DECENTRALIZATION OF FORESTRY RESOURCES IN UGANDA:

REALITIES OR RHETORIC?

by

Abwoli Y. Banana, William Gombya-Ssembajjwe, and Joseph Bahati

Makerere University

Faculty of Forestry and Nature Conservation

P.O. Box 7062

Kampala, UGANDA

Send correspondence to: Abwoli Y. Banana (E-mail: banana@forest.mak.ac.ug)

DECENTRALIZATION OF FORESTRY RESOURCES IN UGANDA:

REALITIES OR RHETORIC?:

Abstract

This paper explores the extent to which decentralization following the enactment of the Decentralization Statute of 1987 has transferred control over forestry resources to local institutions in Uganda. A survey carried out in 43 forests located in eastern, central and western Uganda show unregulated harvesting pattern and use of forest products.

Using Mpigi district as a case study, the effectiveness of local institutions in the governance of forests was examined. Forests located in remote villages of Mpigi district were found to be more degraded than those close to the local administrative centers possibly due to weak monitoring and sanctioning of forest rules by the elected local councils.

The study showed that the central government still controls the management of forest resources in the districts and that there is at present no genuine shift in authority over forest resources to local people.

Keywords: Decentralization, Local forest institutions, local communities, effective monitoring, rule enforcement, and forest degradation

Introduction

Uganda's forests are an essential foundation for the country's current and future livelihood and growth. Sustainable management of these forests, however, is a great challenge not only to forest managers but also to policy makers given that the population is heavily dependent on them for timber, agriculture, and energy production (Hamilton, 1987), resulting in deforestation. At the beginning of the nineteenth century, forests and woodlands covered approximately 45% of the total land area of Uganda. At present, forest cover has been reduced to approximately 4.9 million hectares or about 20% of the total land area (MWLE, 2001). About 30% of the tropical high forest is degraded and the degradation trend continues.

Following the centralization of the management of forest resources in Uganda in 1967, institutions that local people had devised to limit entry and harvesting forest resources lost their legal standing (Banana and Gombya-Ssembajjwe, 2000). The government recruits forest guards to look after government forest reserves. However, this has proved to be economically unfeasible because forest patches are small and scattered over very large areas. The result, subsequently, has been largely unimpressive forest management in Uganda over the past thirty years.

The need to increase community participation in forest management has been a near-universal conclusion of national and international policy initiatives in tropical forestry over the last two decades (Brown *et al.* 2002). The justification for this range from considerations of practicality and cost-effectiveness to philosophical concerns relating to equity and social justice. Decentralization is currently central to ideas about effective public policy, democracy and the environment. The purported benefits of decentralization are many. For example, decentralization can lead to more efficient delivery of public services, more equitable outcomes and greater public participation in public affairs while others argue that decentralization increases the

flexibility of government policies, fuels local institutional capacity and maximizes the accountability of government (Lind and Cappon 2001). Critics, however, argue that decentralizing forest management will lead to greater levels of deforestation. They claim that local governments will under-invest in environment protection since they can not capture all the benefits of the public goods the environment creates (Bahl 1999).

In general decentralization in Uganda aims at ensuring good democratic governance, people's participation in decision making and accountability. It is envisaged that decentralization will permit development of programs tailored to local conditions, reduction of costs, and also provide opportunities for new local authorities to gain skills in planning, management and delivery of services. However, most decentralized natural resources management reflects rhetoric more than substance, and is characterized by some continuation of central government control and management over natural resources rather than genuine shift in authority to local people (Shackleton *et al.* 2002).

This paper therefore explores the extent to which decentralization has transferred control over forestry resources management decision-making to local institutions in Uganda. After more than fifteen years of implementation, there is a need to take stock of both the ecological and social outcomes of decentralization. Are forest resources in general better managed now than they were under the centralized system of administration? Can local institutions enforce forest rules under the Resistance Councils and Committees Statute of 1987 and the Local Government Act of 1997? By examining current harvesting levels of forest produce, especially timber, it is possible to ascertain whether the local councils and local communities are sustainably managing the forest resources. The assumption is that various layers of local government (District, Sub-county, and Village Councils) with the technical assistance of the District Forest Office are

effectively empowered to craft and enforce forest rules. Using Mpigi district as a case study, the effectiveness of local institutions in the governance of forests was examined.

