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PROPERTY RIGHTS AND THE SUSTAINABILITY OF FORESTS IN UGANDA

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Property Rights to Land and Forest Resources

Tenure consists of the bundle of rights which a user or a group of users have in the resources they use. These rights often determine how the users manage those resources. This is because the rights the users have affects the incentives for sound or abusive use. Consequently, tenure must be taken into account when planning strategies for natural resource management.

Land tenure regimes in Uganda

Uganda has a long history of diverse set of laws and social systems governing its land tenure. Since the promulgation of the Land Reform Decree in 1975, only two systems of land tenure are formally recognized as legal in Uganda: leasehold and customary tenure. In practice, however, a complex mixture of land tenure systems continue to function throughout the country. These include:

i. customary tenure
ii. Mailo land, which is a unique to Buganda and a small part of Bunyoro.
iii. freehold, and
iv. leasehold .

Customary tenure

Customary tenure represents the bulk of landholding in Uganda. An individual's access to and use of land is determined by the customary rules of the tribal or clan group to which the individual belongs. Access to and use of land under customary tenure is not static. The rules of access often change depending on the prevailing conditions. It is important to point out that customary tenure does not recognize individual ownership of land. However, it recognises the various rights of the individual to possess and use land subject to the supervision by his clan or community leadership (Makubuya, 1981).

Whereas the British colonial power attempted to alienate land from the people, only a small fraction of the available land was declared crown land. Since Uganda did not become a white settler colony, only a small percentage of these crown lands was alienated to churches, schools and individuals as free holds (Ntambirweki, 1998). The access to most of the crown lands, however, was according to the customary practices of the region in which they were located up to the time of independence. After independence , the crown lands were renamed public lands and continued to be in the domain of customary land tenure except in a few areas where the state had granted freeholds and leaseholds.

Customary tenure in Uganda enjoyed statutory protection under the Public Lands Act of 1969. It was legal for an individual to own land under customary tenure in rural lands not alienated in leasehold or freehold. Furthermore, the land commission had no power to grant a freehold or leasehold of any land occupied by customary tenure, without the consent of the customary occupiers.

Mailo land tenure

In 1900, the British introduced in Buganda and a small part of Bunyoro the Mailo tenure system which is a modified form of freehold. Under the 1900 Uganda Agreement, land in Buganda was divided between the Kabaka (King), notables and the Protectorate Government. The word "Mailo" was derived from the square mile unit of measurement used in the allocation of this land. Mailo land tenure is similar to freehold in that a land title is issued and the interest in land goes on in perpetuity (Marquardt, 1994).

About 1,000 chiefs and private people received land amounting to 9000 sq miles. The remaining land, roughly 16,000 sq miles was vested in the Queen as crown land. The Buganda land law of 1908 disallowed a mailo owner to transfer his land to a person not of the protectorate without the consent of the Governor and the Buganda Legislature.

Following the original allocations, a lively land market developed allowing access to titled land for those having the means to purchase it. At the same time, individuals who were occupying the land at the time of the allotments as customary tenants became tenants of the new landowner. Other tenants were encouraged to move on to mailo land by the owners who saw rental' payments as a source of labour and income.

The 1928 Busuulu and Envujjo Law fixed the rent and tribute payable to the mailo owner by a tenant and limited the freedom of the mailo owner to evict tenants. This guaranteed ample security of tenure to the tenants with respect to occupancy and inheritance. The Busuulu and Envujjo fees established in 1928 were however, never revised until 1975 when they were abolished under the 1975 land Decree. By this time, the fee had become of symbolic, rather than of economic value.

Since its introduction, mailo land has been the subject of continual controversy and misunderstanding. With time, a deadlock over land rights evolved between the land owners who possessed dejure freehold rights over the land and their tenants who enjoyed defacto use (Nsibambi, 1996).

The Land Reform decree of 1975 altered these relationship. The decree vested all land in Uganda in the state. Individual freehold and mailo titles of land were reduced to leaseholds. The decree also extended the scope of public control over land transactions and the ability to impose development conditions on land. The 1975 Land Reform decree was not, however, effectively implemented. Mailo titles were never converted to leaseholds, customary tenants on state land

continued to enjoy an adequate level of security of tenure.

Leasehold and Freehold land tenure

Leasehold and freehold tenure, are more formalised means of access to land especially by non-citizens and in urban centres. Freehold tenure is of limited extent, found mainly in former Ankole, Toro, Kigezi and Bugisu districts. Both private lease and public statutory leases can be found in Uganda. A private lease is granted by an individual land owner to an individual or organisation under terms agreed on by the respective parties. Statutory leases were provided for under the Public Lands Act of 1969.

The main advantage of a leasehold system is that it enables government to control use of property by imposing development conditions in the leases. Those who fail to comply with the conditions may be deprived of their property and it is given to more serious developers. However due to corruption in the civil service, people who fail to comply in the developmental requirements usually pay bribes to keep the lease.

Access to land under different tenure regimes

In Buganda, customary rules of tenure allowed a peasant to lease portions of mailo land ("kibanja") from the landlords. Many Baganda and non-Baganda peasants were able to access land in this way. With the consent of the landlord, the kibanja owner could transfer his rights to the kibanja to a third party or through inheritance to his relatives.

Due to the land market which developed in Buganda after the introduction of the 1900 Uganda Agreement, the wealthy Baganda and non-Baganda were able to purchase titled lands from mailo landlords.

In Northern and Eastern Uganda where most of the land is held under customary land tenure, land markets did not develop. Access to land in these two regions is determined by the prevailing customary rules. Only members of the clan have access to the clan land. Access, use and management of land closely follows the common property regime arrangements. In Western and S.Western Uganda, land holding is primarily under customary tenure. However, a large number of wealthy farmers have been able to obtain statutory lease holds provided for under the Public Lands Act of 1969.

