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POOR PEOPLE IN ENVIRONMENTAL MANAGEMENT IN UGANDA AND TANZANIA

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Executive summary

PART 1. PARTICIPATORY ENVIRONMENTAL MANAGEMENT (PEMA) IMPACTS

Poverty, livelihoods, and knowledge-attitudes-practices in the Participatory Environmental Management (PEMA) Programme

This is a paper on analysing the Participatory Environmental Management (PEMA) programme's impact on poverty, livelihoods, and the knowledge-attitudes-practices syndrome in the Kasyoha-Kitomi forest landscape in Uganda and the South Nguru forest landscape in Tanzania.

- The objectives of the Participatory Environmental Management (PEMA) programme are to improve the livelihood security of poor, natural resource dependent households […] and enhance the capacity of civil society and government institutions to design and implement effective ICD programmes
- The principal purpose is to analyse the poverty situation in each landscape in terms of the level and composition of poverty and the factors causing the poverty of different groups of the population. A secondary purpose is, during the first phase, to be able to indicate the effects of forest management on poor people's livelihoods, to register their relationships with the forest, and not least to analyse the involvement of the poor and marginalised in new initiatives of landscape planning and environmental management.
- DIIS has developed a methodology for monitoring the poverty impacts of agricultural interventions at household level, which is now being used for this purpose.

Constructing a poverty index and poverty profiles

- Poverty profiles for later monitoring of changes in these profiles were developed, based on rural people's own perceptions of poverty.
- The 13 poverty indicators include: land ownership, non-agricultural sources of income, casual labouring, animal ownership, hiring of agricultural labourers, food security, quality of diet, housing quality, health status, children's schooling, dressing, marital status, and age.
- The data for monitoring, i.e. the information collected on poverty, livelihoods, and knowledge-attitudes-practices, have been solicited through ordinary sample surveys, using the same questionnaire in two random samples in the landscapes in Uganda and Tanzania.

- Based on the questionnaires a household's poverty indicator scores are determined and its poverty index computed as the mean of the indicator scores that the household received. The poverty index can be used directly as a measure of poverty, showing household differences in overall poverty status. Three levels of poverty in a population were also identified, however, i.e. the poorest, the less poor, and the better-off.
- These poverty categories are used to draw the poverty profiles, to analyse the different components or faces of poverty within the two landscapes, as well as how they relate to other aspects of behaviour, e.g. forest use. Last but not least, they can be used to measure changes in poverty when, eventually, the survey is repeated.

The poorest, the less poor, and the better-off in the two landscapes; the different faces of poverty

- The first basic result of the study of poverty in Kasyoha-Kitomi and South Nguru is a confirmation of the poverty of peoples in the Participatory Environmental Management (PEMA) areas, relative to comparable areas in Uganda.
- It is also clear that the degree of equity in Tanzania is higher than in Uganda.

Household poverty indicators: 2005 poverty profile

- All indicators are strongly correlated with poverty, except marital status, with which there is no correlation in South Nguru, and health, with no correlation in any of the two landscapes.
- As to the overall score for the three poverty levels taken together, the general tendency is that the people in South Nguru are favoured in terms of land ownership, they do little casual labour, have a much better food security and quality of diet, and dress better, whereas people in Kasyoha-Kitomi are better off in terms of non-agricultural incomes, animal ownership, and housing.
- There is a considerable difference among the better-off, less poor and the poorest households in the landscapes with respect to how they derive their livelihood. On land ownership and hiring and doing casual agricultural labour, people in Tanzania are generally better off, while households in Uganda fare better when it comes to non-agricultural incomes and animal ownership.

- With regard to needs satisfaction i.e. food security, food quality, housing quality, health conditions, child education and dressing these are important aspects widely considered in the conventional basic needs surveys. The level of food security, quality of the diet, as well as dressing is higher in South Nguru than in Kasyoha-Kitomi among all poverty groups. Housing is one measure for which equality is not more prevalent in Tanzania than in the Ugandan landscape. In both landscapes, all these indicators were also correlated with poverty.
- For health and education, as well as the two demographic indicators, marital status and age, the overall situation in the two landscapes was very similar.

PART 2. 2005 LIVELIHOODS OF THE POORER POPULATIONS IN THE TWO LANDSCAPES

In Sections 3 and 4 individual households' poverty and poverty indicators, i.e. their sources of livelihood, needs satisfaction, and basic demography were presented. The following two sections analyse in more detail how people derive their livelihoods, from agriculture, water and fuel, depending on where they live, their history of migration, and ethnicity.

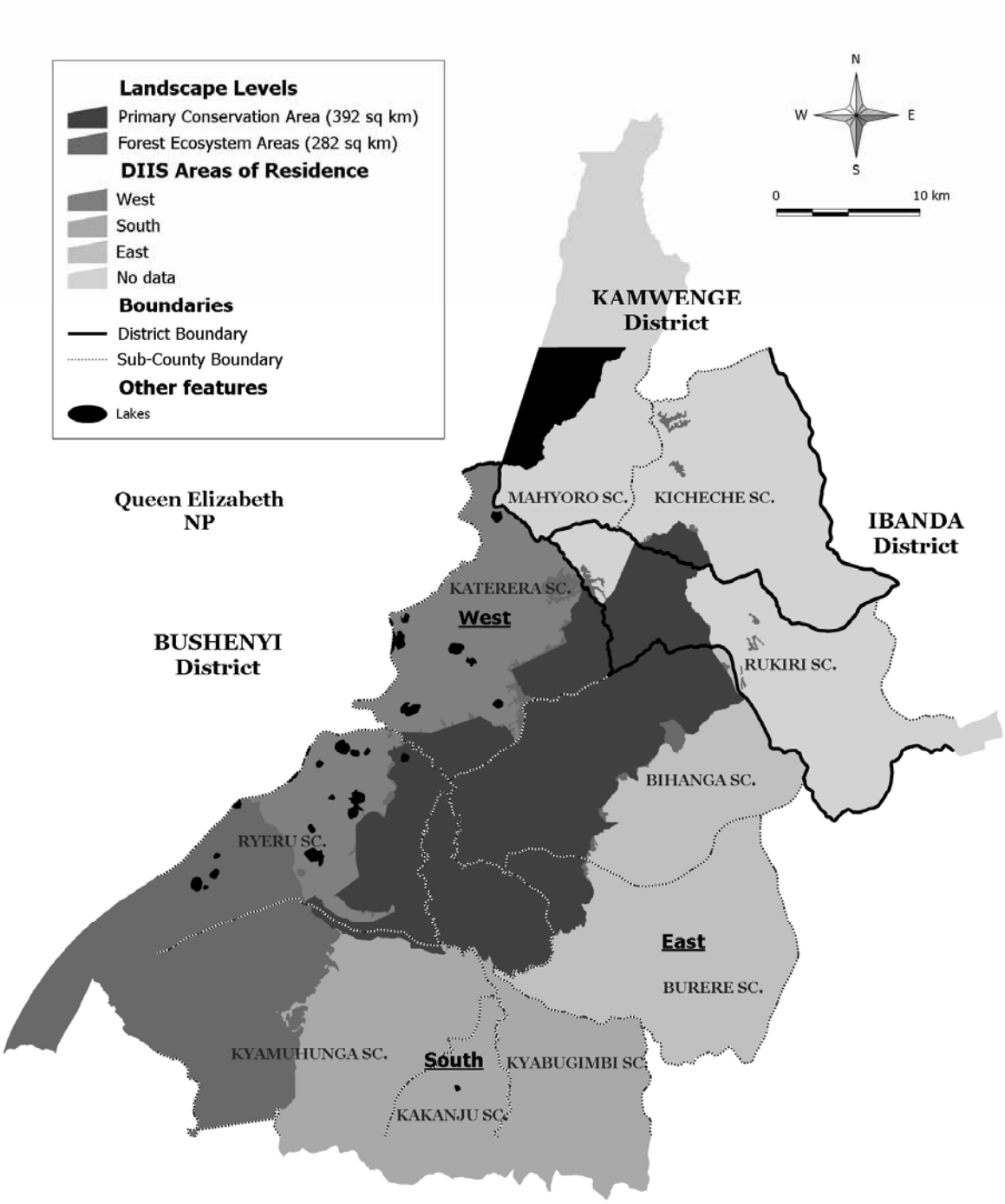
This analysis deals specifically with the poorest section of the population, with whom Participatory Environmental Management (PEMA) is particularly concerned. For the landscape as a whole the livelihoods of the poorest group are seen against that of the other groups, with which it is interacting. Section 5 on Kasyoha-Kitomi can be read separately from the following section 6 on South Nguru.

Livelihoods of the poorest people in Kasyoha-Kitomi of Uganda

Generally, area of residence, migration, and ethnicity are related to poverty in the following ways:

- While ethnicity and poverty are not correlated within the landscape population, there is a very clear connection between poverty level and the birthplace of the head of household in the whole landscape and between poverty and area of residence.
- The great majority of the better-off still remain in their native villages, with the poor being the most migrant part of the population.
- The West has generally newer settlements, and thus has the largest proportion of the poorest households (60% of all the people in the West, against 30-35% of the people in the South and East).

Figure 1. Map of the Kasyoha-Kitomi landscape



The poorest population group was roughly composed as follows:

- In the eastern sub-counties most of the poorest households stay in the villages where their head was born, whether banyankole or bakiga by tribe. In the South, all the people are banyankole, and 40-70% of the poorest households remained in their village of birth, the rest being migrants from within the same district. In most of the West the predominantly Kiga population are mostly migrants from their native Kabale District.

They derived their livelihoods, in the main, from the following:

- Land is very unevenly distributed, with the better-off having much more land than the poorest group, with the less poor in between. Even among those at the poorest level, land is unevenly distributed, 70% owning less than an acre in the West and less than half in the East.
- Almost all land among the unmixed, traditionalist, banyankole of the South is customary land, while 2/3 of the poorest in the East and West have registered ownership to most of their land.
- More than twice as many better-off as among the poorest households have fallow land.
- 60-80% of the poorest rent land.
- Less than 10% of the poorest have cattle, but the majority have some small stock, fewest in the East.
- Almost all farmers in the landscape grow the major food crops, bananas and beans. Just under half of those who grow a crop are also selling it. In the East farming is almost exclusively subsistence based, as few staples reach the market, and farmers there are better-off on food security than in the West, and especially the South.
- The better-of households generally live much closer to their water sources than the poorest. Half of all the households get most of their water from rivers or streams, the other half from an improved source, mostly a protected spring, irrespective of poverty level.
- The banyankole in the South are most likely to have an improved water source, followed by bakiga and waluguru of the West, with least improved sources in the East. Nearly 60% of the poorest people in the West get it from the forest, much less in the rest of the landscape.
- All households in the landscape use mainly firewood for fuel. The poorest have longer to walk for their wood supply, especially in the East, where 65% have more than an hour's walk each way.

Livelihoods of the poorest people in the South Nguru forest landscape, Tanzania

Generally, area of residence and migration are related to poverty in the following way:

- There is a very clear connection between poverty level and area of residence and between poverty and the birthplace of the head of household.
- With almost 60% of the landscape population belonging to the middle, less poor group, all the areas of residence also have most respondents belonging to that group. Polarisation is greatest in the East, where they are just below half, and both the group of better-off and the poorest are bigger than in other areas. Indeed 64% of all the poorest live in the East.
- Contrary to Uganda it is the better-off, who are the most migrant part of the people, with only 50% remaining in their native villages, against close to 70% of both the less poor and the poorest.

The poorest half[1] of the population in South Nguru was roughly composed as follows:

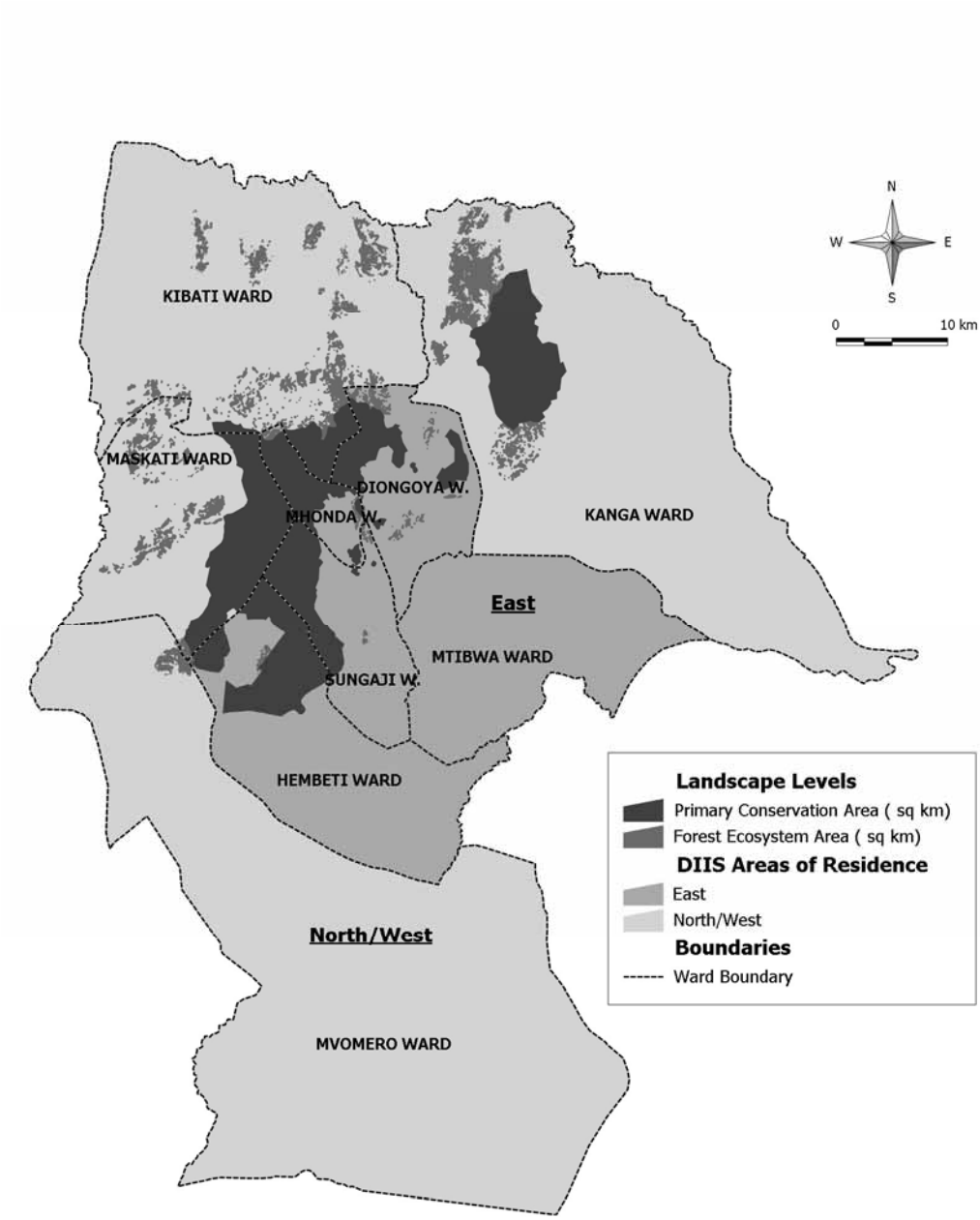
- In the East of the South Nguru landscape, the majority of the poorest half consisted of households staying in villages where their head was born. In the North/West the poorest half was smaller, and also here few were migrants.

They derived their livelihoods, in the main, from:

- Poverty is very significantly correlated with land ownership. Almost half of the poorest half of the people have less than an acre of land, while half of the better off half have more than two acres. Especially in the East the poorest half are also land poor.
- Little land is freehold land, while the great majority is held as customary land, be it among the better-off or the poorest half, in the East or the North/West of the landscape.
- There are hardly any cattle owners among the poorest half in South Nguru. Many more have small stock in the East than in the North/West of the landscape.

[1] In order to get segments of significant size of the poorest people in the landscape to analyse in more detail, the group was expanded to comprise the poorest half of the landscape population, according to the poverty index, the opposite being denoted as the better-off half.

Figure 2. Map of the South Nguru landscape



- Contrary to the situation in Kasyoha-Kitomi, more of the better off half than of the poorest half have improved water sources. In the East the great majority of the poorest half have water from rivers/streams, while in the North/West of the landscape almost half have an improved supply. Of the remainder, on the other hand, many have to do with an unprotected spring or water hole. The great majority of the poorest half, especially in the East, get their water supply from the forest.

- As in Kasyoha-Kitomi all households use firewood for fuel. The poorest half of the people have much longer to walk to fetch firewood than the better-off, and again it is especially in the East, where more than 60% have more than 2 hours to and from their firewood supply.

PART 3. THE 2005 KNOWLEDGE, ATTITUDES, AND PRACTICES SYNDROME IN THE PARTICIPATORY ENVIRONMENTAL MANAGEMENT (PEMA) PROGRAMME AREAS

Forest knowledge, attitudes and practices in Kasyoha-Kitomi forest landscape in Uganda

Knowledge-attitudes-practices monitoring is a tool to understand local stakeholders' forest practices, and their changes over time. This knowledge-attitudes-practices summary again deals with all people in the landscape, where it is carried out for whole populations, only with efforts to distinguish between different poverty levels in situations where it seems both possible and relevant.

- People, who live far from a forest, think that they get little out of it, compared to those living closer by. By far the majority of those living further away believe they get no forest benefits at all. Those who claim to get no forest benefits live mostly – over half the population - to the East of the landscape, where people live scattered and interact least with the forest.
- In the West 70% always regarded the nearest forest as the most beneficial one. In the South, on the contrary, only 30% always got most benefits from the nearest forest, while 50% at some time got more from another forest.
- Most respondents claim that the forest has a moisture/climate regulating effect. More than half the people in the West think that water comes from the forest, where in fact rivers and streams are often seen to originate. Very few in the South and East share this experience.
- The great majority of those benefiting from concrete forest *products* last year did so by collecting or cutting firewood, despite the fact that limitations to it had since recently been more strictly enforced. Other products, such as medicine, timber or poles for building and sale, or grass for thatching, are shared by only 15-25% each. These low percentages may actually be due to recent, more harsh, forest regulations, as much greater proportions benefited from those products in earlier years.
- Few respondents, overall, did not think they could do anything themselves to preserve the forest benefits. Many volunteered to maintain the size of the forest or suggested to put out a fire or report an illegal use as actions one might take. More complicated proposals on the forest density or plant species were suggested by smaller groups.

- There is no connection between poverty level and gaining, neither from non-product forest benefits, nor from forest products. There is correlation between poverty and people thinking there is nothing they can do to continue benefiting from forest products, and even stronger for people maintaining the forest and putting out a fire. In all cases the poorest have least belief in their own possibilities.
- In the landscape as a whole, the poorest feel more restricted than do others in terms of tree felling and cultivation and grazing, which are probably also the activities in which the poor are most likely to engage.
- In the West, there is a stronger sense of restrictions on forest use being imposed by authorities compared to the South and the East. Most people in the South and East suggest that forest regulations emanate from the government, and many suggest several institutions simultaneously. In the West, on the contrary, almost everybody believes that forest restrictions come from the NFA, half of them also mentioning the government, but no other institution. This may also be the explanation why more of the poorest group than of the less poor and the better-off see NFA as instigators of regulations.
- Most people agree that rules restricting the use of the forest are necessary in order to maintain it, but they are a significantly greater majority in the South than towards the West and East. Even more respondents believe that the people themselves also tend to benefit more from the forest rules, if such rules have to get village approval, but it is extremely few, who have actually been drawn into the decision-making in this respect!
- The poor are more often negatively affected by forest problems, e.g. wild animals, because the wealthier people find it easier to respond to diseases or risk loosing crops, and the poorest are more likely than others to cultivate on land at the forest boundary in areas of land scarcity, and thus are the first to experience negative effects coming from the forest.
- People living on the western side of the forest are more bothered by wild animals compared with those living in the East, for whom they are a greater nuisance than for those in the southern part. A central explanation is the adjacent Queen Elizabeth National Park.
- Villagers have a rather clear picture that authority over those who violate rules rests either with the National Forest Authority and/or the government. Only few think that the communities themselves have the authority. Apart from respondents looking to NFA as the organisation to take people to task (which has no poverty bias), all other organisations are much more often mentioned by the less poor and especially by the better-off, than by the poorest, possibly indicating a more detailed understanding of these issues, and a more varied contact with different forest authorities and their rules.

- The analysis of knowledge, attitudes and practices in the forest landscape tends to reveal, that forests are not only a source of resources for the poor, but at the same time pose risks, which more severely affect the poorest people compared to the rest of the population.

Forest knowledge, attitudes and practices in the South Nguru forest landscape, Tanzania

Since relatively few respondents seem to have been able to answer some of the questions on detailed forest behaviour, the knowledge-attitudes-practices analysis is carried out for whole populations, with efforts to distinguish between different poverty levels in situations where it seems both possible and relevant.