Theoretical Considerations: The role of Institutions in Explaining Deforestation

Decentralization is now considered to be crucial for effective public policy, democracy and natural resources management. Decentralization may be presented in the form of formal political structures and institutions or the informal rules of local communities. It is about empowering local actors to make management decisions, rules and regulations.

Institutions can be defined as the "humanly devised constraints that structure human interactions" (Crawford and Ostrom, 1995; North, 1990). Institutions play a key role in determining the condition of the forestry resources by indirectly mediating the effects of social and cultural norms, state policies, technological variables, level of market pressures and demographic pressures.

It is the absence of effective institutions to regulate resource use that allows deterioration of the condition of the forest (Agrawal, 1994, 1995,1996; Varughese, 2000; Gibson, 2001). A forest with enforced rules that limit forest exploitation is most likely to be in better condition than that forest where rules are not enforced.

Without effective institutions to limit and regulate harvesting levels and management practices, forest resources can be overharvested and even irreversibly destroyed, as is often the case in "open access" forests (Hardin, 1968; Ascher, 1995; Ostrom, 1998, 2000, 2001; Tucker 1999; Gibson, McKean, and Ostrom, 2000). In such a situation, resource use would be predicted by the optimal foraging theory of maximizing economic returns while minimizing costs (Schweik, 2000; Gibson, 2001; Stephens and Krebs, 1986).

Proponents of decentralized forest policy argue that rules and regulations made by elected local actors are more effective because they are considered to be more relevant to local situations and are considered as legitimate by the local communities. On the other hand, the implementation of a centralized forestry policy fails because of the high cost of rule enforcement. Under such policy, individuals or communities consider the rules governing the use of the resource to be illegitimate since the desires of the government often do not match the desire of the community.

In an attempt to reduce cost, many contemporary forestry policies in both developed and developing countries are seeking to shift control of forest resources to the community level (Gibson 2001) through the decentralization process. This is because when compared to central government institutions, local institutional arrangements are considered better at providing, *inter alia*, rules related to access, harvesting, and management. Local institutions may also provide a forum that can respond to conflicts quickly and cheaply. Further more, local institutions often provide monitoring and sanctioning methods that are efficient (Ascher, 1995; Ostrom, 1990; Bromley *et al.*, 1992). In Uganda, the current five-tiered local administrative system of elected Local councils (LCs) and executive committees provide such a forum that can respond to conflicts quickly and cheaply.

Historical background

The 1967 Republican constitution abolished all kingdoms in Uganda. All forest reserves owned and managed by local traditional institutions were taken over by the central government. This was not based on the failure of local institutions to manage forest resources; rather, it was as

part of a general political move towards centralization based on the belief that it would be more rational and efficient.

Following the enactment of the Resistance Councils and Committees Statute of 1987 and the Local Government Act of 1997, the delivery of services including the management of natural resources was once again decentralized to the Districts and Local Councils. All forest reserves owned and managed by local traditional institutions prior to 1967 were returned to them for management. Thus the Local Government Act of 1997 involved the transfer of natural resources management decision-making and benefits from the central government to local actors.

The broad objectives for the decentralization of forest resources were to:

- Enhance the role of local government with more devolved responsibility for forest management and the withdraw of the central state from activities that could be carried out more effectively by the local councils and the private sector
- To encourage more active participation of local communities and farmers in the management of the country's forests.

