

*Full Length Research Paper*

# Decentralized governance and ecological health: why local institutions fail to moderate deforestation in Mpigi district of Uganda

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**The outcomes of decentralization policies on the delivery of forestry sector services and ecological health remain ambiguous. Several scholars warn that there is insufficient empirical data to support the assumption that decentralization of forest resources results in better or worse forest governance. In this paper, we investigate the effectiveness of local institutions crafted during the implementation of decentralization reforms of the mid-1990s in Mpigi District of Uganda to moderate forest degradation. We observed cases of both institutional success and failure in forestry management within the district following the decentralization reforms suggesting that decentralization of authority over forests to local user groups, traditional leaders, or officials of local governments may not always produce incentives to prevent a decline in forest extent or condition in the entire landscape. The outcomes of decentralization reforms in the forest sector may be more a function of factors such as 1) the nature of the forests, location, patchiness, and production of external environmental goods and services; 2) the level and strength of market signals for both forest products and crops grown on forest soils; and 3) the diversity of stakeholders and their values and dependence on specific extents and condition of the forest patch.**

**Key words:** Decentralization, forests, deforestation, governance, forest rule enforcement and compliance

## INTRODUCTION

Institutions for forest governance in Africa designed by the colonial forest departments came under widespread scrutiny by the 1970s and 1980s (Rondinelli, 2006; Linda and Cappon, 2001; Hamilton, 1987). Traditional institutional arrangements that produced management systems through learning-by-doing processes had largely been perceived as inefficient. However, more recent evidence suggested that they could more readily adapt resource management strategies to environmental feedbacks (Berkes et al., 2000). The rigid forest-management strategies imposed by central, colonial governments might reflect less the desires and needs of local populations, and restrict their ability to adapt to changing environmental and local contextual factors as these populations were not part of the process for designing and implementing forest-management strategies (Ostrom, 1990; Wilson, 2002).

Decentralization, as a policy instrument, grew in importance as an option to improve the quality of forest management by giving more authority and control over resources to lower levels of government, people who have more intimate knowledge of the natural resources, and the changing needs and desires of local user groups. However, as some communities try to meet their needs and desires, they engage in uncontrolled exploitation of natural resources. This is likely to negatively affect the decentralization policy for natural resources.

The management of forest resources in Uganda has vacillated from centralization to decentralization over the past century (Turyahabwe et al., 2007). The first attempt to decentralize was in 1939 - 1947 with legistration establishing Local Forest Reserves under the districts administration. Recent governance reforms in the forest sector were initiated in 1993 when the Uganda government devolved the ownership and management of central forest reserves to the local governments (we refer in the paper to this period as a phase of 'complete decentralization').

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However, under Statutory Instrument No. 52 of 1995, forest reserves were recentralized. Yet again, the 1997 Local Government Act transferred management functions over forest reserves to the districts and sub-counties, but the 1998 Forest Reserves Order further restricted the functions of local governments by reducing their territorial jurisdiction (Bazaara, 2006; Ribot et al., 2006, Nsita, 2005). Through this order, the central government created central and local forest reserves (we refer to this phase in the paper as 'partial decentralization'). Ribot et al. (2006) referred to this behavior by the central government as "recentralizing while decentralizing."

In this paper, we investigate the impacts of the flip-flopping decentralization reforms of the mid-1990s in Mpigi District, Uganda, on forest condition and, in turn, how the reforms improved or reduced the effectiveness of local forest governance and management. Analysis of forest plot data collected before and after decentralization in selected forest patches of Mpigi reveals an aggregate decline in forest condition. This suggests less effectiveness of forest governance and management and not the improvement expected by advocates of decentralization reforms.

We hypothesize that the aggregate condition of forests declined in the late 1990s was because the decentralization reforms inadvertently dismantled some of these key factors that had maintained the institutional arrangements, and forest extent, since the 1950s. These factors include the level and quality of monitoring the rules and interaction of the well-trained forestry officers and guards with local leaders and user groups. We also hypothesize that the desired outcomes of decentralization, in relation to forest condition and extent, of traditional communities in Mpigi have changed from those of the central forest department and conservation groups. Thus, dismantling the former institutional arrangements and giving communities complete control are anticipated to result in the observed decline in forest condition.

To identify how the decentralization reforms caused the change in forest structure and composition, we draw on the biophysical and socioeconomic data, and other complementary interviews of community elders and forestry officials, to describe and analyze: 1. The specific decentralization made in the forest sector during this period; 2. The change in behavior of Mpigi district elected officials, forestry officers, and guards in forest management and 3. The change in behavior of local forest user groups in forest management.

