule and mninga are left standing, even if they are very small – village government members explained that this is a sort of unwritten law of the village, and people adhere to it because these trees are their future timber, and in addition, these species have become so rare that it is important to save as many as possible to increase their numbers. We were able to observe these trees standing on abandoned shambas.

There is a strong awareness that the forests are in a poorer condition and that this has a direct bearing on the amount of rainfall they have been receiving recently. Many people are worried that if this trend continues, the amounts of rainfall and water will continue to decrease, and with less water, the forests will start to die, which will further exacerbate the problem. They are very aware of the importance of the forests to their livelihoods – one woman from Dodoma Isanga said, 'the forest is everything for us. It is the savings account of those who were born and brought up here – we don't have many educated people here, we're just farmers and have nothing else to fall back on.' As a result they are generally in favour of forest conservation – people in Dodoma Isanga were able to list of variety of benefits to be gained from protecting their forests – good rains, prevention of soil erosion, good weather, fruit, bees, poles, timber, medicines and the ability to market their carbon. A group of women added the greater availability of mushrooms to this list. In Chabima everyone in the village government group agreed that protecting their forests needed to be done, and one older man added, 'if we are well educated by your organisation, then we will be able to understand more about the importance of protecting the forests, but it does seem to be a good idea, since nowadays it rains so little. I think we should protect the forest, but this is for the benefit of our grandsons and granddaughters, not us – we're too old.' And in Kibasigwa, where there hasn't been sufficient rainfall for three years, people were very positive about forest conservation, urging us to introduce it so that they can receive rain once again and end the drought which is blighting their lives. They insisted that no-one would be adversely affected by protecting the forests, since there is not much disturbance apart from fires. A local beekeeper was very much in favour of protecting the forest because there will be more bees and many flowers.

At the same time, however, there are those who are concerned that too much forest conservation will deprive them of the land they and future generations need for cultivation. In Dodoma Isanga, one woman protested, 'we are very poor and uneducated. Our life depends on agriculture and nothing else.' A group of men in the same area were worried that they were going to lose their shambas, and demanded of us, 'are you going to evict us from this area?'

This is connected with land use planning. The lack of land use planning has had a direct bearing on the amount of deforestation taking place, e.g. clear felling of forests for charcoal. All the villages have land certificates, but no land use planning has yet been done, and people have yet to gain a full understanding of the value of land use planning. There are some indications, however, that people in some of the villages have considered this issue – in Ibingu, the village government group told us that although they haven't done any land use planning, they heard that the president had told people that

they should stop farming in the forests, and this gave them the idea to start thinking about setting aside areas of the village for forests and for farming. In Dodoma Isanga, when we talked about forest conservation, people were wary, since they have no secure tenure over their farmland (most people rent land from a large landowner who owns an old sisal plantation) – they said that they would have to make sure that enough land was set aside for agriculture, for themselves and for future generations. Another man in Dodoma Isanga, however, was enthusiastic about the possibilities inherent in land use planning, saying, 'if we have a land use plan in place, then no-one will be affected apart from those who want to use the forest unsustainably, e.g. today I want to cultivate here, tomorrow there, the day after over there – this will not be possible any more with proper land use planning.'

Through our discussions people began to feel that others coming into the villages from outside were having a negative effect on their forests. In Ibingu, one person complained that although they don't make charcoal in their forests, people come from Lumuma to do so – 'these people from Lumuma are finishing our forests!' he cried. Several people in other villages said that very few people would be affected by forest conservation, only people coming in from outside to harvest timber and make charcoal. In Ibingu one man said, 'they will be affected because we will stop them from depleting our forests, but after all, they are not from this village.' The village chairman of Mfuruni was concerned that if they did start forest conservation, it would be difficult since the forests are so far away from the village centre that it will be difficult to know when outsiders come in to work on the fringes of the village.

3.3 Groups vulnerable to REDD and ways that this might be mitigated

People in the villages admitted that in fact there would not be many people who would be seriously affected by REDD and protection of forests, although the situation differed from village to village. Apart from farmers clearing new shambas, the main people to be affected would be timber harvesters and charcoal makers, and most of these are in Chabima and Masugu Juu villages. Those who perhaps would be more affected would be the people who come in from outside the villages, from Kilosa, Ilonga and Lumuma to harvest timber and make charcoal.

However, in almost every village, we heard that the people in the villages who carry out these activities do it not as their staple source of income, but as an additional extra, or as a survival strategy when times are thin – during the cultivation season, very little charcoal or timber is made, because everyone is busy on their shambas. People say that they have no alternative source of income, and one man commented 'if a person has harvested sesame, or pigeon peas, he has no need of making charcoal – it involves such hard work.' People were adamant that if an alternative were provided, then there would be no need to make charcoal, or harvest timber, since these activities are seen as a last resort and involve too much hard work for not much income.

Farmers do not practise much shifting cultivation, but they do open new shambas when the need arises, often when the fertility has declined on a shamba that has been cultivated for 6-8 years. Also young farmers clear new areas when they are starting out in life.

People collecting firewood often gather it from woodland and bushes close to the settlements, rather than going to the forests so they would not be seriously affected.

Mitigation measures for these various groups could include:

- Carry out land use planning to identify areas for cultivation and areas for protection of the forests
- Introduce new techniques to intensify cultivation and the use of rotation of crops on existing shambas to enhance fertility
- Promote conservation agriculture – bring in ideas from the Lindi area where farmers will be working with the Aga Khan Foundation project
- Link with the Ilonga Agriculture Research Institute to identify cash crops suitable for the area, and to seek a source of improved seeds to increase production
- Establish specific rotated areas for coppicing for poles under managed forests
- Promote houses built from bricks – this seems to be a trend which has already started

- Improved stoves for beer brewers
- Carry out a survey of the abundance of mushrooms and facilitate the institution of some sort of controlled and rotated harvesting of them
- Tree planting for fast growing timber trees as an income generating opportunity for people in the villages

An extremely important factor is the demand for timber and charcoal in Kilosa town, which needs to be addressed, but which may be beyond the remit of the project?

- Improved stoves designed specifically for urban areas
- The introduction of gas stoves

3.4 Women in the landscape

As the project aims to demonstrate a pro-poor approach to REDD, a particular focus should be placed on understanding the more vulnerable and marginalised groups. Women have been identified as being particularly vulnerable to REDD. For this reason groups of women were sought and discussions were held with them.

We spoke to many women in the villages. Some were in the village government groups, some were in groups of women, some we encountered in the subvillages. Village government officials told us that in most of the villages, 40% of members of the government are women. In the mixed groups women were prepared to speak out and explain their ideas, and on a few occasions even challenged things that men said.

Women told us that they cultivate with their husbands generally on the same shambas, and share the work, but they said that very often the men are the ones who sell the crops and then it is not certain that the women will see the cash. Some say that it is shared and discussed, others say that their husbands disappear to town and return with very little money. In most of the villages, not many women have an independent income – it seems that collecting and selling mushrooms or firewood are the only options open to most women. However, in Chabima and Ibingu, we heard that 70-80% of women brew beer as their own businesses. It is hard work, involving much collecting of firewood, as well as the brewing process, but at the end, they earn 30,000TSh. Women cooperate together in the villages by forming a rota to ensure that each woman has a chance to brew beer to supply the beer clubs on a regular basis. In Chabima we also met women who make clay pots for a living and who say that they can sometimes make up to 5000TSh a day. One woman said that she has been able to help her husband to see their children through secondary school with the proceeds from her small business.

We asked women what their particular problems were. The most important problem is lack of rainfall. But they also explained that this is having an effect on water supplies. In Mfuruni village, water is very plentiful, clean and safe, but in other villages, there are generally problems of collecting water and its safety for some of the year:

- In Ibingu, there is only one functioning water pump, which doesn't produce sufficient water, particularly during the dry season. Women in these villages complained that they can go three days

without bathing due to lack of water in the dry season. People from Ngaramilo and Kokoto subvillages draw water from Chogwe river, which is close to the village, but women explained that the water isn't safe as they sometimes get bilharzia and diarrhoea.

- In Kibasigwa, women fetch water from Memengwa hill where there is a natural spring. It is between 3-4km away from different parts of the village, and takes around 1.5 hours to reach. Everyone from the village uses this spring, and so do people from the neighbouring village of Izumbi. Some women have access to donkeys and can therefore use them to carry the water containers, or their menfolk may drive the donkeys for them. The spring begins to dry up during the dry season and water is scarce between August and December. At this time, there are long queues of women waiting to collect water – one woman told us that she can leave the house at 6am and not be back until noon, and most of that time is spent waiting. In the rainy season there are many shallow wells which form and which women use, because the spring at Memengwa is so far away, but the water is unsafe so at this time many people fall sick with diarrhoeal diseases. In the past there was no drought and thus plenty of water. Women have great respect for Mememgwa hill and its forests and were adamant that it should not be touched.
- In Masugu Juu, the government built a water pump in the village in 1996. But many people, particularly older people who are not so mobile, use temporary shallow wells closer to their houses. However, people complain that there are frogs and germs in the shallow wells. They say that the water from the pump is clean, although analysis showed that there were also some germs present there during the dry season in 2009. The people we spoke to insisted that no-one got sick as a result of drinking this water, but another group said that around 80% of the village have had typhoid in recent years.
- In Chabima, there is no piped water in the village and all water comes from rivers. These rivers never entirely dry up, although the amount of water flowing may decrease during the dry season. One woman felt that rivers are drying up more these days because there is less rain nowadays, while another claimed that it is God who has decided that rivers should be dry for the moment. Most people commented that the water is not safe, because people wash in the rivers upstream. They pointed out that during the dry season, when there is less water, there is a greater prevalence of abdominal diseases, but at the same time, when the rain starts there is generally a spate of abdominal diseases, since the water suddenly becomes dirty.
- In Dodoma Isanga, water is available from three drilled wells in Kipekenya subvillage and from shallow wells and rivers in other subvillages. Water is freely available in the shallow wells and rivers during the rains, from February to August, although the water is dirty, since there is much sediment and other materials carried by the rivers. But once the rains have finished, the water begins to dry up. Between September and December water is scarce, and women often have to wait for hours in queues to fill their buckets. A group of women told us that they can sometimes wait up to five hours for water, and this protracted absence from home can cause family problems, including conflicts with their husbands.

Women also talked about issues of health and the problems they have in accessing good health care. There are no dispensaries in any of the villages, although they are building one in Dodoma Isanga. In most of the villages there is some sort of decision making involved in where to go for sickness:

- In Dodoma Isanga, people go to Kilosa district hospital or Zombo dispensary, both of which are over 20km away.
- In Mfuruni, people prefer the dispensary in Msimba because the service is better than in Ilonga
- In Chabima, sick people go to the dispensary in Magomeni, or if the case is serious, to hospital in Kilosa
- In Masugu Juu, people go to Kilosa district hospital, but they claim that if you don't have money, the service is very poor.
- In Ibingu, people go to the dispensary in Lumuma village, but if the problem is serious, they go to Kilosa.
- In Kibasigwa, people go to the dispensary in Lumuma – it is a government dispensary and the service is good, although there are not many medical staff.

Women explained that the only means of transport to reach any medical centre is on foot, by bicycle or motorbike, or for serious cases, on a wooden stretcher carried by a group of men.

In some villages there are health assistants – in Dodoma Isanga, the health assistant is consulted for minor conditions such as worms, coughs, headaches, etc. and can provide a limited range of drugs, e.g. treatments for worms and fever. She weighs children for the MCH clinic, and generally provides a link between the district health staff and the people in the village. In Chabima there is also a health assistant, who weighs children, and who also visits people with HIV and advises them on their medication and can also provide counselling – she received training in this in Mikumi town. There are also traditional midwives in the village – most women deliver babies at home, since it is so far to travel to a hospital. In Masugu Juu we heard that some people use medicinal plants to cure themselves, e.g. they use mkundekunde to treat diarrhoea.

The main illness which afflicts people in all the villages is malaria. Women also talked about water borne diseases, including abdominal problems and typhoid which affect many people during the rainy season, as a result of drinking water from unsafe sources, and bilharzia and worms which occur during the dry season when water is scarce. Other problems mentioned were skin, ear and eye problems, pneumonia and other chest problems, STDs, hernias and bad teeth in children.

Other problems which women mentioned was the way that forests are getting more distant as they become degraded and are cleared for agriculture and charcoal. They say that this particularly affects them because of collecting firewood and looking for mushrooms, both of which now take longer to find than in the past.

Women said that they would not be adversely affected by forest conservation – on the contrary, in general, they were in favour of it, with the reservation that there should be sufficient area remaining for agriculture. Their main concern was the recent lack of rainfall which they put down to the decrease in forest area. In Chabima, a woman said, 'our resources will then be available forever for future generations.' Others said that if the forests are protected, they will be able to harvest mushrooms more easily and rainfall will be more reliable. Another woman in Mfuruni said 'it's a good idea, so that we can protect our forest, since no-one is looking after them for the moment. It will also mean that we will continue to get rain.'

When asked about the quality of their lives, many women admitted that things are getting more difficult than in previous years. This is mostly because of unpredictable and insufficient rains, meaning that they are not able to harvest enough food and cash crops. They also felt that they lack farming expertise, and perhaps that if they received some support for their agriculture, this could help to offset the problems with the rain, and thus improve their livelihoods, rather than having to go to the forests and make charcoal. Some said that sesame was a good crop which had already begun to bring in good returns.

4. Conclusion and recommendations

This area is characterised by small settlements in large village areas set amongst hills and forests. Many of the forests are inaccessible because of the steep and high terrain, and some of the forests are far from inhabited areas and so are less exploited. People are aware of the value of their forests, are concerned that they are being degraded and understand the link between forest degradation and decreasing rainfall. Despite this, they do exploit their forests for charcoal and timber, and there is some cultivation in the forests, although it cannot really be called shifting cultivation.

People are concerned about the state of their forests, but there is no-one to advise them on what to do – no-one from the forestry department comes, there are no forest reserves, and no PFM has been initiated. Village governments are unaware of laws, of what is permitted in their forests, of the system of licences and of the levies they should charge those harvesting timber in particular. Although fire is mentioned as a huge problem in all villages, ravaging the forests on an annual basis, there are no strategies for its prevention and control and no systematic penalties for those who cause fires.