The assumptions underlying decentralization of forest resources in Uganda are that forests are threatened with degradation and that negative environmental change can be reversed by introducing new, 'participatory' focussed institutions at the local level to engage local resource managers in sustainable use practices (Lind and Cappon 2001). The Resistance Councils and Committees Statute of 1987 and the Local Government Act of 1997 introduced a five-tiered system of elected Local councils (LCs) and executive committees—LC1 (village), LC2 (parish), LC3 (sub-county), LC4 (municipality), and LC5 (district). Each local council at every level includes an executive committee of nine members who have specific responsibilities. The secretary for environment is in charge of the management of forestry resources. The LC1

includes all residents of the village. The higher-level LCs includes all executive committee members from the LC at the level immediately below them. The LC3, LC4, and LC5 executive committee members are paid; LC2 and LC1 committee members are volunteers. These committees formulate by-laws for management of natural resources. The District Council is also empowered to hire staff to manage and enforce the by-laws.

Description of Study Forests

Forest data was collected from 43 forests located in Central, Eastern and Western Uganda. However, a detailed analysis of the ecological outcome of the decentralization process focussed on a subset of the data gathered from forests located within the same agro-ecological zone—the tall grassland zone around the Lake Victoria basin in Mpigi District of Uganda (Fig.1). This was necessary in order to control for variation attributed to ecological conditions. The forests selected met a number of criteria: a similar range in altitude and similar vegetation type. The research controlled for inherent variations due to topography and ecological factors so that differences in the condition of the forests could be attributed largely to effectiveness of the institutions involved in the management of these resources. The forests in this agro-ecological zone are classified as tropical moist, evergreen forests with closed canopies (Howard, 1991; Barbour, Burk, and Pitts, 1987). They are also locally categorized as medium altitude *Piptadeniastrum-Albizia-Celtis* forests after the three typically dominant tree species in the area.

[Fig.1 about here]

Data Collection methodologies

The level of harvesting activities in the forests provides empirical evidence of the ability district, sub-county and village committees to mobilize and motivate local communities to

sustainably use forest resources. Data on the pattern and extent of forest use by communities is routinely collected since 1995 under the International Forest Resources and Institutions (IFRI) research program. The objective of the IFRI research program in Uganda is to study and monitor how various types of institutional arrangements affect incentives and behavior of forest users in Uganda (Gombya-Ssembajjwe and Banana, 1994; Banana and Gombya-Ssembajjwe, 2000; Becker, Banana, and Gombya-Ssembajjwe, 1995).

In each selected forest larger than 100 ha, 30 plots were randomly distributed over the area of the forest. In small forest patches, fewer number of plots were sampled (Table 1). Once the center of a plot was located, three concentric circles were marked. In the first circle,[1] the amount of ground cover by herbs and seedlings was estimated and species identified. In the next circle,[2] shrubs and tree saplings were identified and their heights and stem diameters measured.[3] Trees were identified and their diameter at breast height (DBH) and height measured in the third circle, which had a radius of 10 meters. Data has so far been collected from a total of 1216 sample plots, of which 372 are located in Mpigi district.

[Table 1 about here]

As a measure of foraging in the forest, evidence of recent human disturbance due to timber harvesting, firewood cutting, charcoal burning, cultivation, and any other form of forest harvesting activity were recorded for each plot. Other forms of data were also recorded, including soil characteristics, slope, slope orientation, elevation, and evidence of livestock, insects, and fire damage (IFRI, 1998).

[1] The first circle had a one meter radius.
[2] The second circle had a three meter radius.
[3] Saplings were defined as young trees with a maximu m stem diameter greater than 2.5 centimeters, but less than 10 centimeters.

In addition to sampling forests, information was collected on the institutional, geographic, demographic, and socioeconomic characteristics of the villages that use these forests using PRA techniques. This data provided a context in which to interpret the observed harvesting levels and the condition of the forest resources under study. Semi-structured interviews were carried out with the personnel of the District Forest Office and the District, Sub-county, Parish and Village Councils.

The interviews focused on the challenges of implementing the Decentralization statute and the Local Government Act in general and the devolution of power over the management of forest resources to local councils in particular.

Results

At present, all sectors of the government except forestry have fully decentralized the delivery of services to the District and Local councils. However, only 5000 ha of small forests gazetted in the 1940s as "Local Forest Reserves," have been legally transferred to the Districts and Local Councils. The large forests gazetted in the 1940s as "Central Government Forest Reserves" have been retained at the center. These large, economically viable forest reserves are, however, to be transferred to the proposed National Forest Authority—a semi-autonomous, profit-oriented body to be soon established by an Act of Parliament. Once again, local institutions have been denied the chance to manage the economically viable forest resources and have been entrusted with only the small, degraded, and economically unviable forest areas.