### **Why do governments decentralize governance of forestry resources?**

Proponents of decentralized forest policy argue that rules and regulations made by elected local actors and leaders of traditional institutions are more effective and less costly to monitor and enforce because they are considered as legitimate by the local communities and are more rele-

vant to local situations (Gibson et al., 2005; Meinzen-Dick and Knox, 1999). Others argue that decentralization increases linkages and harmonization and builds social capital between different actors. These are necessary because factors driving deforestation cut across sectors and involve non-local influences (Andersson, 2004; Dietz et al., 2003; Gibson et al., 1999; Ostrom, 1990). Bazaara (2006) and Ribot et al. (2006) suggested that effective decentralization of resource management requires governing bodies at each level of governance that are both accountable to lower levels and have a secure domain of autonomous decision making. For Uganda, the nested layers of local government administrative structure provide a viable platform for crafting and enforcing forest rules at the various levels of local governance since the local councilors are forest users themselves and they are accountable to other forest user groups through elections (Turyahabwe et al., 2007). Decentralization of authority over forests to local levels of government assumes that local governments will be able to design institutions in-line with the needs and desires of local forest users (Blair, 2000; Conyers, 2006; Rondinelli, 2006).

Opponents of decentralized forest policy however, argue that decentralizing forest management will lead to greater levels of deforestation because individual local governments, especially in the developing countries, often lack the human, physical, and financial resources to be effective governors of natural resources by themselves (Andersson, 2003; Fiszbein, 1997; Gregersen et al., 2005; Larson, 2002). Often, local governments tend to under invest in environment protection (e.g., monitoring and sanctioning of rules) since they cannot capture all the benefits of the public goods the environment creates (Bahl, 1999; Francis and James, 2003; Olowu and Wunsch, 2004; Oksanen and Mersmann, 2003). Other factors that often act as disincentives for local governments to invest in a decentralized forest sector include limited decision-making powers, inadequate property rights, and the poor quality and quantity of the resource to be managed (Agrawal and Ostrom, 2001; Andersson, 2003; Andersson et al., 2005; Meinzen-Dick and Knox, 1999; Ostrom, 1999; Ribot, 1999; Ribot et al., 2006; Sasu, 2005).

No doubt, the review of literature on decentralization reveals that the decentralization of forest governance and the outcomes of decentralization policies on the delivery of forestry sector services and ecological health remain ambiguous (Anderson, 2006). Some scientists suggest that insufficient empirical data support the assumption that decentralization results in better or worse forest governance (Ostrom, 1999; Ribot, 2001; Ribot et al., 2006).

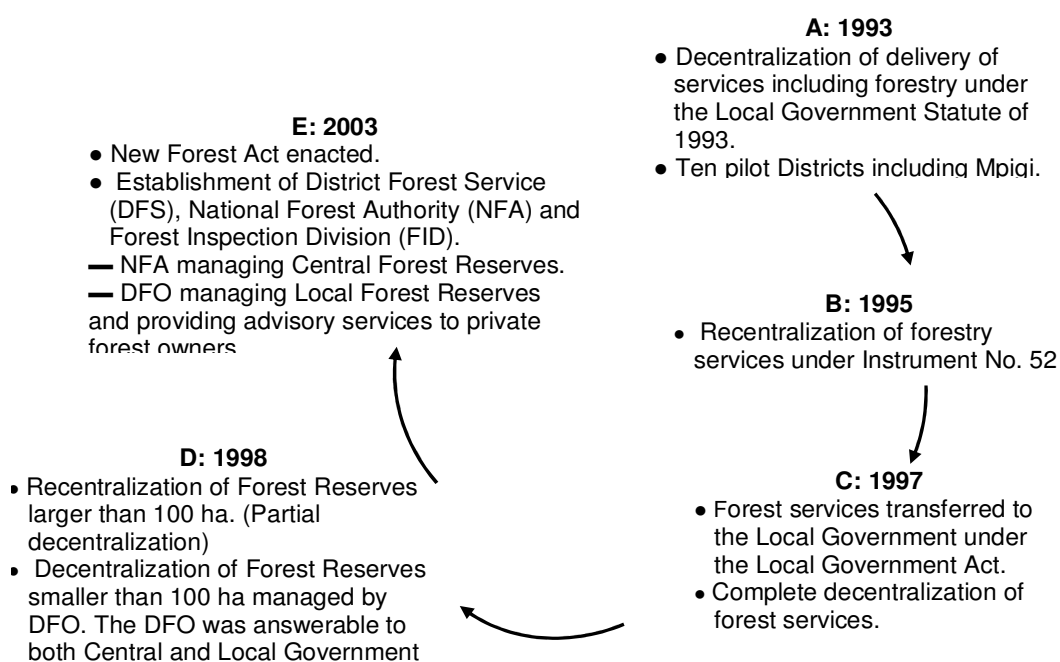
### **"Recentralizing while decentralizing": recent governance reforms in Uganda**

The political decentralization reforms in Uganda included the establishment of a five-tiered system of elected Local

**Table 1.** Administrative hierarchy of the Buganda Kingdom.

Buganda Kingdom traditional administrative hierarchy (from around the thirteenth century)	Equivalent administrative hierarchy created by Colonial Government and maintained by post-colonial governments (1900–87)	Equivalent administrative hierarchy created by Resistance Councils and Committees Statute of 1987 and the Local Government Act of 1997 <sup>a</sup>
Butongole	Village	LC-1
Muluka	Parish	LC-2
Gombolola	Sub-County	LC-3
Ssaza	County	LC-4
Buganda Lukiiko	District	LC-5

<sup>a</sup>LC = local council.