There is a variety of stakeholders in the area, most of whom are local, and most of whom engage in agriculture. Outsiders come in to buy crops, but there is a significant and probably increasing number who come from Kilosa to harvest timber and make charcoal for the urban market. People from the villages also supply this market. Even if people in the villages are willing to protect their forests, it is hard to see how the Kilosa stakeholders will agree to stop doing what they have been doing unhindered for many years.

People say that poverty is more widespread in this area than in the past, partly because of the decrease in rainfall and partly because of the closure of plantations and factories, which has forced people to depend on agriculture for a living. They use this as a justification for having to go to the forests to make charcoal, although they emphasise that no-one would do it if they didn't have to, because it is such hard work. They would welcome an alternative to charcoal making. But poverty is relative, and in fact it seems that apart from the village of Kibasigwa which has been seriously hit by drought three years running, food shortages don't occur, since people cultivate such a range of crops – there is usually something to fall back on. They are able to live reasonable lives, but problems occur when there is a major expense, particularly school fees in the new local secondary schools, and people say that if they had other activities apart from agriculture, they would be able to surmount these problems more easily. Apart from a few enterprising women who make pots, there are very few other opportunities to diversify activities in these villages.

Recommendations

Some recommendations are included in the mitigation measures suggested under section 3.3.

More research could be done on:

- Alternative cash crops for the area
- Possible markets for other crops which are grown but not sold as cash crops
- Any other forest areas of cultural significance, e.g. sacred sites which could be the basis for a forest reserve.
- Suitable fast growing timber trees to supply the Kilosa market
- How and where mushrooms grow, and any way of processing and marketing them as a business opportunity for women

Awareness raising – to complement what people already know and feel.

Introduce strategies to prevent and control fires

Training for village governments and VNRCs on roles and responsibilities, governance , laws and law enforcement

Land use planning to identify areas for cultivation and areas for protection of the forests
During the land use planning process it is important to identify the livestock keepers who bring their cattle into the village on a seasonal basis – if they are not included and decisions are made without them, conflicts are likely to erupt.
PFM – identify forests to start up PFM. Ensure that people understand the implications of PFM – in other parts of the country, villages have set aside very small areas of forest since they weren't quite sure what PFM would entail in the future. Study tours could be conducted to places where people are more confident about PFM.
Promote conservation agriculture – bring in ideas from the Lindi area where farmers will be working with the Aga Khan Foundation project

Links should be forged with the Agriculture department and the Ilonga Agriculture Research Institute to explore ways of working with them over e.g. the introduction of new cash crops and new technology, e.g. improved seeds.

Improved stoves – for beer brewing and also for an urban setting (Kilosa) – together with awareness raising. Or gas stoves for Kilosa town?

Alternative income generating activities, for people to make extra money e.g. during the dry season when many people turn to charcoal making and timber harvesting. In Kibasigwa there is already a tradition of beekeeping – build on this and on any other activity which may be pursued elsewhere.
This could also be directed at the small number of people (around 15) from Kilosa and Magomeni who harvest timber as their main livelihood activity in the forests of Chabima and Dodoma Isanga.

Annex I. Village profiles

DODOMA ISANGA VILLAGE PROFILE

Background

Dodoma Isanga is a traditional village southwest of Kilosa town, with a population of 1308 (708 males/605 females) and 422 households. There are three official subvillages (Kipekenya, with a population of 556 (291m/265f) and 159 households, Isanga – population 413 (284m/189f), 174 households – and Dodoma Kati – population 279 (128m/151f), 89 households) and two areas which are likely to become subvillages – Upangwani, which has a subvillage chairperson and Masugu, which doesn't yet.

The original inhabitants of the village were Wasagara (also known as Wakwiva) but as a result of a large influx of people around the time of villagisation (1970-80s) who came to work on the sisal and sugar plantations and who later settled in the village, there are now about ten different tribes represented in the village (Wapogoro, Wangoni, Wayao, Wapangwa, Waha, Wakwele, Wasukuma, Wafipa, Wangindo and Wamakua). The Wasagara now only make up around 25% of the population, while the Wagogo have become the dominant tribe at around 60%. Each tribe still uses their own language, but communicate with each other in Swahili. More than 80% of the people in the village are Christians and the rest are mostly Muslims.

There are three drilled wells in Kipekenya subvillage, and in other subvillages there are shallow wells and rivers. There is no dispensary, although the people in the village have begun to construct one. The main party in the village is CCM. Other parties (CHADEMA and CUF) exist but have no role in leadership.

The village has been surveyed and they have received a land certificate. However, no land use plan has yet been drawn up.

Forests

The area of forest is in the southwest part of the village and extends as far as Chabima and Nyali. There are two forests, Mvuashati and Bogoyi, which adjoin Ukwiva forest reserve. The main threats to the forest include cultivation within the forest areas, fires, charcoal production and in some areas clear felling patches of forest to discourage the presence of baboons and monkeys. This is done particularly where they come to drink water – it is believed that if there are no trees, the monkeys won't come to drink, and if they don't come, they will also stay away from the shambas.

Most people felt that the condition of their forests is poorer than in the past, due mostly to population increase. They explained that because of the forest degradation, they now get less rain than in the past. One person in the village however said that areas of forest previously cultivated and then abandoned recover after seven years, so in fact the forests are in better condition. We visited an area which was regenerating after several years, and there were bushes, but certainly no large trees. In one aspect, however, the forest can be said to be recovering – in the 1980s, a sugar producer used to come into the forest with a lorry to cut wood to process his sugar. He has not been for many years, and the tracks he used to use are now disappearing.

<u>Forest conservation</u>

When we asked people about forest conservation, they were able to list a variety of benefits to be gained from protecting their forests – good rains, prevention of soil erosion, good weather, fruit, bees, poles, timber, medicines and the ability to market their carbon. A group of women added the greater availability of mushrooms to this list. However, when asked whether they wanted to undertake forest

conservation in their village, the reaction was mixed. The village government group said that it was a good idea in theory, but that in their village there is a particular problem – at the moment, most farmers rent land from an Arab landlord who owns a large estate on which sisal used to be grown. There is plenty of land for people to cultivate and plenty of forest which could be protected. But if the landlord were to sell the land to someone who wanted to cultivate it themselves, then the people would be forced to clear their forest land for cultivation. But if they had set it aside and it became legally protected, they would be in serious difficulties. One man explained, 'If we want to protect the forest, we must make sure we first set aside an area for cultivation sufficient for ourselves and future generations, because we are giving birth and our families are expanding.'

Women living in the Bogoyi area of the village, which is within the forest, agreed that to protect the forest is good and necessary, but they echoed the sentiments of those in the village government group – that they must ensure that there is enough land on which to cultivate first - 'we are very poor and uneducated. Our life depends on agriculture and nothing else,' protested one woman. A group of men in the same area were worried that they were going to lose their shambas, and demanded of us, 'are you going to evict us from this area?'

Another disadvantage of forest conservation was mentioned – people were worried that the population of baboons and monkeys would increase if the forests were protected. 'More baboons and monkeys will attack our shambas if we establish habitats for them in our forests,' said a member of the village government.

Those who would be negatively affected by protecting the forest would be charcoal burners and timber sawyers. However, there are very few of these in the village. One man said, 'if we have a land use plan in place, then no-one will be affected apart from those who want to use the forest unsustainably, e.g. today I want to cultivate here, tomorrow there, the day after over there – this is just not possible any more.' Others were more hesitant, saying 'the forest is everything for us. It is the savings account of those who were born and brought up here – we don't have many educated people here, we're just farmers and have nothing else to fall back on.'

<u>Fire</u>

Fire occurs every year in the forests. A variety of causes of these fires were given:

- They are started by hunters to flush out animals
- Some farmers may cause them inadvertently while clearing and burning their shambas
- Livestock keepers (mostly Masai and Barabaig) burn the forests to stimulate the growth of new grass for their livestock
- Honey hunters light fires to smoke out bees
- Timber sawyers start fires so that they can see the trees more easily
- Women said that sometimes they burn off upupu (a vine with pods which cause a violently itchy rash if touched) and the fire might accidentally spread to the forest.

One group which insisted that it is not involved in causing forest fires was charcoal makers. They require grass to thatch their kilns, so the destruction of the grasses in the forests affects their work – 'if the forest burns after I have arranged the logs for charcoal making, I have to wait until the following season when the grass has grown sufficiently to thatch the kiln,' explained one charcoal burner. He added that they always clear the area around their kilns before they light them, for this very reason.

Drought was also mentioned as an exacerbating factor in the spread of fires – there are more droughts nowadays and the temperatures are hotter, which means that the grasses in the forests are drier and so fires will burn more easily.

We asked whether there are any strategies in place for preventing fires. The village government group told us that it is not possible to put fires out once they have started because they burn so fiercely, but that they can enact bye-laws to attempt to prevent them, and to deal with the consequences. They said

that in the 1990s they did catch one person who had started a fire, and he was jailed for several months. But they also explained that it is difficult to identify who has started the fire, since by the time it has spread and thus been noticed, the person who caused it is likely to be far away.

Forest products

Forests products include, firewood, charcoal, timber, cultivation, mushroom, fruits, medicines, poles for buildings, thatching grasses, meat, honey and sources of water

Firewood

There are two main sources of firewood in the village – some women collect their firewood from their shambas, while others go to the forest, depending on which in nearer, e.g. women in Isanga subvillage collect from their shambas, while those who live in areas closer to the forests e.g Kipekenya, Masugu, Upangwani and Bogoyi, go to the forest. Women in the centre of the village say that in the past it took them half an hour to collect enough firewood for their needs, but nowadays they have to go further and it may take up to three hours. They explain that when they don't have time to go to the shamba or the forest, they use maize cobs instead of firewood. Women in Bogoyi, however, which is situated inside the forest, say that there is no scarcity of firewood for them, and they collect as they need it from very close by. Most women said that they go to seek firewood once a week, although this depends on family size and they type of food they are cooking – the cooking of beans requires more firewood than for fish.

The main tree species favoured for firewood include misada, mibiobio, mitukutu, mifungiri, milwati, misengese. Women collect dry wood, often left over from charcoal burners. There is no commercial sale of firewood in this village.

Poles

Poles are harvested from Mvuashati and Bogoyi forests and are almost entirely for domestic use – it is estimated that an average family house requires around 500 poles to build. A house lasts for around 5-6 years and then has to be rebuilt. The species favoured for poles include bamboo, mpingo, muhungu, mkambaa, muwangaa, mlunduha and misolo. Some bamboo may be sold within the village, for 200TSh per pole. There are a few men who occasionally engage in this business. Generally men harvest the poles and women and children then help to carry them home. In the past it took 1-2 hours to collect a load of poles, but now it takes five hours, since the forests have become more distant due to high demand for poles and an increase in population. It may take around a month to collect enough poles to build a house, although this depends on family size and the willingness to make an effort.

Timber

In the past there were many timber trees in the forests, including mninga, mvule and mkongo. Nowadays these species have disappeared through overharvesting, and the only species now used for timber is mtondoo. A small number of men, and one woman, engage in timber harvesting in the village, and some come from Chabima village and from Kilosa town. These people mainly farm, but when they need extra income they will turn to timber harvesting. If people in the village need timber for house building or furniture, they will buy it from the timber harvesters, for 3000TSh per piece.

There are legal procedures to follow for those who wish to harvest timber in the village. A letter of request must be sent to the village government, who then discuss the request and will grant permission to harvest, or not. The village environment committee oversee all harvesting activities. The village has set a system of payment for the timber – for every 100 pieces of timber harvested, the sawyer leaves twenty pieces in the village. The village government then decides what to do with the timber – whether to sell it, or to give it to the school, village office, etc. Timber buyers may come to the village by bicycle from Kilosa town. However, in reality, most of the timber sawyers operate illegally (wadokozi) and there are very few requests to the village government for permission to harvest timber, since there are so few good trees left.

Charcoal

Charcoal is mostly made when shambas are cleared for cultivation – the felled trees are made into charcoal. However, there are those who make charcoal for a living, or at least boost their income when necessary with charcoal making. It is mostly men who make charcoal, but often women will assist their husbands. And women will come and collect the small branches left over after the charcoal has been made, for firewood. Not everyone in the village knows how to make charcoal. Charcoal can also be for domestic use, although most people use firewood.

The best species for making charcoal are miombo, msani, mtondoo, mrama, although msani is the best of all. Charcoal can be made anywhere in the forest where these species are found but in recent years the trees needed for charcoal production have become increasingly distant, so that nowadays it is necessary to walk three hours to even begin to make charcoal. One person can make ten sacks of charcoal in two or three weeks. This charcoal is sold to traders from Kilosa who come to the village by bicycle to buy it. One sack is sold for 5000TSh in the village, although the price may drop to 3000TSh in times of hunger, and is sold on in Kilosa town for 12000-15000TSh. The charcoal makers say they don't mind the large profit the traders make, because it often happens that the sacks are confiscated in town by forest officers, and then the trader loses everything. We asked why the charcoal makers don't go to town themselves to sell the charcoal, if the returns are so good. They admitted that they are afraid of the forest officers and are not conversant with the ways of negotiating with the officers to convince them to let them keep the charcoal.

In the 1970s-1980s, when the sisal and sugar plantations and industries were in operation, there was employment and people were not forced to make charcoal to survive. The forests were much denser than they are today as a result. People told us that they only make charcoal because they have no alternative source of income – 'if a person has harvested sesame, or pigeon peas, he has no need of making charcoal – it involves such hard work,' commented one man.

Mushrooms

Women collect mushrooms from the forest for domestic use, although they sometimes sell them to each other in the village, at 500TSh for a small bucketful. Men will also pick them if they come across them, but would not make a point of collecting them. Women explained that the type they look for is ulelema, a fast growing edible species. They avoid kitofu, which has white sap and is poisonous. Not everyone is expert at identifying the right mushrooms to eat, and there was one occasion when a village family almost died through eating poisonous mushrooms – it was during a time of hunger and the whole family fainted. They were saved through being given a local remedy from the forest.

Nowadays there are fewer mushrooms than in the past, which women put down to less rainfall. In addition, it used to take around half an hour to reach places where mushrooms grew, but now it takes up to three hours. There is also fierce competition for them with baboons who also eat them.