According to the Local Government Act, the District Local Councils receive 40% of all revenue collected from Central Forest Reserves located in the district and 100% of all revenue

collected from the Local Forest Reserves. The revenue collected in the district from forestry resources is not, however, often plowed back into forestry activities. Instead of providing for more forest guards and forest rangers to carry out forest protection activities, these funds go to the general district budget.

Survey carried out in 43 forests located in eastern, central and western Uganda show unregulated harvesting pattern and use of forest products. Overall, about 40% of 1216 sample plots had evidence of recent consumptive utilization of various forest products such as charcoal burning, firewood collection and timber (see Table 2).

[Table 2 about here]

Of the 372 forest plots located in Mpigi district about 61% of them showed evidence of consumptive harvesting. However, without earlier baseline information on level of forest disturbance and in absence of time series data, no definitive conclusion can be made about the impact of decentralization on forest conditions.

Illegal harvesting of forest products especially timber and charcoal appeared to be more rampant in forests located in remote areas far away from the district administrative center. A Logit regression analysis of number of plots with evidence of timber harvesting against distance from the district administrative center revealed significantly higher levels ($P>0.001$) of timber harvesting beyond 50 km. from the district headquarters. Consistent with the evidence of timber harvesting, the number of timber trees per hectare and size of timber trees (dbh) decreased significantly ($P>0.001$) as distance from the district administrative center increased. Timber trees were on average 15 cm smaller for each 50-kilometer increase in distance away from the administrative center. Gombya-Ssembajjwe (1996) also observed that basal area/plot of commercial timber species decreased as distance from Mpigi district headquarter increased.

The reasons why forests located in remote sub-counties and villages showed more evidence of illegal timber harvesting is not very clear. The expectation was that the forests close to Mpigi town would show a higher occurrence of evidence of timber harvesting than those located in the remote part of the Mpigi district because of differences in market pressure. One of the likely explanations is that valuable timber trees have already been exhausted in forests located close to Mpigi town. Alternatively, it may be that monitoring, enforcement, and sanctioning of forest rules by the elected Village, Parish and Sub-county governments is poor hence the degradation of forest patches located in remote areas.

Discussion with councilors and members of Environment Committees during PRA revealed a lack of interest by the local councils to take on extra duties of managing forest resources due to lack of motivation. For example, members of the village and Parish committees are volunteers and no tangible benefits from the forestry resource accrue to them. The 40% of incomes from permits and licenses do not trickle down to the village council but instead provide budgetary support to the district and sub-county councils. Access to valuable commercial forest products such as timber is restricted to a few individuals who hold licenses issued by the Central Government.

The lack of interest to monitor and enforce forest rules is illustrated by the rarity with which prosecution of forest rule breakers occurs. Court and LC records from the Mpigi district showed that only 14 people were prosecuted in this District for illegal harvesting of firewood, charcoal, and timber in 2000. Ten people admitted the offense and were lightly fined (Uganda Sh. 2000—equivalent to about US $1.20 or labor wage for one day). The number of people prosecuted in 2001 were less than ten. The reason given was that local council elections were conducted during this period and councilors and Environmental Committee members did not want to

antagonize the voters by enforcing forest rules. Obviously, rules work only when they are enforced. Infractions of use rules must be monitored and punished. Otherwise, highly valuable renewable resources such as forests may be so over-harvested that their capacity to regenerate is destroyed (Ostrom et al. 1994; Ostrom 2000; and McKean 2000). Moir (1999) claims that monitoring without sanctions increases appropriation from the common pool resource because appropriators see what others are doing and react by increasing their own appropriation rates.