- Almost half the people live more than 2 hours walk from the nearest forest, and the vast majority of those living that far away does also benefit most from that forest. As distances from the forest get smaller, the less people are tied to the nearest forest, apparently because they get no benefits from it.
- Amongst that half of the landscape population available for the forest benefits analysis, there is no discernible poverty bias, neither in terms of non-product forest benefits, gaining from forest products, nor concerning what people can do to continue benefiting.
- Most respondents stated that the forest has a moisture/climate regulating effect. The claim that water comes from the forest is maintained by relatively few.
- Households benefited most from forest *products* last year by collecting or cutting firewood, despite the fact that since recently its prohibition has been more strictly enforced. Half of them also cut or collected timber or poles for building and sale. Other products, such as medicine, grass for thatching, furniture, sticks, tool handles, or crafts, charcoal, or other gathering and hunting, are collected by 20-30% each.
- It is believed by 40% that nothing can be done by the people themselves to preserve the forest benefits. Of those suggesting actions that people do, the majority think about the size and the density of the forest, the two being the most passive among possibilities.
- Very few people are not aware of any restrictions on forest use. The most commonly felt forest rule is the limitation on cutting trees, but also the prohibition of cultivation and grazing in the forest is widely felt, both probably because these rules restrict behaviour, which many would otherwise resort to. The people living 'far away', in the North/West of the landscape, who earlier benefited most from timber or poles, do also seem to feel the restrictions the most now.
- In general, restrictions are felt equally by the poorest and the better off half of the people.
- Of the households, 67% believe that the government as such introduced forest regulations, but over half of the Tanzanians also think that the village government was somehow involved.

- Most of the households in the whole landscape agree that rules restricting the use of the forest are necessary in order to maintain it, but it is a significantly greater majority in the East than in the North/West of the landscape. They do also believe, however, that the people themselves tend to benefit more from the forest rules, if the rules have to be approved by the village itself. Despite the great majority of people who plead for the importance of people's participation in making forest regulations, it is extremely few who have actually been drawn into the decision-making in this respect!
- The people experiencing any problems due to living close to a forest are very few compared to the Ugandan forest landscape. Of those who claim that the forest is negatively affecting their household, most say that wild animals are a problem, followed by diseases.
- Most respondents claim that local villagers benefit most from the forest.
- Most of the informants identified the national government, in general, as being in charge of taking people to task, who violate the forest rules. Only a third of the informants stated the Forest and Beekeeping Division to, specifically, have that authority, which indicates the authority's low presence in some parts of the forest landscape. As many as 40% of the informants assigned responsibility to the local government. Answers were biased towards the poorest for the central and local government.
- The analysis of knowledge, attitudes and practices in the forest landscape, again in general, tends to reveal, that forests are not only a source of resources for the poor, but at the same time pose risks, which more severely affect the poorest people compared to the rest of the population.

Towards monitoring of poverty, livelihoods, and knowledge-attitudes-practices impacts of the Participatory Environmental Management (PEMA) programme in the forest landscapes of Kasyoha-Kitomi, Uganda, and South Nguru, Tanzania

PART 1. PARTICIPATORY ENVIRONMENTAL MANAGEMENT (PEMA) IMPACTS

1. POVERTY, LIVELIHOODS AND THE KNOWLEDGE-ATTITUDES-PRACTICES SYNDROME IN THE PARTICIPATORY ENVIRONMENTAL MANAGEMENT (PEMA) PROGRAMME

The development programme *Participatory Environmental Management (PEMA): Engaging the Rural Poor as Partners in Conservation*, the first phase of which has been running from the beginning of 2004 to mid 2006, is a DANIDA funded alliance programme implemented by CARE Denmark, Birdlife Denmark, World Wildlife Fund, and Danish Institute for International Studies, with the NGOs Nature Uganda and Tanzania Forest Conservation Group as local partners.

Its objectives are to improve the livelihood security of poor, natural resource dependent households […] and enhance the capacity of civil society and government institutions to design and implement effective ICD [integrated conservation and development] programmes (Participatory Environmental Management (PEMA) Programme Document, p14). The Danish Institute for International Studies is involved in developing both planning processes and systems of monitoring impacts of interventions, ensuring increased wealth of poorer households in forest adjacent communities (Participatory Environmental Management (PEMA) Programme Document, Annex 2). The Danish Institute for International Studies has specifically had as one

of its tasks to develop a methodology for and to carry out monitoring of changing poverty levels, livelihoods and knowledge-attitudes-practices issues at individual and household level, and to relate changes to forest landscape strategic action plans.

Pursuing this objective, the Danish Institute for International Studies is issuing this report on Poor people in environmental management in Uganda and Tanzania: Towards monitoring of poverty, livelihoods and knowledge-attitudes-practices impacts of the Participatory Environmental Management (PEMA) programme in the forest landscapes of Kasyoha-Kitomi, Uganda, and South Nguru, Tanzania.

Poverty profiles are presented in part 1 for both Participatory Environmental Management (PEMA) landscapes consecutively, with a discussion of the methodology on analysing poverty in the two landscapes, and the status on each poverty indicator in both landscapes. Then follows in part 2, sections 5 and 6, a presentation of livelihoods in each of the landscapes. This is done by landscape, so that readers with an interest in only one landscape can avoid reading both – although the sections are so different that an interested reader may gain from reading both. Similarly, for the ease of readers with a special interest in only one of the two forest landscapes, the analyses of forest knowledge, attitudes and practices of households are also in part 3 divided into section 7, on Kasyoha-Kitomi forest landscape, and section 8, specifically on South Nguru forest landscape.

During the first phase of the Participatory Environmental Management (PEMA) programme (2004-06), baseline poverty, livelihoods and knowledge-attitudes-practices profiles of the two landscapes are being prepared. These profiles have a dual purpose. As indicated by the name, their immediate purpose is to analyse the poverty situation in each landscape in terms of the level and composition of poverty and the factors causing the poverty of different groups of the population. The aim is to be able to compare the development of poverty as different phases and interventions of the programme unfold over time.

A secondary purpose (besides monitoring) is already during the first phase to be able to indicate the effects of forest management on poor people's livelihoods, to register their relationships with the forest, and not least to analyse the involvement of the poor and marginalised in new initiatives of landscape planning and environment management.

The poverty profiles are developed on the basis of local perceptions of well-being and poverty, which are elicited through well-being rankings[2]. This is then expanded in the present context by adding analyses of forest related knowledge and behaviour.

Summary of Poverty, livelihoods, and knowledge-attitudes-practices in the Participatory Environmental Management (PEMA) Programme

This is a paper on analysing Participatory Environmental Management (PEMA)'s impact on poverty, livelihoods and knowledge, attitudes and practices in Kasyoha-Kitomi forest landscape in Uganda and South Nguru in Tanzania.

- The objectives of the Participatory Environmental Management (PEMA) programme are to improve the livelihood security of poor, natural resource dependent households […] and enhance the capacity of civil society and government institutions to design and implement effective ICD programmes
- The principal purpose is to analyse the poverty situation in each landscape in terms of the level and composition of poverty and the factors causing the poverty of different groups of the population. A secondary purpose is already during the first phase to be able to indicate the effects of forest management on poor people's livelihoods, to register their relationships with the forest, and not least to analyse the involvement of the poor and marginalised in new initiatives of landscape planning and environment management.
- DIIS has developed a methodology for monitoring the poverty impacts of agricultural interventions at household level, which is now being used for this purpose.

2. CONSTRUCTING A POVERTY INDEX AND POVERTY PROFILES

Perceptions of poverty, well-being rankings and poverty indicators

At heart of the impact monitoring, then, was the development of poverty profiles for later monitoring of changes in these profiles. The development of these poverty profiles took rural men's and women's perceptions of poverty as its starting point. It then continued to translate these perceptions into measurable indicators and combine them into a poverty index. The well-

[2] The methodology was initially introduced at the International Centre for Tropical Agriculture (CIAT), where it was described in detail in Ravnborg (1999), and it has later been used for other districts in the ASPS programme (DIIS 2004), in research in Kabale district in Uganda (Boesen & Miiro, 2004), and now in the PEMA programme in Uganda and Tanzania.

being rankings have shown the continued validity of the most frequently used set of 13 household poverty indicators.[3] The 13 poverty indicators include:

- land ownership
- non-agricultural sources of income
- casual labouring
- animal ownership
- hiring agricultural labourers
- food security
- quality of diet
- housing quality
- health status
- children's schooling
- dressing
- marital status
- age

For each indicator descriptions – and corresponding questions - were developed based on informants' valuations, to match three different degrees of poverty: highest, middle and lowest. Each description, or level, was allotted a score of 100 (highest), 67 (middle), or 33 (lowest): The higher the score, the poorer the household (on that particular indicator).

Table 1 shows the format of the indicator information as obtained in survey questions, and how it was weighted. Three levels were considered for most indicators, while for other indicators only two levels are distinguished. This reflects how the informants used the indicators during the well-being rankings. Some indicators were used as gradients, e.g. housing quality to distinguish between good houses, regular houses and poor houses, while others were used to indicate the presence or absence of a specific feature, such as severe health problems to impoverish

[3] The number of 13 household poverty indicators was not predetermined in any way, but was the number of indicators deemed necessary to adequately reflect the most frequently mentioned aspects of household poverty.

households or not. As revealed through the questionnaire survey, possibly through a combination of answers to different questions, each household received a score for each indicator.[4]

Table 1. Household poverty indicators

Scoring system for indicators constituting the household poverty index

SPSS-Indicator	Score	Description
ILAND	33	Own/uses more than five acres of land
	67	Own/uses between one and five acres of land
	100	Do not own land or own less than one acre
INONAG	33	Have "high entry cost" non-agricultural sources of income, like being professionals, having shops or businesses (trading, transport, etc.)
	67	Have simple non-agricultural sources of income like tailoring, building, crafts-making, brewing beer, making bricks, charcoal etc. or preparing and selling food
	100	Nobody are engaged in non-agricultural sources of income
ILABOUR	33	Nobody from the household worked for others as casual labourers last year
	67	Somebody from the household worked for others as casual labourers, but less than 50 days over the year.
	100	Somebody from the household work for others as casual labourers more than 50 days a year.
IANIMAL	33	Somebody in the household has cattle (and possibly other animals as well)
	67	Nobody in the household has cattle, but they have other animals
	100	Nobody have any animals
IHIRE	33	Hires labourers for at least two of the following tasks: land clearing, ploughing, planting, weeding, harvesting and forestry
	67	Do not hire labourers or hire labourers for one task only
IFOOD	33	Have not experienced a period of food shortage within the last year
	67	Have experienced a period of food shortage within the last year which lasted less than two months or which lasted longer but the only recourse that was taken were eating less meat or using own farm products rather than buying so much
	100	Have experienced a period of food shortage within the last year which lasted two months or more, and recourse was taken to reduced meals, fewer meals, asking for food help or getting aid from a programme, or working for food.
IFEED	33	Bought sugar when they last ran out of sugar, eat meat at least once a month and fry food at least once a week
	67	Either did not buy sugar when they last ran out of sugar, or eat meat less than once a month or fry food only occasionally (but not all three conditions at once)
	100	Went without sugar last they ran out of sugar or rarely buy sugar, eat meat less than once a month and fry food occasionally
IHOUSING	33	Have houses with brick or plastered walls and iron or tile roofs
	67	Have houses which might have iron or tile roof, or plastered walls or walls of bricks or unburned bricks but not both conditions at once
	100	Have houses with walls made of old tins or banana or other leaves and grass-thatched roofs or roofs made of banana or other leaves, old tins or polythene, or have houses that are in need of major repairs
IHEALTH	67	Nobody in the household suffer from T.B., HIV/AIDS, anaemia or chest related diseases or are disabled

[4] For example, if a household owns between 10 and 20 acres of land, this household receives a score of '33' on the indicator ILAND, whereas a household which owns less than an acre of land receives a score of '100' on this indicator.

	100	Somebody in the household suffer from T.B., HIV/AIDS, anaemia or chest related diseases or are disabled
ISCHOOL	33	Have or have had children at secondary school or higher or have children in private schools
	67	Have not (had) children in secondary school, and do only have children in free school
	100	Have not (had) children in secondary school and have only children , who are not in school
IDRESS	33	Woman owns shoes and both the woman and the children got new clothes about three months ago or more recently
	67	Woman either owns shoes and last got new clothes half a year or more ago or the children last got new clothes half a year or more ago or the woman does not own shoes and last got new clothes more than a year ago but children last got new clothes three months or less ago
	100	Woman does not own shoes and both the woman and the children last got new clothes more than a year ago
IMARITAL	67	Household head is a married man who supports the hh. or a single man
	100	Household head is a married man who do not support the hh. or a single, widowed, or divorced woman, or a child.
IAGE	67	Either the household head or the wife is below 55 years of age
	100	Both the household head and the wife are 55 years or above

Questionnaire survey and poverty index

The data for monitoring have been solicited through ordinary sample surveys. In all the studies, questions providing data for the 13 indicators have been the same, while other questions have been posed according to need (e.g. to provide the knowledge-attitudes-practices information required on forest use in the present case).

In order to ensure a 95% probability sample with at least a 5% confidence interval, the required sample size is 384 households in districts of 300 000 inhabitants (Krejcie and Morgan, 1970; as quoted in Bernard, 1994). Consequently samples of 400 (Uganda) and 390 (Tanzania) were selected for the South Nguru and Kasyoha-Kitomi landscapes.

In Kasyoha-Kitomi the sample was selected by starting with 2 villages in each of the six pilot sites (six sub-counties), and 2 villages in each pf four other sub-counties to make for a good geographical spread. In each village 20 households were randomly selected. The larger villages in Tanzania provided 30 households randomly sampled in each, in the six pilot sites plus another seven villages similarly providing a good overall geographical coverage.

Based on the questionnaires a household's poverty indicator scores are determined and its poverty index can then be computed as the mean indicator score that the household received. The household poverty index can be used directly as a relative measure of poverty, showing households' difference in overall poverty status. Three levels of poverty in a population were, also identified, however. It was found that households, which had been ranked as having the highest level of well-being, had an index score below 62 points, while households ranked as

having the lowest level of well-being tended to score above 72 points. Thus households were categorised as being 'poorest' if they had an index value of 72 or above, the category of 'less poor' households has an index value between 62 and 72, while the category of 'better-off' household consists of households having an index value of 61 or lower.

These poverty categories are used as the basis for drawing the poverty profiles and analysing the different components or faces of poverty within the two landscapes, as well as how they relate to other aspects of behaviour, e.g. forest use. They are furthermore used to compare poverty in the landscapes with poverty in similar, neighbouring areas in East-Africa, and they can, last but not least, be used to measure changes in poverty, when the survey is eventually repeated. For any comparisons to be valid it is essential, though, that the indictors, the corresponding questions, the index score calculations, and the thresholds between the poorest half, the 'less poor', and the 'better-off' are kept constant.

Changing poverty, livelihoods and forest practices in the Participatory Environmental Management (PEMA) landscapes

Monitoring of the impact of Participatory Environmental Management (PEMA) in the landscapes measured through changes in poverty (broadly defined) does, of course, to a large extent involve measuring changes in people's livelihoods. Poverty indicators as described above depict elements of livelihoods. The different faces of poverty, in many ways, define different livelihoods, and their description/causation is further enriched when the questionnaire solicits information about access to assets and activities identified through the forest stakeholder analyses as being instrumental for the roles of stakeholder groups.

Obviously, not all changes in the levels of poverty in the two landscapes will be due to forest landscape interventions within the Participatory Environmental Management (PEMA) framework. Some must be attributed to other developments and interventions. Thus, to help overcome this problem of attribution and thus assess the changes in the levels of poverty caused by Participatory Environmental Management (PEMA) related activities, monitoring will include the identification of the people reached by such activities and benefits, as well as studies of changes in their behavior and perceptions. Behavioral and perceptional changes are the outcomes that link outputs to impact.

In order to attribute changes in poverty levels to impacts of forest management interventions (incl. Participatory Environmental Management (PEMA)s), and relate them to their outcomes, it is necessary therefore, besides the poverty indicators, to collect the following information:

- the number and kind of households, that are affected by the different interventions;
- changes in behaviour in the directions which the interventions aim at (or contrary to this);
- Stakeholders' assessments of the link between such changes, their attitudes, and institutional interventions, including those made by Participatory Environmental Management (PEMA).

The presently created poverty profiles constitute baselines, and can be used to analyse the poverty levels in the two landscapes, how they are presently composed, the initial reach by Participatory Environmental Management (PEMA), the effects of the existing forest management, and planning involvement. By comparing the 2005 and later profiles it will then be possible to monitor the outcome of the Participatory Environmental Management (PEMA) interventions in terms of assessing changes in people's behaviour and their correlation with changes in levels of poverty.

Summary of constructing a poverty index and poverty profiles

- Poverty profiles for later monitoring of changes in these profiles were developed, based on rural people's own perceptions of poverty.
- The 13 poverty indicators include: land ownership, non-agricultural sources of income, casual labouring, animal ownership, hiring agricultural labourers, food security, quality of diet, housing quality, health status, children's schooling, dressing, marital status, and age.
- The data for monitoring, i.e. information collected on poverty, livelihoods, and knowledge-attitudes-practices, have been solicited through ordinary sample surveys, using the same questionnaires in two random samples in the landscapes in Uganda and Tanzania.
- Based on the questionnaires a household's poverty indicators' scores are determined and its poverty index computed as the mean of the indicator scores that the household received. The poverty index can be used directly as a measure of poverty, showing households' difference in overall poverty status. Three levels of poverty in a population were also identified, however, i.e. the poorest, the less poor, and the better-off.
- These poverty categories are used to draw the poverty profiles, to analyse the different components or faces of poverty within the two landscapes, as well as how they relate to other aspects of behaviour, e.g. forest use, and they can be used to measure changes in poverty, when the survey is eventually repeated.

3. THE POOREST, THE LESS POOR, AND THE BETTER-OFF IN THE TWO LANDSCAPES; THE DIFFERENT FACES OF POVERTY

The first and most basic result of the comparison of poverty in Kasyoha-Kitomi and South Nguru with that of the three neighbouring Ugandan areas,[5] is a confirmation of the relative poverty of people in the Participatory Environmental Management (PEMA) intervention areas.

Based on the same poverty index, Table 2 places the people of Kasyoha-Kitomi almost at par with those of Rubaya sub-county in Kabale district towards the South, which is notoriously marginal in a Ugandan connection (Boesen & Miiro, 2004).

Table 2. Poverty distribution in Kasyoha-Kitomi and South Nguru forest landscapes and – for comparison - three Ugandan areas neighbouring Kasyoha-Kitomi

Percent households belonging to the poorest, the less poor and the better off groups

Poverty level	**Kasyoha-Kitomi landscape** (N=400)	**South Nguru landscape** (N=390)	**Kabarole District** (N=400)	**Rakai District** (N=400)	**Rubaya Sub–county** (N=360)
Better-off	14%	18%	35%	30%	17%
Less poor	40%	57%	34%	42%	35%
Poorest	47%	25%	32%	28%	48%

South Nguru is at the same level as Rubaya in terms of the proportion of people in the better off category. Interestingly, however, there are fewer in the poorest group and more of the less poor people in South Nguru than in any of the Ugandan areas.

Table 3 shows, furthermore, that the population in Kasyoha-Kitomi is more spread out along the index range than in South Nguru, i.e. the mean index figure for the better-off is lower and the mean index figure for the poorest is higher in Uganda than in Tanzania.

[5] Poverty in K.-K. and S.N. is compared with neighbouring areas in Uganda only because, fortunately, comparable data existed for these areas, developed with the same methods (Boesen and Miiro, 2004).

Table 3. Poverty groups and poverty indices in Kasyoha-Kitomi and South Nguru forest landscapes

Percent households belonging to the poorest, the less poor and the better off groups

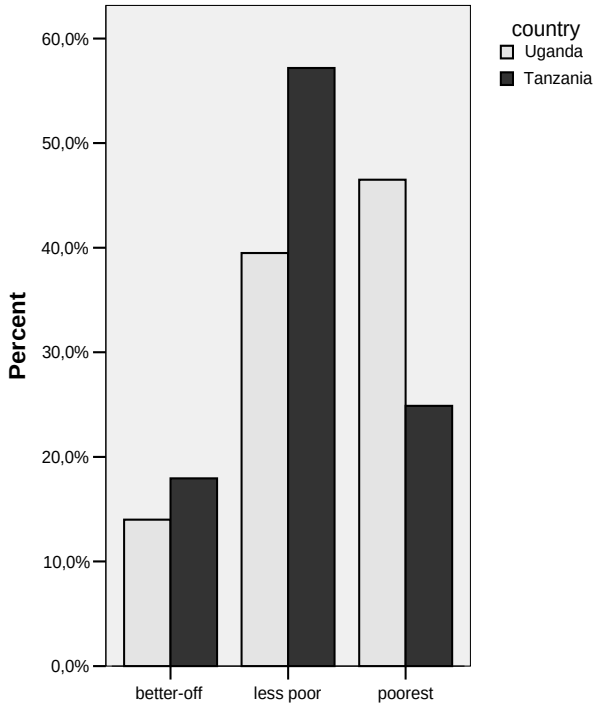
Poverty level	**Kasyoha-Kitomi landscape** (N=400)	**South Nguru landscape** (N=390)	**Kasyoha-Kitomi poverty index mean**	**South Nguru poverty index mean**
Better-off	14%	18%	54,9	57,1
Less poor	40%	57%	66,9	66,8
Poorest	47%	25%	77,1	76,6

Both tables agree, therefore, that the better-off are wealthier and the poorest are poorer in Uganda, and thus the degree of equity in Tanzania is higher than in Uganda.