Customary tenure restricts access of land to women to usufructuary rights only. The marginalization of women occupying land held under customary tenure is due to the fact that,

the land is inherited by the customary heir of the deceased; almost invariably a male member of the family. The 1995 constitution attempts to address this problem by prohibiting cultures, customs or traditions that are against the welfare and dignity of the women. Parliament is in the process of establishing an equal opportunities commission for taking affirmative action in favour of groups marginalized on the basis of gender, age and disability.

Recent developments

In recent years, the government of Uganda has taken interest in simplifying the nation's land tenure system for ease of administration. It is generally acknowledged that the multiplicity of tenure systems has led to confusion and tenure insecurity. Confusion over dejure and defacto land tenure rights have resulted in a recognition of the need to regularize the tenure system. A general consensus for a uniform tenure system has existed for some time. Whether that system is one of freehold, leasehold or customary tenure has been the most difficult issue to resolve.

Following the consultation on Land Tenure Reform by Makerere Institute of Social Research (MISR) in collaboration with the Land Tenure Centre (LTC) at the University of Wiscansin, a draft Tenure and control of Land Bill (1990) was submitted to cabinet. The salient features of the proposed Bill were:

i. the repeal of the Land Reform Decree which is not only controversial but also unworkable;
ii. the introduction, with some exceptions, of freehold throughout the country;
iii. that all land in Uganda would be public land and be vested in and administered by the Uganda Land Commission on behalf of the state until it was alienated in freehold;
iv. that restrictions to acquire land in Uganda be imposed only for non-citizens;
v. that the Land Registry be decentralized to regional or district levels.

However, government did not endorse wholly the above recommendations. The government felt that it was critical to undertake a consultation exercise to solicit the views of the people, particularly those of the north and northeastern parts of the country where most of the land is held under customary tenure. Thus a second technical committee on land tenure reform policy under the overall guidance of the Agricultural Policy Committee of the Bank of Uganda was instituted in 1992.

The committee identified the following issues which it thought were critical to the tenure reform process: uniformity of tenure, freehold tenure, urban land tenure, non-citizen ownership of land,

and common property resources. The recommendations made by the committee were used as a basis for discussion by the Constituency Assembly when debating the 1995 constitution.

The 1995 Constitution of the Republic of Uganda vested the land in the citizens of Uganda. Instead of simplifying the land tenure system, the 1995 constitution reaffirmed the land tenure regimes which existed before the Land Reform decree of 1975. For political reasons, the customary and mailo tenure could not be abolished. The mailo land owners are often the elite, politically powerful and have the capacity to lobby and articulate their rights. On the other hand a very large proportion of the peasant population in Uganda access land through the customary tenure arrangements. And yet these peasants are key producers in the agricultural sector and they would be marginalized if customary tenure was abolished.

Although in the past, customary law has mostly been applicable as a reversionary law (i.e. in the absence of other laws), the 1995 constitution recognises customary tenure as one of the tenure regimes in the country. For the first time it provides the owners of land under customary tenure to be issued with certificates of ownership. What this implies is that customary ownership may be converted to freehold upon registration. Customary land tenure, therefore, has and continues to have great significance for natural resources in Uganda.

The proposed 1998 Land Act includes a provision that a lawful or bonafide occupant of registered land shall enjoy security of occupancy on the land, shall be a statutory tenant of the registered owner and shall pay a ground rent of Shs.5,000 (approx. $ 5) every year, irrespective of the size of the land. It stipulates that where any group of persons hold any land communally, the land may be held on behalf of the group by a trustee chosen by the group, according to the customs of such a community. This provision facilitates the registration of communal land.

The central government or a local government shall hold in trust for the people and protect natural lakes, rivers, ground water, natural ponds, natural streams, wetlands, forest reserves, national parks and any other land reserved for ecological and tourism purposes for the common good of the citizens of Uganda.

The evolution of forest and tree tenure in Uganda

Between 1899 and 1910, control of forests in Uganda was vested in the colonial government, through various agreements with native African authorities. These agreements made all forests

and waste' land the property of the Crown', subject to the natives being allowed to take produce
for their domestic use.

Policies for the acquisition of forest land emphasized production and protection forestry.
Consequently, the principal objectives of forestry policies included the provision of goods and
services; maintenance and improvement of climatic and physical conditions of the country; and
the need to conserve and regulate water supplies by the protection of water catchment areas. A
report in 1929 stressed the role of forestry in climate and water regulation and recommended
much greater protection and major afforestation (Hamilton, 1984). Based on this report and the
significant advances in management and silviculture which had been made by the forest
department between 1900 and 1928, the 1929 forest policy was formulated.

1929 Forest Policy

Uganda produced the first forest policy in East Africa. It was gazetted in 1929. This original
policy has been periodically revised. The key issues in the 1929 policy were:

1. To retain under forests or reafforest all areas of land, the retention of which under forest
   is considered necessary to climate or other indirect grounds.
2. To meet, with due regard to vested rights, such of the demands of the population of
   Uganda as cannot be met by individual or local administration efforts.
3. To advise individuals and local native administrations in all matters concerning
   arboriculture and forestry.
4. In so far as it is consistent with the three proceeding objectives, to manage the state
   forests of Uganda so that they will give the best financial returns on the capital invested.

1964 Forest Act

The Forest reserves and protected tree species are vested in the state by the 1964 Forest Act.
Boundaries of the present forest estate were established by the 1940s. Legislation establishing
forest reserves under district administrations was enacted in 1938 and 1947. These "Local Forest
Reserves" were small, numerous and gazetted to cater to local demands. Their creation was not
expected to detract from the value of "Central Forest Reserves", which were usually larger and
were supposed to serve regional needs." (Hamilton, 1984).

The 1964 Forest Act had several subsequent statutory instruments, the most important being one
in 1967 which centralized the administration of the formerly "Local Forest Reserves". This
meant that the forest services run by district administrations were absorbed into a centrally

organized Forest Department. This was not based on environmental or forestry concern, rather it was as part of a general political move towards centralization based on the belief that is would be more rational and efficient.