Illegal harvesting of forest produce in the districts is also revealed by the amount of illegal forest produce impounded at roadblocks mounted by the Uganda Revenue Authority (URA)-a government body that collects government taxes. Funds raised from the auctioning of impounded forest products are considered Central Government revenue and are still high compared to the revenue collected by the local councils from the sale of forest produce. Although the amount of impounded illegally harvested timber decreased from 200 million shillings in 1996/97 financial year to 70 million in 1998/99 financial year, that of charcoal increased three fold from 0.8 to 2.1 million shillings in the same period (see table 3). The expectation was that local councils would be more effective in monitoring and rule enforcement thereby leading to a reduction in illegal harvesting of forest produce and improved forest conditions.

[Table 3 about here]

Discussion

Although no definitive conclusions can be made about the impact of decentralization on forest conditions without time series data, interviews with local communities and local council leaders show that there is limited 'political will' by the elected councilors to implement the

Decentralization Statute of 1987 in respect to forest management. Given that councilors (local politicians) are the actors charged with implementing decentralization policies, one needs to understand the incentives and constraints these local politicians face.

There is evidence to show that decentralization of forest management is not yet very deep or real. For example, if decentralization has worked, why would the distance from the local administrative center to the forest affect the condition of the forest? This appears to show that enforcement by outsiders (the central government forest service) is still the most important method of forest control. In fact, one could argue that if decentralization worked, the distance variable should be in the opposite direction -- that communities left alone with the power to manage their own forestry resources would have better not worse forests.

There is continued confiscation of illegally harvested forest produce on roads leading to Kampala from the districts. One could argue that if decentralization worked, there would be no illegally harvest forest produce on the market. This appears to suggest that there is ineffective monitoring and rule enforcement at the forest level by village and parish environment committees. So there is clearly a great deal left to be done with the decentralization of forest management. However, the observed degradation of forests located in remote areas of the district also raises questions regarding the effectiveness of the centralization policy whereby the central government forest service through the District Forest Office monitors and enforces forest rules in the entire district.

Due to lack of financial, human and technical capacity, the District Local Councils, including Mpigi District Local Council have delegated the management of forestry resources to the District Forest Officer. The District Forest Office does not receive adequate budgetary support from the Central Government, since it (the government) considers forest resources to be decentralized.

While District Forest Officers are employees of the Central Government, the District Local Councils supervise them. On the other hand, the technical staff that support the District Forest Officer (the Forest Rangers and the Forest Guards) are employees of the District Local Councils. Failure to transfer fully the management of forest resources to the local governments has led to confusion within the forestry sector. This confusion arises from the unclear chain of command for forestry personnel and contributes to unwillingness by the various tiers of local government to take budgetary responsibility for forest protection activities.

The Forest Guard, working together with the Local Council officials at the Sub-County enforces forest rules. However, there are no Forest Guards at the Parish and Village level. The Village and Parish Environment Committee assist the Forest Guard to monitor and enforce forest rules at this level of local government. A verbal warning is given to first time offenders, while tools and illegally harvested products are confiscated on the second offense. When an individual violates forest rules several times, the case is referred to the District Forest Officer who prosecutes the offender at the District Magistrate's court. Thus, the central government through the District Forest Office still controls the management of forest resources in the districts and that there is at present no genuine shift in authority over forest resources to local people.

In theory, the nested layers of local government administrative structure put in place by the 1997 Local Government Act provides a platform for crafting and enforcing forest rules at the various levels of local governance. However, it appears that the elected Village, Parish and Sub-county Councils that would have been most important and effective for devolved forest management do not have the capacity to enforce forest bye-laws. Most of the powers of rule enforcement and sanctioning are vested with the LC 5 (the District Local Council). These powers gradually diminish at each successive lower level of governance. This may partly explain the

decline in quality of forest patches located in remote villages where the only visible local government officials are the village and parish councilors. Authority is needed by the lower councils in order to be effective forest managers. Forest rules crafted by Local Councils at each level should be legally binding.

According to the 2001Forest Policy, the government intends to encourage more active participation of local communities and farmers in the management of the country's forests and to enhance the role of cultural and traditional institutions in forest sector development. Community involvement in forest management may increase the motivation of individuals to protect the resource due to an enhanced sense of ownership and the anticipated increase in benefits.