The following graph depicts the much greater equity in Tanzania than in Uganda in a more illustrative manner, demonstrating the greater size of the less poor group and much smaller size of the poorest group in Tanzania. The better off group is slightly bigger in Tanzania than in Uganda, but it can be shown, that the Ugandans, on average, are wealthier.

At the overall level this may be due to the earlier long period of equity principles prevailing in Tanzanian politics, but an analysis of the structure of poverty in the two forest landscapes further reveals that they score quite differently on certain of the indicators, on which the poverty index is built, and more similarly on others. This may also give a more precise answer to why people in South Nguru seem more equal than in Kasyoha-Kitomi.

Figure 3. Percentage of population at 3 poverty levels in Kasyoha-Kitomi, Uganda, and South Nguru, Tanzania forest landscapes



Summary on the poorest, the less poor, and the better-off in the two landscapes; the different faces of poverty

- The first basic result of the study of poverty in Kasyoha-Kitomi and South Nguru is a confirmation of the poverty of people in the Participatory Environmental Management (PEMA) areas, relative to comparable areas in Uganda.
- It is also clear that the degree of equity in Tanzania is greater than in Uganda.

4. HOUSEHOLD POVERTY INDICATORS: 2005 POVERTY PROFILE

All indicators are strongly correlated with poverty, most at the 0.01 level, except age, for which the correlations in both landscapes is at the 0.05 level, marital status, for which there is no correlation in South Nguru, and for health, with no correlation at all[6].

On the overall score for the three poverty levels taken together, the general tendency is that the people in South Nguru are favoured in terms of land ownership, doing little casual labour, having a much better food security and quality of diet, and dressing better, whereas people in Kasyoha-Kitomi are better-off in terms of earning non-agricultural incomes, animal ownership, and housing.

The profiles are organized in three general sections, namely i) sources of livelihood (land, labour, income, and animal ownership); ii) needs satisfaction (food, shelter, clothes, health, education); and iii) demographic features (marriage and age).

Dimensions of vulnerability, social shame and prestige, relations of dependency etc. are implicit in many of the aspects discussed. Similarly working as a casual labourer does not only imply a specific source of livelihood; it also implies dependency upon others and acceptance of low status employment. Poor dressing, e.g. not owning shoes, does not only imply physical discomfort but also social shame by having to appear bare-footed at public events.

Sources of livelihood

There is a considerable difference among the better-off, less poor and the poorest households in the landscapes with respect to how they derive their livelihood. The following sections depict how households of different poverty levels derive their livelihood in Kasyoha-Kitomi and South Nguru beginning with land ownership and hiring and doing casual agricultural labour, in which people in Tanzania are generally better-off, while households in Uganda fare better when it comes to the last two sources of livelihood, non-agricultural incomes and animal ownership.

[6] No correlation only means that the indicator weighs equally towards poverty for all three poverty groups. Not necessarily that there is no poverty on that score. For health, however, people in both the landscapes, apart from being in an equally bad (or good) situation, seem slightly better-off than in other, but comparable, areas of Uganda – as their poverty score is lower.

Land ownership (ILAND)

Table 4 presents the distribution of land by poverty level in the two landscapes. The table distinguishes between three categories of land ownership, namely those owning more than five acres of land, those owning between one and five acres, and those having less than one acre of land.

While landownership is significantly related to degree of poverty in both landscapes, the distribution is somewhat more skewed in Kasyoha-Kitomi than in South Nguru. Thus in Kasyoha-Kitomi, 38% of the better-off also own more than 5 acres of land, against only 2% who owns less than an acre. In South Nguru the comparable figures are 33% and 30% of the better-off. In contrast 63% of the poorest in Kasyoha-Kitomi own less than an acre of land, while the most land poor comprise 54 % of the poorest in South Nguru.

Taken for all poverty levels the people of South Nguru tend to have a bit more land than in Kasyoha-Kitomi.

Table 4 Land ownership by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (ILAND)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	poorest	
KASYOHA-KITOMI (N=398)	Own > 5 acres of land	38%	7%	1%	9%
	Own < 5 and > 1 acre of land	61%	63%	36%	50%
	Own < 1 acre of land	2%	30%	63%	42%
	Total	101%(N=56)	100%(N=156)	100%(N=186)	
SOUTH NGURU (N=372)	Own > 5 acres of land	33%	16%	4%	16%
	Own < 5 and > 1 acre of land	37%	57%	42%	50%
	Own < 1 acre of land	30%	28%	54%	35%
	Total	100%(N=63)	101%(N=216)	100%(N=93)	

Significant correlation between poverty level and land distribution in both landscapes at the 0.01 level (Pearson chi-square test).

Casual labouring (ILABOUR)

In the well-being ranking, having to work for others as a casual labourer was unanimously mentioned as an indicator of the lowest level of well-being. This association of working as a casual labourer with the lowest level of well-being is partly due to such work being poorly remunerated, partly due to the dependency and low social status associated with accepting such employment.

Table 5 presents the distribution of casual labouring by poverty level in Kasyoha-Kitomi and South Nguru. Three levels of household dependence on casual labouring are distinguished: no dependence, where nobody in the household has worked for others as a casual labourer during the past year; intermediate dependence, where somebody in the households has worked as a casual labourer less than 50 day in total over the last year; and high dependence, where somebody from the household has worked as a casual labourer for more than 50 days during the last year.

Overall, households in Tanzania seem much less dependent on casual labour than do their Ugandan counterparts, as only 40% of all Tanzanian households resorted to this last year, while over half of the Ugandan households did so, and as much as 80% of the poorest group! In both landscapes the better-off are least dependent on casual labour. The more limited extent of casual labouring in Tanzania may be a reminiscent of the times when it was not only ideologically detested but outright forbidden.

Table 5 Casual labouring by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (ILABOUR)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	Poorest	
Kasyoha-Kitomi (N=390)	Nobody worked for others as casual labourers last year	93%	67%	20%	49%
	Somebody worked for other less than 50 days in the year.	0%	21%	27%	21%
	Somebody worked for others more than 50 days a year.	7%	12%	53%	31%
	Total	100%(N=55)	100%(N=153)	100%(N=182)	101%
South Nguru (N=371)	Nobody worked for others as casual labourers last year	71%	56%	58%	59%
	Somebody worked for others less than 50 days in the year	25%	39%	21%	32%
	Somebody worked for others more than 50 days a year.	4%	5%	20%	8%
	Total	100%(N=61)	100%(N=213)	99%(N=89)	99%

Significant correlation between the poverty levels and casual labouring at the 0.01 level for both landscapes (Pearson chi-square test).

Ability to hire labourers (IHIRE)

Although not strictly a source of income, the ability to hire labourers significantly enhances the agricultural opportunities available to a household. Table 6 illustrates the households' ability to hire labourers by poverty level in the landscapes.

The table distinguishes between households who hire labourers for at least two of the following tasks: land clearing, ploughing, planting, weeding, harvesting, and forestry work, which is seen as contributing to a relatively high degree of well-being, and households who do not hire labourers or hire labourers for only one of the tasks above, judged as a more average level.

The two landscapes are very similar in the correlation between hiring labour and poverty, but also in the generally very low level of hiring labour (for more than one task), which at 20% of the households or lower in both landscapes is lower than in similar Ugandan areas.

It is one of not so many measures which indicate slightly more wealth among all poverty levels in South Nguru than in Kasyoha-Kitomi.

Table 6 Ability to hire labourers by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IHIRE)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	poorest	
Kasyoha-Kitomi (N=390)	Hire labourers for at least two tasks	50%	12%	1%	12%
	Hire labourers for <2 tasks	51%	88%	99%	88%
	Total	100%(N=52)	100%(N=155)	100%(N=183)	100%
South Nguru (N=388)	Hire labourers for at least two tasks	61%	13%	7%	20%
	Hire labourers for <2 tasks	39%	87%	93%	80%
	Total	100%(N=70)	100%(N=223)	100%(N=95)	100%

Significant correlation between the poverty levels and ability to hire labourers at the 0.01 level in both landscapes (Pearson chi-square test)

Non-agricultural sources of income (INONAG)

Although agriculture beyond doubt is the most common and important source of livelihood, having non-agricultural sources of income was a feature, which was often mentioned in the well-being rankings as associated with higher levels of well-being. Having non-agricultural sources of income in an agriculturally based economy constitutes a diversification of sources of income as a means to reduce the income variations caused by factors such as climatic and market fluctuations.

Table 7 summarizes the extent to which the better-off, the less poor and the poorest households have different types of non-agricultural sources of income in the two landscapes. Two types of non-agricultural sources of income were identified: those having high entry barriers, often also involving higher or more stable earnings, like being a professional, owning a shop or an equivalent business; and income sources involving lower entry barriers such as tailoring, building, crafts-making, beer brewing or preparing and selling food, bricks, etc.

Only some 24% of all the households in both landscapes had some non-agricultural income, while 76% had none at all. In comparison, one to two thirds of the households in the comparable Ugandan areas neighbouring Kasyoha-Kitomi had some non-agricultural income (Boesen and Miiro 2004, p12).

Table 7 Non-agricultural sources of income by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (INONAG)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	poorest	
KASYOHA-KITOMI (N=392)	Some have "high entry barrier" incomes as professionals, having shops or businesses	62%	6%	2%	12%
	Have incomes as tailors, building, crafts, brewing, or preparing and selling food	19%	19%	4%	12%
	Nobody in the household have non-agricultural sources of income	19%	74%	95%	76%
	Total	100%(N=55)	99%(N=156)	101%(N=186)	100%
South Nguru (N=387)	Some have "high entry barrier" incomes as professionals, having shops or businesses	21%	2%	0%	5%
	Have incomes as tailors, building, crafts, brewing, or preparing and selling food	46%	21%	3%	21%
	Nobody in the household have non-agricultural sources of income	33%	77%	97%	74%
	Total	100%(N=70)	100%(N=222)	100%(N=95)	100%

Significant correlation between the poverty levels and non-agricultural sources of income at the 0.01 level in both landscapes (Pearson chi-square test).

Again despite the existence of significant correlations between poverty levels and non-agricultural incomes in both landscapes, the relationship was much more skewed in Kasyoha-Kitomi than in South Nguru. In Kasyoha-Kitomi as much as 62% of the better-off were professionals, had

shops or businesses, or the like, against only 21% of the better off category in South Nguru and less than 8% of any other group in any of the landscapes.

So, the better off households are not only the most firmly based in agriculture in terms of land ownership; they are also more likely to have more attractive non-agricultural sources of income and thus to benefit from the potential gains from the interaction between these two income sources. Among the poorest very few (3% and 6%) had any non-agricultural income.

Animal ownership (IANIMAL)

Animal ownership and in particular ownership of cattle was another feature related to sources of livelihood, which was frequently emphasized in the descriptions of different levels of well-being obtained during the well-being rankings. It should be noted, though, as a rather tricky measure of wealth, partly because people for superstitious reasons or fear of taxation are unwilling to mention their animal wealth, partly because pastoralists often live outside normal settlements and do not appear in lists of households.

Table 8 presents the ownership of animals by poverty level. The table distinguishes between ownership of cattle; ownership of other animals like goats, sheep, pigs, and chicken and ownership of no animals.

Table 8 Animal ownership by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IANIMAL)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	Poorest	
KASYOHA-KITOMI (N=396)	Somebody in the household has cattle	54%	31%	7%	23%
	No cattle, but they have other animals (goats, sheep, pigs, chicken)	43%	61%	63%	60%
	Nobody has any animals	4%	8%	30%	17%
	Total	101%(N=56)	100%(N=157)	100%(N=183)	100%
SOUTH NGURU (N=360)	Somebody in the household has cattle	11%	4%	0%	4%
	No cattle, but they have other animals (goats, sheep, pigs, chicken)	86%	67%	62%	69%
	Nobody has any animals	3%	29%	38%	26%
	Total	100%(N=70)	100%(N=223)	100%(N=97)	99%

Significant correlation between poverty level and animal ownership at the 0.01 level in both landscapes (Pearson chi-square test)

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As expected, there was a strong correlation between animal ownership and poverty level within both landscapes, with significant differences between the better-off, the less poor and the poorest households. But it was surprisingly different between the two landscapes, with many more cattle owners in all poverty categories in Uganda than in the Tanzanian landscape. In Tanzania on the other hand 29% and 38% (against 8% and 30%) of the less poor and the poorest owned no animals at all.

Needs satisfaction

Needs satisfaction, i.e. food security, food quality, housing quality, health conditions, child education and dressing are widely considered as important aspects in the conventional basic needs surveys. These aspects were similarly reflected in the local perceptions of household well-being inquired into during the well-being rankings.

Household food security (IFOOD)

The level of household food security was a frequently mentioned aspect in the descriptions of well-being obtained during the well-being rankings. Table 9 presents the distribution of households in Kasyoha-Kitomi and South Nguru by poverty level with respect to their level of household food security.

The table distinguishes between households that have not experienced a period of food shortage within the previous year; households that have experienced a period of food shortage of less than two months during the past year; and households that have experienced a period of food shortage lasting more than two months during the previous year (households with a longer period of food shortage, but whose only recourse was to eat less meat, or to rely more on the farm's own produce, or on bought food, were also placed in the middle group).

Generally, the level of food security in 2005 was much higher in South Nguru than in Kasyoha-Kitomi, where it, by the way, was very similar to neighbouring districts in Uganda in 2001.

Table 9 Household food security by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IFOOD)

Forest land-scape	Option	Poverty level			All poverty levels
		Better-off	less poor	poorest	
Kasyoha-Kitomi (N=384)	No food shortage the last year	78%	52%	8%	35%
	Food shortage less than two months	14%	20%	19%	19%
	Food shortage two months or more	8%	28%	73%	46%
	Total	100%(N=51)	100%(N=152)	100%(N=181)	100%
South Nguru (N=368)	No food shortage the last year	99%	76%	27%	67%
	Food shortage less than two months	1%	16%	42%	23%
	Food shortage two months or more	0%	7%	32%	11%
	Total	100%(N=70)	99%(N=219)	101%(N=79)	101%

Significant correlation between the poverty level and food security at the 0.01 level in both landscapes (Pearson chi-square test)

With 46% of all households having experienced food shortage for more than two months over a year, the situation in Kasyoha-Kitomi was equal to that of most other districts in Uganda, whereas it was much better in the Tanzanian landscape where only 11% experienced a food shortage of similar duration. Even the poorest households seem much less food insecure in South Nguru than in Kasyoha-Kitomi (with only 32 % with more than 2 months food shortage against 73% of the poorest in Kasyoha-Kitomi).

Quality of diet (IFEED)

In eliciting the local perceptions of well-being it was found that the diet of different households and their ability to purchase certain food items such as sugar, cooking oil and meat was seen as an important indicator of household well-being. The indicator on the quality of the diet in the survey (table 10) distinguishes three levels of diet quality based upon the extent to which the household consumes sugar, meat and fried food, i.e. whether they bought sugar when they last ran out it, ate meat at least once a month, and fried food at least once a week; or either did not buy sugar when they last ran out of sugar, ate meat less than once a month, or fried food only occasionally (but not all three conditions at once); or went without sugar when they last ran out of sugar, ate meat less than once a month and fry food only occasionally.

Table 10 Quality of diet by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IFEED)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	Poorest	
Kasyoha-Kitomi (N=400)	Buy sugar, eat meat, fry food regularly	32%	4%	1%	7%
	Do not buy sugar, eat meat, or fry food (all three) regularly	66%	82%	61%	70%
	Rarely buy sugar, eat meat, and fry food	2%	15%	38%	24%
	Total	100%(N=56)	101%(N=158)	100%(N=186)	101%
South Nguru (N=390)	Buy sugar, eat meat, fry food regularly	23%	21%	4%	17%
	Do not buy sugar, eat meat, or fry food (all three) regularly	76%	74%	68%	73%
	Rarely buy sugar, eat meat, and fry food	1%	6%	28%	11%
		100%(N=70)	101%(N=223)	100%(N=97)	101%

Significant correlation between the poverty levels and quality of diet at the 0.01 level for both landscapes (Pearsons chi-square test)

The people in South Nguru seem not only much more food secure (as shown above), they are also generally better-off in terms of the quality of the diet than those in Kasyoha-Kitomi as more of them buy sugar, eat meat, and fry food (17% against 7%), and fewer rarely do so (11% against 24%). In both landscapes, however, diet is clearly correlated with poverty.

Dressing (IDRESS)

As the final indicator on which Tanzanians do better than Ugandans in the landscapes, table 11 shows the distribution of better-off, less poor and poorest households according to the dressing quality in the two landscapes. The table distinguishes three levels of dressing quality based on the ways in which dressing was used as an indicator of household well-being in the well-being rankings, namely dressing well, dressing fair and dressing poorly.

Table 11 Dressing by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IDRESS)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	poorest	
Kasyoha-Kitomi (N=376)	Dressing well	43%	13%	5%	14%
	Dressing fair	58%	87%	93%	85%
	Dressing poorly	0%	0%	2%	1%
	Total	101%(N=56)	100%(N=150)	100%(N=170)	100%
South Nguru (N=342)	Dressing well	68%	33%	12%	35%
	Dressing fair	32%	67%	81%	64%
	Dressing poorly	0%	0%	7%	2%
	Total	100%(N=66)	100%(N=201)	100%(N=75)	101%

Significant correlation between the poverty levels and dressing at the 0.01 level in both landscapes (Pearsons chi-square test)

Dressing well is defined as when a woman owns shoes and both the woman and the children (if any) get new clothes on a regular basis (more than twice a year). Dressing fair is defined as when a woman owns shoes, but the woman or the children last got new clothes half a year (or more) ago, or she does not own shoes but she and/or the children got new clothes at least half a year ago. Finally, dressing poorly is defined as when a woman does not own shoes and both the woman and the children last got new clothes a year or more ago.

The dressing is much better in both landscapes today than it was four years ago in neighbouring Kabarole and Rakai Districts in Uganda. While hardly anybody is now in the worst situation, four years ago it was about 10% for all poverty levels on average in Kabarole and Rakai and 20-30 % for the poorest group. In both landscapes dressing is clearly correlated with wealth, but it is significantly better for all three poverty levels in South Nguru than in Kasyoha-Kitomi.

Housing (IHOUSING)

Housing quality also featured prominently in the local perceptions of household well-being. Table 12 describes the housing quality of the populations in the landscapes by poverty levels. Based on the descriptions obtained during the well-being rankings, housing quality is reflected in types of materials which the roof and walls are made of, as well as whether the house is in need of major maintenance.

Table 12 Housing by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IHOUSING)

Forest land-scape	Option	Poverty level			All poverty levels
		Better-off	less poor	Poorest	
Kasyoha-Kitomi (N=394)	Brick/plastered walls and iron/tile roofs	44%	15%	6%	15%
	Plastered/brick walls, or iron/tile roof	51%	76%	76%	73%
	Walls of Mud/tins/leaves and grass/leaves /plastic roofs, or houses needing repairs	6%	9%	19%	13%
	TOTAL	101%(N=55)	100%(N=156)	101%(N=183)	101%
South Nguru (N=356)	Brick/plastered walls and iron/tile roofs	54%	20%	3%	19%
	Plastered/brick walls, or iron/tile roof	36%	45%	26%	39%
	Walls of Mud/tins/leaves and grass/leaves /plastic roofs, or houses needing repairs	10%	36%	71%	42%
		100%(N=39)	101%(N=220)	100%(N=97)	

Significant correlation between the poverty levels and housing quality at the 0.01 level for both landscapes (Pearson chi-square test)

Thus, three levels of housing quality are distinguished, namely good housing quality, where the house has plastered walls or walls made of bricks and has an iron or tiled roof; intermediate housing quality, referring to houses where either the roof is tiled or made of iron sheets, or the walls are plastered or made of bricks (but not both at the same time); and lowest housing quality, which refers to houses with walls made of mud, old tins or banana or other leaves, and the roof is grass thatched or made from banana leaves, old tins, polythene, etc. or houses which are in need of major repairs, irrespective of the materials of walls and roof.

From Table 12 it appears that this is one measure for which equality is not more prevalent in Tanzania than in the Ugandan landscape. In Kasyoha-Kitomi 73% of all households have roofs of corrugated iron, but less than 20% have walls of improved quality. In South Nguru houses with both improved roof and walls are almost as common as in Kasyoha-Kitomi, but much more often than in Kasyoha-Kitomi houses have neither. In both landscapes wealth and housing are, however, correlated, i.e. a better off family is more likely to have a good house than a poor.

Health conditions (IHEALTH)

On health and education, as well as the two demographic indicators, marital status and age, the two landscapes are very similar, overall.

Health is another key aspect when describing well-being. Not only does poor health in itself reduce a person's well-being; having a household member with health problems implies health care expenditures, and it may reduce the income-earning capacity of the household. Based on the ways in which poor health was described during the well-being rankings, a set of diseases associated with serious health problems was identified and forms the basis for the health indicator, distinguishing between households where somebody is either disabled or suffers from tuberculosis (T.B.), HIV/AIDS, anaemia or chest-related diseases (reckoned as belonging to the poorest) and households where nobody suffers from any of these diseases (the less poor).

Although malaria is obviously one of the major health problems, it is difficult to use as a distinguishing indicator, precisely because it is so widespread among all groups, and very difficult to diagnose precisely in the frequent absence of blood tests. Also the widespread stigmatisation of HIV/AIDS, makes this indictor another difficult one on which to get "correct" answers in a questionnaire inquiry, maybe particularly under the less outspoken HIV/AIDS policies in Tanzania (see Tanzania's very low N figure).