Other widely applicable provisions of the Act included: (1) no one may reside, cultivate or graze livestock in a reserve without the written permission of a Senior Forest Officer; (2) certain species are reserved as forest produce and may only be cut with Forest Department approval both within the forest reserve and on other public land; (3) local communities may enjoy special privileges in the use of unreserved forest produce, which they may take from reserved or public forest land without a permit or the payment of fees in reasonable quantities for their own domestic use; and (4) any other form of forest resource use within reserves requires issuance of a permit from a Senior Forest Officer and usually requires payment of a stipulated fee.

1987 Forest Policy

A new forest policy which emphasized further the protective aspects of forestry was gazetted in 1987. The broad objectives of the policy are:

1. To maintain and safeguard enough forest land so as to ensure sufficient supplies of timber fuel, paper, poles, etc.
2. To manage the forest estate so as to optimise economic and environmental benefits to the country.
3. To promote an understanding of forests and trees.

Under this policy nature forest reserves were increased to 20% of the whole forest estate. In these areas, only non-extractive activities such as tourism and research is permitted. A further 30% has been designated as buffer zones with strictly controlled extraction of non-timber forest products by indigenous local population. On the remaining 50%, normal concessions for timber is allowed on sustained yield basis.

No doubt, the Ugandan Forest Policy has been characterized by a strong concentration of power over forest resources in the state and the corresponding lack of ownership and local participation in forest and tree management. Most of the economic trees are reserved trees and cannot be cut without the permission of the forest department; even if such trees are on private lands.

Failure to recognize indigenous systems of forest management and indigenous rights to economically important tree species has led to:

1. loss of incentives by the local communities to protect trees.

2. discouragement of local people to engage in tree planting and reforestation projects.
3. excessive reliance by the state on punitive measures to enforce the law.

In many countries, such forest policies have proved to be ineffective in solving and halting the rate of deforestation. The financial and human resources available to the forest departments are inadequate to carry out the task of policing forested areas without the participation of local communities. Most forest resources in Africa are scattered over large areas which make monitoring and rule enforcement by the state very costly if not impossible.

Prior to 1971, the forest policy in Uganda was strictly implemented by the Forest Department. Compliance to rules by the local people was very high because of the strict monitoring by the Forest Department.

However, after 1971, the forest sector suffered alongside other sectors of the economy during Uganda's turbulent history. The effectiveness of the forestry department was eroded as a result of low levels of funding and general decline in law and order (Hamilton, 1984). As a result, forest management activities became very limited and inefficient. Forest resources on private, communal and public land experienced an "open access" exploitation and/or abandonment and the department lost control of some areas of the forest estate to agricultural encroachment.

Since 1986, however, law and order has been gradually restored by the National resistance government (NRM). The forestry department has been sufficiently funded to rehabilitate the forest estate. Land which was lost through agricultural encroachment has been reclaimed.

Rights over forests and trees under customary and mailo tenure

In Buganda, when a tenant planted economic trees on Mailo-land, the landlord was entitled to get a share of the proceeds and to become the owner of the trees upon the departure of the tenant. Under the indigenous tree tenure rules, some tree species and forests are protected by the community. Protected trees included "sacred trees and sacred forests" which are used for religious ceremonies (Gombya-Ssembajjwe, 1994). Some trees which are believed to house evil spirits can also not be cut so as not to bring bad omen to the society. Third category of trees which are protected by the community are those which are planted along property boundaries.

Although natural forest patches occupying public land are protected by the state, individuals who

put a claim on that land can clear the natural trees for cultivation. People prefer to cut down the natural trees in these patches and plant Eucalyptus trees or agricultural crops. The natural trees are seen to belong to the government while the planted exotic tree species can be cut without seeking permission.

Rights over trees for women

In most communities, its only men who plant trees. This is because land belongs to the men. There are no incentives for women to plant trees since their access to the benefits is uncertain. Even in the few cases where women can plant trees, it is the husbands who decide where and what tree to plant. Often women are only allowed to plant fruit and firewood trees while the men plant economically important tree species. However, with more women entering the work force, an increased number of women can purchase land on their own, and many of them are engaged in tree planting.

Operational Problems in Protecting the Forests in Uganda

Uganda's forests are an essential foundation for the country's current and future livelihood and growth. Natural forests are estimated to cover an area of 63,460 km2 (6,346,000 ha) (FAO, 1993), -- the country's total area is 23,600,000 ha-- of which 23.2% (1,474,800 ha) are gazetted as forest reserves and the remaining 76.8% are ungazetted, on land under either public, private or communal ownership. These forests are interspersed among agricultural areas. The rate of deforestation, of both the gazetted forest reserves and the private forests, is high. For example, the Food and Agriculture Organization (FAO) of the United Nations estimated deforestation at 650 km2 (65,000 ha) annually (FAO, 1993).

Currently, about 95% of the country's total energy requirement is generated by wood from either forests or garden trees (Ministry of Finance, 1994). Over the years, there has been a steady increase in the demand for wood as energy caused by several factors:

a) the world oil crisis of 1973, from which the country has never recovered,
b) Idi Amin's economic war (1972-79) and of civil wars (1978-1986),
c) the implementation of structural adjustment programmes, which has led to removing of subsidies in the energy sector of the economy,
d) increased demand for charcoal and firewood as a result of the oil crisis and structural adjustment, and increased urban human population.

While there are many causes of deforestation, most observers agree that the primary causes in Uganda are:

a) clearing for agriculture,
b) pitsawing and mechanical logging for timber,
c) charcoal burning,
d) cutting for commercial firewood, and
e) road building, power transmission, and urbanization.

Government forest agencies and management problems they face

The Forest Department in Uganda is headed by the Commissioner of Forestry and assisted by four Assistant commissioners in charge of management; utilization; finance; and training and administration.

The District Forest Officers (DFOs) supervise the management and utilization of forest resources in the districts. They are the representative of the Commissioner of Forests. However, in the recent decentralization process, forest resources in the district has been placed under the district local authorities. Sixty percent of revenue collected from forest resources remain within the district. Consequently, the DFO reports to the District council, headed by an elected district chairman and he also reports to the Chief Administrative Officer (CAO) who represents the interest of the President and that of the Minister for Local Administration.