**Figure 1.** Rapid back and forth of decentralization, recentralization and decentralization from 1993 to present.

Councils (LCs) after the enactment of the Resistance Councils and Committees Statute of 1987. The nested-layer structure and mechanisms of local governance build on and mimic the administrative hierarchy of the Buganda Kingdom, as shown in Table 1.

Following the implementation of the Local Governments (Resistance councils) Statute in 1993, the government relinquished ownership, withdrawal, management, exclusion, and alienation rights of the central forest reserves (Figure 1 and Table 2).

However, under Instrument No. 52 of 1995, they were again recentralized due to perceived lack of capacity of district councils to manage forestry resources (Nsita, 2005). Yet, again the 1997 Local Government Act transferred management functions over forest reserves to the districts and sub-counties, but the 1998 Forest Reserves Order further restricted the functions of the local govern-

ments by reducing their territorial jurisdiction over forests (Bazaara, 2006; Ribot et al., 2006). Ownership and management of forest reserves of less than 100 ha were entrusted with the local governments while forest reserves larger than 100 ha were retained by the central government due to perceived lack of capacity of district councils to manage forestry resources (Nsita, 2005).

Under the new Forest Act of 2003, a Forest Inspection Division (FID) in the Ministry of Water and Environment was formed to supervise the activities of the created autonomous National Forest Authority (NFA) responsible for central forest reserves; and the District Forest Services (DFS) created to offer advisory services to private and customary forest owners (these non gazetted forests form 70% of the total forest estate in Uganda). These three institutions replace the Forest Department (Republic of Uganda, 2003).

**Table 2.** Changes in property rights, benefits, and responsibilities following governance reforms in the forest sector (1993–present).

	Pre-decentralization of the forest sector (prior to 1993)	Decentralization of the forest sector (1993–95) <sup>a</sup>	Partial decentralization (sharing of rights and responsibilities in the forest sector) (1997–present)
<b>Rights</b>			
Alienation	Central government could change the land use of forest land by act of parliament.  All forest land and trees owned by CG <sup>b</sup> .	Local government could change the land use of a forest by enacting bylaw.  All forest land and trees owned by LG <sup>c</sup> .	Central government could lease forest land to private developers.  Forest reserves of commercial value owned by the CG (542 forest reserves with a total area of 1,455,130 ha).  Small forest reserves owned by LG (192 forest reserves with a total area of 5,000 ha).
Access	Local communities enter and harvest freely for subsistence use.  Commercial harvesters enter and harvest on purchase of permit.	Local communities enter and harvest freely for subsistence use.  Commercial harvesters enter and harvest on purchase of permit.	Local communities enter and harvest freely for subsistence use.  Commercial harvesters enter and harvest on purchase of permit.
Management	CG prepares and approves forest management plans.  CG issues harvesting and permit, collects fees and penalties.	LG issues harvesting and permit, collects fees, and penalties.	CG issues harvesting permit on recommendation from LG through DFO.  DFO collects fees and penalties on behalf of LG and CG.
Revenue sharing	100% to CG	60% to CG; 40% to LG	From CFRs: 60% to CG; 40% to LG. From LFRs: 100% to LG.
<b>Responsibilities</b>			
Sourcing for funds	CG	LG	CG and LG
Monitoring and rule enforcement	CG	LG	LG and CG

Between 1995 and 1997, the forest sector was recentralized. bCG = central government (through NFA and Uganda Wildlife Authority (UWA)). cLG = local government (including all the nested layers).