Table 13 presents the distribution of the populations by poverty level with respect to health status. The two landscapes do not appear to differ in terms of health. As expected, health-wise, the poorest seem to be worst off in both landscapes, but the apparent health gradient from the better-off to the poorest in both landscapes, is just not significant. Also the people in both landscapes, judged by their health score, seem slightly better-off than in similar Ugandan areas.

Table 13 Health conditions by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IHEALTH)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	Poorest	
KASYOHA-KITOMI (N=392)	Nobody suffers from TB, HIV/AIDS, anaemia, chest diseases or are disabled	89%	83%	77%	81%
	Somebody suffers from TB, HIV/AIDS etc or are disabled	12%	17%	23%	19%
	Total	101%(N=52)	100%(N=155)	100%(N=185)	100%
South Nguru (N=291)	Nobody suffers from TB, HIV/AIDS, anaemia, chest diseases or are disabled	85%	75%	66%	75%
	Somebody suffers from TB, HIV/AIDS etc or are disabled	15%	25%	34%	25%
	Total	100%(N=59)	100%(N=164)	100%(N=68)	100%

Insignificant correlation between the poverty levels and health in both landscapes. (At 0.055 very nearly significant in South Nguru) (Pearson chi-square test)

Children's education (ISCHOOL)

The ability to educate children was identified as a measure of well-being considering the financial responsibilities attached to it and the future opportunities that well-educated children represent to a household. Three aspects of schooling were taken into account, namely whether the household had any children going to school at all; the type of primary school , whether no payment school (UPE/other public); or private school currently attended by children from the household, and whether any children of the household currently or previously attended secondary school. Table 14 presents the distribution of households according to their ability to educate children by poverty level in the two landscapes.

As would be expected, the better off households in both areas can significantly more easily afford private schools or education up to secondary level, than are the less poor and poorest households. Similarly, the poorest households are significantly more likely to have children, who do not attend school at all. The two landscapes appear very similar in both respects, but the relationship is even more skewed in South Nguru than in Kasyoha-Kitomi.

Table 14 Education of children by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (ISCHOOL)

Forest land-scape	Option	Poverty leve			All poverty levels
		better-off	less poor	Poorest	
KASYOHA-KITOMI	Children in private schools or secondary school	49%	16%	8%	17%
	Only children in public school, none in secondary school	37%	69%	68%	64%
	Only children not in school	14%	15%	24%	19%
	Total	100%(N=51)	100%(N=130)	100%(N=152)	100%
South Nguru (N=284)	Children in private schools or secondary school	62%	9%	1%	18%
	Only children in public school, none in secondary school	35%	69%	65%	62%
	Only children not in school	4%	21%	33%	21%
	Total	101%(N=55)	99%(N=160)	99%(N=69)	101%

Significant correlation between the poverty levels and schooling at the 0.01 level for both landscapes (Pearsons chi-square test)

Demographic characteristics

Demographic features – more specifically the marital status of the household head and the age of the household head and spouse – constitute the final general aspect, which emerged from the local descriptions of well-being. Households headed by singles, particularly widows, were generally perceived as disfavoured, just as old age was often seen to reinforce other conditions associated with low levels of well-being. The two forest landscapes were very similar in both respects, and their people much less disfavoured on these accounts than on so many others. The following section describes the better-off, the less poor and the poorest households with respect to their marital status and age of household head in the sample areas.

Marital status of household head (IMARITAL)

Table 15 describes the marital status of the household heads by poverty level. It distinguishes between the average household, i.e. male household heads, who live with the family, are absent, but supportive of the family, or are single; and the poorest, the female household heads, who are either singles, divorced or widowed. Households with male heads, who live elsewhere and do nothing to support their families, i.e. are virtually not there, are also placed in the latter group, as are child headed households.

Table 15 Marital status of household head by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IMARITAL)

Forest Land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	Poorest	
Kasyoha -Kitomi (N=398)	Household head is a supportive married or single man	96%	91%	80%	86%
	The head is a woman, a child, or a male not supporting the household	4%	9%	21%	14%
	Total	100%(N=56)	100%(N=157)	101%(N=185)	100%
South Nguru (N=386)	Household head is a sup-portive married or single man	84%	85%	83%	84%
	The head is a woman, a child, or a male not supporting the household	16%	15%	18%	16%
	Total	100%(N=82)	100%(N=221)	101%(N=97)	100%

Significant correlation between the poverty levels and marital status at the 0.01 level in Kasyoha-Kitomi, .but no correlation in South Nguru (Pearson chi- square test)

In terms of marital status there is very little difference between the landscapes. The better-off and less poor are slightly more prone to be male and supportive of the household than the poorest households in Uganda, while in Tanzania there is no difference across poverty levels.

Age of household head and spouse (IAGE)

Despite the emphasis placed on old age as a descriptor of the households of the lowest levels of well-being by local well-being ranking informants, Table 16 shows only a weak correlation in Uganda and none in Tanzania between age of the household head and spouse and poverty level.

Overall, very few households are headed by couples of which at least one is above 55 years of age, namely 4-10% in the two landscapes. There is no significant difference between landscapes in terms of age composition.

Table 16 Age by household poverty level in the forest landscapes Kasyoha-Kitomi, Uganda and South Nguru, Tanzania

Percent households per poverty level (IAGE)

Forest land-scape	Option	Poverty level			All poverty levels
		better-off	less poor	poorest	
KASYOHA-KITOMI (N=399)	Household head or wife is < 55 years old	95%	93%	86%	90%
	Household head and wife are >55 years old	5%	7%	14%	10%
	Total	100%(N=56)	100%(N=158)	100%(N=185)	100%
South Nguru (N=379)	Household head or wife is <55 old	91%	94%	85%	92%
	Household head and wife are >55 old	9%	6%	15%	8%
	Total	100%(N=69)	100%(N=215)	100%(N=95)	

Significant correlation between the poverty levels and age at the 0.05 level for Kasyoha-Kitomi only (Pearsons chi-square test)

Summary on household poverty indicators

- All indicators are strongly correlated with poverty, except marital status, for which there is no correlation in South Nguru, and health, with no correlation in both landscapes.
- On the overall score for the three poverty levels taken together, the general tendency is that the people in South Nguru are favoured in terms of land ownership, doing little casual labour, having a much better food security and quality of diet, and dressing better, whereas people in Kasyoha-Kitomi are better-off in terms of earning non-agricultural incomes, animal ownership, and housing.
- There is a considerable difference among the better-off, less poor and the poorest households in the landscapes with respect to how they derive their livelihood. On land ownership and hiring and doing casual agricultural labour, people in Tanzania are generally better-off, while households in Uganda fare better when it comes to non-agricultural incomes and animal ownership.
- With regard to needs satisfaction i.e. food security, food quality, housing quality, health conditions, child education and dressing, these are widely considered important aspects in the conventional basic needs surveys. The level of food security, the quality of the diet, as well as dressing are higher in South Nguru than in Kasyoha-Kitomi among all poverty groups. Housing is one measure for which equality is not more prevalent in Tanzania than in the Ugandan landscape. In both landscapes, all of the indicators were also correlated with poverty.
- On health and education, as well as the two demographic indicators, marital status and age, the situation in the two landscapes were very similar overall.

PART 2. 2005 LIVELIHOODS OF THE POOREST POPULATIONS IN THE TWO LANDSCAPES

The livelihoods of different households in the population of a landscape are, as we have shown above, to a large extent based on material conditions, i.e. their individual resource endowments. There are other, broader characteristics, however, playing a role in determining people's livelihoods, such as the environmental situation of the area where people live, as well as their history of living there, incl. tribal background.

Sections 5 and 6 analyses people's livelihoods in this broad sense, but as the Participatory Environmental Management (PEMA) objectives are particularly to increase the wealth of the poorer households (Participatory Environmental Management (PEMA) 2003, Annex 2) and improve their livelihood security (Participatory Environmental Management (PEMA) 2003, p14) these sections deal especially with the poorer populations in the two landscapes. However, to give a clear picture of the situation of the poorest households compared to that of the whole landscape population, for all factors these two groups are also compared.

Furthermore, the discussion is carried out for each landscape separately, allowing readers with a special interest in Kasyoha-Kitomi and Uganda to limit reading to section 5 and those interested in South Nguru and Tanzania to read section 6 only (see Uganda map on p. 5 and Tanzania map on p. 8).

5. LIVELIHOODS AMONG THE POOREST IN THE KASYOHA-KITOMI FOREST LANDSCAPE

Apart from the households' individual resource endowments, ecological background, and family histories, broader social factors also play a role for livelihoods, but in the areas we are concerned with here such aspects as urbanization and educational background are of very limited differentiation, and, therefore, have very little bearing on livelihoods. In Kasyoha-Kitomi only 2% of the households have no agricultural land, and all the eight households concerned belong to the poorest household category (not an urbanised lot). Hardly any (less than 2%) of the household heads have an education reaching beyond secondary school, three out of the six being among the better-off. Those 7% of all the household heads that did reach secondary school

comprise 4%, 8%, and 17% respectively of the poorest, less poor, and those who are better-off, meaning that the correlation is significant, but the number of people involved is small.

People's participation in an agricultural group, a natural resource management group, or any other group, i.e. active involvement with civil society, is usually regarded as important for their livelihoods as well. However, this is rather limited in both landscapes. In Kasyoha-Kitomi only around 20% claimed simply to have a member in any such group, compared to 50% in a similar survey in neighbouring Kabale District (Boesen and Miiro 2004, p 42). It was clearly correlated with poverty level, as 13% of the poorest in the Kasyoha-Kitomi survey and 25% of the better off households claimed group membership.

Poverty and area of residence, migration pattern and tribal affiliation in Kasyoha-Kitomi

While ethnicity and poverty is not correlated within the landscape population as a whole, there is a very clear connection between poverty level and the birthplace of the head of household in the whole landscape (0,01 level). Of the better off households 75% still live in their native villages, with just over 10% each being born in another village in the district or outside the district. Of the poorest, on the other hand, 40% live in the same village, where they were born, nearly as many live within the same district, and over 20% were born outside the district.

The poorest households, comprising almost half of all the households in the Kasyoha-Kitomi landscape, are especially concentrated in its western part, towards the Queen Elizabeth National Park (Katerera and Ryeru sub-counties in the survey), where they make up 60% of the households, against 36% in the South, towards the population centres, (Kyabugimbi, Kyamuhunga, and Kakanju sub-counties) and 29% east of the forest (Burere and Bihanga sub-counties). The West, South, and East of the forest landscape are depicted in the map on p. 5.

This difference is clearly also related to the settlement pattern: of all households in the landscape, who remained in their native village, 20% belong to the better off group and 33% to the poorest, while among the migrants less than 10% are better-off and more than 50% rank among the poorest. Put in another way, 70-80% of the population to the South and East were born in the village where they now live, while only half that number did so in the West, the remainder having migrated there. Among the poorest households almost 70 % in the western sub-counties are migrants. In the South and East, on the contrary, 55-60% live in their native village. The West thus has somewhat newer settlements.

While, overall in the landscape, there is no correlation between poverty level and tribe, clearly the major groups of bakiga migrating from Kabale district in the deep south, and of banyankole moving there from within the area contribute to lowering the poverty status of the West. The third tribe in the landscape, the Luguru tribe of Bitoha parish in Ryeru sub-county in the West, who are all native to the same village where they now live, are drawing the poverty index upwards, as many of them belong to the less poor and better-off. The Ugandan waluguru, a small tribe in one parish only, are in no way related to their Tanzanian namesakes, the Luguru tribe, which is the second major tribe in the South Nguru landscape.

Of the poorest in the landscape 52% are banyankole, 41% bakiga, and 7% are of the Luguru tribe. In the South the poorest are 100% banyankole. In both the two other sub-counties the Kiga tribe is slightly bigger than the Nyankole tribe, while the waluguru make up 59% of the poorest in Bitoha parish.

Land, animals, and agriculture of the poorest

Poverty is very much related to land-ownership: in the landscape 63% of the poorest have less than an acre of land, 77% of the better-off have more than 2 acres, and the biggest group of intermediate households, the less poor, 39%, are those having an intermediate 1-2 acres of land.

As shown in Table 17, land ownership is very unevenly distributed even among the poorest households. More people own the larger areas of land in the South and East than in the more recent settlements in the West, where 70% of the poorest have less than an acre of land!

Table 17 Land owned by the poorest households by residence in the Kasyoha-Kitomi forest landscape, Uganda.

Percent households belonging to the poorest level

Residence **Land owned**	**West** (N=120)	**South** (N=43)	**East** (N=23)	**Kasyoha-Kitomi total** (N=186)	**Kasyoha-Kitomi all poverty levels** (N=398)
>2acres	5%	14%	17%	9%	27%
1-2acres	25%	42%	22%	29%	32%
<1	70%	44%	61%	63%	42%
Total	100%	100%	100%	101%	101%

Significant correlation between the living areas and land owned at the 0.05 level (Pearsons chi-square test)

In the West and East over 60% have registered ownership to most of their land, while this is the case for only 10% in the South. The remainder, i.e. as many as 90% of households in the South, have unregistered, customary land. Clearly this difference cannot be due to migration patterns alone, since there are twice as many migrants in the West as in the East, but nearly the same number in the East and South. Migrants do seem more prone to seek more modern, secure ownership than non-migrants, and the need for secure, registered ownership seems even stronger for migrants to another district than for internal migrants, but with 45% migrants the low level of land registration of the Southern parishes must also be due to a mutually re-enforcing effect of an overwhelmingly unmixed, traditionalist Nyankole population, with relatively large holdings, already felt as secure enough.

Of the better off households in the whole landscape 50% leave land to lie fallow, while only 17% of the poorest can afford to do so, all of them mostly doing it because of falling fertility. Only 9% of the poorest in the West, who also had least land, have fallow land, against some 33% of the poorest in North/West of the landscape. As usual, the poorest are most likely to rent land, to supplement the little land they have. However, among the poorest people in Kasyoha-Kitomi in the South and East, who had most land, 84% and 57% had also been renting in one of the last two seasons. 77% of those in the western counties did so.

The poverty score on the animal ownership indicator is very similar to neighbouring Kabarole and Rakai districts both for the landscape as a whole and for the poorest part of the households, of whom 30% have no animals at all, 63 % own some smallstock, while 7% also have a few cows. The poorest have a little more animals in the West and South than in the East.

Of all farmers in the landscape 85-95% grow beans and bananas (eaten cooked as a staple). For all major crops grown, there is a slight, hardly discernible, bias against the poorest. Next in importance are root crops, i.e. cassava, sweet potatoes, and yams, followed by small grains and maize, all staples and grown by upwards of 50% of the farmers. Fruits and vegetables are grown by about 40%, and export crops, the only crops grown exclusively for sale, by just below 40%.

Beans and bananas are sold by fewer farmers, especially among the poorest households of whom only 55% sell beans and 37% bananas. Other staples are sold by less than ¼ of the poorest farmers, but, interestingly, among the poor more farmers sell maize, root crops, and groundnuts, than among the better off half.

Many more of the poor farmers in the South sell beans, bananas, groundnut and small grains than in the other parts of the landscape. Especially in the East, farming is very much subsistence

based as hardly any staples like bananas, maize, or small grains, nor groundnuts get to the market. The East, at the same time, is much better-off on food security, with "only" 57% of the poorest households reporting severe food insecurity, compared with both the West and especially the South, with 73% and 82% of the poorest households experiencing a high degree of food insecurity. This only goes to confirm that, contrary to beliefs, it is quite normal for those households that are least involved in the market, also to be the most food secure.

The exception are export crops, which are sold by 13% of the poorest in the West, 16 % in the South and 22% in the East.

The waluguru grow more crops than do other tribes, and at the same time they are the most food insecure of the tribes, in terms of the length of period with too little food. This is probably related to a very high frequency of selling food crops, which again may well be because they grow and sell very little export crops compared with the Kiga and Nyankole tribesmen.

One obvious target for agricultural interventions supposed to be able to increase agricultural production, and thus to reduce over-exploitation of forest resources, are agricultural practices, i.e. soil conservation and improvement, and improved technologies practised by people in the forest landscape. Often the better off people would be expected to be more likely to employ agricultural improvements, education making it more easy for them to afford it, etc.

There is no clear connection, however, between poverty level and the first of the practices looked at, soil conservation, neither in the landscape as a whole, nor in its constituent parts. On the other hand, as Table 18 shows the area in which people live is very significantly related to whether they regard soil erosion as a problem and the degree to which they undertake soil conservation. While much more soil erosion is observed in the South and East than in the West, only just over 50% of the poorest in the East try to prevent it, against 80% in the North (where the problem is much less) and South. There the same numbers, or a little less, practise soil improvement, whereas only less than 10% of the households in the East do so.

Table 18 Soil conservation and improvement by area of residence among the poorest households in the Kasyoha-Kitomi forest landscape, Uganda

Percent households belonging to the poorest level

Residence **Soil practises**	**West** (N=120)	**South** (N=43)	**East** (N=23)	**Kasyoha-Kitomi total** (N=186)	**Kasyoha-Kitomi all poverty levels** (N=397)
Observe a lot of soil erosion	33%	73%	78%	47%	54%
Practise soil conservation	80%	81%	52%	77%	76%
Practise soil improvement	80%	52%	9%	74%	72%

Significant correlation between the areas of residence and agriculture at the 0.01 level (Pearsons chi-square test)

When it comes to what people do to prevent soil erosion, to improve the soils, or other agricultural innovations, there are again no significant correlation between improvements and poverty level (Table 19), but all the agricultural practices noted below are correlated with area of residence, although not in the same way for all practices.

The more complicated (and expensive) work to prevent soil erosion, i.e. earthworks or grass/trash lining are clearly more prevalent in the West, followed by the East, while undertaken by very few in the South. (It is not significantly related to the tribe). The easier contour ploughing on the contrary is done by most people in the South, approximately half the households in the East, and much fewer in the West. This difference is especially caused by less than 10% of all bakiga in the landscape applying contour ploughing.

The same picture is actually revealed for contour ploughing for composting (which may be both soil conservation or soil improvement), and application of manure: they are done by most of the waluguru, by fewer banyankole, and least by the Kiga tribes-people. Composting and manuring are also done by fewest of the households in the East (bakiga and banyankole).

Table 19 Agricultural practices used by area of residence among the poorest households in the Kasyoha-Kitomi forest landscape, Uganda

Percent households belonging to the poorest level

Residence / **Agricultural practice**	**West** (N=120)	**South** (N=43)	**East** (N=23)	**Kasyoha-Kitomi total** (N=186)	**Kasyoha-Kitomi all poverty levels** (N=398)
Earthworks or lining against erosion	52%	14%	35%	41%	40%
Contour ploughing against erosion	24%	72%	48%	38%	38%
Compost/refuse/mulch for soil conservation or improvement	83%	84%	26%	76%	78%
Apply any manure for soil improvement	42%	51%	5%	40%	44%
Improved seeds	11%	21%	15%	14%	23%
Irrigation	10%	9%	5%	9%	11%
Integrated pest management	3%	23%	10%	8%	9%

Agricultural practice is significantly correlated with area of residence at the 0,01 level for Earthworks etc. for Contour ploughing, for Composting etc. for Applying manure, and for Pest management, but the correlation is not significant for Seeds and Irrigation. (Pearson chi-square tests).

About 15% of the Nyankole households use improved seeds, irrigation or integrated pest management, and a similar number of bakiga use improved seeds. All other agricultural innovations are practised by very few, if any, of the poorest in the landscape.

Natural resources and the forest: water and fuel wood

There is no correlation between the poverty level and the landscape population's use of different unimproved and improved water resources. As shown in Table 20, rivers and streams are used by app. 50% of the whole population, unprotected springs, wells or water holes by another 20%, while 45% have a protected source, be it a protected spring (by far the most common), pumped or tap water. About 33% also use supplementary rainwater.

The time used to fetch water (the distance) on the other hand is very clearly correlated with poverty: of the better-off 52% live within 10 minutes from their water source and only 14% have more than 20 minutes to walk, whereas 40% of the poorest live more than 20 minutes away from their source of water and only 21% are within 10 minutes of theirs.

A Nyankole family living in one of the southern sub-counties has a very good chance of being served with an improved water supply, most likely a protected spring. This is in fact fair enough,

since the worst quality water is available to the poorest in the south, from unprotected springs or even water holes as there are few rivers or streams. Kiga or Luguru households in the West and East are much more likely to have water from rivers or streams.

The poorest people in the South do not only appear to have more improved water sources, but also those closest to their residence, as only 30% have more than 20 min. to walk to get water. In the West it is not many more, 38%, whereas it is fully 70% of the poorest households in the East, who have a very long distance to their water supply.

With nearly 60% of the poorest in the West and less than 10% in the South and East describing that their water source originates from the forest, the correlation is with residence rather than with poverty level. The bakiga and to some extent the banyankole of the West have water originating in the forest, which is the case for less than 10% of the waluguru.