In practice it is difficult for the DFO to meet the interest of all these concerned parties. While the priority of the Commissioner of Forestry is to sustainably manage forest resources, the local district authority's priority is to raise revenue for the district. Selling of forest produce is the greatest source of revenue for districts. As a result, there is strong pressure from the local politicians to harvest as much timber as possible from the natural forests.

Although the DFOs and their assistants are employed by the central government, the field staff (including rangers and forest guards) are employees of the district council. Due to staff retrenchments and a freeze on recruitment in the civil service, most District Forest Offices are understaffed, e.g. in most districts there is one DFO and one assistant DFO (both of whom are degree holders). Similarly the local administration is not keen on increasing the forest field staff. Consequently, it is usual for only one forest ranger and two forest guards to be in charge of all forest resources (both government forest reserves and non-gazetted forest areas on public land) in one county of the district. This has led to poor monitoring and rule enforcement and an increase in illegal harvesting of the resource and a decline in the amount of revenue collected.

The DFOs have low morale and are not well motivated to effectively manage the forest estate. The low morale is caused by:

i. poor remuneration. A graduate forest officer earns about $100 - 200 a month, a forest ranger with a certificate earns between $ 40 - 60 while the forest guards earn about $20 a month. The lack of effective revenue collection by the government, fluctuation in world coffee prices, and the debt burden are some of the reasons advanced for the inability of the government to pay adequate salaries. Underpayment encourages forest officers to solicit for bribes from illegal forest users. Several forest officials in the field "proudly" quote a phrase, "man eats where he works" as a justification for the rent-seeking behaviour.

ii Poor working relationship with the communities. Because of the wide spread corruption among the forest officials and confiscation of tools and forest produce of illegal harvesters, foresters have a poor working relationship with the local communities. Consequently, communities do not readily assist the forest officials in monitoring and rule enforcement. Even in areas where collaborative management is being tried, the biggest problem is to restore the trust between the government officials and the local communities.

iii. lack of facilities. District forest offices operate with minimal funding. With the exception of donor funded activities, there is often no funds to carry out the various forest activities such as boundary opening, planting, maintenance and monitoring activities. Lack of field vehicles and funds for fuel makes it difficult for the forest officers to supervise field operations carried out by the forest rangers and forest guards. This further encourages field officers to be corrupt as there are no adequate supervision and monitoring of the field staff.

iv. Budget ary limitations. Operating funds are supposed to be obtained from the central government treasury at the beginning of each financial year. Often, only a quarter of the DFOs' budget is received by the District and not on time. For example, it may come when the planting season is over.

v. Non-payment or late payment of wages. Late payment of casual workers make it difficult to hire dependable labourers for routine forest operations. One of the result of this, is the recruitment of forest workers who can not carry out forest tasks effectively.

vi. Corruption. There is high level of corruption in all institutions relevant in forest rule - enforcement.

vii Limited economic opportunities. In rural areas where most of the forest resources are found there are very limited economic opportunities. Consequently, many local communities depend on forest resources for their livelihood.

Drawing on Empirical Data

IFRI pilot study:Lwamunda and Namungo Forests

Initial International Forestry Resources and Institutions (IFRI) research studies were carried out

in Lwamunda Forest Reserve under government (exploitation) institutional arrangment and Namungo Forest under a private (individual) institutional arrangement. These two forests were selected for IFRI pilot study because of their proximity (25 km) to Kampala city, their location in a densely populated area, and their closeness to each other. The two forests are in the same ecological system, and are used by the same local community. They differ only in ownership and in the rules governing them. The initial studies were conducted in 1993 and repeated in 1997.

Methodology

The research team consisted of a forester and a sociologist, knowledgeable about the culture of the people of the area and able to understand and speak their local language. A local person from the area of study with a vast knowledge of both botanical and vernacular (Luganda) names of trees, shrubs, herbs and grasses found in forests of the study area was also recruited. All members of the research team (with the exception of the local hired person) had been trained in IFRI instruments which was conducted in the country by an Indiana University research team led by Professor Elinor Ostrom. It was necessary to have a woman sociologist on the team because women would respond with more confidence to questions asked by fellow women than when the same questions were asked by men, whereas men were indifferent to the gender of the researchers.

A forest sample plot consisted of three concentric circular areas, one for sampling ground cover and woody seedlings (a 1 metre-radius), one for sampling shrubs and saplings (a 3 metre-radius), one for sampling trees (a 10 metre-radius, with a sampling area of 0.0314 ha). Seedlings are defined as young trees or shrubs usually less than 1 metre tall and less than 2.5 cm in diameter. Saplings are defined as young trees with a maximum stem diameter less than 10 cm but greater than 2.5 cm. A tree was accepted as a tree if its diameter measured at breast height (DBH) was greater than or equal to 10 cm. The centre of the forest plot was randomly selected. In order to do statistical comparisons, the locations of random forest sample plots were accomplished by placing a grid over a forest map (in cases where such maps are available) and using a random number table to select coordinates of a random point in the forest.

The number of plots completed in order to obtain a representative sample depended upon the size of the forest and the level of confidence desired about the measurement taken. A minimum

of 30 plots (sampling area of 0.94 ha) in all natural forests in the size range of 20 to 2,000 hectares was considered adequate to get representative measures of the forests. If the forest is homogeneous or very small (less than 20 ha), then fewer than 30 plots might be sufficient.

Data on social attributes of the communities using the forests studied was collected using the participatory rural appraisal (PRA) methodology.

Results

The field data was used to analyse a number of senarios which could be helpful in determining the sustainability of forests under different institutional arrangements.

Factors hypothesized to influence sustainability

A number of factors have been posed by many scholars to adversely affect the sustainability of forests (Elinor Ostrom,1990). The can be categorised in two broad categorises namely, economic and population factors; and institutional design and rule factors. The socio-economic data was used to analyse these factors and the results have indicated that economic and population fators have negative influence on both Lwamunda and Namungo forests and therefore are not likely to lead to sustainability of the two forests. As shown in Table 1, both forests were assigned negative values for three of the economic and population variables. Both forests are located close to active markets for forest products (Kampala is only 25 kilometres away by paved road), have experienced rapid population growth rate, and substantial population pressure in the surrounding area.