Conclusion and Recommendations

It appears from the study that enforcement by outsiders is the most important method of forest control and that the central government through the District Forest Office still controls the management of forest reserves in the districts. At present, there is no genuine shift in authority over forest resources to local people.

The various layers of local governance should be sufficiently authorized and empowered to resolve forest-related conflicts, apprehend and properly fine offenders instead of having to pass them over to the District Forest Offices or Sub-county level forest guards. In addition to strengthening local forest institutions, there is a need to review the amount and nature of penalties given to those who repeatedly fail to comply with forest rules and regulations. At present, there is inadequate sanctioning of violators of forest rules.

Local councils should be empowered and strengthened through training in simple forest management skills. This can enable Village and Parish Committees and local communities to

manage forest resources better and to broadly participate in making and implementing forest policy in Uganda. Already, the Forest Department has been piloting collaborative forest management in selected forest reserves. From the pilot studies, there is some evidence to show that involvement of local communities in forest management may help to improve forest conditions. However, it must be recognized that it has been four decades of minimal involvement of local institutions and communities in forest management. Therefore, it is going to take a long time and a lot of effort for the village, Parish Sub-county Local Councils and local communities to organize locally, develop the rules, develop a sense of legitimacy, and put in place a mechanism to monitor and enforce forest rules.

ACKNOWLEDGEMENTS

The authors are very grateful for the continuing support from Ford Foundation. It has enabled us to systematically collect data from over forty forests in Uganda over the last five years. We are also grateful to the residents within the villages around the study forests who provided us with a link that helped to interpret the condition of the forests. We are also grateful to Patty Dalecki and S. Shaun at the Workshop in Political Theory and Policy Analysis, Indiana University for their invaluable skills and efforts in the editing and preparation of this paper. Last but not least, we also would like to thank Amy Poteete and Prof. Elinor Ostrom at the Workshop in Political Theory and Policy Analysis, Indiana University, for the academic guidance they provided to us.

References

Agrawal, Arun. 1994. Rules, rule making, and rule breaking: Examining the fit between rule systems and resource use. In Rules, games, and common-pool resources, eds. E. Ostrom, R. Gardner, and J. Walker, pp. 267-282. Ann Arbor: University of Michigan Press.

_____. 1995. Population pressure = forest degradation: An oversimplistic equation? Unasylva 181(46):50-58.

_____. 1996. The community vs. the markets and the state: Forest use in Uttarakhand in the Indian Himalayas. Journal of Agricultural and Environmental Ethics 9(1):1-15.

Ascher, William. 1995. Communities and Sustainable Forestry in Developing Countries. San Francisco: Institute for Contemporary Studies Press.

Bahl, R. 1999 'Fiscal Decentralization as Development Policy.' *Public and Development Finance* 19: 59-75

Banana, Abwoli Y., and William Gombya-Ssembajjwe. 2000. Successful forest management: The importance of security of tenure and rule enforcement in Ugandan forests. In People and forests: Communities, institutions, and governance, eds. Clark Gibson, Margaret A. McKean, and Elinor Ostrom, eds., pp. 87-98. Cambridge, MA: MIT Press.

Barbour, Michael G., Jack H. Burk, and Wanna D. Pitts. 1987. Terrestrial Plant Ecology. 2d ed. Menlo Park, CA: Benjamin/Cummings.

Becker, C. Dustin, Abwoli Y. Banana, and William Gombya-Ssembajjwe. 1995. Early detection of tropical forest degradation: An IFRI pilot study in Uganda. Environmental Conservation 22(1) (Spring): 31-38.

Becker, C. Dustin, and Elinor Ostrom. 1995. Human ecology and resource sustainability: The importance of institutional diversity. Annual Review of Ecology Systems (26):113-133.

Bromley, Daniel W. 1991/1992. Property rights as authority systems: The role of rules in resource management. Journal of Business Administration 20(1 & 2): 453-470.