Table 20 Time used to fetch water and different water sources used for household consumption by area of residence and tribe among the poorest households in the Kasyoha-Kitomi forest landscape, Uganda

Percent households belonging to the poorest level

Residence **Time and source**	**West** (N=119)	**South** (N=43)	**East** N=23)	**Kasyoha-Kitomi total** (N=185)	**Kasyoha-Kitomi all poverty levels** (N=398)
>20 min. to fetch water	38%	30%	70%	40%	33%
Rivers and streams	66%	9%	50%	51%	51%
Unprotected springs, wells, or water holes	13%	42%	23%	21%	25%
Improved water sources	45%	54%	27%	44%	38%
Water source originating in the forest	57%	7%	9%	39%	34%
Tribal affiliation	**Kiga** (N=75)	**Luguru** (N=13)	**Nyankole** (N=94)		
>20 min. to fetch water	31%	69%	44%	40%	33%
Rivers and streams	68%	62%	36%	51%	51%
Unprotected springs, wells, or water holes	19%	0%	25%	20%	25%
Improved water sources	25%	39%	61%	45%	38%
Water source originating in the forest	55%	8%	31%	39%	34%

Rivers and streams, and origin of water source, both for residence and tribe, unprotected springs etc. for residence, improved water source for tribes, are signicantly correlated at the 0,01 level. Time used is correlated with residence at the 0,05 level. North/West are not correlated. (Pearson chi-square tests

Water is used productively by app. 60% of the landscape's better off population, but less than 40% of the poorest. Among the poorest, under 10 % of the households use water for irrigation (numbers are too small to give precise figures), and just over 10% use it for watering animals, irrespective of residence (Table 21). The exception, when it comes to residence, is the use of water for brewing, done by 28% of the poorest in the West, and again about 10 % of the households in North/West of the landscape.

Table 21 also shows that 25% (more than half the users) take productive water from rivers or streams, most in the West and very few in the South (where such sources are uncommon). Almost as many use an improved water source (some few combining both), but nobody does so in the East, where such sources are fewest.

Table 21 Type of productive water resource use, and source used by area of residence among the poorest households in the Kasyoha-Kitomi forest landscape, Uganda

Percent households belonging to the poorest level

Residence / **Water use and source**	**West** (N=119)	**South** (N=43)	**East** (N=23)	**Kasyoha-Kitomi total** (N=185)	**Kasyoha-Kitomi all poverty levels**(N=394)
Irrigation	-	-	-	5-10%	5-10%
Animals	13%	14%	13%	13%	24%
Brewing	28%	9%	9%	22%	21%
Any productive use	46%	24%	26%	38%	43%
Rivers and streams	33%	7%	22%	25%	28%
Unprotected springs, wells, or water holes	13%	7%	4%	10%	13%
Improved water sources	26%	16%	0%	21%	21%
Water originates from forest, % of productive water users	47%	10%	33%	40%	33%

Water use for brewing is correlated with residence at the 0,01 level, any productive use at the 0,05 level. Other use correlations are insignificant. Use of productive water from Rivers and streams is significantly correlated with residence at the 0,01 level and from Improved sources at the 0,05 level. Water from Springs etc. is not correlated at all. Numbers of productive water users in the South and East are too small for the correlation to be significant. (Pearson chi-square tests).

The origin of the productive water (14% of sources originating in the forest) is not correlated with the poverty level of landscape households. Residence of producers and origin of productive water is significantly related, with by far the most users in the western sub-counties, where also more water for production comes from the forest.

All households in the landscape, irrespective of poverty status, area of residence and tribal affiliation, use mainly firewood for fuel (Table 22 above). Supplementary use of kerosene and charcoal is not correlated with poverty level, but for the poorest group both correlate significantly with both area of residence and tribe. A lot of the banyankole in the South supplements firewood with kerosene, and so do almost all of the waluguru.

Table 22 Fuel use by area of residence among the poorest households in the Kasyoha-Kitomi forest landscape, Uganda.

Percent households belonging to the poorest level

Residence **Fuel use**	**West** (N=120)	**South** (N=43)	**East** (N=23)	**Kasyoha-Kitomi total** (N=186)	**Kasyoha-Kitomi all poverty levels** (N=399)
Firewood	99%	100%	100%	100%	98%
Kerosene	16%	47%	4%	22%	20%
Charcoal	17%	7%	0%	12%	14%
Tribal affiliation	**Kiga** (N=75)	**Luguru** (N=13)	**Nyankole** (N=95)		
Firewood	100%	100%	100%	100%	98%
Kerosene	0%	92%	30%	22%	20%
Charcoal	23%	0%	6%	13%	14%

Kerosene use is significantly correlated with both residence and tribe, and charcoal use with tribe at the 0.01 level. Charcoal use with residence at the 0.05 level.

Like distance to water, so is distance to firewood, as seen from Table 23, much smaller the wealthier the household (significantly correlated with poverty level). Among the poorest, the majority in the East live more than an hour's walk from their supply of wood. In the East and South, however, this resource is much more equally distributed, except that more than 60% of the waluguru have more than an hour to go to fetch firewood.

Table 23 Distance to firewood by area of residence among the poorest households in the Kasyoha-Kitomi forest landscape, Uganda

Percent households belonging to the poorest level

Residence / Distance	West (N=117)	South (N=43)	East (N=23)	Kasyoha-Kitomi total (N=183)	Kasyoha-Kitomi all poverty levels(N=391)
Less than 30 min.	33%	28%	13%	29%	33%
30 min.- 1 hour	28%	42%	22%	31%	33%
More than 1 hour	39%	30%	65%	40%	35%
	100%	100%	100%	100%	100%

Correlation between distance and residence significant at the 0.05 level.

Summary of livelihoods of the poorest people in Kasyoha-Kitomi of Uganda

In Sections 3 and 4 individual households' poverty indicators, i.e. their sources of livelihoods, needs satisfaction, and basic demography were presented. The following two sections analyse in more detail how people derive their livelihoods, from agriculture, water and fuel, depending on where they live, their history of migration, and ethnicity.

This analysis deals specifically with the poorest section of the population, with whom Participatory Environmental Management (PEMA) is particularly concerned. For the landscape as a whole the livelihoods of the poorest group is seen against that of the other groups, with which it is connected of course. This section on Kasyoha-Kitomi can furthermore be read separately from the next section on South Nguru.

Generally, area of residence, migration, and ethnicity are related to poverty in the following way:

- While ethnicity and poverty are not correlated within the landscape population, there is a very clear connection between poverty level and the birthplace of the head of household in the whole landscape and between poverty and area of residence.
- The great majority of the better-off still remain in their native villages, with the poor being the most migrant part of the population.
- The West has generally newer settlements, and thus has the largest proportion of the poorest households (60% of all the people in the West, against 30-35% of the people in the South and East).

The poorest population group was roughly composed as follows:

- In the eastern sub-counties the poorest group consists mainly of households staying in villages where their head was born, banyankole in Bihanga and bakiga in Burere sub-county.
- In the South, all the people are banyankole, and from 40 to 70% of the poorest households remained in their village of birth, the rest being migrants from within the same district.
- In the western sub-counties the southernmost parish, Ndangaro, was also dominated by people of the Nyankole tribe, having similarly migrated there from within the district.
- In Katerera Sub-county and also Buzenga Parish in Ryeru the predominantly Kiga population were mostly migrants from their native Kabale District.
- Finally in Bitoha Parish, also in the West, almost 60% of the poorest were Luguru by tribe, staying in their native village.

They derived their livelihoods, in the main, from the following:

- Land is very unevenly distributed, with the better-off having much more land than the poorest group, with the less poor in between.
- Even among those at the poorest level land is unevenly distributed: On average, the size of land owned is biggest in the South and smallest in the West, where 44% and 70%, respectively, of the poorest own less than an acre of land.
- Almost all land among the unmixed, traditionalist, banyankole of the South is customary land, while 2/3 of the poorest in the East and West have registered ownership to most of their land.
- More than twice as many of the better-off as of all the poorest households have fallow land, very few of the poorest in the West, but a bit more in the North/West of the landscape, and mainly because of decreasing soil fertility. Of the poorest 60-80% rent land.
- Less than 10% of the poorest have cattle, but the majority have some small stock. There is least small stock in the East.
- Almost all farmers in the landscape grow the major food crops, bananas and beans, and all staples (cassava, sweet potatoes, yams, maize and small grains) are grown by more than half of them. Just under half of those who grow a crop are also selling. In the East farming is almost subsistence based, as few staples reach the market, and farmers there are better-off on food security than in the West, and especially the South.
- Contrary to expectations soil conservation or improvement are not correlated with wealth, whereas both are practised much more by the poorest people in the West than in the East, and especially the South. Other agricultural innovations are little used in the landscape.

- The better off households generally live much closer to their water than the poorest. Half of all the households get most water from rivers or streams, the other half from an improved source, mostly a protected spring, irrespective of poverty level.
- The banyankole in the South are most likely to have an improved water source, followed by bakiga and waluguru of the West, with fewest improved sources in the East. Nearly 60% of the water in the West originate from the forest, less than 10% in North/West.
- Water is only used productively by a sizeable proportion of the poorest people in the West, where almost 30% use water for brewing, and of which nearly half originate in the forest.
- All households in the landscape use mainly firewood for fuel. The poorest have longer to walk for their wood supply, especially in the East, where 65% have more than an hour's walk each way.

6. LIVELIHOODS AMONG THE POOREST IN THE SOUTH NGURU FOREST LANDSCAPE

Apart from the households' individual poverty (sections 3 and 4), ecological background, ethnicity, and family histories (this section), broader social factors also play a role in livelihoods, but in the areas we are concerned with here, such things as urbanization and educational background are of very limited differentiation, and therefore have very little bearing on livelihoods. In South Nguru, less than 2% of the households have no agricultural land, and of the 7 households concerned only one belongs to the better off household category (so not a very urbanised lot). Hardly any (just over 1%) of the household heads have an education reaching beyond secondary school, four out of five being among the better-off. Those 4% of all the household heads that do reach secondary school comprise 0%, 2%, and 15% respectively of the poorest, less poor, and those who are better-off, meaning that the correlation is significant, but the number of people involved is very small. Actually it is even smaller than in Uganda, although more skewed towards the better off household heads.

People's participation in an agricultural group, a natural resource management group, or any other group, i.e. active involvement with civil society, is usually also regarded as important for their livelihoods. However, this is limited in both landscapes, and in South Nguru only 2% claimed to have a member in any such group, much less than the 20% reached in Uganda.

Residence and poverty levels in the South Nguru forest landscape

The poorest level of households, according to the poverty categories discussed earlier comprising 25% of all the households in the South Nguru landscape, are concentrated in the easternmost wards where 64% of them live.

As shown in Table 24, there is greater polarisation between the better-off and the poorest in the eastern wards than elsewhere in the landscape, with a larger percentage of both the better-off and the poorest and fewer of the middle group, the less poor. This is probably due to the fact that the eastern wards, made up of Diongoya, Mtibwa, most of Mhonda, Sungaji, and Hembeti wards, are located closest to the landscape's urban centre, Turiani Town, and along the main lines of communication.

The northern part (Kanga ward around the separate Kanga Forest Reserve) is the poorest area with almost the same percentage at the poorest level as in the eastern wards, i.e. 28%, but fewer of the better-off. The poorest level comprises only 14% of the people in the western wards

(Mvomero, Maskati, and Kibati wards) and 17% in Ubiri village, located in Mhonda ward, but in the middle of the central Nguru South Forest Reserve.

Table 24 Area of residence (eastern, western, and northern wards, and Ubiri village) by poverty level (better-off, less poor, poorest) in the South Nguru forest landscape, Tanzania

Percent households per poverty level

Area of residence	Poverty level[b]			Total of South Nguru
	better-off	less poor	poorest	
Eastern wards	25%	46%	30%	100% (N=210)
Western wards	10%	76%	14%	100% (N=90)
Northern ward	10%	62%	28%	100% (N=60)
Ubiri village	10%	73%	17%	100% (N=30)
Total	18%	57%	25%	100% (N=390)

Significant correlation between poverty levels and residence at the 0.01 level (Pearsons chi-square test).

A methodological deviation for analysis of livelihoods of the poorest in South Nguru

Because of the relatively low degree of population polarisation in Tanzania and the high concentration of the population in the eastern wards of the South Nguru landscape compared with its western and northern wards, and the central village, the poorest level in the western, northern, and central parts would have yielded figures too small for a significant analysis. In order, therefore, to get significant sizes of segments of the poorest people in the landscape to analyse in more detail, it was decided to operate only with the 'East', comprising the more densely populated parts, with better lines of communication, to the East of the forest reserve (the same eastern wards as before), and the 'North/West' located to the North and West of the reserve – and within it.

The East (the eastern wards), then, comprises Diongoya Ward, Mtibwa Ward, Mhonda Ward (except Ubiri Village), Sungaji Ward, and Hembeti Ward. The North/West comprises the western wards, Mvomero Ward, Maskati Ward, and Kibati Ward, and the northern ward, Kanga Ward, and includes also Ubiri Village. The East and North/West of the South Nguru forest landscape are depicted in the map on p.8.

Similarly the poorest group, for the purpose of studying the least well off, was expanded to comprise all the households with a poverty index figure above the index median for the whole landscape, i.e. the poorest half of the landscape population, the opposite being denoted as the better off half (the median figure being placed in the better off half, which thus comprises 202 against 188 in the poorest half group).

Table 25 Area of residence ('East' and 'North/West' parts of the landscape) by Poverty level (the 'better off half' and the 'poorest half') in the South Nguru forest landscape in Tanzania

Percent households per area of residence

	Poverty level		Total of South Nguru
Area of residence	**Better off half** (N=202)	**poorest half** (N=188)	(N=390)
East (N=210)	48%	52%	100%
North/West (N=180)	57%	43%	100%
Total	52%	48%	100%

Insignificant correlation between poverty level and residence. (Significant only at 0.1 level). (Pearsons chi-square test)

Although the resulting correlation in Table 25 between the poverty categories and the area of residence is not significant, there is a continued tendency for the 'East' to have a greater percentage of respondents from the poorest half than the 'North/West' of the landscape does.

Poverty and the migration pattern in the South Nguru forest landscape – with an note on tribal affiliation

In South Nguru, there is a clear tendency for the poorest half of the people to remain in the village where they were born, which 71% do, whereas the same is the case for less than 60% of the better off half of the people. The tendency is the same whether they live in the East or North/West of the landscape - and the opposite of the tendency in Uganda.

Whereas tribal affiliation in Uganda is another obvious category of background identity, that does not seem to be the case to the same degree in Tanzania. Maybe it is regarded as belonging more to the private sphere. After a long period of public and political denial of its importance, a question about the tribe of the head of household drew a "missing" answer from 65% of the interviewees. This renders any analysis of the remaining 35% "positive" answers virtually useless, as the meaning of the missing answers is unclear.

Let it just be noted that the majority of those who did state their tribe in the East were waluguru (62%), in the North/West of the landscape wazigua (82%), the other tribe making up most of the remainder in both areas (despite bearing the same name, the Luguru tribe of Tanzania has no relationship with its namesake in Uganda).

Among those who did indicate their tribal affiliation there is a tendency for the waluguru to be the poorest, i.e. 60% of them belong to the poorest half in the East, and 100% belong to the poorest half among the small group of waluguru in the North/West of the landscape. In the East only 32% of the minority wazigua belong to the poorest half, and in the North/West, where they are the majority, 54% of them are among the poorest half of the population.

Land, animals, and agriculture of the poorest half of the people in South Nguru

Poverty, as already seen in the poverty analysis, is very significantly correlated with land-ownership: in the landscape 46% of the poorest half have less than one acre of land, while 34% have more than 2 acres; among the better off half, 27% have less than an acre of land and 49% more than 2 acres (half of them even have more than 5 acres, which only a handful of the poorest half do). Thus the difference is upward skewed in Tanzania and downward in Uganda in terms of numbers of poorest and better-off, and even more so in terms of acres owned. Land ownership is very uneven, even among the poorest half of the households.

As shown in Table 26 land owned by the poor is smallest on average in the East, where 57% have less than an acre of land. On the other hand, nearly 50% of the poorest half in the North/West of South Nguru have more than 2 acres of land

Table 26 Land owned by the poorest half by area of residence in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half of the population per area of residence

Residence / Land owned	East (N=108)	North/West (N=77)	South Nguru total (N=185)	South Nguru all house-holds (N=380)
>2acres	25%	47%	34%	42%
1-2acres	19%	21%	20%	22%
<1	57%	33%	46%	36%
Total	101%	101%	100%	101%

Significant correlation between the residence and land owned at the 0.01 level (Pearsons chi-square test)

In Tanzania relatively few, 17% of all households and 12% of the poor, as shown in Table 27, have registered ownership to any of their land, regarded as the more secure land right. By far the greatest part of the land, especially in the North/West of the landscape, is held under a customary land right, mostly inherited.

The small remaining part is leasehold, i.e. rented land, which is only common in the East (to some extent as a commodity from which to earn an income for people with enough land). The poorest, as usual, are most likely to rent land to supplement the little land they otherwise have. Among the poorest half in the East, customary land is held by "only" 66% of the people, since as many as 24% has some leasehold land. This may be even more in reality, since in Tanzania renting land is a really insecure form of holding, as the owner has to reclaim it after a few years in order for it not to revert to become property of the leaser.

Over 30% of the migrants in the East declare that most of their land is leased! Hardly any of them has land in freehold. Actually, among migrants from within the same district in both parts of the landscape more than half rented land last year. Curiously, hardly any of the migrants coming from another district did so, which may be because people with land to rent out prefer to do it to somebody from their own tribe, or because migrants from other districts have more fear of loosing the land?

Table 27 Land right held by the poorest half by area of residence in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half of the population per area of residence (multiple response)

Residence **Land owned**	**East** (N=86)	**North/West** (N=73)	**South Nguru total** (N=159)	**South Nguru all households** (N=380)
Freehold land	17%	6%	12%	17%
Leasehold land	24%	3%	15%	9%
Customary land	66%	96%	80%	87%

Less than 20% of all the households in the landscape leave land to lie fallow, a bit more in the East than in the North/West of the landscape. Also in the East, those with more land, both among all households and among the poorest, can better afford to fallow land than those households who have less land. In the North/West of the landscape there seems to be no such relationship.

In Uganda the loss of fertility of the soil was for all groups the major reason for fallowing land. In Tanzania that was also the case for the better off half, while for more than half of the poorest households lack of resources, manpower or money were given as the most prominent reasons for not being able to farm all their land.

All 15 cattle owners in the sample in the East belong to the better off half of the people. In the North/West of the landscape, where only two admit to be cattle owners, they are both among the poorest half and own less than 3 heads of cattle. That might be due to our sampling method and the settlement pattern in the western villages, where the Masai cattle herders are settled in separate villages, none of which happened to be selected for the survey. Also people may tend to avoid declaring cattle owned, in order to avoid superstition, envy, taxation, or even for fear of legal actions against environmental degradation. In the East cattle owners are more integrated in the ordinary villages. Among the poorest half, small stock are much more widespread in the East than in the North/West of South Nguru.

Typically for Tanzania, as seen in Table 28, the crop most grown by all farmers in South Nguru is maize. Like most other crops it is grown by a larger part of the better off half than of the poorest half, indicating a tendency for the better off half, generally, to grow a greater variety of crops. The only exception among the staples are root crops, which are grown by more of the poorest half of the farmers than maize, probably as a better coping mechanism against food shortages..

The other exception again, like in Uganda, are the export crops, i.e. coffee, tea, tobacco, cotton etc, mainly for exports and definitely for sale, and which especially in the East are grown by many more of the poorest half than of the better off half of the people. In the West a smaller number, equal for the poorest and better off half, grow export crops.

Table 28 Crops grown by the poorest half by area of residence in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half per area of residence (multiple response)

Residence / Crops grown	East (N=110)	North/West (N=78)	South Nguru total (N=188)	South Nguru all households (N=390)
Maize	56%	74%	64%	73%
Bananas	51%	40%	46%	48%
Root crops	74%	67%	71%	67%
Small grains	6%	26%	14%	18%
Rice	37%	24%	32%	35%
Beans	3%	33%	15%	18%
Export crops	70%	40%	57%	49%
Fruits/vegetables	31%	44%	36%	39%

Crops are sold by even fewer farmers in the Tanzanian landscape than in Uganda. According to answers in the survey just around half of those households that stated that they grow maize are also selling it (37% selling, 73% growing maize). More of the better off half and less of the poorest half are selling.

Table 29 Crops sold by the poorest half by area of residence in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half per area of residence (multiple response)

Residence / Crops grown	East (N=110)	North/West (N=78)	South Nguru total (N=188)	South Nguru all households (N=390)
Maize	20%	36%	27%	37%
Bananas	1%	12%	5%	4%
Beans	0%	31%	13%	11%
Export crops	20%	19%	20%	17%
Fruits/vegetables	8%	3%	6%	13%

According to Table 29 maize and fruits and vegetables are the only crops sold by more of the better off half than of the poorest half in Tanzania. Other main selling crops: export crops, beans and bananas (of which neither is selling a lot!), are sold by more of the poorest half than of the better off half, the same tendency as in Uganda with the poorest as the least self-reliant.

Only export crops and fruits and vegetables seem to be sold by more poor people in the East than in the North/West of South Nguru where they, on the other hand, sold more maize, bananas, and beans. More of the poorest half of the households in the East had to buy food last year (88% vs. 69%), more had longer periods of food shortage over the year (IFOOD, see p.29), and less had any supplementary non-agricultural incomes (INONAG; p. 26). In short the poorest half in the East seemed even less self-reliant than those in the North/West of the landscape.