The institutional design and rules factors had mainly a positive influence on Namungo faorest and mainly a negative one on Lwamunda forest. The major differences were in institutional stability, understanding of rules in use by local users, graduated sanctions for rule breakers, the quality of monitoring, and the opportunities for the local users to participate in modification of the rules governing the forest. All these were positive for Namungo forest and negative for Lwamunda forest. For example, Namungo forest was under close supervision of a family member (son of property owner, Mzee Namungo), who with the help of hired labour regularly monitored the forest boundaries. Therefore, the quality of patrol and monitoring was better in Namungo forest than Lwamunda Forest Reserve, where, only two poorly motivated forest guards

are employed to patrol a forest which is almost 120 times bigger than Namungo forest.
Graduated sanctions for rule-breaking appeared more likely to exist and be enforced by owner
of Namungo forest due to personal contacts with the local community than was the case of
Lwamunda forest, where rule-breakers are supposed to be prosecuted in courts of law. However,
in both case, local governing bodies at the village level (Local Council 1 (LC 1) and sub-county
level (LC 3) provide access to low-cost conflict resolution at the local level.

Table 1. Sustainability factor score

SUSTAINABILITY FACTORS	FORESTS			
	Namungo 1993	Namungo 1997	Lwamunda 1993	Lwamunda 1997
Economic and Population factors:				
1. Distance to markets for forest products	-	-	-	-
2. Population growth-rate	-	-	-	-
3. Population pressure in surrounding area	-	-	-	-
Institutional Design and Rule factors:				
4. Institutional stability and understanding of users	-	-	-	-
5. Monitoring, sanctions, conflict resolution, and governance, are organised in multiple layers of nested enterprises	-	-	-	-
6. Rapid access to low-cost conflict resolution	-	-	-	-
7. Graduated sanctions on violations enforced	-	-	-	-

8. Quality of monitoring
9. Local users can participate in modification of rules
10. Local users design institutions governing use of forest

+
+

+
+
+
+

-

+
+

+
+
+
+

-

-
+

+
-
-
-

-

-
+

+
-
-

-

SUM OF SUSTAINABILITY FACTORS

2
2
-6
-6

A minus sign denotes that the factor was found to reduce the probability of sustainability of the forest.
A plus sign indicates that the factor increased the probability that the forest would be sustained in its
current condition. The bigger the sum of sustainability factors the more likely is the forest to be
sustained. There was no difference between the results of 1993 and 1997 studies.

Human consumptive Disturbances

There was significant differences in the occurrance of human consumptive disturbances between
Lwamunda and Namungo forests in the 1993 study (chi-square = 17.4, DF = 3, p<.001).
Indications of commercial firewood-cutting, pit-sawing, and charcoal-making, were noted in
more than 60% of the plots in Lwamunda Forest Reserve, while less than 50% of the plots in
Namungo revealed evidence of such exploitation (Becker,et al, 1995). The 1997 study has
revealed that there are still significant differences in the occurrance of consumptive disturbances
between the two forests (Chi-square = 34.6, DF = 3, p<.005). There were more disturbances in
Lwamunda forest (66%) than in Namungo forest (43%).
Forest value

The number of trees in Namungo forest was greater than in Lwamunda forest, but only by about
17 trees per hectare during the 1993 study visit. However, the difference in number of trees
became significant in 1997. There were 80 trees per ha in 1997 in Namungo then in Lwamunda
forest (Table 2). Therefore, the standing volumes, an index of the amount of timber in the forest,
was somewhat greater in Namungo forest than in Lwamunda forest. The mean of the DBHs for
all the trees were not significantly different between the two forests, especially during the second
visit as exploitation of the large diameter trees had taken place in Namungo forest during this
period.

Species richness, a key determinant of Simpson Recipricals and Shannon's diversity indix,
shown in Table 2 suggested that there was a drop in the richness, but this drop was greater in the
case of Lwamunda forest than Namungo forest. Since the repeated study did not exactly go to
the same sample plots, the explaination could that in the initial study more tree species were
captured than in the second study.

Table 2. Comparison of Summary Statistics for the thirty plots in
Lwamunda and Namungo forests in 1993 and 1997 respectively

Variables

Forest and year of study

Lwamunda
1993
Lwamunda
1997

Namungo
1993
Namungo
1997

Number of plots:

Mean DBH:

Total Stem Count:

Mean Height:

Stems per plot:

Projected Stem Count/ha.:

Species Richness:

Simpson Reciprocal:

Shannon Index:

30
23. 14
325
15. 66
10. 83
338
68
0. 04
3. 66
30
23. 28
298
12. 75
9. 93
309
57
0. 04
3. 56
30
24. 48
343
17. 60
11. 43
355
63
0. 03
3. 68
30
23. 51
374
12. 26
12. 47

389
62
0. 03
3. 61

The number of trees in the case of Lwamunda froest dropped by 29 and the species richness by 11. While in case of Namungo forest number of trees rose by 34, and species richness dropped by 1.

Conclusions

a) Namungo forest had a higher sum of the factors hypothised to affect sustainability forests than Lwamunda forest, and therefore, could be expected to be in better condition than Lwamunda Forest Reserve.

b) As predicted there was less occurrance of human consumptive disturbances in Namungo forest than in Lwamunda forest, and

c) There were more trees per (stem count) in Namungo forest than in Lwamunda forest.

The apparent better condition of the private forest could be attributed to institutional stability, good monitoring practiced, and availability of cheap conflict resolution mechanism as hypothised in Table 1.

Findings from other forest studies: A comparison

The intinial findings from the IFRI studies conducted in Lwamunda Forest Reserve and Namungo forest indicated that forests under private institutional arrangement might be better governed than those under the government institutional arrangemnent. However, it was found necessary to conduct further similar studies in other forests under both government and private institutional arrangements in a similar agro-ecological zone -- the tall grassland -- and demographic, socio-economic settings as Lwamunda and Namungo forests. Therefore, 12 forests found in Mpigi District were selected for further studies. These forests were selected for the study taking into account the local population density, and distance from Kampala, the major market centre for forest products as well as the institutional arrangements. The selected forest are presented in Table 3.