Wild animals

Baboons, monkeys and a few bushpigs live in the forests around the village. Baboons and monkeys come to the village when crops are ripening – baboons particularly like sunflowers, although they generally don't attack sesame shambas. There are not as many bushpigs as there were in the past, since they have been extensively hunted for food by people in the village. In the past there were lions, but the last time one was seen near the village was in 1975.

Agriculture

Most people cultivate in areas within the village, both in the uplands and lowland areas. There are few valley areas for wetland cultivation. Most of the people in the village hire land from the land holder who

owns a large area of land, previously a sisal plantation, which is close to the village. The system of payment for one acre of land is in kind:

- 1 sack of maize (110kg)
- 1 bucket (18-20kg) of sesame
- 1 sack of sunflower seeds (75-80kg)

People in the village government group estimated that only around 10% of farmers cultivate in the forests, mostly in Bogoyi forest, very few in Mvuashati. Farmers clear an area of forest and generally cultivate it for about five years – at this point the fertility has decreased and farmers move on and clear another shamba. When a shamba has begun to be less productive, farmers often plant cassava which can tolerate less fertile soils. People told us that if a shamba has been abandoned, it will take around 7-8 years to recover, but it will not be as dense as it was previously. However, we saw an area which had been left for about seven years, and there were only bushes and small trees growing on it, and certainly no large trees. When farmers clear a shamba, they cut down all the trees, most of which are collected and used to make charcoal. Timber trees, however, like mkongo, mvule and mninga are left standing, even if they are very small – village government members explained that this is a sort of unwritten law of the village, and people adhere to it because these trees are their future timber, and in addition, these species have become so rare that it is important to save as many as possible to increase their numbers. We were able to observe these trees standing on abandoned shambas.

The main food crops are maize, rice, sorghum, beans, pigeon peas, cassava, cowpeas and mung beans (choroko). The main cash crops are sesame and sunflower and sometimes cassava and maize are sold if there is a surplus. There are also orange and tangerine trees and coconut palms.

Sesame

Sesame is becoming the main cash crop in the village and it was estimated by the village government group that over 80% of the people in the village now cultivate it. They say that they like cultivating sesame because less time is spent on looking after it while it is growing – there are no problems from birds, although sometimes it may be attacked by baboons. Most people cultivate between 1-2 acres, although there are a few who farm up to five acres of sesame. From one acre between 270-300kgs can be harvested depending on the amount of rainfall that year. However, people said that their yields are generally low and this is for several reasons – partly because there has not been enough rain in recent years, and partly because of disease which afflicts the sesame plants. There is a disease, which they think is a fungus, which causes the leaves to fold near to the flowering period, which affects the growth of the plant and the flowers. Very few farmers use pesticides or treatment for fungus on their sesame, and so the yields remain low. In addition no-one uses fertiliser. There is a ward extension officer who only comes to the village rarely. A group of women admitted, 'when he gives us technical advice on how to cultivate our crops better, we don't follow his instructions,' explaining that they only have small fragmented shambas and there doesn't seem to be any point in farming them in an expert way.

Traders from Kilosa town come to the village to buy sesame. From Kilosa it is taken to Dar es Salaam and sold. The price paid for sesame is 70,000TSh for a sack of 90kg, but in Kilosa town this is sold on for between 150,000-200,000TSh. Farmers complained about the low prices and said that they have no power to fix the price – it is set by the buyers without any involvement of the farmers – but they understand that they have no alternative, so are forced to sell at that price.

Sunflowers

Farmers often cultivate up to 2 acres of sunflowers. They generally mix the sunflowers with maize on the same shamba. They are able to harvest around seven sacks of sunflower seeds, each sack weighing between 75-80kg. They say that if they cultivated sunflowers separately from maize, they would harvest twice the amount from one acre. No fertiliser or pesticides are used and farmers don't see that this is necessary – there are no diseases and the only problem is attacks by birds and some rodents.

Traders come from Kilosa town by bicycle to buy sunflowers, paying 20,000TSh per sack. This is then sold on in town for 28,500TSh. But farmers complain that this price is low. When asked to compare sunflowers and sesame, they say that even though the price of sesame seems low, it is better than the price of sunflowers.

Livestock
A few people in the village keep hens, pigs, goats and ducks. It was estimated that there is no-one with more than twenty hens. People keeping hens say that they have problems with poultry diseases.

Outsiders who come to the village
Traders come from Kilosa town on bicycles to buy sesame, sunflowers, cassava and maize. In addition, people come from Kilosa and Chabima to harvest timber, and from Kilosa to buy charcoal.

Projects/NGOs in the area
There are no projects or NGOs in the village apart from the TFCG/MJUMITA REDD project.

Groups
There is a women's group, consisting of a few women from Kipekenya and Isanga subvillages which started in 2009. They rear chickens but are still only at the initial stages. The village government group told us that they are planning to form a group to rear dairy goats. The idea came from the livestock department of the district council. There is also a VICOBA in the village, although it doesn't appear to be active. There are male and female members, but no-one was clear how many there are.

VNRC
There is an environment committee, consisting of members selected from the village government, but mostly an old man who is very active. The committee was formed at the time of the last local government election in October 2009. This committee provides harvesting licences for the few people who apply to harvest timber in the village. The committee has some idea of its roles and responsibilities, e.g. they were able to say that they have the authority to take steps against those who cut down protected tree species, such as mninga or mvule.

Services
Water
Water is available from three drilled wells sited in Kipekenya subvillage and from shallow wells and rivers in other subvillages. Water is freely available in the shallow wells and rivers during the rains, from February to August, although the water is dirty, since there is much sediment and other materials carried by the rivers. But once the rains have finished, the water begins to dry up. Between September and December water is scarce, and women often have to wait for hours in queues to fill their buckets. A group of women told us that they can sometimes wait up to five hours for water, and this protracted absence from home can cause family problems, including conflicts with their husbands.

Health services
There is no dispensary in the village, although the people have started to build one themselves. They have so far built the foundation. In the meantime, there is a health assistant present, who is consulted for minor conditions such as worms, coughs, headaches, etc. and who can provide a limited range of drugs, e.g. treatments for worms and fever. She weighs children for the MCH clinic, and generally provides a link between the district health staff and the people in the village.

The most prevalent complaints in the village are malaria, followed by pneumonia, skin and eye problems, bilharzia, coughs, worms and STDs such as gonorrhoea, syphilis and HIV. The nearest health centres are Kilosa district hospital and Zombo dispensary, both of which are over 20km away.

Livelihoods

People felt that their lives were worse than in the past. In the past there were commercial plantations and factories (sisal and sugar) near to the villages and so people were able to work and gain a steady income. Now these have closed and there is no source of employment. They all now have to depend on agriculture, which is unpredictable because of the poor rains. Poverty is more widespread, and for this reason many people now make charcoal – this never happened in the past. However, the village government group did say that at least with sesame as a cash crop, nowadays it is possible to make a reasonable living, although they feel it could be much better.

MFURUNI VILLAGE PROFILE

Background

Mfuruni is a traditional village northwest of Kilosa town, with a population of 725, divided between 153 households. There are three subvillages - Malungu A, Malungu B and Iselo. The terrain of the village land is hilly and most of the houses are built on the hills. The main tribe traditionally present in the village is the Wakaguru, but there are also members of other tribes present – Wasagara, Wanyamwezi, Wahehe and Wayao. Everyone in the village is Roman Catholic. Political leadership is from CCM.

The village has been surveyed, but there is a boundary conflict with Ilonga village. There is no piped water in the village, but there are plenty of natural springs from which water flows year round. There are also two rivers close to the village. There is no dispensary in the village, so people either go to Msimba or Ilonga dispensary, in neighbouring villages. There is a school with 212 pupils but only two classrooms. There is no VNRC. The road to the village is impassable by vehicles.

Forests

The village is surrounded by hills which are covered in forests. The names of the forests are Iselo, Lukulu, Iboya and Matuli. Iboya, which is the only forest close to the village, received its name because there is a beacon (boya), placed there in colonial times (although no-one is sure what date it was put up). It is recognised as an important water catchment, and it is from here that many of the village's springs and streams emerge. We went to Vianzi spring, where people from the Vianzi area of the village draw their water and the water was clear and clean. People in the village believe that this forest is guarded by Kaguru spirits. It is said that one person, many years ago, tried to clear an area for cultivation from the forest. The next day he saw a hen on the cleared shamba, just where he had stopped clearing. He instantly fell sick and since that time, no-one has dared to cultivate near or in Iboya forest – everyone from all tribes fear the spirit and wouldn't dare to bring harm to the forest. In addition, fires never burn in the forest, since it is evergreen, and therefore fires stop when they reach it.

People from all groups told us that the condition of the forests is not as good as it was in the past. This is mainly because of shifting cultivation, fires and charcoal burning. When we asked what they thought about forest conservation, the reaction was mixed – one woman said 'it is a good idea, so that we can protect our forest, since no-one is looking after them for the moment. It will also mean that we will continue to get rain.' But the village chairman was cautious, saying that it was important to set aside a large enough area for cultivation before any forest conservation was done. He is also worried that if they do start to protect their forests, it will be difficult for them, since the forests are far away from the village centre and it will be hard to detect any illegal activities being carried on there.

<u>Fire</u>

Every year, forests are burnt. The fires are started for a variety of reasons:

- Hunters may start fires in order to flush out wild pigs and ndezi
- Timber harvesters start fires so that they can more easily locate timber trees. They also like to remove upupu, a species of climber which causes itchy skin rashes
- Charcoal burners sometimes start fires by accident
- Honey hunters use fire to smoke out bees and it may spread if not extinguished

- Some young people light fires deliberately – they make fire traps out of old cloth and matches which explode when they have run away. The fire then may spread.

There are no real strategies for preventing fires in place in Mfuruni. The village government group told us that it is impossible to put out fires once they have started because strong winds fan them and they spread so quickly. A few years ago a house was burnt down by a fire which originated in the forest. They claimed that many fires come from Ilonga and Chanzulu villages and are not started in Mfuruni, although other sources suggested that there are factors originating in this village which cause fires to start. However, if village officials see anyone starting a fire, they can arrest them, adding that in 2005 three people from the village were caught and fined 5000TSh each. The village government members said that to stop fire effectively it would be necessary to start in Ilonga or even Kilosa town, since this is where most fires originate from. They also felt that if bye-laws were enacted to prevent fire, people would see this as motivation to start more fires.

Shifting cultivation is not practised as much as it was in the past. Most people now cultivate on the same area, although some may move into the forests in search of areas with moisture for dry season cultivation.

Those who might be affected by forest conservation include charcoal burners and a few timber harvesters, as well as the few farmers who still practise shifting cultivation.

Forest products

The following forest products are collected in the forests: firewood, timber, ropes, medicines, charcoal, fruit, mushrooms, poles, thatching grasses and honey. The forests are also water catchments for Kilosa town.

Firewood

Firewood is collected in the nearby forests and also from shambas. It is wholly used for domestic purposes. Women collect the firewood for cooking, while it is men's responsibility to gather firewood for burning bricks. We heard that a few people come from Kilosa town to collect firewood from forests on the edge of the village.

People told us that in the past it took 30 minutes to gather a headload of firewood, but nowadays it takes two hours. The frequency of trips for firewood depends on family size and the type of food they cook. One woman explained that she goes to the forest once every three days.

Poles

Poles are cut wherever suitable trees grow – close to home in wooded areas, and from the forests. The preferred species for poles are mihamvi, mimanga, dumilangumbi, mikole, mikunju, mrama, mwisa, mguhu (for some species they split wider trunks into lengths to use as poles). There are no laws about poles – anyone can collect them from anywhere, since there is no commercial use of poles.

Men cut the poles while women and children help to carry them home to the village An average family house with two rooms and a sitting room can take up to 600 poles to build. It may take up to a month to cut and collect the poles, depending on the capacity of the family. In the past, it took much less time to find poles, but nowadays they are more distant – it used to take half an hour, but now it can take as much as four hours. A family will usually build a new house about once every 5-6 years. In the past it was less – 'we used to shift around all the time, but nowadays we stay put, because we've been educated about this,' explained an older man.

Timber

Timber is harvested from the forests around the village, but there are fewer than 25 people who carry it out, most of whom come from Ilonga and Kilosa town – a man explained 'the timber harvesters talk to the ones in the business in Ilonga village and then they come and cut timber in our village.' There is no system in the village for charging duty for timber extracted. All timber is harvested illegally, and it is sold

in Ilonga, in the vicinity of Kobe forest. While driving through the village we saw a pit beside the road, which indicates that no-one is afraid of being arrested for illegal pit sawing. And they used mninga as a supporting pole while they were cutting the planks, in order to disguise it.

The best species for timber include mninga, mvule, msungwi (also called mpilipili), mninga maji, mpululu (mkulingo), mwembeti, msolo and mtoloti, abundant in riverine forests. However, nowadays there is much less mninga and mvule than there was in the past.

Charcoal
In Mfuruni there are only about five charcoal makers, since most of the people who make charcoal are from Ilonga and Kilosa, and for this reason most charcoal is made close to Ilonga for ease of transport. Both men and women make charcoal, but it is the men who sell it. It is mostly made when times are very hard – a group of men explained 'people from Mfuruni don't make charcoal because we are too busy with our crops – we don't have time.'

Rope
Most rope species are climbers and include matolwe, vikoko, mlwati, msani and usisi. Rope is used mainly for house construction, but women also use it to tie up their bundles of firewood. Its use is almost entirely domestic, although people from Ilonga may occasionally come looking to buy rope. Men mostly collect ropes, but unmarried women may also collect it when house construction is underway. In the past, rope could be collected in two hours, but nowadays it takes around five hours – two reasons were given for this: partly because the forests are further away than they were in the past, but also because of drought which particularly affects climbing plants.

Mushrooms and fruit
Mushrooms are available in November and December, depending on rainfall. Both men and women collect them, arranging trips to the forest for the purpose, but it is important to be able to distinguish between edible and non-edible types. Collection of mushrooms is done for domestic use, but also for business – one fungu (a small pile of about four mushrooms) sells for 200TSh at Ilonga market and a day's selling can bring in up to 8000TSh.

Everyone collects fruit, on the way to the shamba or to get firewood, but it is only for eating and not for sale. The main types of fruit consumed include mabungo, manjakwe and matolwe.

Honey
Some men harvest honey from the forest using fire to smoke out the bees. The honey is for domestic use.

Medicinal plants
Traditional healers use plants for treatments of some diseases.