One obvious target of agricultural interventions, which are supposed to be able to increase agricultural production, and thus to reduce over-exploitation of forest resources, are agricultural practices, i.e. soil conservation and improvement, and improved technologies practised by people in the forest landscape. Often the better off people would be expected to be more likely to employ agricultural improvements, education making it more easy for them to afford it, etc.

There is no significant connection, however, between poverty level and observed soil erosion in either landscape parts. On the other hand, as Table 30 shows, the area people live in is very significantly related to whether they regard soil erosion as a problem, and the degree to which they undertake soil conservation. Much more soil erosion is observed in the East than in the North/West of the landscape, and almost all those of the poorest half in the East, who observe a lot of erosion on their fields, do also claim to do something about it, which do significantly less of those belonging to the better off half – strangely enough. In the North/West where less than 10% of all households, and 15% of the poorest half, observed major erosion problems, there was no significant correlation between poverty and erosion.

Table 30 Soil conservation and improvement by area of residence among the poorest half of the households in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half per area of residence

Residence **Soil practises**	**East** (N=110)	**North/West** (N=78)	**South Nguru total** (N=188)	**South Nguru all house-holds** (N=390)
Observe a lot of soil erosion	59%	15%	41%	37%
Practise soil conservation	51%	13%	35%	24%
Practise soil improvement	14%	1%	9%	6%

The only significant correlations are between the areas of residence and soil conservation in both landscape parts and between poverty and soil conservation in the East at the 0.01 level (Pearsons chi-square test)

Few people do anything to improve their soils, neither among the better- off half nor poor, nor in the East or the North/West of the landscape.

Among the landscape's poorest half, then, 51% in the East and 13% in the North/West of the landscape practise some soil conservation, which almost inevitably means terracing, done by 48% and 12%, in the East and North/West (Table 31). Considering its cost, it is very difficult to explain, however, why in both landscape parts many more of the poorest half of the farmers than of the better off half make any kind of earthworks? It can only to a limited degree be explained by better land belonging to the better off half, since they do complain of observing soil washing down during rains almost to the same extent as the poorest half. Perhaps it is also because the better off half have more possibilities of getting other plots of land?

Composting, both for conservation and improvement, and manuring are only done by few farmers, be they among the better off half or the poorest half, and only in the East. Application of improved seeds is practised by just over 20% of the poorest half in the whole landscape, and considerably more among the better off half. Use of irrigation is done by fewer of the poorest half of the households, and again by twice as many of the better off half.

Table 31 Agricultural practices used by area of residence among the poorest half of the households, who have land, in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half per area of residence

Residence **Agricultural practice**	**East** (N=102)	**North/West** (N=76)	**South Nguru total** (N=178)	**South Nguru all house-holds** (N=372)
Earthworks or lining against erosion	48%	12%	33%	23%
Contour ploughing against erosion	1%	0%	1%	1%
Compost/refuse/mulch for soil conservation or improvement	18%	0%	11%	9%
Apply any manure for soil improvement	12%	0%	7%	9%
Improved seeds	22%	21%	22%	29%%
Pesticides/pest management	18%	17%	18%	20%
Irrigation	7%	7%	7%	14%%
Storage	19%	7%	14%	15%

Agricultural practise is significantly correlated with area of residence at the 0,01 level for Earthworks etc. for Composting etc. and for Applying manure, at the 0,05 level for Storage, but the correlation is not significant for Seeds, Pesticides and Irrigation. (Pearson chi-square tests).

For pest management and storage on the other hand there is no poverty bias. It is interesting that improved storage is undertaken by about 15 % in Tanzania, while it was not mentioned in Uganda among important practises, which may be because it is a relatively new practise promoted through agricultural programmes.

Natural resources and the forest: Water and fuel wood

Contrary to the situation in Kasyoha-Kitomi in Uganda, Table 32 shows a clear poverty bias in Tanzania in the landscape population's use of the different unimproved and improved water resources: The better off half uses much more of the improved water sources, but are also more responsible for the limited use there is of unprotected springs or water holes, compared to the poorest half, of whom 84% are fully or partly restricted to the use of water from rivers or streams.

This is partly due to the fact that the North/West of the landscape has received most of the improved supplies in the landscape, maybe because they otherwise had to turn to unprotected spring or water holes. They are also generally better off than the people of the East. The result is that almost half of the poorest half of the population in the North/West of the landscape have an improved supply against only 27% in the East, where fully 98% of the poorest half have to turn to rivers or streams for their water supply, or at least to supplement it.

Table 32 Time used to fetch water and different water sources used for household consumption by area of residence of the poorest half of the households in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half per area of residence

Residence / Time and source	East (N=110)	North/West (N=78)	South Nguru total (N=188)	South Nguru all households (N=390)
>20 min. to fetch water	32%	15%	25%	18%
Rivers and streams	98%	64%	84%	76%
Unprotected springs, wells, or water holes	0%	21%	9%	13%
Improved water sources	27%	49%	36%	46%
Water source originating in the forest	91%	64%	80%	68%

Rivers and streams, unprotected springs etc. and improved water source, and also origin of water source, are significantly correlated with area of residence at the 0,01 level. Time used is correlated with area of residence at the 0,05 level (Pearson chi-square tests).

This is one reason why more of the poorest half of the people in the East have a longer way to walk to their domestic water supply, than they do in the North/West of South Nguru. More of

the poorest than of the better off half in the whole landscape have more than 20 minutes' walk to fetch water.

The same proportions of the better off half and the poorest in the landscape, just over 20%, but somewhat more in the East than the North/West, claim to supplement their regular source of household water with rain water.

Over 90% of the poorest half in the East declare that their water supply comes from the forest, and so do 64% of those in the North/West of South Nguru

As shown in Table 33, water is used productively by 56% of the landscape's households – a bit more than in Uganda. It has no poverty bias in Tanzania. Most water is used for watering animals and for irrigation, very little for brewing, which is the exact opposite of the situation in Uganda. Both for animals and irrigation water is used by significantly more people in the East than in the North/West of the landscape.

Table 33 also shows that 42% of the poorest half (more than two thirds of the users), especially in the East, take productive water from rivers or streams. By far most of the productive water originates in the forest, again especially in the East, where the rivers and streams come from the forest.

Almost all households in the landscape, irrespective of poverty status and area of residence, use mainly firewood for fuel, as shown in Table 34. The diminutive supplementary use of kerosene and/or charcoal is not correlated with poverty level nor area of residence (figures for kerosene use in areas of residence are too small to render the apparent difference significant).

Table 33 Type of productive water resource use and source used by area of residence of the poorest half of the households in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half category per area of residence

Residence / Water use and source	East (N=110)	North/West (N=78)	South Nguru total (N=188)	South Nguru all households (N=372)
Irrigation	25%	6%	17%	17%
Animals	64%	39%	53%	43%
Brewing	2%	5%	3%	5%
Any productive use	76%	40%	61%	56%
Rivers and streams	60%	18%	42%	27%
Unprotected springs, wells, or water holes	18%	19%	19%	12%
Improved water sources	23%	6%	16%	20%
Water originates from forest, % of productive water users	89%	65%	83%	71%

Water use for irrigation and animals is correlated with area of residence at the 0,01 level, as is any productive use. Other use correlations are insignificant. Use of productive water from Rivers and streams, and from Improved sources are significantly correlated with area of residence at the 0,01 level. From Springs etc.is not correlated at all. (Pearson chi-square tests).

Like distance to water, so does distance to firewood seem smaller the wealthier the household is, as this is also significantly correlated with poverty level (Table 34). Among the poorest half over 60% in the East live more than an hour's walk from their supply of wood, whereas in the North/West of the South Nguru landscape, distance to the source is much more equally distributed, with 'only' just over 40%, who have more than an hour's walk each way to fetch firewood.

Table 34 Type of fuel used and distance to the source by area of residence among the poorest half of the households in the South Nguru forest landscape, Tanzania

Percent households belonging to the poorest half category per area of residence

Residence / Fuel use	East (N=110)	North/West (N=78)	South Nguru total (N=188)	South Nguru all households (N=390)
Firewood	98%	99%	98%	97%
Kerosene	1%	5%	3%	4%
Charcoal	5%	5%	5%	7%
Distance to source				
Less than 30 min.	14%	35%	22%	24%
30 min.- 1 hour	25%	23%	24%	31%
More than 1 hour	62%	42%	54%	45%
	101%	100%	100%	100%

Kerosene use is significantly correlated with both residence and tribe, and charcoal use with tribe at the 0.01 level, Charcoal use with residence at the 0.05 level.

Summary of livelihoods of the poorest people in the South Nguru forest landscape, Tanzania

As mentioned above, on Kasyoha-Kitomi, sections 3 and 4 presented individual households' poverty indicators, i.e. their sources of livelihoods, needs satisfaction, and basic demography. The following two sections, including this one, analyse in more detail how people derive their livelihoods, from agriculture, water and fuel, depending on where they live, their history of migration, and ethnicity.

This analysis deals specifically with the poorest section of the population, with whom Participatory Environmental Management (PEMA) is particularly concerned. For the landscape as a whole, the livelihoods of the poorest group is seen against that of the other groups, with which it is of course connected. This section on Kasyoha-Kitomi can furthermore be read separately from the next section on South Nguru.

Generally, area of residence and migration are related to poverty in the following way:

- There is a very clear connection between poverty level and area of residence and between poverty and the birthplace of the head of household. Too few (35% only) answered the question on tribal affiliation.

- With almost 60% of the landscape population belonging to the middle, less poor group, all the areas of residence also have most respondents belonging to that group. Polarisation is greatest in the East, where they are just below half, and both the group of the better-off and the poorest are bigger than in other areas. Indeed 64% of all the poorest live in the East.
- Contrary to Uganda it is the better-off who are the most migrant part of the people, with only 50% remaining in their native villages, against close to 70% of both the less poor and the poorest.

Because of the low degree of population polarisation in Tanzania, the poorest and the better off levels would have yielded figures too small for a significant analysis. In order, therefore, to get significant sizes of segments of the poorest people in the landscape to analyse in more detail, the group was expanded to comprise the poorest half of the landscape population, the opposite being denoted as the better off half. The poorest half of the population in South Nguru was roughly composed as follows:

- in the eastern wards, or the East, the majority of the poorest half consisted of households staying in villages where their head was born, primarily, it seems, of the Luguru tribe.
- In the North/West of the South Nguru landscape the poorest half was smaller, and here also few were migrants. Among those stating their tribal affiliation almost 75% belonged to the Zigua tribe.

They derived their livelihoods, in the main, from:

- Poverty is very significantly correlated with land ownership. Almost half of the poorest half of the people have less than an acre of land, while half of the better off half have more than two acres, and 25% have even more than five acres of land. Especially in the East the poorest half are also land poor, while the distribution in the North/West of the landscape comes close to the average for the whole landscape population.
- Little land is freehold land. A bit more, in the East, is leased, while the great majority is held as customary land, be it among the better off or the poorest half, in the East or the North/West of the landscape.
- Less than 20% of all households have fallow land, among the poorest half mainly because of lack of resources.
- There are hardly any (confessed) cattle owners among the poorest half in South Nguru. Many more have small stock in the East than in the North/West of the landscape.

- The better off half generally grow a greater variety of crops than do the poorest half, and thus most crops are grown by more of the better off half than of the poorest half of farmers. The only crop grown by over 70% of all the farmers is the daily food, maize, grown also by more than 70% of the poorest half in the North/West of the landscape, but outgrown by root crops in the poorer East.
- Crops are sold by few of the poorest people in South Nguru. Less than half of all those who grow maize do also sell it (the most selling crop!).
- More soil erosion is observed by the poorest half in the East than in the North/West of the landscape. Almost all of the of the poorest half of the people in the East who observe soil erosion also claim to do something about it. Almost inevitably earthworks or lining. Few people do anything to improve their soil.
- Application of improved seeds, pest management, and improved storage are practised by only 15-30% of all the farmers, with a small bias towards the better-off.
- Contrary to the situation in Kasyoha-Kitomi more of the better off half than of the poorest half have improved water sources. In the East the great majority of the poorest half have water from rivers/streams, while in the North/West of the landscape almost half have an improved supply. Of the remainder, on the other hand, many have to do with an unprotected spring or water hole. The great majority of the poorest half, especially in the East, get their water supply from the forest.
- Of the poorest half in the East 76% use water productively, against 40% in the North/West of the landscape. Mostly to water animals, fewer for irrigation, and, contrary to Uganda, hardly anybody say they use it for brewing. Most get their productive water from the forest.
- As in Kasyoha-Kitomi all households use firewood for fuel. Of the households 5% claim to supplement it with charcoal, and even fewer with kerosene. The poorest half of the people have much longer to walk to fetch firewood than the better-off, and again it is especially in the East, where more than 60% have more than 2 hours to and from their firewood supply.

PART 3. THE 2005 KNOWLEDGE, ATTITUDES AND PRACTICES SYNDROME IN THE PARTICIPATORY ENVIRONMENTAL MANAGEMENT (PEMA) PROGRAMME AREAS

The third part of the paper presents the baseline for monitoring the knowledge-attitudes-practices syndrome in the two landscapes. Knowledge-attitudes-practices monitoring is a tool to understand local stakeholders' practices, and their changes over time, in relation to the use and management of the forests as well as the knowledge and attitudes upon which such practices are based. The tool provides an opportunity to better understand drivers of change in the forest ecosystems within the landscapes.[7]

Together with the investigations on the different faces of poverty and the characteristics of local inhabitants' livelihoods, knowledge of the knowledge-attitudes-practices syndrome should give an improved understanding of the detailed motivation behind the activities of different groups in a forest landscape, and can in particular help refine the formulations of goals and strategies in the Participatory Environmental Management (PEMA) programme by determining who needs which type of information through what combination of activities. The assessment forms the basis of a knowledge-attitudes-practices survey as a part of the baseline data to be repeated in five years.

In fact it can already be summarised that the analysis of knowledge, attitudes, and practices in the two forest landscapes tends to reveal, that forests are not only a source of resources for the poor but at the same time pose risks, which more severely affect the poorest compared to the rest of the population.

In the following the knowledge-attitudes-practices data from the baseline survey of local stakeholders is presented. Again knowledge-attitudes-practices analyses are presented separately for Kasyoha-Kitomi in section 7 and for South Nguru in section 8. Since relatively few respondents seem to have been able (or willing) to answer some of the (possibly sensitive)

[7] Questions aiming at exploring people's knowledge, attitude and practices in relation to the forest might refer to any forest in the surroundings if no specific forest is mentioned, i.e. the nearest forest.

questions on detailed forest behaviour, the knowledge-attitudes-practices analysis is carried out for whole populations, with efforts to distinguish between different poverty levels in situations where it seems both possible and relevant.

7. FOREST KNOWLEDGE, ATTITUDES AND PRACTICES IN THE KASYOHA-KITOMI FOREST LANDSCAPE IN UGANDAS

People, who live far from a forest, seem to perceive that they get rather little out of it, compared to those living closer, who tend to benefit more. As shown in Table 35, more than 75% of all the people in the landscape, who live within one hour's walking distance from the nearest forest also do benefit most from that forest, while just under 50% of the people, who live more than an hour's walk away from the nearest forest, also claim not to benefit most from it – and in fact by far the most of them seem to get no forest benefits at all (see also Table 36).

Table 35 Households benefiting from the forests by distance to the nearest forest in the Kasyoha-Kitomi forest landscape, Uganda

Percent of all households in the landscape

Forest benefits **Distance to nearest forest**	The household benefits <u>most</u> from the nearest forest	The household <u>does not</u> benefit most from the nearest forest	Total
Less than 1 hour's walk	77%	24%	100%(N=251)
More than 1 hour's walk	55%	45%	100%(N=136)
Total	69%	31%	100%(N=387)

Correlation between distance to the forest and benefiting from it is significant at the 0.01 level (Pearsons *Chi-square test).*

The analysis of forest benefits and distances to forests is complicated by the fact that they may concern different forests and different years: Questions about whether the nearest forest is also the one that benefits households the most; whether households actually benefited from forest products last year; and whether households always benefited most from the nearest forest may in fact yield 8 different combinations of answers, of which 5 make sense and 3 contain inconsistent or mutually contradictory answers, as also demonstrated in Table 36.

Those 24% of all respondents in the landscape, who claim not to benefit most from the nearest forest, nor to have benefited from any forest products last year, and never to have benefited from any other forest, are clearly people who consistently get no forest benefits whatsoever.

The other tiny groups, who presently do not benefit most from the nearest forest, are those who have always benefited more from a more distant forest (3%) or give inconsistent answers (6%).

In the West and South it is less than 20% of the people, who get no forest benefits at all, while that is the case for just over 50% in the East. This is obviously connected with the fact that only around 30% in the West and South (26% and 33%) live more than one hour's walk away from the nearest forest, whereas it is 60% of the people in the East, where people in the forest landscape apparently live more scattered and interact less with the forest.

Table 36 Households' benefits from forests by area of residence in the Kasyoha-Kitomi forest landscape, Uganda

Percent of all households in the landscape

Residence / Forest product	West (N=192)	South (N=115)	East (N=75)	Total (N=382)
Nearby forest was always most beneficial	66%	26%	20%	45%
Nearby forest is most beneficial, but get no actual benefit from forest products last year	4%	4%	11%	5%
Nearby forest is presently most beneficial, but at some time it was another forest	8%	38%	4%	17%
Another forest has always been more beneficial	1%	7%	1%	3%
Get no forest benefits	16%	19%	51%	24%
Total	95%	95%	87%	94%
Inconsistent answers	4%	5%	13%	6%

Correlations between residence and nearby forest being most beneficial, some-time benefits from another forest, and no forest benefits are significant at the 0.01 level (Pearsons Chi-square test).

In the West 70% always regarded the nearest forest as the most beneficial one (4% getting nothing concrete out of it last year though), and only 8% say they ever got more from another forest. In the South, on the contrary, only 30% always got most benefits from the nearest forest, almost 40% at some time got more from another forest, while 7% have always benefited most from a more distant forest than the one nearest.

This difference between West and South may be because the migrant bakiga of the West are more prone always to chose the nearest forest for whatever purpose, whereas the banyankole, long time natives in the South, were earlier less tied to the nearest forest, compared to the situation under today's stricter forest regulations regime. The fact that 45% of the households in the South, according to another answer, owns a private forest, which is likely to be on a small plot adjacent to their other holdings, may also contribute to a more ambiguous answer as to whether or not they get the most from such a small nearby plot. Less than 10% in the North/West of the landscape have private forests.

A more relaxed attitude to forests may also be why over 20% of all households in the South (answering a different question) had at some time used forest land for a non-forest purpose, mostly clearing and cultivation. Only just over 10% did so in the West, and two people only in the East.

Considering that people probably got most benefits from the nearest forest, and in order to maintain a manageable questionnaire, it was decided to ask most questions about the nearest forest only. Answers were then deemed relevant concerning information about forest benefits only from that part of the respondents, who claimed presently to benefit most from the nearest forest. According to Table 37 that concerned 67% of all the interviewees, and of that group 62% stated that they had actually benefited from forest products last year, and their answers were therefore the ones selected for analyses of forest product benefits.

Table 37 Households claiming benefits from the nearest forest by area of residence in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households in the landscape

Residence / Forest benefit	West (N=199)	South (N=120)	East (N=78)	Total (N=397)
People that benefit most from the nearest forest	80%(N=156)	71%(N=84)	35%(N=27)	68%(N=267)
- and benefiting from forest products last year	74%(N=148)	64%(N=77)	23%(N=18)	61%(N=243)

Most respondents, as seen from Table 38, claim that the forest has a moisture/climate regulating effect, when asked directly. Despite the questionable character of this claim (microclimate etc.!), it probably results from the frequent claims to that effect from forest authorities and politicians.

Table 38 Households claiming non-product forest benefits by area of residence in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households benefiting most from the nearest forest

Residence / Non-product forest benefit	West (N=156)	South (N=84)	East (N=20)	Total (N=260)	Total of the poorest (N=128)
Moisture / climate regulation	94%	96%	75%	93%	93%
Source of water	51%	7%	10%	34%	32%
Tourism / spiritual	3%	0%	0%	1%	0%

The forests climate regulating effect and as a source of water are correlated with residence at the 0.01 level of significance. The tourism correlation is not significant. No correlation with poverty.

On the other hand the claim that water comes from the forest, seems clearly related to the fact that often rivers and streams are seen to originate there, which is true for 57% of the respondents in the West and 7 and 9% in the South and East (Table 20). The forest does not seem to play any explicit spiritual or tourism role.

As shown in Table 39, the great majority of those benefiting from concrete forest *products* last year did so by collecting or cutting firewood (95%), despite the fact that limitations to this had since recently been more strictly enforced. Other products, such as medicine, timber or poles for building and sale, or grass for thatching, are shared by only 15-25% each of those landscape households, who benefit from forest products at all.

These low percentages may actually be due to recent, more harsh, forest regulations. Of those households claiming to benefit from a forest product from the nearest forest last year, the great majority also gained in earlier years from cutting or collecting firewood (95%). As seen from Table 40, however, a much greater proportion benefited in earlier years from timber and poles for building or sale, and from other products as well, especially in the West.