Table 3. Matrix for selection of forests studied

DISTANCE FROM KAMPALA (km)

INSTITUTIONAL ARRANGEMENTS

Government
Private

Nature
Forests
Exploitation
Forests
Individual
Forests
Communal
Sacred Forests

Within 30
Buttobuvuma
Mpanga
(Lwamunda)
Mugomba
Mugalu
(Namungo)
Bukasa
Semalizi

Within 80

Kizzikibi
Kyambogo
Lukambagire
Najjakulya
Magezigoomu
Mukasa

The selection of the forests under government and private individual institutional arrangements
was done with full cooperation and participation of the DFO, Mpigi District. Forests under
communal institutional arrangement was done with help of the earlier studies on traditional
forest reserves in the district (Gombya-Ssembajjwe, 1994 & 1995). Only two forests were
selected in the government nature institutional arrangement becasue there are only two forests
under that institutional arrangement in the district. Nature and sacred forests are for non-consumptive purposes, therefore, they can be used to compare the conditions of forests for
consumptive purposes.

Results and Discussions

IFRI Hypothesized Sustainability Factors

Factors which are likely to reduce sustainable forest management were assigned one negative

value and those which are likely to promote sustainable management were assigned one positive value. These factors fall into two broad categories namely the economic-demographic and the institutional design and rules. Ostrom, et al. (1993) have hypothesized that an institutional arrangement with a large sum of sustainability factors is more likely to govern the forests in a more sustainable way than one with a low sum.

Table 4. Institutional scores of sustainability Factors

HYPOTHESIZED FACTORS	INSTITUTIONAL ARRANGEMENTS
Government	
Private	
Communal	
Economic and Population Factors	
Distance to markets for forest products	-

	-
Population growth rate in settlements	+
	+
	-
Population pressure from surrounding area	-

	-
Institutional Design and Rule factors	
Institutional stability & clarity to users	-
	+
	+
Monitoring, sanctions, conflict resolutions, & governance, are organised in multiple layers of nested enterprises	+
	+
	+

Quality of monitoring
-
-
+

Rapid access to low cost conflict resolution
-
+
+

Enforcement of graduated sanctions on violations
-
+
+

Local users design institutions governing use of forest
-
-
+

Local users may participate in rule modification
-
+
+

SUM OF SUSTAINABILITY FACTORS
-6
+2
+4

The first category of the hypothesized factors tends to influence the institutions governing the forests negatively in all the institutional arrangements. In the government and private institutional arrangements, the negativity is due to the population pressure from the surrounding urban centres. In case of the communal institutional arrangement in addition to that negativity there is another one resulting from ethnic heterogeneity of the population in the settlements. Distance to markets, population pressure, growth rate and heterogeneity do not favour forest sustainability. The second category affected the government institutional arrangements more than the private and communal institutional arrangements. For example, although the local governing bodies from village levels (Local Council 1 [LC1]) up to LC3 provide low cost conflict resolving facilities at the local levels, they are not being used in case of the forests under the government institutional arrangements. However, there are doubts whether such courts

would be fair in their rulings, as the use of forests under government ownership has become a political issue at local levels. Political candidates known by the local forest users to be against illegal harvesting in government forests are less likely to be voted to the local offices.

Graduated sanctions (e.g. a warning for first offender, village court for second time offender, etc.) for rule-breaking enforced by property owners appeared are more likely to work in the private institutional arrangement than in the government institutional arrangements, when it is enforced by officers working under instructions from their superiors. Under government institutional arrangements, local forest uses have no right of modifying the rules governing the forests and the score was negative, while in the private institutional arrangement, there was a possibility for the local forest users to negotiate with property owners on the modification of some rules. Under the communal institutional arrangement, local forest users present at the time of consultation with the spirits may participate in modification of the rules.

Human consumptive disturbances in the forests

As discussed in our findings from Lwamunda and Namungo, we observed and recorded any human consumptive disturbances in each of the plots where we conducted forest mensuration.

The human consumptive disturbances observed and recorded during the study included pitsawing, charcoal burning, commercial firewood harvesting, agricultural encroachment, and others (mainly harvesting of building poles). In some plots only a single type of disturbance was observed (e.g. harvesting for commercial firewood): in others the consumptive disturbance was a process whereby one disturbance led to others especially in forests found within 30 km from Kampala. For example, harvesting for pitsawing as the original disturbance, followed by charcoal burning, and in some plots charcoal burning was followed by agricultural encroachment. However, it was the most recent disturbance as observed by the research team in each plot that was recorded. For each disturbance recorded a value of 1 was assigned to it.

In some plots, there were no disturbances observed and these are coded in Table 5 as none', and were also assigned the same value of 1. The total sum of these two categories of observations was then the same as the total number of sample plots taken in a forest. Results are presented in Table 5.

Table 5. Types of human consumptive disturbances and their occurrence

Institutional Arrangements	Forests	Size	Disturbances and their Occurrence	Total Plots
		(ha)	None	
			(%)	
			PS	
			CB	
			CF	
			AE	
			Others	
Government Nature				
	Mpanga	453		
			28	
		93		
			0	
			0	
			0	
			0	
			2	
			30	
	Buttobuvuma	1096		
			4	
		13		
			3	
			10	
			5	
			4	
			4	
			30	
Government Exploitation				
	Mugomba	725		
			0	

0
2
7
13
3
5
30

Lwamunda
4696
10
33
13
3
4
1
4
30

Kizzikibi
520
2
7
16
2
3
0
7
30

Kyambogo
760
4
13
23
1
0
0
2
30

Private
Individual
Mugalu
150
3
10
8
9
6
3
1
30

Namungo
40
17
57
3
1
1
7
1
30

Lukambagire
100
7
23
0
4
10
7
2
30

Najjakulya
50
17
57
10
1
0
1
1
30

Private
Communal
Bukasa
0.5
3
100
0
0
0
0
0
3

Semalizi
0.5
5
100

0
0
0
0
0
5

Mukasa
1.0
8
100
0
0
0
0
0
8

Magezigoomu
20
10
33
10
3
1
2
4
30

Key: PS = Pitsawing; CB = Charcoal burning; CF = Commercial firewood; AE = Agricultural encroachment.
This table shows the types of human consumptive disturbance and their frequency in each forest. None means
no human disturbance was observed and recorded.