Hunters
The main animals in the forests are baboons, wild pigs and some monkeys. There are around 20 people in the village who hunt, using dogs. They consume the meat at home and sell it in the village, charging 3000TSh per fungu (about four pieces of meat).

Agriculture
All men and women cultivate, in upland and lowland areas. There are areas of wetlands in the village which are cultivated, and some go to Iselo forest where there is much land suitable for irrigation. Shifting cultivation has been practised, but most now farm the same shamba for long periods – one older man told us, 'I have cultivated the same shamba for 25 years now and I haven't moved once.' Some people told us that if you move too close to the forest, there will be problems with baboons stealing crops, so it is easier to cultivate near to other shambas. Another man said to us, 'if you cultivate in the forest and you don't have a dog, you won't harvest a thing – those baboons are real pests. They almost sneer at you as they eat through your crops.'

The main food crops cultivated include maize, beans, cassava, cowpeas, pigeon peas, yams and sweet potatoes. They don't cultivate round potatoes because there is no market for them locally. Cash crops include beans, sunflower, tomatoes, peppers and nyanya chungu. They attempted to cultivate coffee in the 1990s, but stopped in 1998 because the market was so poor – 'We would harvest 40 litres from half an acre,' explained one man. 'The price per litre was 300TSh which means we worked very hard and only made 12,000TSh.' Sesame was also attempted but no-one now cultivates it in the village. A 4kg container of sesame was sold for 5000TSh in Ilonga which was not a good price, 'and anyway,' explained one man, 'farming sesame isn't in our blood, so that's why we don't cultivate it – it's just beans for us.'

The seasonal calendar for agriculture in the village is as follows:

Oct-Dec Preparation of shambas
Dec-Jan Planting (depending on rain)
Jan-Feb Weeding – two days after planting, weeding done twice
May-June Harvesting
Jun-Aug A few people prepare their shambas for maize

The most important cash crop for the people in Mfuruni is beans. Everyone cultivates beans. Each farmer cultivates up to two acres in upland and lowland areas and also in the wetlands, to which about a quarter of farmers have access. With irrigation, farmers can cultivate beans three times, if they depend on rain, only twice. They harvest 3-4 sacks of beans from one acre. The calendar for the farming of beans is as follows:

	Preparation of shambas	**Planting**	**Weeding**	**Harvesting**
1st season	October-November	December	Two weeks after planting	February
2nd season	February	March	Two weeks after planting	June
3rd season (irrigated)	June-July	July-August	Two weeks after planting	October

Farmers take their beans to sell in the monthly market at Ilonga. The price ranges from 750-1000TSh per litre. The highest price can be commanded by the beans which are cultivated in irrigated areas during the dry season, since they are relatively scarce.

Sunflowers

The other important cash crop is sunflowers. Farmers generally cultivate one or two acres in the uplands. From one acre planted only with sunflowers, a farmer can harvest five sacks. One sack is 30 four litre containers. A four litre container sells for 800TSh. Therefore, one sack sells for 24,000TSh and from an acre around 120,000TSh can be made. However, many farmers mix maize with sunflowers on their shambas, and this obviously means that they harvest less. They generally sell their sunflowers in Ilonga at the monthly markets.

Livestock

There is no real tradition of keeping livestock in this village. Around 15 people keep pigs as a business. They sell the meat in the village. One man said that since there is a high demand for pork in the village, there is no need to take the meat to Ilonga or Kilosa, although they occasionally come to buy pigs in the village.

Outsiders coming to the village
Some people come to harvest timber, make charcoal and collect firewood in the village from Kilosa and Ilonga, and some traders come to look for beans to buy, but this doesn't often happen.

NGO/Projects in the area
There are two NGOs which come to the village:
- HUDESA which deals with vulnerable children
- CAMFED which gets girls into secondary schools and supports them while there.

Services
Water
There is no system of piped water in the village, but we heard that there are so many springs that water is simply not an issue. It was estimated that there is a spring or stream for every three houses in the village. People fetch water straight from the spring and therefore say that it is clean and safe. Many people have dammed the springs with tree bark to make it easier to collect. This water is available all year. There is also a river which runs close to the village – the river Lukulu which starts in Idete village.

Health
People say that they go to Msimba or Ilonga dispensary, but they prefer Msimba dispensary because the service is good. The main disease that people suffer from in Mfuruni is malaria. Other problems mentioned include hernias, abdominal pains, elephantiasis and ear infections.

Road
There are two roads which go to Mfuruni village from Kilosa town. One, which is actually no more than a wide footpath of around 2m wide, goes through Ilonga village and over hills to Mfuruni. It is passable only on foot, and rarely by bicycle because of the steep hills, but is much used by all people in the village going to market, to Kilosa or Ilonga. The other road to Mfuruni starts from Msimba village. This road was made by people in the village three years ago, using only their own tools – picks, hoes and axes – with the objective of making their village accessible by vehicle. The government didn't bring any machinery however, so it was never finished well and as a result the only vehicle which has come to the village has been a tractor which brought sacks of cement for school construction. This road is now only used to get to Msimba dispensary, and bushes and shrubs are now growing along it.

School
There is a school in the village which was built in 1975. This replaced a Roman Catholic school which fell down in 1972. However, the school only has two classrooms for 212 pupils. The school has all seven classes, but due to the lack of classrooms, classes have to share classrooms, e.g. standard 1 shares a room with standard 2 – each class faces a different way and have their blackboards on opposite walls. The teachers are not happy with the situation and they are planning to build more classrooms. The headteacher who lives in Ilonga and travels to Mfuruni every day says that it is a serious challenge working in this school because of the lack of space. Last year (2009) four students were selected to go to secondary school. The headteachers said that these students who are in secondary school have motivated other pupils to study harder to succeed in their exams

Standard of living
People in the village government meeting told us that life is improving since they can make good money from selling beans, which they can cultivate over three seasons. However they added that a big problem is still the fact that they don't have a road to connect them with Ilonga and Msimba. The village tried to make a road to Msimba, but they didn't receive any support for this project from the government.

CHABIMA VILLAGE PROFILE

Background

Chabima village is a traditional village which was originally based around the households of Masumo, Madinga and Msagati. More people moved into the village during villagisation in 1974, coming from Manyomvi, Mnozi, Ngaramilo and Mabwelebwele. The people from Mabwelebwele moved to Chabima because of flooding in their own village. Others came in the 1980s from Luwemba in Dodoma region and from Iringa, attracted by possibilities for agriculture.

There are three subvillage - Muhuzizi, Shuleni and Ikamba. The total population of the village is 1151 (622 males and 529 females) divided between 249 households. The two main tribes are the Wakaguru and the Wasagara, who are about evenly represented at around 90% of the population. Other tribes include Wahehe, Wagogo, Wangoni, Wayao and Wanyamwezi. Three quarters of the population are Christian, and the others are Muslim. The politics of the village is CCM.

Water is entirely drawn from nearby rivers. There is no dispensary in the village – people go to Kilosa town or Magomeni dispensary. There is a school in the village with seven classrooms, but only two teachers. The village has been surveyed, but a land use plan has not yet been done. The certificate does not appear to be in the village. There is no VNRC.

Forests

There are three main forests in Chabima village - Kaleo, Sele and Ikamba. Sele and Kaleo forests border Muhuzizi subvillage while Ikamba forest is next to Ikamba subvillage. These forests are catchments for some small streams that run into the village.

People explained that the condition of the forests is not as good as in the past. This is caused by four main factors – shifting cultivation, fires, charcoal making and timber harvesting. When asked what they thought about forest conservation, however, people felt that it was a good idea – 'our resources will then be available forever for future generations,' commented one woman. Others said that if the forests are protected, they will be able to harvest mushrooms more easily and rainfall will be more reliable. The village government group told us that those who would most be affected by forest conservation would be charcoal burners and timber harvesters.

<u>Shifting cultivation</u>

Farmers clear new shambas, mostly for sesame, on land that has never before been cultivated, or which have been left for over four years. It was estimated that around a quarter of the farmers in the village practise shifting cultivation. After clearing a new shamba, a farmer will cultivate it for three years, then leave it once fertility begins to decrease. However many then plant permanent crops such as oranges. After a shamba has been abandoned, no-one else is allowed to cultivate there – it is considered to belong to the farmer who originally cleared it and the shamba is rented out for 10,000TSh. One person complained, 'if you rent a shamba, the owner demands it back after a year because the shamba is now cleared again and easier for him to continue farming.' Another young man added that there are people who have cultivated areas and abandoned them but they don't allow other people to cultivate them despite the fact that they no longer tend them.

<u>Fire</u>

The forests burn every year. The main causes include:

- Hunters flushing out animals
- People dropping cigarettes
- People who light fires to predict how long they will live according to how long the fire burns
- Livestock keepers who burn in order to stimulate new growth of grasses
- Timber harvesters who burn the forest and grasses in order to identify timber trees better and also to get rid of upupu, a vine which causes an itchy rash

- Farmers also burn to remove upupu from their shambas – 'there is so much upupu, that we have to burn to get rid of it,' explained one farmer.
- Young men purposely set 'fire traps' using old clothes and matches. The fire starts twelve hours later with an explosion, but the perpetrators are far away by then.
- Some claim that the fires start at the DCs office in Kilosa town and spread to the village, rather than starting in the village itself.

The village government group told us that they are prepared to make bylaws to combat the problem of fire, and they also thought it would be a good idea to involve the people in the village in keeping a watch out for fires. They told us that they tell farmers to make fire breaks before burning their shambas and that in 1995 four people were arrested in the village when the fire they had lit to burn their shamba spread. They were given a warning and released.

Forest products

A variety of forest products are obtained from the forests - firewood, timber, charcoal, poles, ropes, medicines, fruit, mushrooms, grasses and honey.

Firewood

Firewood is collected from shambas and from areas of shrubs and bushes. No-one goes to forests like Sele, Ikamba and Kaleo as these forests are very far away. It is mostly women and children who collect the firewood, although unmarried men would get their own firewood. It is almost entirely for domestic use, although it was mentioned that about five women engage in the sale of firewood on a very small scale – 'the sellers persuade the buyers that they need some firewood, that's all it is,' explained one group. The women sell firewood at 500TSh a bundle. Much firewood is also used for preparing local beer – it was estimated that 70% of the women in the village make beer, on a rota basis, using larger pieces of firewood than they would use at home for cooking food. The frequency of trips to collect firewood depends on the size of the family and the type of food cooked. For normal domestic use, a trip once every 3-4 days is sufficient, but for beer making, it is necessary to go every two days. In the past, firewood could be picked up from around the house, but nowadays it is necessary to set aside at least four hours.

Poles

It takes over 400 poles to build a house. Houses need to be built every six years or so – the main agents of their destruction are termites and rain. Men go to the forests in the village or to thickets closer at hand to cut poles and bring them back, sometimes assisted by women in the family. The preferred species for poles include bamboo, mpingo, muhungu, mkambaa and muwangaa. In the past, it would take an hour to bring back a bundle of poles, but now it takes 4-5 hours. The total time spent collecting enough poles to build a house is between three weeks and one month.

Timber

There are about 15 men in the village who harvest timber and saw it into planks in all the forests in the village. They generally do this during the dry season when they are not occupied with farming. There is very little timber cut during the rainy season. Some others may occasionally come from Kilosa, but it is mostly people in the village. The main species harvested are mninga, msungwi, mkole, msani/mtondoo, mkalati, mkangazi, mhembeti and mvule. There doesn't appear to be any system for obtaining permission at village level for harvesting timber, and no-one attempts to seek permission. Nowadays there are fewer timber trees and species such as mninga and mvule have all but disappeared.

People come from Kilosa to buy timber. People in the village told us that they can't take timber to Kilosa because they don't know how to avoid being caught by forest officers – 'If you go to Kilosa with timber,' explained one man, 'you will be played around with until you are caught.' Another group told us that if you go out at night and wait at Mdukwi, on the boundary between Chabima and Dodoma Isanga, it is possible to see ten bicycles transporting 4-8 planks of timber to Kilosa every day.

If a person from the village needs timber, they can buy it from those who process it in the forests. A 6ft plank is sold for 2000TSh, a 10ft plank for 3000TSh in the village. Roofing timber, usually mnyenye and mwembeti, is sold for 1000TSh for one piece. In Kilosa the price is higher, as much as 6000TSh for a plank.

The village government say that they do patrols in the forests, once a month, until the situation improves, and then they stop. Often they will observe that there is too much illegal timber coming out of the forest, and then they will start up the patrols. If they find sawyers in the forest, they generally run away and the patrols are able to confiscate their timber and tools. In 2008 two people were arrested, one of which had 60 pieces of timber. He paid a fine of 100,000TSh. A saw was taken from another person and he was charged 10,000TSh to reclaim it. If they find people transporting timber on bicycles, they charge them a duty of 200TSh per timber.

Charcoal

Not many people in the village make charcoal and it is certainly not a full time occupation – those who make it do it as an additional extra to their normal farming activities. Everyone is free to make charcoal, and most do it on the edges of the forest, rather than inside the forest. The charcoal is not sold outside the village – no-one takes it to Kilosa and no-one comes from Kilosa to buy. Its sale is similar to that of firewood – a few customers may be persuaded to buy some on odd occasions.

The village government members explained that a few years ago a group of people from Winza-Reling'ombe area came to the forest near Muhuzizi searching for minerals (the people in the group were not able to specify which minerals they were looking for). When they couldn't find any, they made charcoal instead, from trees felled by someone from the village. They were arrested and had to pay 1000TSh per sack of charcoal to the village government.

Ropes

Men make ropes when they are building a house. The rope comes from msani trees.

Mushrooms and fruit

It is mostly women who go specifically to collect mushrooms, but men may also pick them on the way back from their shambas. It was estimated that about a quarter of the women in the village pick mushrooms and then sell them in the village – they can't take them to Kilosa because they rot so quickly. One fungu sells for 100TSh.

Women complained that there are fewer mushrooms nowadays, which they put down to increased fires and to droughts. A mushroom harvesting trip used to take two hours but now it can take as much as six hours – 'places where there were forests aren't forests any more, which is why it is so much more difficult to find mushrooms nowadays,' commented one woman.