Bromley, Daniel W., David Feeny, Margaret McKean, Pauline Peters, Jere Gilles, Ronald Oakerson, C. Ford Runge, and James Thomson, eds. 1992. Making the Commons Work: Theory, Practice, and Policy. San Francisco, CA: Institute for Contemporary Studies Press.

Brown, David., Yam Malla., Kate Schreckenberg and Oliver Springate-Baginski. 2002. From Spervising ' Subjects' to Supporting 'Citizens' : Recent Developments in Community Forestry in Asia and Africa. *Natural Resources Perspectives.* No. 75. February 2002.

Bruce, John W., and Shem E. Migot-Adholla, eds. 1994. Searching for Land Tenure Security in Africa. A World Bank book. Dubuque, IA: Kendall/Hunt Publishing.

Crawford, Susan E., and Elinor Ostrom. 1995. A grammar of institutions. American Political Science Review 89(3) (Sept.): 582-600.

Gibson, Clark. 1999. Politicians and Poachers: The Political Economy of Wildlife Policy in Africa. Cambridge: Cambridge University Press.

_____. 2001. Forest Resources: Institutions for local governance in Guatemala. In Protecting the commons: A framework for resource management in the Americas, eds. Joanna Burger, Elinor Ostrom, Richard Norgaard, David Policansky, and Bernard Goldstein, pp. 71-89. Washington, DC: Island Press.

Gibson, Clark, Margaret A. McKean, and Elinor Ostrom. 2000. Explaining deforestation: The role of local institutions. In People and forests: Communities, institutions, and governance, eds. Clark Gibson, Margaret A. McKean, and Elinor Ostrom, pp. 1-26. Cambridge, MA: MIT Press.

Gombya-Ssembajjwe, William. 1996. Analysis of Institutional Incentives for Sustainable Management of Tropical Moist Forests: A Case of Mengo Forests, Uganda. Ph.D. Thesis, University of Wales, Bangor.

Gombya-Ssembajjwe, William, and Abwoli Banana. 1994. A program to study and monitor the impact of institutional arrangements and incentives on forest resources in Uganda. Working paper. Bloomington: Indiana University, Workshop in Political Theory and Policy Analysis.

Government of Uganda. 1964. The Forest Act. Laws of Uganda Chapters 2 & 6.

Gregersen, Hans M., and Allen L. Lundgren. 1989. Linking Monitoring and Assessment to Sustainable Development. Forestry for Sustainable Development. Working paper no. 2. St. Paul: College of Natural Resources, University of Minnesota.

Hallenstvedf, A. 1995. Regulations control and enforcement: The west-Nordic countries. Paper presented at the 5th Common Property Conference, "Reinventing the Commons," 24-28 May 1995, Bodø, Norway.

Hamilton, A.C. 1987. Deforestation in Uganda. Oxford: Oxford University Press.

Hardin, Garrett. 1968. The tragedy of the commons. Science 162:1243-1248.

Howard, P.C. 1991. Nature Conservation in Uganda's Tropical Forest Reserves. Gland, Switzerland: International Union for the Conservation of Nature (IUCN).

IFRI (International Forestry Resources and Institutions). 1998. Field Manual, version 8.0. Bloomington: Indiana University, Workshop in Political Theory and Policy Analysis.

Lind, J. and J. Cappon. 2001. Realities or Rhetoric? Revisiting Decentralization of Natural Resources Management in Uganda and Zambia. Acts Press. African Centre for Technology Studies, Nairobi, Kenya

McKean, Margaret A. 2000. Common property: What is it, what is it good for, and what makes it work? In People and Forests: Communities, Institutions, and Governance, eds. Clark Gibson, Margaret A. McKean, and Elinor Ostrom, pp. 27-55. Cambridge, MA: MIT Press.

MWLE (Ministry of Water, Lands and the Environment). 2001. The National Forest Plan. Government of Uganda Draft Report May 2001.

Moir, Robert. 1999. Spies and Swords: Behaviour in Environments with Costly Monitoring and Sanctioning. New Brunswick: University of New Brunswick Press.