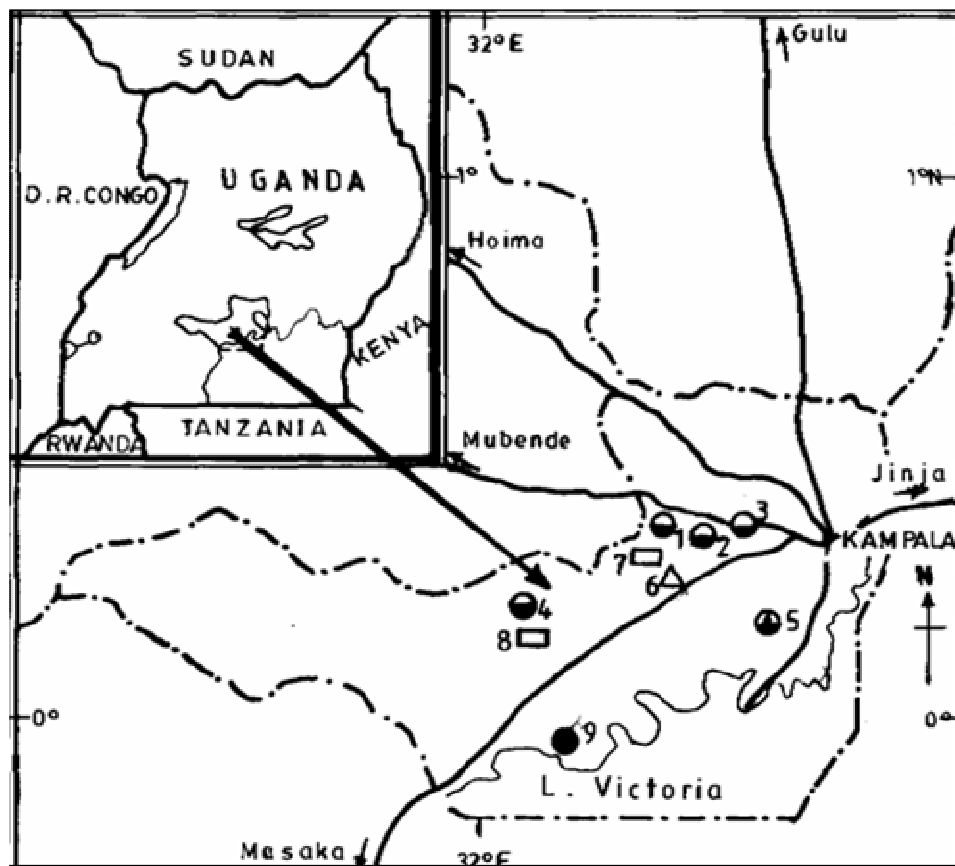
Previous empirical research in Mpigi District has found that the colonial institutions governing forests had been fairly resilient, maintaining the extent of forest cover in government reserves despite several disturbances while the extent of forest cover outside of government reserves, under formal private or informal community ownership, have largely been declining (Vogt et al., 2006). The study explored the condition of the remaining forest patches in Mpigi District based on the structure (basal area, biomass, etc.) and composition in a sample of patches.

Vogt et al. (2006) finding points out that attributes of the process of design and maintenance of these institutions helped to explain their success. Important factors include the actors involved in the creation of limits and rules (British government authorities, forestry officials, and members of the Buganda Kingdom). Also, the district forest officer and forest guards (FG) were both upward and downward accountable. They monitored frequently

and enforced consistently, and implemented management strategies on behalf of the central government. They also had to keep in good standing with local, traditional authorities and users groups with whom they had frequent contact. Thus, the DFO and guards were familiar with the nature of the forests and the changing needs and desires of the people, which could be reflected to the center while strictly enforcing rules of forest use handed down from the center.

#### STUDY METHODS

The study was conducted in selected sites located within the tall grassland agro-ecological zone around the Lake Victoria basin in Mpigi District of Uganda (Figure 2). The vegetation in this agro-ecological zone is characterized as a tropical, moist evergreen forest / savanna mosaic (Barbour et al., 1987; Howard, 1991). Mpigi District was chosen because it is situated mostly within one agro-ecological zone and hence the forests were assumed to be ecologically similar. In addition, Mpigi District was a pilot district for decentralization,



**Figure 2.** Map of Uganda showing Mpigi District and Uganda Forestry Resources and Institutions Center (UFRIC) forest sites included in the study: 1) Lwamunda A, 2) Lwamunda B, 3) Butto-buvuma, 4) Kizzikibi, 5) Mugomba, 6) Mpanga, 7) Namungo, 8) Najjakulya, and 9) Magezigoomu.

**Table 3.** Attributes of forests studied.

Forest name	Forest area (ha)	Tenure <sup>a</sup>	Distance to Kampala (km)	Population density <sup>b</sup>
Butto-Buvuma	453	CFR	25	Low
Kizzikibbi	520	CFR	70	High
Lwamunda A	694	CFR	30	Low
Lwamunda B	400	CFR	30	Low
Magezigoomu	20	Sacred forest	70	Medium
Mpanga	500	Nature reserve	30	Medium
Mugomba	150	CFR	20	Medium
Najjakulya	50	Private	60	High
Namungo	40	Private	30	Low

aCFR = central forest reserve managed by the DFO on behalf of the central government. bLow = 50–99 per km; Medium = 100–149 per km; High = 150–299 per km. c Sacred forest = communal forest but DFO provides management support. d Private forest= DFO provides management support.

and contains a large number of forests covering more than 36,000 ha of land under different tenure arrangements. Mpigi District also neighbors Kampala and has historically provided forest products for the capitol.

A total of nine forests (Table 3) in Mpigi District were sampled in

1994/95 (Gombya-Ssembajjwe, 1996), just prior to the enactment of the 1997 Local Government Act, and repeated five years later. The criteria for selection of individual forests included type of ownership, distance to Kampala, and population pressure (UBOS 1991) on that forest. Private forests were included because private