Fruit is gathered by anyone who sees it and it is never sold. The main types of fruit eaten in the village are mifuru, msada, mng'ongo, matongatonga, zambarao, mtolwe, matuja, masele or manjakwe, mtundwe and mkwaju. There is less fruit around these days, because of forest degradation and also because of competition with baboons.

Honey

Honey is harvested by men from the forests, using fire to smoke out the bees. Only small amounts are obtained, and it is for domestic consumption.

Medicinal plants

Traditional healers are present in the village, and use medicinal plants, which they gather from the forests, for the treatment of some ailments. No-one in the meetings was able to provide any further details, however.

Hunting
People we spoke to said that there is no hunting in this village, although there are wild pigs and baboons which attack crops.

Agriculture
Shambas are in Isele and Ikamba forests, in the uplands and lowland wetlands near to the village. Food crops include maize, beans, cassava, pigeon peas, sorghum and bananas. Cash crops cultivated are beans, sunflowers, sesame, groundnuts, pigeon peas, cassava and vegetables such as Chinese cabbage, cabbage and tomatoes. They also have more permanent crops such as papayas, oranges and sugar cane. They cultivate rice, but only small amounts purely for domestic consumption. People agreed that the best cash crops as far as business is concerned are beans and sesame.

The people we spoke to said that there is one agricultural extension officer for the division of 16 villages. He never visits, and if he does, it is when all the crops have already been destroyed. It was suggested that this officer should come and spend a year in each village, rotating gradually through all the villages and setting up demonstration plots.

Maize
Maize is cultivated in the highlands and lowlands by everyone in the village, often on newly cleared shambas, for three years, until the fertility begins to decline. The maximum area one farmer cultivates is around two acres. From one acre, three sacks of maize is generally harvested. People agreed that this is low, but put it down to bad rains, lack of expertise and lack of capital with which to buy fertilisers. If the rains are good, farmers can harvest two crops of maize, but one is more usual. Maize is normally not sold, unless there is a surplus.

Sesame
Fewer than a quarter of the people in Chabima cultivate sesame. There were several reasons given for not cultivating sesame:

- A freshly cleared shamba is required (or a shamba which was abandoned over four years ago), and most people in the village don't like clearing new shambas.
- There isn't enough rain
- There are insects which attack sesame.
- One woman told us 'crops these days always need pesticides, and without pesticides you don't harvest anything.' – most people can't afford any inputs.

However another man disagreed, saying, 'people in this village don't understand the importance of cultivating sesame. They are quite happy to spend 2000TSh on local beer instead of buying Karate, which for that price would be enough for a whole acre.'

From one acre, farmers say that they harvest 2-3 sacks if the rains are good, otherwise they might end up with only 30kgs. People also complained that they don't have improved seeds, so if they plant late they harvest nothing. With modern seeds, even if they are planted late, a certain amount will be harvested. Some people had heard that there are good seeds called Naliendele and Lindi 11, but no-one uses them. Another reason given for low yields is that farmers don't thin their crop – sometimes seven seedlings can be found in one hole. Farmers claim that at the time that thinning needs to be done, they have many other agricultural tasks, including weeding other crops. The VEO told us that there is a plan to start a demonstration plot in the village so that everyone can learn from it.

Traders come from Kilosa town on bicycles or motorbikes – 'they don't bring lorries because we harvest so little!' explained a woman. Sales are done with 4kg containers, one of which sells for 3500TSh.

Sunflower

This is a new crop in the village and was started last year (2009). It is cultivated both in the lowlands and the uplands, often mixed with maize on the same shamba. This contributes to low yield – 'from one acre we harvest ten sacks if the sunflowers are planted separately on a shamba, but if they are mixed with maize, we only harvest around three sacks,' said the VEO. Another factor may be the seeds – farmers get their seeds from Kipekenya, a subvillage of Dodoma Isanga, and are not sure of their quality, although the VEO assured them that the seeds come from the Agriculture Research Institute at Ilonga. The most any farmer cultivates is two acres of sunflowers.

Farmers take their sunflower seeds to Kilosa by bicycle and extract the oil at a press in town. From one sack they can get up to 20 litres of oil. One litre of oil sells for 2000TSh in the village. In Kilosa they can only sell it for 1700TSh.

Beans

Everyone cultivates beans. Both men and women work on the shambas, but only men sell the harvested crop. Most families are not able to cultivate more than two acres, although if capital is available, it is possible to cultivate five acres. No fertilisers or pesticides are used. From one acre, a farmer can harvest 2-3 sacks. Each sack is around 120 litres

Most farmers are able to cultivate two crops of beans a year, and the small number of farmers with access to irrigated land in the lowlands can cultivate a third crop during the dry season, although fungal diseases and insects attack the crop and the leaves turn yellow before the beans are mature. The seasons are as follows:

1st season	December-February	low yields because of heavy rains, high price
2nd season	April-June	high yields, low price
3rd season	August-November	low yield, high price

Traders come from Kilosa town to buy beans, and sometimes farmers themselves transport their own beans to town. However, they mostly let the traders come to the village, since the price is better than trying to sell them in town. One litre generally sells for 600-700TSh, so one sack sells for around 72,000TSh. The proceeds of one acre can therefore be 216,000TSh. Some farmers complained that the traders use litre measures which actually measure 1.25 litres.

Livestock

There is no tradition of keeping livestock in Chabima. Most people keep a few hens and some keep goats, but only for domestic use. Masai occasionally pass through the village and graze their cattle in the forests. This sometimes leads to farmers-pastoralist conflicts in the village as pastoralists bring their cattle to graze on people's shambas.

Outsiders coming into the village

People come in for a variety of reasons – to saw and buy timber, to buy cash crops such as sesame and beans, to look for minerals. Also pastoralists especially Masai come seasonally. Some women come from Kipekenya subvillage in Dodoma Isanga to make beer.

NGOs/projects in the area

There are no NGOs or projects in the area.

Other livelihood activities

<u>Pot making</u>

About 6-8 women in Chabima make clay pots for business, selling each pot for 500TSh. Clay is collected locally. We spoke to one woman who says she can make up to ten pots per day. Buyers come to her house in Ikamba subvillage, or she takes them to the village centre to sell them. She learnt the skill from her mother and she is training her daughters. The money she receives is her own, but she

says that she discusses its use with her husband. At the moment they have two children at Masanze secondary school, so most of her earnings go on this, combined with some of her husband's money.

Local brew making

Around 70% of the women in the village make local beer. They make it out of maize, sorghum and finger millet. There is a rota – each woman makes one barrel of beer a month and sells it at the beer clubs in the village. Each day three barrels of beer are made and sold, but on Saturdays and Sundays this goes up to five barrels, since most of the village spend most of those days drinking. Brewing beer takes up much firewood – women told us that for one barrel they use four logs, which means four trips to the forest to find the logs. One barrel brings in 30,000TSh, and out of this they have to pay duty of 5000TSh to the village.

Services

Water

There is no piped water in the village and all water comes from rivers, including the Chogwe, Chabima, Mlolwa and Muhuzizi rivers. These rivers never entirely dry up, although the amount of water flowing may decrease during the dry season. One old man felt that rivers are drying up more these days because there is less rain nowadays. Another woman from Ikamba subvillage claimed that it is God who has decided that rivers should be dry for the moment. Most people commented that the water is not safe, because people wash in the rivers upstream. They pointed out that during the dry season, when there is less water, there is a greater prevalence of abdominal diseases, but at the same time, when the rain starts there is generally a spate of abdominal diseases, since the water suddenly becomes dirty.

Health

There is no dispensary in the village and sick people go to hospital in Kilosa or to the dispensary in Magomeni. The main diseases mentioned were malaria, as well as dysentery and vomiting, bilharzia, pneumonia, typhoid and skin diseases.

In the village there is a health assistant, who weighs children, and who also visits people with HIV and advises them on their medication and can also provide counselling – she received training in this in Mikumi town. There are also traditional midwives in the village – most women deliver babies at home, since it is so far to travel to a hospital.

Education

There is a school in the village with seven classrooms. However, there are only two teachers – the headmaster and his assistant. The headmaster assured us that he will be getting more teachers next year. In most years, students pass the exam to go to secondary school, but it is difficult for them to attend – the schools are far from home, in Masanze, near to Zombo and Miyombo villages, so students have to rent a room, at 3000TSh per month, which is generally beyond most parents, on top of the school expenses. In 2009, 23 students were selected for the secondary school, but only nine are presently studying – the others dropped out because they couldn't afford to continue. One girl left because she was pregnant.

Standard of living

Some people said that their lives are not bad compared with the past, because they are able to make a reasonable living from their crops, and from other activities such as pot making. But others complained about the unpredictable rains nowadays and said that they can't rely on anything any more, and therefore life is more difficult.

MASUGU JUU SUB VILLAGE PROFILE

Background

Masugu Juu is a sub village of Magomeni village, which has been awarded small town status recently. The subvillage is west of Kilosa town. It is a traditional settlement, being in existence before independence. At that time, the area was occupied by a white farmer known only as George who cultivated papayas, from which he extracted the sap. George left in 1960 without paying his employees, so in order to gain compensation, the employees occupied the area and began to farm there themselves. People from the adjacent hills then began to move in in the 1970s, from nearby sisal plantations, attracted by the possibilities of cultivating maize, rice and beans. And older man said, 'If you go to the hills nowadays, you can find a lot of clay cooking pots which show that there used to be people living here.' At the same time, now people are moving back to the hills to the places their parents originally moved from, in search of fresh agricultural land.

The population of Masugu Juu subvillage is between 189-200, and this includes many children. The original inhabitants are from the Wasagara tribe, also known as the Wakwiva, but nowadays there are representatives from other tribes including Wagogo, Wasangu, Wangindo, Waluguru, Wanyamwezi and Wangoni. Most people in the village are Christian, but there are also a few Muslims. The main party which controls the village government is CCM. Masugu Juu subvillage was surveyed as part of the village of Magomeni, but the subvillage government is not sure whether they have any land certificate because of their status as a subvillage. No land use planning has been done.

There is a water pump in the subvillage but people also use shallow wells. There is no dispensary and nor is there a school – people go to Kilosa hospital for their health needs, and to schools in nearby villages.

Forests

The subvillage is close to the forest called Masugu Juu. Other forests are called Mzizimila and Mdukwi which adjoin the forests in Chabima. However, these two forests are far from the village centre and no-one cultivates there. People commented that the condition of the forests is getting worse as the population increases – 'every year at least ten young people graduate from school and they all clear new shambas because they have no other way of earning money,' said one man.

The main threats to the forest were identified as shifting cultivation, which is principally done for the farming of sesame, fires, charcoal burning and clear felling of trees to prevent baboons and monkeys from attacking shambas – 30m around a shamba can be cleared, although this area will be used for cultivation the following year. Another argument for clearing the trees around a shamba is to allow enough light for the crops to grow. The people we spoke to were generally in favour of forest conservation – one old man said, 'if we are well educated by your organisation, then we will be able to understand more about the importance of protecting the forests, but it does seem to be a good idea, since nowadays it rains so little. I think we should protect the forest, but this is for the benefit of our grandsons and granddaughters, not us – we're too old.' Charcoal burners and timber sawyers would be affected by initiating forest conservation, but people said that there was plenty of opportunity for them to harvest from their own shambas. People from Kilosa, who come for various forest products, would also be affected

<u>Fire</u>

Fire occurs every year. People said that it often starts near the DC's office and spreads to the village. Farmers clearing their fields can accidently allow fires to spread, and hunters light fires to flush out animals. The Masai also start fires to encourage the growth of new grass when they move into the forests in September.

Forest products

A variety of forest products are obtained from the forests: firewood, charcoal, timber, ropes, medicines, mushrooms, poles, thatching grasses, honey and fruit. The forests are also catchments for the village.

Firewood

Firewood is collected from nearby shambas and from Masugu Juu forest. In addition, people from Kilosa and also from Magomeni come to collect firewood – they go directly to the forest without consulting village leadership, and no-one asks them where they are going or demands a levy. Those who come from Kilosa town mainly collect firewood for business.

Women say that they can carry enough firewood for five days in one load. Others couldn't estimate the frequency of collecting firewood, since they bring some home every day on the way back from the shamba. Women agreed that there is no problem of firewood in this village – 'it's everywhere, close by,' explained one woman, and went on to add that this was no different from the past.

Poles

The trees favoured for poles include mrama, miyombo, mkenge, mpingo, mfumbili (mkunguga) and mwalaka. Men cut the poles and women and children help to carry them home. They are only for domestic use – no-one sells them. A family house can take up to 300 poles, but we heard that many people nowadays are building with bricks – 'We are becoming more aware and so are building brick houses which last much longer,' said a young man. In the past it would take only half an hour to gather a bundle of poles, but now it can take up to two hours. The explanation was that the population is increasing and all the young men who finish school rush to the forest for poles to build a house with.

Timber

In colonial times, there was a company based in Kilosa called SINGA, which harvested mitondoo trees for timber from Masugu Juu forest and transported them to Kilosa town for sawing. This went on until 1980 by which time they had finished the timber trees from the accessible parts of the forest. They are now harvesting in Zombo and Ulaya (close to Nyali, one of the REDD project villages). Timber is now harvested in Masugu Juu forest and also in Mzizimila and Mdukwi by local people but also by people from Kilosa and from Magomeni. One person from Kilosa is now harvesting timber from Misufi and Migude. There are no laws that govern timber harvesting in the village and anyone can come to harvest timber at any time and they will not be bothered by anyone.

About a quarter of the people in the subvillage harvest timber, which they transport to Kilosa by bicycle. Buyers also come from Kilosa by bicycle to obtain timber. People told us that the driving force behind timber harvesting in the village was hunger. During house construction, timber is bought (e.g. for doors) at 1500-2000TSh per plank. The same plank, however, would be sold in Kilosa town for 6000TSh. Nowadays timber species are becoming more scarce, and it is now very difficult to get hold of mninga or mvule.

Charcoal

Charcoal is widely made in this village, and everyone is said to be an expert at making it. No-one depends on charcoal for their livelihood, since everyone cultivates crops – instead people see it as a survival strategy when times are hard and they need a quick source of cash. It is mostly men who make it, but women will help in times of hunger when they need money. People also make charcoal as a by-product of clearing new shambas and in addition many cut down trees all around their shambas to prevent attacks by baboons. People also come from Kilosa town to make charcoal in our forests but there are few of them in comparison with the local people. One person can make twenty sacks of charcoal in a month, depending on how committed they are to the task.