Frequency distribution of the disturbances

A chi-square analysis was carried out on the disturbances to test for the significance of the
frequency distribution differences between the institutional arrangements. The disturbances
were aggregated under the institutional arrangements and the analysis was carried out to test
for the significant difference of disturbance frequency between the institutional arrangements
(nature forest reserves, exploitation forest reserves, private forests, and the communal forests).
The computed 2 = 31.7 was greater than the critical 2 = 21.0 at 5% level, and approximately
equal to 2 = 32.9 at 0.1% level for 12 DF, indicating some significant differences in the
distribution of disturbances between the institutional arrangements.
Considering the two broader institutional arrangements (government and private) a chi-square

test for the significant difference of the frequency distribution of disturbances between the government and private institutional arrangements resulted in computed $\chi^2 = 19.5$ greater than the critical $\chi^2 = 15.0$ for 5 DF at 1% level, indicating that frequency distribution of human consumptive disturbances was significantly different.

Taken together, the results of the chi-square tests suggest that there was more occurrence of disturbance in government exploitation institutional arrangement than in the other three institutional arrangements: the indication was that forests under this arrangement are used more by the local forest users than forests in other institutional arrangements. However, agricultural encroachment was more concentrated in forests under the private institutional arrangement than any other arrangements.

The distance from the major market centre, Kampala, was one of the factors assumed to affect the conditions of the forests being used for consumptive use. A chi-square analysis was carried out to test the significance of frequency distribution differences of the disturbances between the two distances (within 30 km and 30-80 km from Kampala). The computed $\chi^2 = 29.5$ is greater than the critical $\chi^2 = 19.5$ at 5% level and $\chi^2 = 18.4$ at 0.1% level for DF = 4. Therefore, the frequency distribution of the disturbances between the two distances is significantly different. The difference of distribution of no-disturbance and all-disturbance was also statistically significant ($\chi^2 = 31.4$). There was more occurrence of pitsawing disturbance in forests that are 30-80 km from Kampala than in forests that are within 30 km from Kampala. Charcoal burning and agricultural encroachment was more frequent in forests that are within 30 km from Kampala than in those that are 30-80 km from Kampala. This supports the observation that the process of deforestation starts with pitsawing, then charcoal burning, then agriculture. If this is true then forests within 30 km no longer have timber tree species in harvestable sizes so as to attraction a concentration of pitsawyers. Or it could be that charcoal burning is more financially profitable than pitsawing for forest users near Kampala, because of the low investment in charcoal production and the ever-increasing demand.

Aggregated forest values

As a way of deciding which institutional arrangement would result in better governed forests, comparison of aggregated forest values was done by institutional types. The aggregated forest values as presented in Table 6.

Table 6. Aggreated Forest Values by Institutional type

Institutional Arrangement	Trees (No)	Species Richness	Shannon index	Simpson Recipr	Basal Area (cm2)per plot	Mean Ht (m)
Government (Exploitation)	1692	132	4.04	0.02	0.75	12.4
Government (Nature)	699	90	3.84	0.03	0.77	14.6
Private	1134	114	3.96	0.02	0.60	11.7
Communal	539	62	3.41	0.04	0.80	11.0

The study has indicated that species richness vary with the number of plots aggregated into a

unit. The species richness and Shannon index increased, while Simpson reciprocal decreased, as the number of plots increased. Using species richness variable it could be suggested that forests under government institutional arrangements, due to their sizes are better in species richness the the private institutional arrangements. However, with basal area per plot, the institutional arrangements (communal and government nature) whose forests are for non-consumptive use had the highest while the private individual institutional arrangement had the lowest figures for basal area. This indicates that most trees of harvestable sizes in government exploitation and private individual forests have been harvested.

Conclusions

a) The private communal institutional arrangement had a higher sum of the factors hypothised to affect sustainability forests than private individual and government institutional arrangements, and therefore, could be expected to be in better condition of forests under the communal institutional arrangement to be better than those of forests in ohter institutional arrangement.

b) As predicted, the distribution of human consumptive disturbance was significantly different between the institutional arrangements, with exploitation forests under government institutional arrangement having more disturbance and sacred forest under private communal institutional arrangement having the least disturbances. Also, there was more disturbances in forests within 30 km from Kampala than in those 30-80 km from Kampala.

c) Forests under the private communal institutional arrangement had the biggest basal area per plot, while those under private individual institutional arrangement had the smallest basal area per plot. However, forest under government institutional arrangement had the highest species richness, while those under private communal institutional arrangement had the lowest species richness.

The apparent better condition of the forests under private communal institutional arrangement could be attributed to institutional stability, good monitoring practiced, and availability of cheap conflict resolution mechanism as hypothised in Table 4.

Theoretical Variables Necessary for Sustainable Forest Use: Conclusions

The role of tenure

Security of tenure of natural resources is an important issue if local communities are to use sustainably natural resources in their localities. It includes questions of both ownership and access to resources. Tenure determines whether local people are willing to participate in the

management and protection of forests and trees.

During the colonial period, indigenous people's rights to harvest and dispose of trees was significantly restricted. Similarly, after independence, Uganda's forest policy, like many other developing countries, has been characterized by the strong concentration of power over forest resources in the central state apparatus, and the corresponding lack of local participation in forest and tree management. The net result has been:

- loss of incentives by the local communities to protect trees;
- discouragement of local people to engage in tree planting and reforestation projects; and
- excessive reliance by the state on punitive measures to enforce the law.