**Table 4.** Tree stock in Mpigi District in 1994/95 and 1999/2000.

Statistics from samples							
		Date of site visits	Mean	Std. dev.	Std. error mean		
Biomass (Mg/ha)		1994/95	199	100	33		
Biomass (Mg/ha)		1999/2000	123	84	28		
Basal area (m <sup>2</sup> /ha)		1994/95	21	7	2		
Basal area (m <sup>2</sup> /ha)		1999/2000	15	9	3		
Stem density (stems/ha)		1994/95	329	91	30		
Stem density (stems/ha)		1999/2000	244	101	33		
Paired differences							
		Mean	Std. dev.	Std. error mean	t	Df	Sig. (two-tailed)
Pair 1	Biomass (Mg/ha)	75	60	20	3.793	8	.005
Pair 2	Basal area (m <sup>2</sup> /Ha)	5	6	2	2.695	8	.027
Pair 3	Stem density (stems/ha)	84	97	32	2.608	8	.031

owners may harvest or convert their forests as they wish, but permits for commercial harvesting must still be obtained through the district forest office and local councils. The office also continues to provide advisory services to private owners about sustainable forest management, as many communities are also reliant on private forests for provision of firewood, water, poles, and handicrafts for subsistence.

Forest plots were laid out and biophysical measurements were carried out according to the International Forestry Resources and Institutions (IFRI) research protocols (Ostrom, 1998, see <http://www.indiana.edu/~ifri>). Data about trees in the sample plots were compiled for structure estimates of each forest. This included an analysis of total aboveground biomass, basal area, stem density, and DBH. These individual forest structure estimates were then compiled to assess aggregate change in the Mpigi forest estate during the period of study. Additionally, for each species, the changes in absolute basal area (sum of all stems for that species) were calculated. These forest parameters were used as indicators of forest condition to assess the impact of decentralization.

Dry biomass per stem is estimated by using the following algorithmic equation developed by Brown et al. (1989):

$$\text{kg/tree} = \exp(-3.1141 + 0.9719 \ln(D^2H)),$$

where D is the DBH in centimeters and H is the tree height in meters.

For the aggregate analysis of forest change in Mpigi District, descriptive statistics were run on all forests for each visit to determine the median and range of plot biomass and basal area estimates. A two-tailed, paired, sampled t-test was run to test for significance in the difference between structural values in 1994/95 and 1999/2000.

Social data collection on institutional changes in the Mpigi forest sector was carried out at two levels. At the district level, the district forest officer and his staff were interviewed to capture the change and division of roles and responsibility of forest monitoring, rule enforcement, and development of forest management plans for both the central and local governments between 1994/95 and 1999/2000. Additionally, the DFO provided access to records and annual reports for this time period. From these documents, we gleaned changes in sector funding, level of staffing, and the decision-making process in the Mpigi District forest sector.

At the community level, institutional, geographic, demographic, and socioeconomic characteristics of the villages that use these forests were collected using participatory rural appraisal (PRA) tech-

niques including mapping and group discussions. Discussions were held with local politicians, elders, and forest user groups. This data provided a context in which to interpret the observed forest use patterns and the condition of the forests under study. We use decline in basal area to categorize whether a forest is rapidly degrading, degrading, or stable. As a proxy to willingness to participate in sustainable forest management, questions on the perception of the level of conservation measures applied in the sampled forests and the conformance of user groups to formal rules-of-use were asked to the various forest user groups for the two study visits.

We draw on data from the community level to characterize the variation in how incentives and behaviors of local users groups has changed across this agro-ecozone from just prior to decentralization (mid-1990s) and five years after implementation of reforms (late 1990s). We also draw on a regional-level study to characterize more aggregate shifts in incentives to local user groups operating across the agro-ecozone over longer temporal durations: from the 1950s to the implementation of the decentralization reforms (mid-1990s).

## RESULTS

### Condition of forests in Mpigi District between 1994/95 and 1999/2000

Our aggregated analysis of the data collected from the Mpigi District forest estate between 1994/95 and 1999/2000 revealed a general decline in the number of trees in these forests. It suggests an increase in the rate of stem harvesting between these two dates. The increase in levels of harvesting in the period of study was possibly in response to high market demand for fuel wood products and food crops but with no strong institutions to mitigate the harvesting pressure.

Aggregated basal area, mean tree density (DBH > 10 cm), and total above-ground biomass from the nine study forests in the landscape significantly declined during this period ( $p < 0.05$ ) (Table 4).

An analysis of the changes in average basal area (average of nine forests) revealed that species sold in Kampala timber markets over the past five years and those

**Table 5.** Ten tree species with greatest decline in average basal area across forests, 1994/95 to 1999/2000.

	1994/1995 (cm <sup>2</sup> /m <sup>2</sup> )	1999/2000 (cm <sup>2</sup> /m <sup>2</sup> )	Change (cm <sup>2</sup> /m <sup>2</sup> )	Use <sup>a</sup>
<i>Celtis mildbraedii</i>	1.5856	0.8632	0.7223	T
<i>Celtis durandii</i>	1.2017	0.6228	0.5790	T
<i>Parinari excelsa</i>	0.6417	0.1064	0.5352	T
<i>Piptadeniastrum africanum</i>	0.9528	0.5241	0.4287	T
<i>Antiaris toxicaria</i>	1.7081	1.3741	0.3341	T
<i>Macaranga monandra</i>	0.5965	0.3047	0.2918	FW
<i>Trichilia prieureana</i>	0.4460	0.1568	0.2892	FW
<i>Erythrophleum guineense</i>	0.2463	0.0000	0.2463	FW
<i>Ficus capensis</i>	0.2494	0.0093	0.2401	FW
<i>Pseudospondias macrocarpa</i>	1.4203	1.1834	0.2369	FW
<sup>a</sup> T = timber; FW = firewood.				
	<b>1994/95</b>		<b>1999/2000</b>	
Mean	0.90		0.51	
Standard Error	0.17		0.16	
Standard Deviation	0.55		0.49	
Observations	10.00		10.00	
Pearson Correlation	0.952606			
P(T<=t) one-tail	0.000023		Significant	
P(T<=t) two-tail	0.000046		Significant	