Charcoal is made in all the forests in the village – Masugu Juu, Mzizmila and Mdukwi. The best species for making charcoal are mtalula, miyombo, msani, mtondoo and muyombo. Msani is favoured above all the others.

Charcoal is sold in the village and in Kilosa town. In the rainy season, a sack of charcoal fetches 5000TSh in the village and 12000TSh in town. In the dry season, the price is 3000TSh in the village and 8000TSh in town. The reason for the discrepancy is that people are busy with agriculture and have no time for charcoal production during the rains. The demand remains the same, but the supply dwindles. The old men who make charcoal don't go to town to sell it since they are afraid of being caught by forest officers. They sell in the village to people who come from Kilosa, or to young men who will take it to town.

A story was told by the subvillage secretary of a woman from Kilosa town who came to the forest to make charcoal in order to provide herself with the initial capital to start a business in town. She has not come again to make charcoal, but is running her business in Kilosa.

When we visited the forest, we saw many areas where charcoal had been made, and many more trees which had been cut down and arranged in piles to begin making charcoal.

Ropes
The main species used for rope are msani and miyombo. Men make rope when building houses and when harvesting sesame. Women use ropes for tying up bundles of firewood.

Mushrooms and fruit
Both men and women collect mushrooms when they come across them. They are used for domestic consumption and not for sale, although some say that they have seen them being sold in Magomeni. People say that everyone knows how to identify edible and non-edible mushrooms. But they are much scarcer than they were in the past, and this is because of fires and drought which seem to happen every year. In the past they could just collect them from their shambas – 'now we can go a whole year without eating a mushroom,' commented one woman. However, they don't mind so much because there are plenty of other types of food to eat.

Fruit is also scarce in comparison with past year and they put this down to strong competition with baboons.

Medicinal plants
Not everyone knows about medicinal plants, but some are well known, e.g. the type which can help to cure dysentery.

Wild animals
There are baboons, which are pests, and bush pigs, although these have been much hunted for food. Dikdiks are also hunted. There are cheetahs, leopards and pythons on the other side of Masugu hill.

Agriculture
People have shambas within the village and around the edges of the Masugu Juu forests, in both lowlands and on the higher ground. Mzizimila and Mdukwi forests are far from the inhabited parts of the forests, so they don't cultivate there. Many new shambas are cleared every year, because of people moving on from old shambas, but especially because so many young people finish school each year and want a shamba of their own to cultivate. Shifting cultivation is particularly practised for sesame, but not for maize.

Main food crops include maize, beans, sorghum, cassava (although this is heavily attacked by baboons), mung beans, cowpeas and pigeon peas. Cash crops are sesame, sunflowers, and a few coconuts. One old man has tried to cultivate tobacco.

Sesame
Sesame is cultivated in both lowland and upland areas. They farm sesame on the same shamba for about five years, then move on to clear another shamba, or extend the original shamba. Most farmers

cultivate around 2-3 acres, but one old man told us that he can farm 20 acres of sesame. The harvest is small – two sacks of sesame from one acre. People told us that this is because they don't use any pesticides or fertilizers, and this is especially a problem since there is a type of insect which attacks the crop three days after it has germinated and which means that it has to be planted again. There is an agricultural extension officer assigned to the village, but she never comes – 'these agriculture guys, they don't even know that Masugu Juu exists!' cried one man. Another young man who cultivates sesame and sunflowers said, 'when you go to the district to inform them that there are insects attacking your crops, they just give you instructions – 'spray this and that' – and don't even come to check what the problem might be.'

Sesame cultivation is as follows:

Preparation of shamba	October-January
Planting	February
Weeding	Two weeks after germination
Harvesting	April-May

People come to the village on bicycles or motorcycles from Kilosa to buy the sesame, and take it back to Indian traders. The price of sesame fluctuates – early in the season, just after harvesting, the price of a 85-90kg sack may be only 40,000TSh. This may rise to 120,000TSh later on. Sometimes farmers sell the sesame in 4kg containers for 3500TSh. No levy is paid to the village by traders coming in to buy crops.

Sunflower

Sunflowers are cultivated in the uplands and also in the lowland areas, and are planted just after maize. However, more is harvested in the lowlands – people say that the number of seeds in a sunflower is less in the uplands than in the lowlands, but there isn't enough space in the lowland areas for everyone to cultivate enough sunflowers. From one acre of lowlands, farmers harvest 6-7 sacks, while in the uplands they harvest 3-4 sacks. No fertilisers or pesticides are used.

There are two ways of selling sunflowers – either as seeds or as oil after processing it:

- Seeds – a sack of seeds sells for 20000-25000TSh. Buyers come from Kilosa.
- Oil – oil is extracted in Kilosa at the pressing machine. From one sack they can get 24 litres of oil if the seeds are fully ripe, otherwise they will get 17 litres. They can sell the oil in town for 1600TSh per litre (38400TSh per sack) or return to the village with it, where they will get 2000TSh per litre (48000TSh per sack).

The maximum a farmer may get from one acre (7 sacks) is therefore 336,000TSh (selling oil in the village), and the minimum is 140,000TSh (selling seeds for 20,000TSh).

People told us that they prefer to press the oil first then sell, rather than selling plain seeds, and they prefer to sell in the village rather than in town where the price isn't so high. But there are other factors:

- If they sell the oil at the machine, just after pressing, they get the money immediately rather than selling the oil in small quantities in the village. It is also less trouble and so many farmers prefer to do this, therefore making 268,800TSh from one acre.
- There is only one machine in Kilosa town. After harvest it is possible to find huge queues of more than 200 sacks waiting to be processed, which may take as long as three days. For this reason, if farmers need money immediately, they may opt to sell it as seeds rather than waiting to process it.

Maize

Maize is cultivated as a food crop. It can be cultivated two or three times in the same year. From one acre, they can harvest 6-7 sacks, depending on the rain. Farmers complain that they don't have any expertise, and one young man added, 'we have an agricultural extension worker in the ward, but even she doesn't farm using any expertise and this year she didn't harvest a thing, so how is she supposed to help us?'

Farmers summed up their opinions of the various cash crops, saying that the best option was sesame, since it rarely eaten by birds. Sunflower it easy to cultivate, but it is attacked by birds (quelea quelea) and so much time has to be spent in scaring birds away as it is ripening.

Ousiders in the village
People come frequently from Kilosa to collect firewood, and to make timber and charcoal. Others come to buy crops, such as sesame, sunflowers and also chickens. Masai livestock keepers bring their cattle to the forests. They come from Mbamba, Tindiga and Kivungu, all of which are villages in Kilosa district. One Masai herder can have up to 2000 cattle. There have been conflicts between livestock keepers and farmers over the perceived damage that cattle do. Some cases have even been taken to court in Kilosa.

NGOs/projects in the area
There are no projects or NGOs working in the village.

Services
Water
The government built a water pump in the village in 1996. But many people, particularly older people who are not so mobile, use temporary shallow wells closer to their houses. However, people complain that there are frogs and germs in the shallow wells. They say that the water from the pump is clean, although analysis showed that there were also some germs present there during the dry season in 2009. The people we spoke to insisted that no-one got sick as a result of drinking this water, but another group said that around 80% of the village have had typhoid in recent years.

Health
People go to Kilosa district hospital from Masugu Juu, but they claim that if you don't have money, the service is very poor. Some people use medicinal plants to cure themselves, e.g. they use mkundekunde to treat diarrhoea. The most widespread health problems in the village are malaria, typhoid, which is common even in children, pneumonia, eye diseases (loss of vision in older people), bilharzia, coughs during cold weather, worms and hernias. Children suffer from bad teeth.

Education
Children go to primary schools in Magomeni, Lamlilo and Msufini which are all around 7km away. The secondary school (Kutukutu) is in Magomeni. At the moment, there are four students from the subvillage at secondary school.

Standard of living
An older man complained, 'life is getting worse, since we don't harvest as much as we did in the past, the weather is a problem and there are many diseases which attack our crops.' Others say that the rains were better in the past. Another man said that they lack agricultural expertise, so they can't cultivate properly – if they were to receive support for their farming, their lives might improve.

KIBASIGWA VILLAGE PROFILE

Background

Kibasigwa was a subvillage of Lumuma village and it now has a population of 950. There are two subvillages of Kibasigwa – Kibasigwa A and B. People have lived in this area for a long time, but during the villagisation programme in the 1970s, the inhabitants were moved to Lumuma. But soon after being moved, they came back again and resettled in their old houses, in order to resume cultivating maize. The original tribe is the Wasagara, but in 1988 other tribes (Wahehe and Wagogo) began to come to the village, attracted by the fertile land. They all speak each other's languages now. Most of the population is Christian, although there are a few Muslims. Politically, CCM are the main party in the village government.

There are few services in the village – there is no piped water and people collect their water from a spring which is almost 3km from the centre of the village. There is no dispensary – people travel to Lumuma which is over 10km from the village. There is a school, but it is still being built. The village was surveyed in 1996 and they have the certificate though the village chairperson did not know who has the certificate at the moment. However, no land use plan has yet been done. There is no VNRC in the village.

Forests

Most of the land in the village is covered with shrubs and bushes and many baobab trees. There is one forest, Memengwa forest which adjoins Manyomvi, a subvillage of neighbouring Lunenzi village and is around 3km from the village centre. This forest is a catchment for the water which they use and for this reason they say very strongly that they don't disturb the forest in any way. However, people say that the condition of their forest is not as good as in the past – the main threats they mentioned was fire and drought, although people say that they don't practise shifting cultivation in the forests. One man said, 'we don't bother to cultivate in the forest as we have plenty of areas close to or village'.

Fires occur every year, and are particularly destructive at the moment because everything is so dry as a result of the drought. No-one indicated who starts the fires or any reasons for them starting, saying they only see them once they appear from the forests. There are no strategies for dealing with fire – people say you can't put them out because they burn so fiercely and all they can do is run from them when they start spreading.

People in Kibasigwa were very positive about forest conservation, urging us to introduce it so that they can receive rain once again and end the drought which is blighting their lives. They insisted that no-one would be adversely affected by protecting the forests, since there is not much disturbance apart from fires. A local beekeeper was very much in favour of protecting the forest because there will be more bees and many flowers.

<u>Forest products</u>

The forest products they use from the forest include firewood, poles, timber, mushrooms, honey and thatching grasses. They also explained that their rain comes from the forest and also the water than emerges from the spring on Memengwa hill.

Firewood

Women collect firewood from near the village, from the bushes and shrubs. They say they go once every three

days. In the past it took them two hours to collect enough firewood for three days, but now it takes four hours, since they have used up all the trees which used to be nearby. Some take bundles of firewood to Lumuma because of the lack of income from agriculture, but they say it is too hard and pays too little (1000TSh per bundle). We saw a man and woman carrying firewood to sell in Lumuma village as we were driving from the village. If they sell the firewood in Lumuma, they may come back with cassava, or they may buy beer. People from Lumuma come to Kibasigwa to collect firewood for domestic and commercial use, but on a small scale, although if there is an important festival such as Idd el Fitr, they may even come with a lorry. There was a big argument about the presence of the lorry, as if some of the people in the group were trying to hide the fact that harvesting of firewood on such a large scale could take place, but in the end, they admitted that it could have happened.

Charcoal
The people we spoke to said that no-one makes charcoal in this village – 'Our men don't make charcoal because they don't know how to,' explained one woman. They added that it is not allowed by the forest officer who is based in Lumuma so there is less incentive to learn how to make it. However, it seems that people in Lumuma make charcoal.

Timber
People here don't harvest timber. If they need timber for doors, windows, etc they get it from Manyomvi, a subvillage of neighbouring Lunenzi. The main species used are msungwi, mninga, mkangazi and msani.

Poles
People get their poles from nearby bushes. Mostly the harvesting of poles is for domestic use, but some people sell them in Lumuma and vehicles have been known to come for a load of poles, though very rarely.

Wild animals
There are baboons and wild pigs that destroy the crops. There are hunters in the village, but initially people told us that no-one ate bush meat. However, it seems that people were worried that we might be from the game department – later another person said 'it is not possible to live here without eating bush meat,' suggesting that everyone, from time to time, does eat hunted meat.

Honey
There are around 16 people in the village who keep bees. One man we spoke to has 16 beehives. The hives are made from mikongoro and are sited close to the house. He says that no-one puts their beehives in Memengwa forest, since they prefer to keep their hives close to their houses. However, they also harvest wild honey from trees. He gets ten litres of honey from one beehive – this is less than it should be because of the drought and the consequent lack of flowers. One litre can be sold for 2000TSh in the village. He told us that he would welcome strategies to deal with fire, since a blaze can destroy his beehives.

Agriculture
The main area of shambas is in the lowlands within the village. People say that they don't practise shifting cultivation at all. The village landscape is flat and people say it was forested long ago and is now still fertile – they leave shambas fallow and come back to them later. The forested hills are distant and rocky, and for this reason no-one needs to go to the forest to cultivate. The cash crops cultivated are sunflowers, maize and sometimes beans and sesame. Other crops include pigeon peas and ground nuts. In the past the village was well known for maize cultivation – 'lorries used to come to the village to transport the maize,' one older man told us. However, the village has been afflicted by drought for three seasons now, so there have been no harvests for three consecutive years. When the

project team visited the village in April, their maize was drying up with the lack of rain, and never recovered.

Maize
Farmers cultivate 3-8 acres of maize. A small number of farmers cultivate using oxen or donkeys. In the past they used to harvest 8-10 sacks of maize from one acre, but at the moment they are harvesting nothing due to the drought. Buyers used to come in lorries from Mpwapwa and Kilosa but nowadays people have to go to Lumuma to buy maize, paying 5000TSh for one bucket. Both men and women cultivate, but it is the man who sells the maize – 'sometimes a man goes to drink beer and they come to the house and take maize in exchange for what he has drunk in the bar,' one woman complained.

Sunflowers
About a quarter of the people in the village cultivate sunflowers as a cash crop, although one group told us that the system of cultivating sunflowers hasn't really taken hold in this village. Many farmers mix sunflowers with maize, and from a mixed shamba, 2-3 sacks of sunflowers can be harvested. If they are cultivated alone, 5-6 sacks can be harvested. No fertilisers or pesticides are used, although there is a disease which is said to cause the leaves to dry up just before the sunflower matures. There is an agricultural extension officer in Lumuma, but he never visits the village to train them in new practices – 'we don't know him!' cried one woman. Another man said, 'we have got used to farming in our traditional way and so we have not got round to asking him to come.'