Table 39 Households benefiting from forest products last year by area of residence in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households benefiting from forest products from the nearest forest last year

Residence / Forest product	West (N=148)	South (N=77)	East (N=18)	Total (N=243)	Total of the poorest (N=114)
Firewood	97%	95%	78%	95%	97%
Source of medicine	35%	5%	39%	26%	23%
Timber or poles	21%	26%	17%	22%	22%
Grass for thatching	23%	8%	11%	17%	15%
Other gathering and hunting	5%	1%	22%	5%	4%
Furniture, sticks,handles, crafts	3%	0%	17%	3%	3%

Correlations between residence and firewood and medicin are significant at the 0.01 level, grass at 0.05 level, others not significant (Pearsons Chi-square test). No correlation with poverty.

Table 40 Households benefiting from forest products in earlier years by area of residence in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households benefiting from forest products from the nearest forest in earlier years

Residence / Forest product	West (N=147)	South (N=72)	East (N=19)	Total (N=238)
Firewood	99%	94%	68%	95%
Source of medicine	70%	1%	32%	46%
Timber or poles	84%	42%	26%	66%
Grass for thatching	45%	4%	21%	31%
Other gathering and hunting	31%	3%	37%	23%
Furniture, sticks, tool handles, crafts	28%	1%	21%	19%

Correlations between residence and firewood, medicine, timber, grass, gathering and hunting, and furniture etc. are significant at the 0.01 level (Pearsons Chi-square test).

Since Table 40 compares several earlier years with one year's information in Table 39, a certain last year decrease is to be expected, but the out-of-proportion decrease in people cutting timber or poles appears to be the result of that activity being particularly visible - and now severely punished.

The respondents were also asked about what the people in the landscape think they are doing themselves to preserve the forest benefits, and in response, according to Table 41, surprisingly few thought they could do nothing, especially in the South, where they were only 6% of the respondents.

Table 41 What households say they do in order to continue benefiting from forest products by area of residence in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households benefiting from forest products from the nearest forest (multiple response)

Residence / Activity	West (N=156)	South (N=82)	East (N=26)	Total (N=264)	Total of the poorest (N=128)
Nothing can be done	22%	6%	27%	17%	23%
Maintain/enlarge the forest	19%	67%	39%	36%	31%
Maintain density of the forest	27%	16%	39%	24%	21%
Preserve plant species	13%	17%	39%	17%	20%
Put out a fire/report illegal use	45%	21%	31%	36%	32%

Correlations between residence and nothing can be done, maintaining the forest, preserving plant species, and put out a fire are significant at the 0.01 level, maintain density at the 0.05 level (Pearsons Chi-square test). Correlation between poverty level and maintaining the forest and put out a fire are significant at 0.01 level, nothing can be done at the 0.05 level.

A correspondingly large proportion in the South, 67% of those benefiting from the nearest forest, volunteered, as one thing they do, the ability to at least maintain the size of the forest, while the largest group in the West, 45%, suggested to put out a fire or reporting an illegal use, another relatively easy response. More complicated proposals, dealing with the forest density or plant species were suggested by smaller, but still substantial, groups.

The only proposition finding hardly any supporters at all was about preservation of animals. It is very likely that people near the Kasyoha-Kitomi forest have a stronger sense of wild animals being a nuisance more than constituting a possible benefit as a hunting trophy or for meat.

While there is no connection between poverty level and which group of households might gain, neither from non-product forest benefits, nor from forest products, there is a 0.05 level correlation between poverty and people thinking there is nothing they can do to continue

benefiting from forest products, and even stronger (0.01 level) for people maintaining the forest and putting out a fire. In all cases the poorest have least belief in their own possibilities.

People in the West are clearly having a stronger sense of restrictions on forest use imposed on them by authorities, compared to the South and East. Table 42 shows that only 4% of the western people know of no restriction on forest use, and very many people report that they are restricted both in terms of felling trees, cultivation or grazing in the forest, and from extraction of goods from the forest.

In the South most people feel limited by only one forest regulation, the most common being limitation on tree felling or on extraction of goods from the forest. In the East ¼ of the people benefiting from the nearest forest don't feel restricted in their forest use!

In the landscape as a whole, the poorest feel more restricted than do others in terms of tree felling and cultivation and grazing, which are probably also the activities in which the poor are most likely to engage.

In this connection it is also interesting to see the difference between the people in the West and those of the South and East with regard to whom they think regulate forest use. As it is evident from Table 43 most people in the South and East suggest, generally and vaguely, that forest regulations emanate from the government, and many suggest several institutions simultaneously (prominently among others the NFA). In the West, on the contrary, more than 90% believe forest restrictions to be instigated by the NFA, which is more than twice the number of people, who also mention the government. Hardly anybody in the West implicate any other institution. This may also be the explanation why more of the poorest group than of the less poor and the better-off see NFA as instigators of regulations, whereas there is no poverty correlation for the government, and fewer of the poorest mention any other institution.

Table 42 Restrictions on forest use felt by households by their area of residence in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households benefiting from forest products from the nearest forest

Residence / **Restriction**	**West** (N=156)	**South** (N=82)	**East** (N=26)	**Total** (N=264)	**Total of the poorest** (N=128)
Don't know of any restriction	4%	5%	23%	6%	6%
Felling trees limited	96%	63%	67%	83%	91%
Cultivation or grazing in the forest prohibited	80%	16%	56%	58%	64%
Extraction of goods limited	49%	43%	15%	44%	48%
Charcoal burning prohibited	15%	2%	0%	10%	14%
Hunting limited	10%	1%	0%	6%	6%

Correlations between residence and no restrictions, felling trees, cultivation, extraction, and charcoal burning are significant at the 0.01 level, hunting at the 0.05 level. Correlations between poverty level and felling trees and cultivation etc. significant at the 0.01 level. No other correlations are significant. (Pearsons Chi-square test)

Table 43 Instigators of forest regulations according to households, by their area of residence in the Kasyoha-Kitomi forest landscape in Uganda

Percent of the households benefiting from forest products from the nearest forest

Residence / **Institution instigating regulation**	**West** (N=154)	**South** (N=81)	**East** (N=23)	**Total** (N=258)	**Total of the poorest** (N=127)
NFA	92%	61%	61%	80%	88%
Government	42%	77%	70%	55%	55%
Environment organisation	2%	51%	30%	20%	9%
Local government or village	1%	47%	22%	17%	8%
Forest owners	1%	17%	0%	6%	5%
PEMA	0%	1%	39%	4%	4%

Correlations between residence and each of the institutions are significant at the 0.01 level. Correlations between poverty level and NFA, environment organization, and local government are significant at the 0.01 level, government at 0.05 level (Pearsons Chi-square test). No other correlations are significant

That 39% of the respondents in the East points to Participatory Environmental Management (PEMA) as having made the forest regulations is probably mostly a sign of the generally low

awareness of the easterners (or it is possibly the coincidental result of somebody connecting Participatory Environmental Management (PEMA) and heavier enforcement of rules appearing on the scene at the same time?).

Most people, i.e. 73% of the households in the landscape as a whole, according to Table 44, agree that rules restricting the use of the forest are necessary in order to maintain it, but they are a significantly greater majority in the South than towards the West and East. Even more respondents, 83% in the whole landscape, but significantly fewer in the East, believe that the people themselves would also tend to benefit more from the forest rules, if such rules have to get a village approval. None of these figures have a poverty bias.

Table 44 People's participation in the formulation of forest regulations according to households, by their area of residence in the Kasyoha-Kitomi forest landscape in Uganda

Percent of the households benefiting from forest products from the nearest forest

Residence / Participation in regulation	West (N=156)	South (N=79)	East (N=21)	Total (N=267)
Anybody in the household participated	12%	8%	0%	9%
Necessity of rules in order to maintain the forest	64%	94%	67%	73%
Village approval of rules benefits the people	82%	93%	56%	83%
Knowledge of villages that have to approve rules	14%	26%	19%	18%

Significant correlation between residence and respondents thinking about the necessity of rules and their benefits to people at the 0.01 level. The correlation for participation as such or knowledge is not significant (Pearsons Chi-square test).

Despite the great majority of people who plead for the importance of people's participation in making forest regulations, it is actually extremely few, less than 10% of all households, who have been drawn into decision-making in this respect! And only twice as many know about villages (a village) whose approval of forest regulations is necessary.

Table 45 shows that 62% of all the informants in the forest landscape have experienced problems recently from living close to a forest. For the 38% that claim not to experience any difficulties the explanation might be that they actually do not feel that they live so close to a forest that it creates problems, cf. Table 35.

Among the 62% that do face problems, considerable differences between the different poverty levels exist. Of the better-off 34% reported that their household was negatively affected whereas that was true for 64% of the less poor and 70% of the poorest.

Table 45 Any problems experienced in relation to being near a forest by household poverty level in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households per poverty level

Option	Poverty level			All poverty levels (N=398)
	better-off	less poor	poorest	
No problems experienced recently from living close to a forest	66%	36%	30%	38%
Problems experienced recently from living close to a forest	34%	64%	70%	62%

Significant correlation between poverty level and experiencing problems from living close to a forest at the 0.01 level (Pearsons chi-square test).

Taking a closer look at the types of problems and how the households at different well-being levels are affected (Table 46), there are again a significant correlation between poverty levels and being bothered by the presence of wild animals, invading plants and diseases related to the forest, for instance disease caused by the black fly.

The poor are more often negatively affected by these problems, e.g. wild animals are clearly seen as the main problem, mentioned by nearly all, i.e. 58% of the 62% having forest problems at all, but only 32% of the better-off found wild animals to be a problem compared to 68% of the poorest. Two reasons can explain why the poor are more affected by living close to a forest. Firstly, and not surprisingly, the less poor and the better-off can better respond to diseases or risk loosing crops. Secondly the poor people are more likely than other well-being groups to cultivate on land at the forest boundary in areas characterised by land scarcity. They are so to say the first to experience negative effects coming from the forest. The exception from the poor having most problems is the case of insects where no significant correlation is found.

This was also substantiated in interviews for a separate stakeholder analysis in villages where most land close to the forest boundary had been abandoned because of crop raiding animals. The few people left were all poor people that had no alternative land to cultivate, and the areas with better fertility are mostly owned by the better-off (Raben et al. forthcoming).

Table 46 Specific problems resulting from being near a forest by household poverty level in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households per poverty level

Option	Poverty level			All poverty levels (N=400)
	better-off	less poor	poorest	
Wild animals are a problem	32%	55%	68%	58%
Diseases are a problem	11%	20%	26%	22%
Insects are a problem	13%	17%	8%	12%
Invading plants are a problem	0%	3%	7%	4%

Significant correlation between the poverty level and wild animals as a problem at the 0.01 level, diseases as a problem and invading plants as a problem at the 0.05 level . No significant correlation between the poverty level and insects as a problem (Pearson chi- square test).

As further shown in Table 47, 76% of the households in the present survey with less than one acre experienced problems with the forest, whereas only 42% of those having five to ten acres considered the forest to cause problems.

Table 47 Problems as a result of being near a forest by number of acres owned by household in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households in the landscape

Option	The household had problems (N=379)
Less than 1 acre of land owned by the household	76%
1-2 acres of land owned by the household	59%
2-5 acres of land owned by the household	46%
5-10 acres of land owned by the household	42%

Significant correlation between the problems from being near a forest and the number of acres owned by the household at the 0.01 level (Pearson chi- square test).

If the problems of being near a forest are cross tabulated with location within the Kasyoha-Kitomi forest landscape a significant variation appears (Table 48). People living on the western side of the forest are almost four times as much bothered by wild animals compared with those living in the southern part, and the people in the East almost twice as much. A central explanation to the high percentage of households being bothered by wild animals on the western side of the forest reserve is the adjacent Queen Elizabeth National Park. Frequently, animal movements along a corridor between the two forest reserves in the West furthermore cause incidents of crop raids into the fields of the local households or injury on persons. As

emphasised earlier the West finally has the highest number of poor people (60%) among the areas of residence.

Among people living on the eastern side of the forest, 44% mention wild animals as a problem. Only 24% mention wild animals as a problem in the southern part. This can perhaps be explained by the denser population and more developed infrastructure, together with the fact that the poor only make up 36% of the households.

A somewhat similar pattern can be seen for diseases which are mentioned as a problem for 29% in the West, 31% in the East, but only 3% in the South.

Table 48 Problems as a result of being near a forest by area of residence in the forest landscape Kasyoha-Kitomi, Uganda

Percent of all households in the landscape

Residence / Forest problem	West	South	East	Total (N=400)
Wild animals are a problem	84%	24%	44%	58%
Diseases are a problem	29%	3%	31%	22%

Significant correlation between the area of residence and both wild animals as a problem and diseases as a problem at the 0.01 level(Pearson chi- square test).

As shown in Table 49, 57% of all the respondents suggested that local villagers benefit and 50% that government authorities benefit from the forest in the Kashyoha-Kitomi landscape. The high number of informants stating that local villagers are benefiting is quite surprising, taking into consideration the recent harsh forest regulations, which have restricted local inhabitants from entering the reserve for forest goods. It does indicate a positive attitude to build upon when implementing Collaborative Forest Management. Still, the positive perceptions seem a bit contradictory to other data collected in the landscape through stakeholder analysis and vision-based planning.

Only 7% mention external people as being those who benefit most. This seems to correspond well with the current halt to any commercial extraction from the forest reserve. However, looking 5-10 years back one might find that external people (in collaboration with government branches) are those that have benefited most through logging activities.

Table 49 The people benefiting most from the forests in the Kasyoha-Kitomi forest landscape, Uganda

Percent of all the households in the landscape(multiple response)

Option	**Total** (N=400)
Local villagers benefit from the forest	57%
Government people or other officials benefit from the forest	50%
External people or others benefit from the forest	7%

When it comes to perceptions about who has the mandate to exercise authority over those who violate rules, Table 50 shows that villagers seem to have a rather clear picture, that it rests either with the National Forest Authority (66%) and/or the government (57%), but perhaps they were more blurred on who of the two?

A smaller number, i.e. 18%, seem to perceive that an environmental organisation had the authority. Another 9% identified Participatory Environmental Management (PEMA) as the specific authority. 15% of all the informants assigned the local government and, finally, only 10% mentioned that the communities themselves had any authority.

According to forest legislation NFA, the local government as well as, in some cases, the community have different kinds of responsibilities. NFA has been very much present in the landscape in the year before this survey was carried out, which is reflected in the high number of informants that mentioned NFA as the authority.

Table 50 The organisation that appears to respondents to have the authority to take those people to task who violate the forest rules, in the Kasyoha-Kitomi forest landscape, Uganda

Percent of the households per poverty level(multiple response)

Option	Poverty level			All poverty levels
	better-off (N=53)	less poor (N=152)	Poorest (N=181	(N=386)
National Forest Authority	64%	66%	70%	68%
Government	76%	57%	55%	59%
Environment organisation	53%	16%	9%	18%
Participatory Environmental Management (PEMA)	13%	11%	7%	9%
Local government or village	47%	13%	9%	16%
Community members	32%	10%	5%	10%

Apart from respondents looking to NFA as the organisation to take people to task (which has no poverty bias), all other organisations are much more often mentioned by the less poor and especially by the better-off than by the poorest, possibly indicating a more detailed understanding of these issues, but also a more varied contact with different forest authorities and their rules.

As shown in Table 39 and 40 the household benefited in many ways from the forest last year. Interviews with stakeholders have indicated a high number of forest goods that are extracted illegally under the current restrictions on using the forest (Raben et al. forthcoming).[8] Is seems plausible to assume that the history of confrontation between local inhabitants and the NFA can explain, therefore, that only 15% of the informants volunteered to indicate that someone in the households had seen anybody violate the forest rules.

The informants that agreed that somebody in their households had seen violations of the rules, were asked to state what the person violating the forest rules actually did, who it was and whether the incidence was reported. Although the numbers (N=57) were too small to be really statistically reliable, it is notable that answers included cutting firewood, hunting, collecting plants, grazing livestock or cultivating within the forest reserve; that 90% of positive respondents regarded the culprit as a local person (as different from a foreigner); that only 12% did report the incident; and that half of the remainder abstained to avoid conflict, while 40% did so in some degree of opposition to the rules.

[8] Note that the collection of firewood is not an illegal activity in Uganda's forest reserves.

Summary of forest knowledge, attitudes and practices in the Kasyoha-Kitomi forest landscape in Uganda

Knowledge-attitudes-practices monitoring is a tool to understand local stakeholders' forest practices, and their changes over time. This knowledge-attitudes-practices summary again deals with all people in the landscape, where it is carried out for whole populations, only with efforts to distinguish between different poverty levels in situations where it seems both possible and relevant.

- People who live far from a forest think that they get little out of it, compared to those living closer, who benefit more. By far the most of those living further away believe they get no forest benefits at all. Those who get no forest benefits are most – over half the population - to the East of the landscape, where people live scattered and interact least with the forest.
- In the West, 70% always regarded the nearest forest as the most beneficial one, and few ever got more from another forest. In the South, on the contrary, only 30% always got most benefits from the nearest forest while 50% at some time (or always) got more from another forest. This difference may be because the migrant bakiga of the West are more likely always to choose the nearest forest, whereas the banyankole, long time natives in the South, were earlier less tied to the nearest forest than under today's stricter forest regulations regime.
- Most respondents claim that the forest has a moisture/climate regulating effect. More than half the people in the West think that water comes from the forest, where in fact rivers and streams are often seen to originate. Very few in the South and East share this experience.
- The great majority of those benefiting from concrete forest *products* last year did so by collecting or cutting firewood, despite the fact that limitations to this had since recently been more strictly enforced. Other products, such as medicine, timber or poles for building and sale, or grass for thatching, are shared by only 15-25% each. These low percentages may actually be due to recent, more harsh, forest regulations, as much greater proportions benefited from those products in earlier years.
- Few respondents, overall, thought that they could do nothing themselves to preserve the forest benefits. In the South many volunteered that maintaining the size of the forest is one thing they do, while the largest group in the West suggested to put out a fire or report an illegal use - both relatively easy responses. More complicated proposals on the forest density or plant species were suggested by smaller groups. The only proposition finding no supporters at all was about preservation of animals.

- There is no connection between poverty level and gaining, neither from non-product forest benefits, nor from forest products. There is correlation between poverty and people thinking there is nothing they can do to continue benefiting from forest products, and even stronger for people maintaining the forest and putting out a fire. In all cases the poorest have least belief in their own possibilities.
- In the landscape as a whole, the poorest feel more restricted than do others in terms of tree felling, cultivation and grazing, which are probably also the activities in which the poor are most likely to engage.
- In the West, where people report that they are restricted both in terms of felling trees, cultivation or grazing in the forest, and from extraction of goods from the forest, there is a stronger sense of restrictions on forest use imposed by authorities compared to the South, where people feel limited by only one forest regulation, and the East.
- Most people in the South and East suggest, generally and vaguely, that forest regulations emanate from the government, and many suggest several institutions simultaneously. In the West, on the contrary, almost all believe forest restrictions come from the NFA, half of them also mentioning the government, but no other institution.
- This may also be the explanation why more of the poorest group than of the less poor and the better-off see NFA as instigators of regulations, whereas there is no poverty correlation for the government, and fewer of the poorest mention any other institution.
- Most people agree that rules restricting the use of the forest are necessary in order to maintain it, but they are a significantly greater majority in the South than towards the West and East. Even more respondents believe that the people themselves also tend to benefit more from the forest rules, if such rules have to get a village approval, but it is extremely few who have actually been drawn into decision-making in this respect!
- The poor are more often negatively affected by these problems, e.g. wild animals. Two reasons can explain why poor are more affected by living close to a forest. Firstly, and not surprisingly, the less poor and the better-off can better respond to diseases or risk loosing crops. Secondly the poor people are more likely than other well-being groups to cultivate on land at the forest boundary in areas characterised by land scarcity, and thus the first to experience negative effects coming from the forest.
- People living on the western side of the forest are more bothered by wild animals compared with those living in the East, for whom they are a greater nuisance than for those in the southern part. A central explanation is the adjacent Queen Elizabeth National Park. A somewhat similar pattern can be seen for diseases.

- Most respondents suggested that local villagers benefit most from the forest, which is quite surprising, taking into consideration the recent harsh forest regulations restricting local inhabitants from entering the reserve for forest goods. Half the people also mentioned government authorities.
- When it finally comes to perceptions about who has the mandate to exercise authority over those who violate rules, villagers seem to have a rather clear picture that it rests either with the National Forest Authority and/or the government. Only few thought that the communities themselves have the authority. NFA has been very much present in the landscape the year before this survey was carried out which is reflected in the high number of informants that mentioned NFA as the authority.
- Apart from respondents looking to NFA as the organisation to take people to task (which has no poverty bias), all other organisations are much more often mentioned by the less poor and especially by the better-off than by the poorest, possibly indicating a more detailed understanding of these issues, and a more varied contact with different forest authorities and their rules.
- In sum, the analysis of knowledge, attitudes and practices reveals that forests are not only a source of resources for the poor, bur at the same time pose risks, which more severely affect the poor compared to the rest of the population.

8. FOREST KNOWLEDGE, ATTITUDES AND PRACTICES IN THE SOUTH NGURU FOREST LANDSCAPE, TANZANIA

While the people in the Kasyoha-Kitomi landscape in Uganda seem somewhat closer connected to their nearest forest the shorter the distance to it, the relationship is clearly the opposite in the South Nguru landscape: Not only do almost half the people live more than 2 hours' walk from the nearest forest, but as shown in Table 45, of those living that far away as much as 85% benefit most from that forest. As distances from the forest get smaller, the less are people in Tanzania tied to the nearest forest, to the extent that less than 10% of those who live within 10 minutes walk from their nearest forest also think they get the most benefits from it.