used for commercial fuelwood were the same as those showing the greatest decline in average basal area across the Mpigi forests (Table 5). Changes in the ten tree species most harvested by the community the years 1994/95 and 1999/2000 were significant. There is a high demand for timber in Kampala and Mpigi District possibly due to improved levels of livelihoods and also increased demand for commercial firewood used for burning bricks in Mpigi District and for use in factories in Kampala. According to the FAO (2003) the production index for timber steadily increased from 58 in 1990 to 600.5 in 1997 while the rate of wood biomass and charcoal demand increased by 3 and 6% per annum respectively.

#### Community-level case studies: mid- and late 1990s

Even though there was an aggregate decline in the number of stems, biomass, and basal area across the Mpigi landscape, some of the individual forest patches were improving and others were stable (Table 6).

The forest patches in the study were similar in terms of market access, population density and only differed in management regimes. However, we observed cases of both institutional success and failure in forestry management within the district following the decentralization reforms. Five of the nine sampled forests were in the “degrading” or “rapidly degrading” categories, and four were in

the “stable” category. Communities reported increased or continued compliance with the laws in regard to timber and charcoal harvesting in Namungo’s forest, Mpanga, Lwamunda A and Kizikibi forest patches during the period of the study (Table 7). These forests had positive outcomes with regard to forest condition after decentralization reforms although they had different management regimes.

We found relatively low levels of compliance to harvesting rules among communities using Najjakulya, Mugomba, Magezigoomu, Butto-buvuma and Lwamunda B before or after decentralization. These forests had negative outcomes with regard to forest condition after decentralization reforms.

#### Change in behavior of district officials following governance reforms in Mpigi District

From the interviews with local politicians and district forest officials, it was clear that the local governance actors were demoralized and apprehensive by loss of ownership and decision-making powers and never accepted the recentralization of the forest sector. Local politicians have continued to agitate for the decentralization of the sector. Consequently, the local council reduced the level of investment in the forest sector. From 1993 to present, the district forest service has been characterized by a drastic decline in funding. Table 8 shows the changes in funding

**Table 6.** Change in forest condition of sampled forests in Mpigi District, 1994/95–1999/2000.

Forest	Forest area (ha)	Basal area (m <sup>2</sup> /ha)		Change in forest condition
		1994/95	1999/2000	
Butto-Buvuma	453	24	16	Degrading
Kizzikibbi	520	25	17	Degraded but improving
Lwamunda A	694	22	21	Stable
Lwamunda B	400	28	9	Rapidly degrading
Magezigoomu	20	18	9	Rapidly degrading
Mpanga	500	31	35	Stable
Mugomba	150	10	5	Rapidly degrading
Najjakulya	50	10	6	Degrading
Namungo	40	27	23	Stable
		<b>1994/95</b>		<b>1999/2000</b>
Mean		21.7		15.7
Standard Error		2.5		3.2
Standard Deviation		7.6		9.7
Skewness		-0.7		0.9
Observations		9.0		9.0
Pearson Correlation		0.75896		
P(T<=t) one-tail		0.01080		Significant
P(T<=t) two-tail		0.02161		Significant

**Table 7.** Change in conformance of rules-in-use to formal rules, 1994/1995–1999/2000.

Forest name	Commercial fuelwood <sup>a</sup>	Timber	Conservation measures
Butto-Buvuma	Increased conformance with laws	Noncompliance with laws	Declined from lax to nonexistent
Kizzikibbi	Increased conformance with laws	Increased conformance with laws	Improved from lax to about right
Lwamunda A	Continued compliance with laws	Noncompliance with laws	Improved from lax to about right
Lwamunda B	Continued compliance with laws	Increased conformance with laws	Continued lax
Magezigoomu	Noncompliance with laws	Noncompliance with laws	Improved from nonexistent to lax
Mpanga	Continued compliance with laws	Continued compliance with laws	Too restrictive
Mugomba	Noncompliance with laws	Noncompliance with laws	Continued nonexistent
Najjakulya	Noncompliance with laws	Noncompliance with laws	Improved from nonexistent to lax
Namungo	Continued compliance with laws	Increased conformance with laws	Continued to be about right
<sup>a</sup> Charcoal and commercial firewood.			

**Table 8.** Human and financial resources available to Mpigi District forest service following the decentralization reforms.