Some people sell their sunflowers as seeds, while others take their crop to Lumuma to the pressing machine. Buyers come from Mpwapwa to buy sunflowers. One sack is sold for 15000TSh, while one litre of oil is sold for 2000TSh. Men sell the crop and some women complained that sometimes they don't bring the money home, but spend it in town.

Beans
It was estimated that less than a quarter of the people in the village cultivate beans. Before the drought, farmers used to cultivate two acres of beans, and would harvest four sacks from one acre. One sack is sold for 90,000TSh and traders come from Kilosa and Mpwapwa on bicycles or with donkeys, and even in the past with small lorries.

For beans, the shamba is cleared in February, the crop planted in March and the weeding is done in March and April. The beans are harvested in May and June.

Livestock
Around 20% of the people keep donkeys and some have hens. The Wagogo people, who traditionally are livestock keepers, often have cattle – it was estimated that over a quarter have herds of between ten and one hundred cattle.

Outsiders who come to the village
People come from Mpwapwa and Kilosa to buy maize although in the last few years not many have come because of the poor harvests. People sometimes come from Mpwapwa and Mbuga to hire donkeys when they are harvesting their crops.

Projects, NGOs and groups in the area
There are no projects or NGOs in the area, nor are there any groups in the village.

Services
Water
Women fetch water from Memengwa hill where there is a natural spring. It is between 3-4km away from different parts of the village, and takes around 1.5 hours to reach. Everyone from the village uses this spring, and so do people from the neighbouring village of Izumbi. Some women have access to donkeys and can therefore use them to carry the water containers, or their menfolk may drive the donkeys for them. The spring begins to dry up during the dry season and water is scarce between

August and December. At this time, there are long queues of women waiting to collect water – one woman told us that she can leave the house at 6am and not be back until noon, and most of that time is spent waiting. In the rainy season there are many shallow wells which form and which women use, because the spring at Memengwa is so far away, but the water is unsafe so at this time many people fall sick with diarrhoeal diseases. Women told us that some people use Water Guard, but very few. In the past there was no drought and thus plenty of water. Women have great respect for Mememgwa hill and its forests and were adamant that it should not be touched.

Health

There is a dispensary at Lumuma – it is a government dispensary and the service is good, although there are not many medical staff. The most common disease is malaria which mostly occurs in the rainy season. Other health problems which affect the people are chest and bronchial ailments during the cold season, pneumonia, diarrhoea during the rainy season as a result of drinking water from unsafe sources.

Education

There is a primary school which is still being built, although there are already students from standards 1-7 studying at the school. The headteacher said the school was initiated politically although they had not made any preparations to have a school in the village.

Standard of living

People were unanimous in their view that life is much harder nowadays because of the drought and the consequent lack of food.

IBINGU VILLAGE PROFILE

Background
Ibingu village is a traditional village which was in existence before independence. Its original inhabitants were the Wasagara, but since then many other people have come to live in the village, including people from Lumuma and Kidenge, and members of other tribes – Wagogo, Wahehe, Wakaguru, Watiliko (from Kibakwe). People came to Ibingu attracted by the fertile land available in the village. 75% of the population is Christian and the rest are Muslim.

The population of Ibingu is 1970 (900 males and 1070 females). There are four subvillages – Ngaramilo (population 430), Kokoto (360), Msufini (670) and Shuleni (500). Until 1999 when it became a village in its own right, Lunenzi village was a subvillage of Ibingu. Lunenzi has two subvillages - Lunenzi and Manyomvi. Some people from Ibingu still cultivate in areas that belong to Lunenzi village and as a result there have been land related conflicts. The village has been surveyed and there are beacons on the boundaries which were put in place by land officers from Morogoro. The village government has the land certificate, but no land use plan has yet been done.

There is one water pump in this village and no dispensary. There is a primary school. CCM is the dominant political party. A VNRC has recently been set up (since the TFCG/MJUMITA project has been launched).

Forests
There are two large forests - Ng'ombela and Mungh'anga - which are not far from the village centre. They are mostly accessible, although some parts of them are steep and rocky. Several streams start from these forests. People told us that the condition of their forests isn't as good as in the past, and put this down to shifting cultivation, although this is not a big problem, fires, which occur every year, and charcoal burning and timber harvesting. We asked what people thought about forest conservation – most said that they would be happy to protect the forests, since nowadays the rains are so unpredictable. 'There will now be more trees since we will not be disturbing them. Also animals will have more space to live,' said one man. People were not worried that anyone would be adversely affected by protection of the forest – 'the only ones who will be affected are charcoal burners and timber harvesters. They will be affected because we will stop them from depleting our forests, but after all, they are not from this village.'

<u>Fire</u>
Fire burns the forests every year. The main causes of fire are hunters, people dropping cigarettes, farmers burning their shambas and also burning off upupu. In addition, the Barabaig (Wamang'ati) livestock keepers, who are based in a distant village, Mnozi, start fires to stimulate the growth of new grass. Some people in the village also start fires to gauge their lifespan – the longer the fire burns, the longer their life will be.

There are no strategies to control fires in place. The village government group told us that they understand the effects of fire and now that they have a VNRC they will make an effort to stop it, but they urged the project to assist them.

<u>Forest products</u>
A variety of forest products are collected, including firewood, timber, ropes, medicines, charcoal, fruit, mushrooms, poles, grasses, honey and fruit.

Firewood
Women collect firewood for domestic use from nearby wooded areas – they don't need to go to the forests, which are around 5-6km away, since there is plenty of more accessible firewood. Firewood is collected 3-4 times a week, and women say that while in the past it only took around one hour to collect enough firewood, now it takes 3-4 hours. Men also collect firewood, but as a business, to sell to women who make local beer (mkorogo). The price of a bundle of firewood ranges from 700-1000TSh. Both

women and men say that supplies of firewood are being depleted because of increases in population and also because of the amounts of beer which are made, which use much firewood.

Poles

Men cut and collect poles, while women assist with carrying them home. People build their houses out of poles – a new house has to built once every 5-6 years - and it was estimated by a group of men that it takes 400-500 poles to build one house. A few men cut poles as a business. Poles are collected from the nearby areas of woodland, but sometimes people go to Kipela and Mungh'anka forests. The best species for poles are misani, milengwe, piniti, mmanga and mrama. In the past, it took an hour to cut and collect a bundle of poles, but nowadays, it takes 3-4 hours. In total it takes about three weeks to a month to collect sufficient poles for one house.

Timber

No-one in the village knows how to cut and saw timber. However, timber harvesting takes place in the village because people come in from Lumuma, a neighbouring village. They harvest timber from both of the forests in the village. They are generally from the Hehe tribe, traditionally a tribe which works with timber. The village receives no levies from them, because it is all carried out illegally. One man explained, 'When we ask them why they go straight to our forests without reporting first to the village office, they say that they don't know what procedures to follow.' Another man told us that in 2008, two people from Lumuma asked permission to harvest timber. The permission was granted on the condition that for every ten pieces of timber, they pay two pieces to the village. He added, 'we preferred timber to a levy because it is easy for money to be swindled by a revenue collector, but the timber was used for the school and therefore benefitted everyone.'

The favoured species are mninga, msungwi and msani. If people in Ibingu want timber for house building, they buy it from the timber sawyer. One piece costs 4000-4500TSh while roofing timber costs 2500TSh per piece. However, it is difficult to get timber nowadays – one man complained that it is almost impossible to get a 10ft piece of timber – all that is available is 6-7ft pieces. They put this scarcity down to uncontrolled harvesting and also to the clearing of forest for agriculture.

The village government group told us that now that they have established a VNRC, they will be more proactive in protecting their forests and will be able to ensure that no-one goes in without permission. It seems that they already have some awareness of their role concerning unsustainable harvesting.

Charcoal

There are only three or four men who make charcoal from Ibingu village. However, others come to Ibingu to make charcoal from Lumuma village. The preferred species are mtelele and msani. No-one relies on charcoal for their livelihood – everyone farms and only makes charcoal when they have the time or need some extra cash as a result of a poor harvest. A group of men said that no-one was aware that there was anything wrong with making charcoal, and it wouldn't occur to the charcoal makers to ask permission to do something they have always done unhindered. But one person complained, 'these people from Lumuma are finishing our forests!'

The charcoal is sold in Lumuma, the ward headquarters. One sack is sold for 4200TSh, and one bucket for 700TSh. One sack contains seven buckets. No levy is paid to Ibingu.

Thatching grasses

Both men and women collect grass for thatching the family home from areas near the village. However a few people, women and men, also collect grass as a business. One bundle of grass sells for 500TSh, but when the forests burn, the price goes up to around 800TSh.

Ropes

Men collect ropes for house construction. The preferred species is msani.

Mushrooms

Both men and women collect mushrooms from nearby forests, although it is only women who make special expeditions to seek them. However, women told us that nowadays there are very few mushrooms because of the scarcity of rain – 'we haven't eaten mushrooms once this year, because of the rain and the fires that have burnt the forests!' cried one woman.

Agriculture

The main area of cultivation is Kipela, in the western part of the village, in uplands and in the wetlands close to the village. Some people cultivate in Ng'ombela forest – patches of cultivated areas can be seen on the more degraded hills, which people no longer consider to be forest. Water comes down to the wetlands from the Mung'hanga hills, but it is not a large enough area for more than about a quarter of the population to farm there. People prefer to cultivate in the wetlands, because they harvest more than in the upland areas. There is not much shifting cultivation. People will stay on a shamba for 5-7 years, and only move when fertility begins to decline, while some don't move at all – one man pointed out to us that he has farmed the same shamba since 1997. They told us that although they haven't done any land use planning yet, they have still had the idea (which came from the President when he told people to stop farming in the forests) to set aside areas of the village for forest and for farming.

The main cash crops cultivated are beans, sesame, sunflower, ground nuts, cassava and pigeon peas, as well as Chinese cabbage, cabbage and tomatoes. More permanent crops include papaya, oranges and sugar cane. Food crops include maize, sweet potatoes, cassava, pigeon peas and bananas.

The most important cash crop is beans and everyone in the village cultivates them, usually around two acres, but up to five acres if there is the money to hire labour. Men and women both work on the shambas, but it is the men who sell the crop and often control the money.

In a year, beans can be cultivated twice. The first season begins in March and the beans are harvested in June, and the second time, the beans are planted in August and harvested in November. No fertilisers or pesticides are used. From one acre, farmers reckon that they will harvest three sacks, each sack weighing around 120kg. Buyers come from Kilosa town, Mpwapwa and Dodoma, by bicycle, motorcycle and sometimes with vehicles when the amount is sufficient (3 to 4 tons). Beans sell for 700TSh per litre, although farmers complain that one litre is equivalent to 1.25kg. The produce from one acre can bring in 216,000TSh.

The village government group told us that at the moment buyers pay a levy to the district but nothing remains in the village. However, the VEO said that they have just received a receipt book so that they can collect the levy from crop buyers. They are planning to recruit an agent whose job will be to collect this levy. The VEO was not sure what percentage of the levy should stay in the village and how much should go to the district council, but he thought it was 50% to the district council, 25% to the village and the remaining 25% to the agent. The levy will be 2000TSh for every 100kg sack.

Sesame is cultivated by fewer than a third of farmers – most say that they prefer beans and are more used to it. Farmers don't use fertilisers or pesticides, although there are many insects with attack the crop. They harvest up to two sacks from one acre. Buyers come to Ibingu from Kilosa town by bicycle or motorcycle. The price of sesame ranges from 750-800TSh per litre. A 20 litre bucket sells for 15,000-16,000TSh. A group of farmers explained that sometimes traders provide an advance payment of 50,000TSh before the crop is harvested, with the rest payable after harvest. They don't like taking the advance payment but it is often unavoidable, because of urgent needs for cash.

Very few people cultivate sunflowers – possibly only ten in the whole village – because there are too many destructive birds (quelea quelea) and too much time has to be devoted to scaring birds when the crop is ripening. In addition there are insects which cut the flowers as they ripen. Sunflowers are planted in upland shambas of not more than two acres. When they are harvested, the seeds are taken to Kilosa and the oil is extracted. The oil is brought back to the village where there is a ready market – there is no need to sell it in Kilosa. From one sack, 20 litres of oil can be pressed. One litre of oil is sold for 2000TSh – in Kilosa it would only fetch around 1700TSh.

There is Ward Agricultural extension officer who lives in Lumuma, the ward centre, 10km from Ibingu. However, he doesn't come to the village to give advice to farmers. We heard that he would come only if he were given money to pay for his fuel.

Outsiders coming into the village
People come into the village to saw timber, and to buy sesame and beans. Most come from Lumuma and Mpwapwa, and some from Kilosa.

NGOs/projects in the area
Apart from the TFCG/MJUMITA project, there are no other projects or NGOs in the area.

Other livelihood activities
Local brew making
More than 80% of women brew local beer out of maize, sorghum and finger millet. They brew by rota, each woman making one barrel of beer a month. Three barrels are made per day, and on Saturdays and Sundays, five are made. From one barrel, a woman makes up to 30,000TSh. The village takes a levy of 5000TSh per barrel from the woman. Beer brewing uses much firewood – around four logs per barrel, which have to be collected individually from the forest, since they are heavy.

Services
Water
There are two water pumps in the village, in Msufini and Shuleni subvillages, but one of them doesn't work, and the other one does not produce sufficient water, particularly during the dry season. Women in these villages complained that they can go three days without bathing due to lack of water in the dry season. People from Ngaramilo and Kokoto subvillages draw water from Chogwe river, which is close to the village, but women explained that the water isn't safe as they sometimes get bilharzia and diarrhoea.

Health
People go to the dispensary in Lumuma village, but if the problem is serious, they go to Kilosa. The only means of transport to reach any medical centre is on foot, by bicycle or motorbike, or for serious cases, on a wooden stretcher carried by a group of men. Common health problems include malaria and water borne diseases such as bilharzia and diarrhoea, which occur mostly during the dry season when water is scarce. Other conditions that were mentioned include gonorrhoea and syphilis, cervical and throat cancer.

Education
There is a primary school with six classrooms and six teachers. There is a secondary school in Lumuma village which is 5km distant. Some students from Ibingu attend the secondary school.