Table 51 Households benefiting from the forests by distance to the nearest forest in the South Nguru forest landscape in Tanzania

Percent of all households in the landscape

Forest benefits / **Distance to nearest forest**	The household benefits most from the nearest forest	The household does not benefit most from the nearest forest	Total (N=381)
Less than 10 minutes walk	9%	91%	18%
Between 10 minutes and 1 hours walk	29%	71%	25%
Between 1 and 2 hours walk	45%	55%	8%
More than 2 hours walk	85%	15%	49%
Total	54%	47%	100%

Correlation between distance to the forest and benefiting from it is significant at the 0.01 level (Pearsons *Chi-square test).*

When it comes to more detailed analyses of forest benefits, there are, unfortunately, as seen from Table 52, a rather large group, in Tanzania consisting of 25% of the households, who give inconsistent and mutually contradictory answers to questions about whether the nearest forest is also the one that benefits households the most; whether households actually benefited from forest products last year; and whether households ever benefited more from any other than the nearest forest. It was decided, therefore, to exclude the respondents giving inconsistent answers to these questions from further analysis of forest benefits.

Another 23% of the households seem not to use the forest at all, i.e. to get no benefits from it. Those respondents who stated clearly that they got no benefits at all from any forest were, likewise, excluded from the analysis of forest benefits.

Table 52 Households' benefits from forests by area of residence in the South Nguru forest landscape in Tanzania

Percent of all households in the landscape

Residence **Forest product**	**East** (N=207)	**North/West** (N=180)	**Total** (N=387)
Nearby forest was always most beneficial	26%	28%	27%
Nearby forest most beneficial, but yielded no actual benefit from forest products last year	38%	11%	25%
Nearby forest is presently most beneficial, but at some time it was another forest	1%	1%	1%
Another forest has always been more beneficial	0%	0%	0%
Get no forest benefits	19%	27%	23%
Total	84%	66%	75%
Inconsistent answers	16%	34%	25%

Correlation between residence and nearby forest being most beneficial is significant at the 0.01 level (Pearsons Chi-square test).

Of the remaining just over 50% of the landscape's households, only 3 (1%) have ever benefited more from another forest than from the nearest one. So, oddly enough, people, who live close to a forest, do seem less attached to that forest (Table 51), not because they have a preferred forest, which is just a bit further away, but rather because they get no benefits at all, or they give inconsistent answers.

The only major difference between households living to the East of the forest reserve and those living in the North/West of the landscape, is that, while thinking that the nearest forest in general benefits them most, a much larger percentage of the eastern population actually got no benefit from forest products last year. In the North/West of the landscape the same people joined either those with no forest benefits at all or giving inconsistent answers, which in both cases may actually be a result of the stricter implementation of forest rules by th forest authorities, which in the East may explain why people got no forest product benefits last year.

The population available for forest benefits analysis resulting from Table 52, i.e. claiming that the nearest forest is also the one benefiting them most, is finally presented below in Table 53. Unfortunately, (and unexpectedly) it is considerably fewer than in Uganda. Furthermore, among those stating that they do benefit in general from the nearest forest, nearly half again declared that they got no benefits from forest products last year, and thus had to be excluded from the forest product analysis!

Table 53 Households claiming benefits from nearest forest by area of residence in the South Nguru forest landscape in Tanzania

Percent of the households in the landscape.

Residence / Forest benefit	East (N=207)	North/West (N=180)	Total (N=387)
People that generally benefit most from the nearest forest	65%(N=134)	39%(N=70)	52%(N=204)
- and benefiting from forest products last year	27%(N=56)	28%(N=51)	28%(N=107)

Amongst the half of the landscape population available for the forest benefits analysis, there is no discernible poverty bias, neither in terms of non-product forest benefits, gaining from forest products, nor concerning what people can do to continue benefiting.

Most respondents, when asked directly, stated that the forest has a moisture/climate regulating effect, as seen from Table 54. Despite the questionable character of this claim (microclimate etc.!), it probably results from the frequent declarations to that effect from forest authorities and politicians.

On the other hand, the claim that water comes from the forest is maintained by relatively few, considering that it is clearly related to the fact that often rivers and streams are seen to originate in the forest, which is true for 90% of the respondents in the East and 65% in North/West of the landscape, and only a little less of all households both poor and better-off. The forest does not seem to play any explicit spiritual or tourism role, as that is suggested by only 1 respondent!

As shown in Table 55, all of those 28% (N=107) of the landscape households who declared that they benefited from forest *products* last year, did so by collecting or cutting firewood, despite the fact that its prohibition has since recently been more strictly enforced.

Table 54 Households claiming non-product forest benefits by area of residence in the South Nguru forest landscape in Tanzania

Percent of the households benefiting most from the nearest forest

Residence / Non-product forest benefit	East (N=133)	North/West (N=69)	Total (N=202)
Moisture/climate regulation	94%	80%	89%
Source of water	23%	41%	29%
Tourism/spritual	1%	0%	0%

The forests' climate regulating effect and as a source of water are correlated with residence at the 0.01 level of significance. The tourism correlation is not significant. No significant correlation with poverty. (Pearsons Chi-square test).

Table 55 Households benefiting from forest products last year by area of residence in the South Nguru forest landscape in Tanzania

Percent of the households benefiting from forest products from the nearest forest last year

Residence / Forest product	East (N=56)	North/West (N=51)	Total (N=107)
Firewood	100%	100%	100%
Timber or poles	54%	49%	51%
Source of medicine	32%	29%	31%
Grass for thatching	30%	28%	29%
Furniture, sticks, tool handles, or crafts	29%	24%	26%
Charcoal burning	21%	18%	20%
Other gathering and hunting	21%	14%	18%

No significant correlations (Pearsons Chi-square test).

Half of them also cut or collected timber or poles for building and sale. Other products, such as medicine, grass for thatching, furniture, sticks, tool handles, or crafts, charcoal, or other gathering and hunting, are dealt with by 20-30% each of those households who did benefit at all from forest products last year.

There is no significant difference between area of residences with regard to benefits from any of the forest products.

Likewise for most of the products there is hardly a discernible difference in the number of households benefiting now and earlier. The only significant exception, as seen from Table 56, being cutting and selling or using timber or poles.

Since Table 56 compares several earlier years with one year's information in Table 55 a certain last year decrease is to be expected, but the out-of-proportion decrease in people cutting timber or poles, especially in the more distant parts of the landscape, where rules may have been most leniently enforced earlier, appear to be the result of that activity being particularly visible - and becoming severely punished more recently.

Table 56 Households benefiting from forest products in earlier years by area of residence in the South Nguru forest landscape in Tanzania

Percent of the households benefiting from forest products from the nearest forest in earlier years

Residence / Forest product	East (N=56)	North/West (N=33)	Total (N=89)
Firewood	91%	91%	91%
Timber or poles	59%	82%	67%
Source of medicine	43%	36%	40%
Grass for thatching	27%	18%	24%
Furniture, sticks, tool handles, and crafts	27%	27%	27%
Charcoal burning	23%	39%	29%
Other gathering and hunting	18%	15%	17%

Correlation between residence and timber at the 0.05 level is the only one which is significant (Pearsons Chi-square test).

The people in the landscape were also asked about what they think people themselves do to preserve the forest benefits, and in response, according to Table 57, many more people than in Uganda, in fact 40% of those benefiting from forest products, actually think that nothing can be done!

Of those suggesting actions that people do, the vast majority thought about the size and the density of the forest, the two being suggested by approximately equal numbers – and being the most passive among possibilities.

Only few suggested things demanding a more active effort on their part, such as putting out a fire, reporting an illegal use of the forest, preservation of plant species, or keeping most of the animals in the forest, for that matter - the latter proposition having no adherents at all, maybe because the presence of wild animals near cultivated areas is really disliked.

Table 57 What households say they do in order to continue benefiting from forest products by area of residence in the South Nguru forest landscape in Tanzania

Percent of the households benefiting from forest products from the nearest forest

Activity \ Residence	East (N=118)	North/West (N=66)	Total (N=184)
Nothing can be done	38%	43%	40%
Maintain/enlarge the forest	25%	21%	23%
Maintain density of the forest	26%	23%	25%
Preserve plant species	2%	3%	2%
Put out a fire or report illegal use	13%	17%	14%

No significant correlations (Pearsons Chi-square test).

Very few people, just over 10% in both areas of residence, know of no restrictions on forest use, as initially demonstrated in Table 58. The most commonly felt forest rule is the limitation on cutting trees, but also the prohibition of cultivation and grazing in the forest is widely felt, both probably because they restrict behaviour, which many would otherwise resort to. Most restrictions are felt equally by the poorest and the better off half of the people, the only exception being prohibition of cultivation or grazing, which seems to be felt by slightly more of the better-off.

The people living 'far away', in the North/West of the landscape, who earlier benefited most from timber or poles (Table 56), also seem to feel the restrictions most now.

It is characteristic for the Tanzanian setup, compared to that of Uganda, that 67% of the households here, as seen in Table 59, believe that the government as such introduced forest regulations and over half think that the village government was somehow involved, while only 10% or less thought of another institution, and nobody of a private owner. The fact that 9% of the respondents pointed to Participatory Environmental Management (PEMA) as having made

the forest regulations is probably mostly a sign of generally low awareness – or the coincidental result of Participatory Environmental Management (PEMA) and heavier enforcement of rules appearing at the same time?

Table 58 Restrictions on forest use felt by households, by their area of residence in the South Nguru forest landscape in Tanzania

Percent of the households benefiting from forest products from the nearest forest

Residence / Restriction	East (N=133)	North/West (N=69)	Total (N=202)	Total of poorest half (N=121)
Don't know of any restriction	13%	12%	12%	12%
Felling trees limited	50%	64%	55%	59%
Cultivation or grazing prohibited	41%	44%	42%	36%
Extraction of goods limited	21%	12%	17%	22%
Charcoal burning prohibited	9%	0%	5%	5%
Hunting limited	1%	1%	1%	0%

Correlation between residence and felling trees is significant at the 0.05 level, no other significant correlation with residence. Poverty and cultivation or grazing are correlated at the 0.05 level, no other significant correlation with poverty. (Pearsons Chi-square test).

There is only a rather week correlation between poverty and a low level of the poorest half thinking that the Forest and beekeeping division instigated the forest regulations.

65% of the households in the whole landscape agree that rules restricting the use of the forest are necessary in order to maintain it, but it is a significantly greater majority in the East than in the North/West of the landscape (Table 60). Only a bit fewer respondents, 56% in the whole landscape, and again significantly more in the East, do also believe, however, that the people themselves tend to benefit more from the forest rules, if they have to be approved by the village itself.

Table 59 Instigators of forest regulations according to households, by their area of residence in the South Nguru forest landscape in Tanzania

Percent of the households benefiting from forest products from the nearest forest

Residence Institution instigating regulation	East (N=123)	North/West (N=62)	Total (N=185)	Total ot the poorest half (N=113)
Government	64%	71%	67%	64%
Local government or village	54%	57%	55%	56%
FBD	14%	7%	11%	6%
Environment organisation	10%	10%	10%	12%
Participatory Environmental Management (PEMA)	10%	8%	9%	9%

No significant correlations with residence; with poverty only for FDB at the 0.05 level (Pearsons Chi-square test).

Table 60 People's participation in the formulation of forest regulations according to households, by their area of residence in the South Nguru forest landscape in Tanzania

Percent of the households benefiting from forest products from nearest forest

Residence Participation in regulation	East (N=134)	North/West (N=70)	Total (N=204)
Necessity of rules in order to maintain the forest	74%	47%	65%
Village approval of rules benefits the people	67%	34%	56%
Anybody in the household participated in making rules	8%	4%	6%
Knowledge of villages that have to approve rules	23%	24%	24%

Significant correlation between residence and respondents thinking about the necessity of rules and their benefits to people at the 0.01 level. The correlation for participation as such or knowledge is not significant (Pearsons Chi-square test).

Despite the great majority of people who plead for the importance of people's participation in making forest regulations, it is actually extremely few, only 6% of all households, who have been drawn into the decision-making in this respect! It is also remarkable, therefore, that with just under 25% it is actually quite many respondents who know about villages (/a village) whose approval of forest regulations is necessary!

As seen from Table 61, the cross tabulation between poverty levels and whether informants experience problems from living close to the forest gives significant correlations, but (surprisingly) the less poor (20%) more often experience problems from living close to a forest than do the poorest (12%). The better-off are least negatively affected by the forest.

The sum of all poverty levels, 16%, experiencing any problems caused by living close to a forest is very low compared to the Ugandan forest landscape, and may be due to uncertainty regarding the possible consequences of giving a positive answer, and may therefore also be the cause of erratic answers. The low number also means that the following analysis is bereft with insecurity.

Table 61 Any problems experienced in relation to being near a forest by household poverty level in the South Nguru forest landscape, Tanzania

Percent of the households per poverty level

Option	Poverty level			All poverty levels (N=390)
	better-off	less poor	poorest	
No problems recently from living close to a forest	93%	80%	88%	84%
Problems recently from living close to a forest	7%	20%	12%	16%

Significant correlation between poverty level and recent problems from living close to a forest at the 0.01 level (Pearsons chi-square test).

As shown in Table 62, of those 16% (N=62) claiming that the forest was negatively affecting their household, most claim that wild animals are a problem (93%), when asked directly. Secondly diseases are mentioned by 44% as a negative effect. Invading plants are mentioned by 11% as a source of problems, whereas neither insects - nor people - are considered a problem in the South Nguru landscape.

Table 62 Specific problems resulting from being near a forest, experienced by households in the South Nguru forest landscape, Tanzania

Percent of the households in the landscape experiencing problems from living close to the forest (multiple response)

Option	Households (N=62)
Wild animals are a problem	93%
Diseases are a problem	44%
Invading plants are a problem	11%

Most of all the landscape's respondents (69%), as seen from Table 63, claim that local villagers benefit most from the forest. Government authorities were mentioned by 39% as those that benefit from the forest in the South Nguru landscape. Finally 34% mention external stakeholders as being those that benefit most.

Table 63 The people benefitting most from the forests in the South Nguru forest landscape, Tanzania

Percent of all the households in the landscape (multiple responses)

Option	Total (N=390)
Local villagers benefit from the forest	69%
Government people or other officials benefit from the forest	39%
External people benefit from the forest	34%

According to Tanzanian forest legislation central forest reserves like the ones in the South Nguru Landscape are under the jurisdiction of the Forest and Beekeeping Division. The current process of devolution of aspects of the management to local government has been initiated. But involvement of the communities through PFM has only recently been initiated by the Participatory Environmental Management (PEMA) programme. The analysis of which organisations posses the authority to take people to task is complicated by the fact that respondents may think of different violations and different levels. Accordingly, a rather blurred picture of responses appears (Table 64).

Of the informants 55% identified the national government as being in charge. Only a third of the informants stated that Forest and Beekeeping Division has the authority to take people, who violate forest rules, to task, which indicates the authority's low presence in some parts of the forest landscape.

It was stated by 22% that Participatory Environmental Management (PEMA) has the authority, and 8% stated that another environmental organisations was responsible for the forest governance. As many as 40% of the informants assigned responsibility to the local government, and finally 11% mentioned that the communities themselves has the authority.

Answers were biased towards the poorest for the central and local government, the community, and other environmental organisation, while for PEMA only significantly more of the better-off think that it has the authority.

Table 64 The organisation that appears to have the authority to take people to task, who violate the forest rules in the South Nguru forest landscape, Tanzania

Percent of the households in the landscape

Option	**Total** (N=385)	**Total of the poorest half** (N=184)
Government	55%	63%
Forest and Beekeeping Division	32%	32%
Participatory Environmental Management (PEMA)	22%	14%
Other environmental organisations	8%	11%
Local government	40%	45%
The community	11%	16%

Significant correlation between poverty level and the government, PEMA, and the community at the 0.01 level, and other environmental organisation and local government at the 0.05 level (Pearsons chi-square test).

The very varied answers given by the respondents can partly be understood as a response to the many authorities that do hold part of the mandate to govern the forest reserves.

As earlier presented in Table 58, the vast majority of the inhabitants were aware of some kind of restriction with regard to the use of the forest. The respondents were, however, also asked about the specific illegal activities, which in their view are taking place in the forests within the landscape. This question is very sensitive, so it is hardly surprising that respondents, who acknowledge that they or anyone in their household have seen somebody violating rules regarding forests in the form of undertaking specific illegal activities, are still only 22% of all respondents.

According to the local stakeholder analysis (Raben et al. forthcoming) a large number of different activities take place within the South Nguru forest reserves. Respondents were asked whether the person violating the forest legislation had cut trees, taken trees or wood out of the forest, taken animals or meat from the forest, taken plants from the forest, grazed animals in the forest, cultivated in the forest or any other activity. Yet, the informants only categorized four types of activities that they had seen taking place: As many as 92% identified people cutting trees, while only 10% mentioned hunters, 7% herders, and finally 8% mentioned people opening up agricultural land. The great majority of those identified as culprits were categorized as local people (86%) and the rest were foreigners.

Despite the fact that 22% agreed that they or somebody in their household had seen somebody violating the forest rules, it is actually extremely few, only two persons, that confirmed that they

had actually reported the violation to an authority. The practice of not reporting is explained by some 75% of those actually seeing violations by the fact that informants wish to avoid conflict. A few do not agree with the rules or believe that the violator would probably be successful in avoiding being taken to task (some 15 people each).

Summary of forest knowledge, attitudes and practices in the South Nguru forest landscape, Tanzania

Knowledge-attitudes-practices monitoring is a tool to understand local stakeholders' practices, and their changes over time Since relatively few respondents seem to have been able (or willing) to answer some of the (possibly sensitive) questions on detailed forest behaviour, the knowledge-attitudes-practices analysis is carried out for whole populations, with efforts to distinguish between different poverty levels in situations where it seems both possible and relevant.

- Almost half the people live more than 2 hours' walk from the nearest forest, and the vast majority of those living that far away does also benefit most from that forest. As distances from the forest get smaller, the less are people in Tanzania tied to the nearest forest, apparently because they get no benefits from it.
- Amongst the half of the landscape population available for the forest benefits analysis, there is no discernible poverty bias, neither in terms of non-product forest benefits, gaining from forest products, nor concerning what people can do to continue benefiting.
- Most respondents stated that the forest has a moisture/climate regulating effect. The claim that water comes from the forest is maintained by relatively few.
- Households benefited most from forest *products* last year by collecting or cutting firewood, despite the fact that its prohibition has since recently been more strictly enforced. Half of them also cut or collected timber or poles for building and sale. Other products, such as medicine, grass for thatching, furniture, sticks, tool handles, or crafts, charcoal, or other gathering and hunting, are dealt with by 20-30% each.
- It is believed by 40% that nothing can be done by the people themselves to preserve the forest benefits. Of those suggesting actions that people take, the vast majority thought about the size and the density of the forest, the two being the most passive among possibilities. Only few suggested things demanding a more active effort on their part, such as putting out a fire, reporting an illegal use of the forest, preservation of plant species, or keeping most of the animals in the forest.
- Very few people know of no restrictions on forest use. The most commonly felt forest rule is the limitation on cutting trees, but also the prohibition of cultivation and grazing in the forest is widely felt, both probably because they restrict behaviour, which many would otherwise resort to. The people living 'far away', in the North/West of the landscape, who earlier benefited most from timber or poles, do also seem to feel the restrictions most now.

- Most restrictions are felt equally by the poorest and the better off half of the people, the only exception being prohibition of cultivation or grazing, which seems to be felt by slightly more of the better-off.
- Of the households 67% believe that the government as such introduced forest regulations, but over half of the Tanzanians think that the village government was somehow involved, while very few thought of another institution.
- Most of the households in the whole landscape agree that rules restricting the use of the forest are necessary in order to maintain it, but it is a significantly greater majority in the East than in the North/West of the landscape. They do also believe, however, that the people themselves tend to benefit more from the forest rules, if they have to be approved by the village itself. Despite the great majority of people who plead for the importance of people's participation in making forest regulations, it is actually extremely few who have been drawn into the decision-making in this respect!
- The people experiencing any problems due to living close to a forest are very few compared to the Ugandan forest landscape. Of those who claim that the forest is negatively affecting their household, most say that wild animals are a problem, followed by diseases.
- Most respondents claim that local villagers benefit most from the forest.
- Most of the informants identified the national government as being in charge of taking people to task, who violate the forest rules. Only a third of the informants stated that Forest and Beekeeping Division has that authority, which indicates the authority's low presence in some parts of the forest landscape. As many as 40% of the informants assigned responsibility to the local government. Answers were biased towards the poorest for the central and local government.
- Finally, the vast majority of the inhabitants were aware of some kind of restriction with regard to the use of the forest. But in view of its sensitivity it is hardly surprising that respondents, who acknowledge that someone in their household has seen somebody violating concrete forest rules, are only about 20% of them all.
- The analysis of knowledge, attitudes and practices in the forest landscape, again in general, tend to reveal that forests are not only a source of resources for the poor, but at the same time pose risks, which more severely affect the poorest people compared to the rest of the population.

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