	Pre-decentralization of the forest sector (prior to 1993)	Decentralization of the forest sector (1994–95)	Partial recentralization of the forest sector (1995–present)
Operational funding	All from CG <sup>a</sup> ~ Ush 70 million (considered adequate)	All from LG <sup>b</sup> ~ Ush 20 million (considered inadequate)	~ Ush 1 million from CG and ~ 7 million from LG (considered extremely inadequate)
Staffing (salaries provided by CG throughout)	4 forest officers; 3 assistant forest officers; 7 forest rangers; 28 guards; 11 casual forest patrol workers; 4 administrative staff	4 forest officers; 3 assistant forest officers; 7 forest rangers; 28 guards; 11 casual forest patrol workers; 4 administrative staff (Retrenchment of forest staff by CG began.)	1 forest officer; 0 assistant forest officers; 3 forest rangers; 14 guards; 0 casual forest patrol workers; 0 administrative staff
LG= Local government. CG= Central government			



and staffing levels in Mpigi District prior to decentralization (before 1993), after full decentralization (between 1993 and 1994), and following partial decentralization (from 1997 to present).

Annual funding for district forest activities declined from Ugshs 70 million prior to the 1993 decentralization reforms to Ugshs 8 million. Similarly, the number of staff employed in the forest sector declined significantly, as shown in Table 8. Even the central forest reserves did not receive funds from the center since forestry was not a priority area for the central government. The central government remitted to the district conditional grants for provision of social services such as education, health and roads (Francis and James, 2003). Due to lack of funds, only 14 guards were employed to monitor and enforce rules in the entire forest estate in Mpigi District compared to 28 FGs and 11 casual patrol workers employed before decentralization. According to the communities interviewed, local councils not only reduced funding to the district forest office, but in some cases local councilors encroached and participated in the illegal harvesting of forest products from both central and local forest reserves.

## DISCUSSION

It was clear that change in governance, population, or access to markets did not explain the observed diversity in forest conditions in the district. Some forest patches were found to be in stable or improving condition after decentralization reforms while others were degrading. What did the stable or improving forest patches have in common?

We found very high levels of compliance to both timber and fuelwood harvesting rules in Mpanga Forest, a forest where there is a very high level of monitoring and rule enforcement because it is a strict nature reserve. For the past five years, its protection has been funded by the European Union. There are seven guards who monitor and enforce forest rules. In contrast, there are only fourteen guards to monitor and enforce rules in the rest of the forest estate in Mpigi District. Consequently, conservation measures were perceived by the community to be too restrictive and that the community had very limited access rights to the resource after the decentralization reforms.

In Namungo, a private forest we also found very high levels of compliance to both timber and fuelwood harvesting rules before and after decentralization. Mr. Namungo, the forest owner, works closely with the village-level council and neighboring community members to regulate harvesting. The community members have an incentive to cooperate with Mr. Namungo to protect the forest because he allows them to collect forest products from his forest estate.

In Kizzikibbi forest reserve—where there was also high compliance to both timber and charcoal harvesting rules -

rules—we found better cooperation among local councilors, community members, and district forest officer. The DFO stated that the local councils near this forest, together with local community members, had developed and enforced strict harvesting rules and regulations. Cooperation among stakeholders was achieved after the community observed rapid decline in tree cover over recent years in Kizzikibbi forest reserve and in other forests neighboring area. The community had an incentive to protect the forest reserve. Consequently, conservation measures were perceived by the community to have improved from lax to about right. The community expected the condition of the forest to improve even more in the future.

Finally, communities using Najjakulya, Mugomba, Magezigoomu, Butto-buvuma and Lwamunda B did not comply with both timber and fuelwood harvesting rules before or after decentralization. In these forests, there was no organized form of monitoring or rule enforcement by either the DFO or the forest owners. Consequently, large quantities of timber and fuelwood sold in Kampala timber yards originated from these forest patches. Conservation measures were perceived by the community to be lax or nonexistent and the structures of these forest patches were found to be degrading.

Apparently, compliance of local people to timber and firewood harvesting rules was observed to occur in areas where there was either strict enforcement of rules by the forest owner or where there was cooperation with local communities and the forest owners to protect the forest. This is in agreement with findings by Gibson et al. (2005) that rule enforcement by the local user group significantly correlated to good forest conditions whether or not the user groups are formally organized, dependant on the forest for a series of resources, or possess social capital. This was found to be true in government owned forests as well as in community owned, private or co-managed forests. For example, Namungo's forest was in better condition than Najjakulya private forest. Namungo is conservation minded and has both the traditional respect (as a sub-county chief in the Buganda Kingdom) and the financial ability to enforce and monitor harvesting levels (Becker et al., 1995). This forest owner also works closely with the village-level council and neighboring community members to regulate harvesting. Not all owners are conservation minded and willing to conserve the high-value commodities available in their private forests, particularly in this period of high demand for timber and commercial fuel wood.