Namaalwa Justine, William Gombya-Ssembajwe and Ole Hofstad. 2001. The profitability of deforestation of private forests in Uganda. International Forestry Review Vol. 3(4): 229-306.

North, Douglass C. 1990. Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press.

Ostrom, Elinor. 1990. Governing the Commons: The Evolution of Institutions for Collective Action. New York: Cambridge University Press.

Ostrom, Elinor, Roy Gardner, and James Walker. 1994. Rules, Games, and Common-Pool Resources. Ann Arbor: University of Michigan Press.

_____. 1998. The international forestry resources and institutions research program: A methodology for relating human incentives and actions on forest cover and biodiversity. In Forest biodiversity in North, Central and South America, and the Caribbean: Research and monitoring, Man and the Biosphere Series, vol. 22, eds. F. Dallmeier and J. A. Comiskey. Carnforth, Lancashire, UK: Unesco and the Parthenon Publishing Group.

_____. 1999. Coping with the tragedies of the commons. Annual Review of Political Science 2:493-535.

_____. 2000. Reformulating the commons. Swiss Political Science Review 6(1) (Spring): 29-52.

_____. 2001. Commons, Institutional Diversity of. Encyclopedia of Biodiversity 1:777-791.

Ostrom, Elinor, Roy Gardner, and James Walker. 1994. Rules, Games, and Common-Pool Resources. Ann Arbor: University of Michigan Press.

Schweik, Charles M. 2000. Optimal foraging, institutions, and forest change: A case from Nepal. In People and forests: Communities, institutions, and governance, eds. Clark Gibson, Margaret A. McKean, and Elinor Ostrom, pp. 99-134. Cambridge, MA: MIT Press.

Shackleton, Sheona., Bruce Campbell., Eva Wollenberg and David Edmunds. 2002. Devolution and community-based Natural Resource Management: Creating Space for Local people to Participate and Benefit? Natural Resources perspective No. 76 March 2002.

Stephens, D. W., and J. R. Krebs. 1986. Foraging Theory. Princeton, NJ: Princeton University Press.

Tucker, Catherine M. 1999. Private versus common property forests: Forest conditions and tenure in a Honduran community. Human Ecology 27(2):201-230.

Uganda Forest Department. 1951. A History of the Uganda Forest Department, 1898-1929. Entebbe: Uganda Forest Department.

Varughese, George. 2000. Population and forest dynamics in the hills of Nepal: Institutional remedies by rural communities. In People and forests: Communities, institutions, and governance, eds. Clark Gibson, Margaret A. McKean, and Elinor Ostrom, pp. 193-226. Cambridge, MA: MIT Press.

Table 1. Size and Distance to District Administrative Center of sampled forests in Mpigi district

Forest name	No. of Plots	Forest size/ha	Distance to admin. Center in Kilometers
Butto-buvuma	30	453	23
Kizzikibi	30	520	72
Kyambogo	30	760	66
Lukambagire	30	100	70
Lwa munda	30	1096	29
Magezigoomu	30	20	79
Mpanga	30	500	34
Mugalu	30	150	32
Mugomba	26	150	28
Mukasa	8	2	24
Najjakulya	30	50	60
Namungo	30	40	31
Semalinzi	5	2	10

Table 2. Number of sample plots with evidence of illegal consumptive disturbance (N=1216 sample plots randomly located in 43 forests)

Type of Disturbance	Frequency	%
No Disturbance	723	59.5
Charcoal and Firewood	358	29.4
Timber	103	8.5
Cultivation	27	2.2
Poles	5	0.4
Total	1216	100

Table 3. Government Revenue Collected from Impounded, Illegally harvested Forest Produce

Resource	**Total Revenue (Uganda Shillings)[1]**		
	1996/97	1997/98	1998/99
Impounded Timber	201,129,038	105,678,472	69,558,611
Impounded Charcoal	-	893,100	2,119,800
Impounded Fuelwood	-	-	312,000

Source: Forest Department (unpublished data), 1999

1 On average, Ug. Sh. 1600 was equivalent to one Us $ during this period

Fig 1 Distribution of study forests in Mpigi District