Incentives for conservation by local people can be improved by increasing the value of the resource to local people by, for example, granting more access rights or by granting local communities a percentage of forest concession revenues. The local government ACT (1997) stipulates that local communities receive 60% of forest concession revenues. It is assumed that this incentive will encourage local communities to engage in sustainable forest use. It is on the basis of this that many local communities are participating in collaborative forest management with the government.

Insecurity of land and tree tenure may explain the observed general degradation of the forests and decrease of forest cover throughout Uganda. For example, tenants on Mailo-land are discouraged from planting trees by the land lords. Similarly local communities local communities are not willing to sustainably use and manage state owned forest reserves because of lack of reduced access rights. Communities views government forest reserves as state property. Unfortunately, the state is not backed with enough resources to enforce its rules. Consequently, a number of government forest reserves are exploited as open-access resources.

And yet insecure tenure alone does not explain the observed variance of degradation that we found in our study's forests. The most significant difference between the forests is the high level of illegal consumptive utilization in forests under different institutional arrangements. Some government forests are in good condition while some private and forests on public land are degraded. To account for this variance, we turn to an explanation that features the enforcement of rules at the local level.

Quality of monitoring and rule enforcement

Although all forest reserves had clearly defined boundaries, the study reveals that monitoring is difficult and costly in most government reserves because these reserves are often large with long borders, requiring many forest guards to monitor them effectively. The financial and human resources available to the Forest Department, however, are inadequate to carry out the task of policing these forests. In addition, the government officials (forest guards, forest rangers, and forest officers) who monitor and enforce the rules are poorly paid and, thus not motivated to carry out their duties. As a result, forest users who choose not to comply to the rules can easily escape detection. This allows individuals to use forests illegally and, hence, leads to forest over exploitation.

Some government and private forests which are small are in contrast, in good condition. These seem to have a much greater level of monitoring and rule enforcement. For example, Namungo Forest is small (60 ha.) with short borders and a path around two sides of it. Namungo's family lives on the side of the forest and the settlements are on the other side. Since Namungo values the forest for his own rights to harvest timber (after due notification of his intention to harvest) and employs farm workers who can be forest guards for part of each day, his forest has more guards than an average government reserve. Additionally, because local residents are allowed to exercise their traditional rights to harvest forest products (e.g., firewood, poles, medicines, fruit, fodder, and other forest products), residents tend to protect actively the forest against outsiders who try to use Namungo Forest. Thus, the level of rule enforcement in Namungo's Forest is relatively high, both because the Namungo family employs private guards, but also because locals enjoy strong and secure rights to products within the forest. The advantage of the forest's small size, short borders, and perimeter path around two sides helps to make monitoring more effective.

On the other hand Echuya is a large government reserve and yet it is in good condition. There are certain important features of Echuya which help to limit the amount of illegal consumptive use. Although subject to the same constraints on manpower and resources that discourage other government guards from effectively enforcing the national rules, the Forest Department staff in Echuya has augmented its monitoring capabilities by using the help of a pygmy community. The department allows the pygmies the right to live within, and appropriate products from, the forest on a daily basis - rights that other local residents do not possess. Because they live within

the forest, the pygmies are in a good position to monitor who is harvesting from the forest, especially since locals are allowed by law to enter the forest only once per week (on Thursdays). Echuya's physical layout also helps protect it from over exploitation. The Kabale-Kosoro road is the only road passing through the reserve and can easily be patrolled. Thus, while Echuya is large when compared to Namungo Forest, accessibility is difficult, the level of monitoring is significant, and the likelihood of being caught is quite high when harvesting illegally.

The department's reliance on the pygmies as forest monitors is effective for three reasons. First, because the pygmies do not live with the rest of the community, they do not fear retaliation from those they report to the Forest Department staff. Second, pygmies are less likely to collude with other local residents in breaking rules since there is no social interaction between the two communities. Third, pygmies have an incentive to protect the forest on which they depend on a daily basis.

Forest users can have access to forest resources without them destroying the resource in the process if they are aware:

- of possible consequences of not complying with the rules;
- that there is sufficient monitoring of rule compliance; and
- those individuals who abstain from obtaining forest products illegally must not at the same time witness a large number of their neighbours obtaining substantial income from breaking the same rules and regulations (Ostrom, 1990).

In most forests which were in poor condition, the local people are aware that there is no effective rule enforcement. The absence of effective management and enforcement has turned these forests into a resource that can be exploited on a first-come first-served basis leading to their over exploitation.

Therefore, it can be concluded that for local communities to have access to forest resources without them destroying the resource, attention must be paid to both the rules that allocate property rights over forest products and how those rules are enforced.

Empirical studies carried out indicate that forest resources are more likely to be sustainably utilized if an effective structure of institutional arrangements exists that gives rise to an authority system meaningful at the local level. A government forest reserve (state property) and a private forest (private property) can be as degraded as a communal forest (common property) if there

are no effective institutional arrangements and associated organizational mechanisms to monitor
and enforce rules in order to prevent wanton harvesting of the resource. Regardless of the de
jure property regime, all forests can be de facto open-access regimes if there are no effective
institutions and mechanisms to the rules.

In a few forest sites, we have been able to collect time series data. The assertions made five
years ago on the importance of tenure, rule enforcement and successful forest management were
again found to be valid. Land and tree tenure insecurity has again been found to discourage local
participation in forest management and forest protection activities. This in turn increases the
cost of monitoring and rule enforcement by the state.

Local participation in forest management

>From these studies and other pilot schemes, government has now realised that part of these
increasing costs can be reduced by involving local communities in the management of forest
resources in their vicinity. Employing locals to monitor in the place of regular national staff,
together with increase tangible benefits to the local communities will greatly improve the
condition of the forests. Given management institutions wherein local residents have greater
stake in the resources and management of a forest, it appears that successful forestry
management might endure. Namungo Forest appears to be sustainably used not only because
of its guards, but because community residents are allowed to use the forest according to
traditional custom. This makes residents more motivated to discourage outsiders from invading
the forest.

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