It is also important to ask why some communities responded proactively to perceived degradation while others did not. According to the DFO of Mpigi, some LCs are more sensitized about the advantages of good forest management and has become concerned with rampant degradation. Some have begun to limit the level of harvesting and promote regeneration, as in the case of Kizzi-

kibbi central forest reserve. The Local Councils near this forest have been sensitized by NGOs, researchers and service providers.

The degree of awareness and sensitization varies within the local councils in Mpigi district. Some local councils are led by conservation minded leaders who are able to attract local and international NGOs to sensitize their communities. The different levels of sensitization about the environment may explain why some communities complied with rules and others did not and may also explain the observed variation of change in forest condition among the sampled forests.

The decline in level of funding in the forest sector following decentralization may also have contributed to the decline in forest health. Prior to the commencement of the decentralization process in 1993, all revenue from the forest reserves was collected by the District Forest Office (DFO) and remitted to the central government. The central government would then transfer funds to run all services in the districts. After the implementation of the Local Governments (Resistance councils) Statute, only 60% of the revenue was remitted to the central government; 40% was retained at the district to run local government programs in health, education, and roads. However, the central government stopped funding the forest sector at the local level. Without funds the local government could not employ adequate number of guards and rangers to monitor and enforce forest rules.

What proponents of decentralization reformers, as in the Uganda case, also often assume is that local and traditional users need and desire to maintain some extent of forest patches, in a particular condition, in their governance unit. However, the traditional strategies of local user groups have changed since the colonial period and no longer require maintenance of a forest patch in a specific condition in a village in order to maintain the flow of forest products on which their livelihoods currently depend. Thus, as hypothesized, the wholesale decentralization of ownership or management rights to lower levels of governance did not result in the maintenance of extent and condition of forests in Mpigi District similar to that maintained by the central forest department.

However, that is not to say that the traditional institutions regulating the flow of goods and services from "forests" remain. In communities without forests or where forests had been significantly degraded, we found institutions emerged that limited the frequency of cropping and harvesting in forests and restricted access to outsiders, to ensure the flow of fruits, fuel wood, and poles (currently important goods). This flow does not necessarily require the maintenance of the forest patch or a specific forest condition.

How were forest patches, and their condition, maintained prior to this attempt at decentralization? The DFO and forest guards were responsible to both the local community and the central government. They had frequent

contact with local communities and could see changes in the relationship, through time, of the communities to the forest and evaluate those impacts on the forest, and the management strategies on the communities. This could be relayed to the center to account for management strategies of the entire forest estate and public goods it provides. Thus, a well-funded DFO should be able to be able to keep the community informed of local change in resource use and management strategies, maintain the trust of local users and leaders, and maintain levels of monitoring, enforcement, and implementation of management strategies requested by the central forest department. That is, the DFO played an important role of linking the two levels of government, which desired to produce different goods and services from the same set of forest patches.

However, even the above institutional arrangements have recently had difficulties in maintaining the extent of forests in reserves under a specific condition. This is because they have not been updated to reflect the current land-use and forest-management strategies of local users. The original process of institutional design involved more traditional and local authorities than this process of decentralization reforms. If the designers of the decentralization reforms had included many of these actors (Buganda Kingdom officials, mailo owners, local councilor, etc.), they likely would have discovered the divergence in preferences as to how the forests of Mpigi should be used and managed at this point in the history of the region. With that knowledge, they could have collectively updated and strengthened the former multilevel arrangements to address the current multiple demands from the forests of Mpigi.

## Conclusion

The process of creation of the new institutions left unclear control of the forest sector and de facto responsibility for forests on the DFO, local leaders, and users groups. Worse, the budget, staffing, and activities of the DFO were severely curtailed, regardless of whether the district or central government had control over the territory during this period. Thus, without any real restrictions, the lower administrative levels and user groups could continue the use and management strategies they desired, which include the increase in harvesting and occasional cropping, but did not necessarily jeopardize the "forest" products on which they currently depend. This is what led to the change in structure and composition we measured.

Our findings suggest that decentralization of authority (even complete) over forests to local user groups, traditional leaders, or officials of local governments may not always produce incentives to prevent a decline in forest extent or condition. Placing authority of forest governance at one specific level of government (local, central, or multi) may not succeed at maintaining the flow of forest

goods and services, through time, to all stakeholders.

While crafting new institutional arrangements to manage forest resources, one should take into account the following: 1) the nature of the forests (extent, regeneration rate, location (soil types and distance to market), patchiness, and production of external environmental goods and services); 2) level and strength of market signals for both forest products and crops grown on forest soils; and 3) diversity of stakeholders and their values and dependence on specific extents and condition of the forest patch (those both near and distant to the forest).

Since the above factors change through time and space, the local forest governance institutions may also need to be adapted to these changes. Robust institutions that are effective in moderating deforestation are likely to be those that contain a provision for periodic updating, negotiated by all relevant stakeholders at a given time, to reflect current social context and ecological health of the forests. The long-term maintenance of a forest's condition or extent, *ceteris paribus*, may be more, a function of how the institutional arrangement governing that forest was designed and maintained than a specific distribution of authority over the forest between different levels of government and user groups.

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