Standard of living
People say that the unpredictable rains is making their lives harder than they were in the past, when they could rely on the rain. Sometimes they plant their seeds, then a freak rainstorm washes them away, or disease attacks their crops, so that their harvests are small.

Annex II Terms of reference

Title: Analysis of the drivers of deforestation and stakeholders in the Lindi and Kilosa project sites for the project Making REDD work for communities and forest conservation in Tanzania.

Date: 8th June 2010.

1) Introduction

1.1 Overview

The Tanzania Forest Conservation Group in partnership with the Community Forest Conservation Network of Tanzania (MJUMITA) is implementing the project 'Making REDD work for communities and forest conservation in Tanzania'. The project aims to reduce greenhouse gas emissions from deforestation and forest degradation in Tanzania in ways that provide direct and equitable incentives to communities to conserve and manage forests sustainably. The project will achieve this by supporting the development of a Community Carbon Cooperative hosted within the existing Network of Tanzanian communities engaged in participatory forest management.

The project includes a component aimed at addressing the drivers of deforestation at the two piloting sites in Kilosa and Lindi Rural districts.

Output 2: *Replicable, equitable and cost-effective models developed that are designed to reduce leakage across project sites and provide additional livelihood benefits to participating rural communities.*

The work outlined in this terms of reference relates to an analysis of the deforestation drivers and stakeholders in the two districts.

The project document describes this activity as follows:

Activity 2.1 Analyse drivers of deforestation and forest degradation.

How to avoid or reduce the leakage problem is one of the most critical challenges in ensuring that REDD projects are achieving real reductions in GHG emissions at a national and global scale. A first step in addressing leakage is to carry out a detailed analysis of the drivers of deforestation and forest degradation within a landscape. By understanding the drivers of deforestation it will be possible to determine the kinds of activities that may be displaced by improving forest conservation and management i.e. primary leakage. In Tanzania, key drivers include demand for agricultural land, timber, fuelwood, fodder, poles and charcoal. Wild fires are also a key threat. For each site, these drivers need to be further analysed to determine, for example, whether forests are being cleared for subsistence agriculture or for commercial agriculture such as for biofuel production. Whether timber is for local markets or for more distant markets such as China. For each site the project will analyse the drivers of deforestation and other threats to the forest and this analysis will help to determine the most likely leakage scenarios. The analysis will look not only at the pressures on the forests and the drivers behind those pressures but will also look into the reasons why response strategies to date have failed to prevent deforestation and forest degradation. This would include analysis of the shortcomings of participatory forest management in the respective forest areas. This will build upon the considerable work that TFCG and other institutions have already undertaken on participatory forest management which has already identified some of the key challenges in relation to costs vs revenues, communication and governance. In addition, as part of this analysis, the project will carry out a stakeholder analysis for each landscape with a particular focus on identifying forest user groups and those most dependent on resource extraction from natural forests.

2) Objective of the consultancy

The objectives of the consultancy are to:

i. Identify and describe drivers of deforestation and forest degradation within the landscape.

ii. Identify and describe stakeholders within the two landscapes with a particular focus on their relationship to forests and their roles in causing or avoiding deforestation.
iii. To identify groups who might be vulnerable to REDD and to understand the nature of their vulnerability and ways to mitigate that vulnerability.
iv. Provide a description of the role of women within the landscapes with a particular focus on their relationship to forests and areas of vulnerability in relation to REDD.

3) Scope of work

3.1 Drivers of deforestation

Understanding the drivers of deforestation and forest degradation are critical if we are to address those drivers effectively. This is at the heart of the project. Deforestation drivers are a subset of drivers of land cover change. These drivers are affected by various factors including the socio-demographic characteristics, biophysical and infra-structure attributes, presence of conservation units and local, national and international markets for forest products and other natural resources. In a recent paper by DeFries et al 2010, it was found that urban population growth and agricultural markets are key drivers rather than rural population growth. Similarly Rudel et al 2009 found that increasing areas under industrial agriculture were increasingly important drivers in some parts of the Tropics. Other studies have found that the socio-economic well-being of adjacent communities is positively correlated wtih increased deforestation (Alves and Hogan 2009).

Agriculture

At this stage the project has identified agriculture as an important driver of deforestation within both the Kilosa and Lindi project landscapes. There is thus a need to understand more about the nature of the agriculture that is being practised. Are the products consumed locally or are they sold? If products are sold who is buying them and who are the consumers. What kinds of agriculture are being practised and by whom? What are the crops? Is shifting or permanent agriculture being practised and if it is shifting, how long do farmers cultivate an area and for how long is it left as fallow? What criteria are used in selecting (or rejecting) sites for cultivation? What is the seasonality of agriculture? How much revenue do farmers earn from the different forms of agriculture?

Fire

In a visit to the area by a TFCG team in 2008, fire was the most frequently recorded sign of disturbance in the Lindi forests. Understanding more about the causes of fire is important. What are the uses of fires in forests in the two landscapes? Who is starting fires and for what reason?

Charcoal

Charcoal production has also been detected in both landscapes, albeit at low levels. It is thus interesting to know whether there are any signs of an increase in charcoal production and again, what is the market structure for this charcoal. Which areas are particularly vulnerable? Who is producing the charcoal?

Timber

Logging has been a factor in deforestation further North. It is unclear what the trends are within Lindi and Kilosa and further work is needed on this. Is there demand for timber in the landscape? If so, from where? How is the trade organised?

Land tenure

Are issues related to land tenure linked to deforestation in the two landscapes. And if so, in what ways are they linked?

Wild animal control

In some areas, forests have been cleared as a way to control animals such as bushpigs, rodents, baboons and monkeys who may cause crop damage.

Commercial agriculture

Have there been any initiatives or proposed initiatives to develop industrial agriculture such as biofuels or large scale timber plantations.

Livestock
In some areas, grazing of livestock is a cause of forest degradation. It can also be a cause of deforestation where fire is used to clear areas for pasture land.

Other
Other causes of deforestation that have been recorded in the Eastern Arc Mountains and Coastal forests include mining, human settlements, collection of fuel wood for domestic use and for brick making, and harvesting poles and timber for local construction.

It is envisaged that information about deforestation drivers will be collected through interviews with key informers; interviews with women's groups and interviews with stakeholder groups or individuals.

The information on drivers of deforestation will be an important component of the scenario analysis that will be developed as part of the process of defining the baseline scenario of the project.

3.2 Stakeholder analysis
According to (Gimble et al. 1995), the term stakeholder refers to "*all those who affect, and/or are affected by the policies, decisions and actions of the system. They can be individuals, communities, social groups or institutions of any size, aggregation or level in society*". The aim of this component of the work is to understand the individuals, communities, social groups and institutions that are affected by or who affect the project's aim of reducing emissions of greenhouse gases from deforestation and forest degradation in the project area.

The Consultant will identify all groups with a stake in the two Project Areas. This will include groups identifiable within the project villages such as hunters, herbalists, subsistence farmers, fisher people, bee keepers, loggers, village government officials, religious leaders, political party representatives, charcoal producers and shop keepers. It will also include groups outside of the villages with a stake in the area such as local government, traders, transporters of agricultural produce, development projects, commercial agricultural enterprises including biofuels companies, timber dealers, political parties and others.

The consultant will brainstorm with key informers in order to identify the communities, social groups or institutions with a stake in the area. The Consultant will also ask informers to categorise those groups according to their influence and importance to the project. The consultant will also categorise each stakeholder in terms of their motivation to engage in the project; their interest in the project and the effect of the project on their interests and their relationship with other stakeholders.

The information that is collected through this activity will inform various components of the project including the selection of a representative group to carry out the scenario analysis, developing appropriate project activities, informing the process of ensuring Free Prior and Informed Consent.

The Consultant will design a questionnaire that will include, but not be limited to, the following issues:

About the interviewee
Age
Gender
Education level
Tribe
First language
Other languages
Length of time in the area
Main livelihood activity

Other livelihood activities
Number of people in his / her household
Amount of land
Any information about the history of the area where s/he now lives

How does s/he currently use the forest
How frequently does s/he use the forest
Which forests does s/he use?
How important are forest products to his / her livelihood
Has s/he observed an increase in deforestation recently
What are the main causes of deforestation that s/he has observed? Who is doing this? Follow up questions to find out more about the activities that are causing the deforestation.
Would s/he support more protection for the forests?
If so why? If not why not?
How does s/he think that the project can stop deforestation?
What other kinds of people use the forest? Where do they come from? How frequently do the visit?
Does s/he trade any forest products?
Has s/he cleared any forest in the last 10 years?
If so, was it undisturbed forest? Or secondary forest?
What did s/he plant in the areas that were cleared?
Does s/he plan to clear forest in the near future?
If so why? If for agriculture, what will s/he plant?
Does s/he anticipate other threats to the forest in the future?

Agriculture
Seasonal calendar of crops.
Where does s/he sell her / his agricultural products?
Which crops are sold? To whom?
Does s/he receive any support such as technical advice from extension workers for his / her activities?
Has s/he planted any trees? If so, which species? For what purpose?

Health
Do s/he have access to a clinic?
Does the clinic meet her needs?
What are the main health problems in the village?

Water
Where does s/he get water from?
Is there enough water through the year?
Is the water clean?

Fire
Does s/he use fire to clear his / her land or for other purposes apart from cooking?
Has s/he observed forest fires?
Are forest fires increasing in frequency or intensity?
Who starts fires in forests? Why? When?

Conflict
Are there any conflicts within the village? If so between whom?

3.3 Vulnerability analysis

Through discussions with key informants identify groups who might be particularly vulnerable to restrictions on activities that result in deforestation; and those who might be vulnerable to restrictions on activities that cause forest degradation. Identify the nature and severity of that vulnerability and ways to mitigate the vulnerability.

3.4 Gender analysis

As the project aims to demonstrate a pro-poor approach to REDD, a particular focus should be placed on understanding the more vulnerable and marginalised groups. Women have been identified as being particularly vulnerable to REDD. As such the consultant should pay particular attention to understanding gender roles within the communities in terms of women's livelihood strategies, their involvement in decision making at household and community level, their dependence on forest resources and their understanding and concerns with regard to REDD and participatory forest management.

The consultant will undertake a discussion with at least one group of women in each village using the questionnaire included in Appendix I.

3.5 Training

As it is envisaged that the consultant will only be able to visit three villages in Lindi Region, she will provide training to one of the Project Staff in the methods required to undertake this work. The consultant will then assist in the collation of the data and the write up of the results.

3.6 Sampling strategy

It is envisaged that the survey will be carried out in 6 villages in each landscape equivalent to 50 % of the project villages. In five villages in Lindi District, the consultant will undertake the work herself whilst the remainder will be carried out by project staff.

5) Deliverables

- **Report on the deforestation drivers and stakeholders of the Lindi Project Landscape**

This report will include:
Executive summary
Table of contents
Acknowledgements
List of acronyms
Introduction outlining the objectives of the activities and providing some background to the study
Sampling strategy this will summarise the criteria for selecting the sample villages; a summary of the number of women and men interviewed; a summary of the kinds of stakeholders who have been consulted.
Description of the deforestation drivers in Lindi: this will provide a detailed description of the deforestation drivers that were recorded in Lindi.
Description of the stakeholders: this will describe the kinds of stakeholders present in the project area including an indication of their role in causing or avoiding deforestation; their level of importance to the project; and any other relevant issues.
Description of groups vulnerable to REDD: this will provide more detail on groups which are particularly vulnerable to REDD including a description of their vulnerability and ways that this might be mitigated.
Women in the landscape: this will describe the results of the interviews aimed at identifying the role of women in the landscape; their vulnerability to REDD and ways to mitigate their vulnerability.

In the appendices, detailed profiles of each of the villages that was surveyed will be provided including all of the interview results.

Conclusion and recommendations: this will summarise any key conclusions and make recommendations with a particular focus on areas where the consultant considers that additional research is required.

- **Report on the deforestation drivers and stakeholders of the Kilosa Project Landscape**

As above

Consultancy report
This report will describe the activities undertaken during the consultancy. This will include a detailed list of everyone who was consulted.

Reports will be presented in 11pt, arial, A4 with 0.6 inch margins.

5) Location

Field work and training will be carried out in Lindi Rural whilst the report writing will be carried out at the Consultant's place of work. Transport and accommodation will be provided for the Consultant whilst in Lindi.

6) Timescale

Preparatory work will be conducted between 25th and 26th June.
Field work by the Consultant in Lindi will take place between 28th June – 3rd July 2010 with additional villages being covered by the project team between 4th – 10th July.
Write up of the Lindi work will be carried out by 31st July 2010.
Field work in Kilosa will be carried out by the project team during the 1st two weeks of August with write up being completed by the end of August.

Activity	**Number of days**
Field work	6
Planning days	2
Data analysis and report preparation	9
Total	**17**

References
Ruth S. DeFries[1], Thomas Rudel[2], Maria Uriarte[1] & Matthew Hansen[3] 2010 Deforestation driven by urban population growth and agricultural trade in the twenty-first century **Nature Geoscience 3**, 178 - 181 (2010)

Annex III. Schedule of work

Day	Activity	Location
7-8-10	Courtesy Visit to DNRO Office (this was done with a phone call) • Asking for forest officer to participate in the activity Field Visit to Dodoma Isanga • Meeting with Village government • Meeting with group of women • Forest visit to check deforestation	Kilosa town Dodoma Isanga
9-8-10	Field visit to Masugu Juu • Meeting with sub village council members and some village elders • Meeting with group of women • Field visit to check deforestation activities	Masugu Juu and nearby forests
10-8-10	Visit Mfuruni village • Meeting with village council members • Meeting with group of women • Visit forest to check deforestation	Mfuruni village
11-8-10	Visit Chabima village • Meeting with village council members • Meeting with group of women • Visit forest to check deforestation	Chabima village
12-8-10	Visit Kibasigwa village • Meeting with village council members • Meeting with group of women • Visit forest to check deforestation	Kibasigwa village
13-8-10	Visit Ibingu village • Meeting with village council members • Meeting with group of women • Visit forest to check deforestation	Ibingu village
14-8-10	Meeting with the Lumuma Ward Agricultural officer	Lumuma village/ward
16-8-10	Meet some district staff • District Natural Resources Officer • District Agricultural and Livestock Development Officer	Kilosa town