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**A PLAN TO MONITOR THE IMPACT OF  
INSTITUTIONS AND INCENTIVES ON  
MANAGEMENT OF NATURAL FORESTS**

**Decentralization: Finance and Management Project  
Associates in Rural Development, Inc.**

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This volume represents more than one year's worth of study and research. In addition to preparing this monitoring plan, the project supported development of the International Forestry Resources and Institutions (IFRI) database, and conducted an IFRI training program and pilot study in Uganda. All of these activities required the assistance and support of the DFM staff at Associates in Rural Development (ARD), Inc., the IFRI team at the Workshop in Political Theory and Policy Analysis at Indiana University (the Workshop), the Department of Forestry at Makerere University, and AID/AFR/ARTS/FARA. The monitoring plan presented here is the product of that team effort. Thanks and acknowledgments are due to all those who participated in and supported the many phases of this project.

The DFM Project is managed by ARD, Inc. in collaboration with the Workshop, and the Metropolitan Studies Program of the Maxwell School of Syracuse University.

The DFM Project's primary focus is the analysis of institutions that perform key funding, management and maintenance functions in order to suggest ways in which these institutions can improve performance and establish policies which encourage sustainability. The project provides research and technical assistance to AID field missions and central bureaus to help analyze institutional structures that support local autonomy and sustainable management of resources.

## I. INTRODUCTION

### A. Background

A potentially promising approach toward addressing natural resource degradation is to facilitate and support the devolution of authority and responsibility for natural resource management to regional and local organizations, institutions and interest groups.

In 1992 the Decentralization: Finance and Management (DFM) Project undertook a year-long study to explore the above hypothesis. The study resulted in a report that described several conditions which appear to encourage communities to sustainably govern and manage natural resources.

As a follow-up to that study, DFM was asked by the Africa Bureau of USAID (USAID/AFR/ARTS/FARA) to propose a method by which the movement towards local autonomy could be monitored; that is, a plan to monitor the impact programs and projects which attempt to promote local autonomy for resource management decision making actually have on communities, institutions, and the resources themselves.

At the same time that the DFM Project was exploring these issues, the Workshop in Political Theory and Policy Analysis of Indiana University (which is a collaborator with ARD, Inc. on the DFM Project) was undertaking similar research under the auspices of the Food and Agricultural Organization of the U.N. (FAO).

The research approach the Workshop and the FAO decided to pursue was to develop the International Forestry Resources and Institutions (IFRI) database. The goal of the IFRI program is to help researchers gain a greater understanding of how individuals, groups, and local governments govern forests, the diverse resources within them, and trees in agro-forestry settings. The IFRI database provides an empirical base for analysis of data on how forest associated institutions affect incentives; how incentives encourage users to engage (or not engage in) destructive or sustainable practices; how users establish their own effective governance arrangements or continue to pursue independent strategies; and, how users are affected by government-driven development activities and policies.

Because of the parallel nature of the DFM and IFRI research programs, it was decided to combine resources so that the projects could provide mutual support; and, to base the monitoring plan on use of the IFRI database and its data collection instruments (which are attached as appendix 1).

Being based on IFRI, this monitoring plan design concentrates on forests. The definition of forests used by the IFRI program is broad however, and includes other resources

found within a forest that are important to users.<sup>1</sup> The intention is that the plan be flexible enough so that it will be adaptable for natural resource programs and projects which are concerned with the impacts institutions and incentives have on natural resource governance and management.

This monitoring plan has been designed based to a large degree on a Uganda pilot study and training program which was conducted in September and October, 1993, by the DFM Project (ARD, Inc. and the Workshop at Indiana University), and the Department of Forestry at Makerere University in Kampala, Uganda. The pilot study's experiences in Uganda provide examples illustrating the methods described in the plan, and a complete Uganda sample monitoring plan is included as Appendix 2.

## **B. The Impact of Institutions and Incentives on Sustainable Management of Resources<sup>2</sup>**

The monitoring plan described here, and the IFRI program it is based on, propose to study complex forestry issues, including the intricate structures developed to govern them, through a linkage of social and natural science approaches to understanding forests. The linkage will be provided through the Institutional Analysis and Development (IAD) analytical framework, developed over several decades at the Workshop. The IAD framework (see Figure 1) provides a method for identifying and analyzing how attributes of a physical/material world interact with the attributes of the community and with the specific rules which govern a particular situation (the rules-in-use), to affect the incentives facing individuals in that situation -- and the likely outcomes that will result (Ostrom, Huckfeldt, Schweik and Wertime, 1993, p. 4)<sup>3</sup>.

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<sup>1</sup> The IFRI program defines a forest as an area of at least .5 hectares, covered by vegetation (trees, bushes, shrubs, grasses) exploited by at least 3 households, governed by a similar legal structure.

<sup>2</sup> The discussion in this subsection is taken to a large degree from two sources: Ostrom, E., S. Huckfeldt, C. Schweik, and M. Wertime; 1993; *A Relational Archive for Natural Resources Governance and Management*; Paper Prepared for the IUFRO Conference August 1993; Bloomington, IN; Workshop in Political Theory and Policy Analysis; and, Ostrom, E., L. Schroeder, and S. Wynne; 1993; *Institutional Incentives and Sustainable Development*; Boulder, CO; Westview Press.

<sup>3</sup> Two definitions are essential for understanding the IAD approach. *Institutions* are the sets of rules that shape human interactions; i.e. "the people and the patterns of regular, repetitive interactions among them" that not only influence (in terms of production systems) the transformation of inputs into outputs, but also social interactions that structure how decisions get made. By this definition, institutions include families, communities, voluntary organizations, private firms and governments. *Incentives* include not only financial rewards and penalties, but also the positive and negative changes in outcomes that individuals perceive will be likely if a certain action is taken within a particular physical, social and institutional context. Incentives can therefore include opportunities for prestige, personal comfort and satisfaction in either a physical or social sense, and a conformity to common practices. They can stem from government imposed rules and/or from community cultural values.

# A FRAMEWORK FOR INSTITUTIONAL ANALYSIS

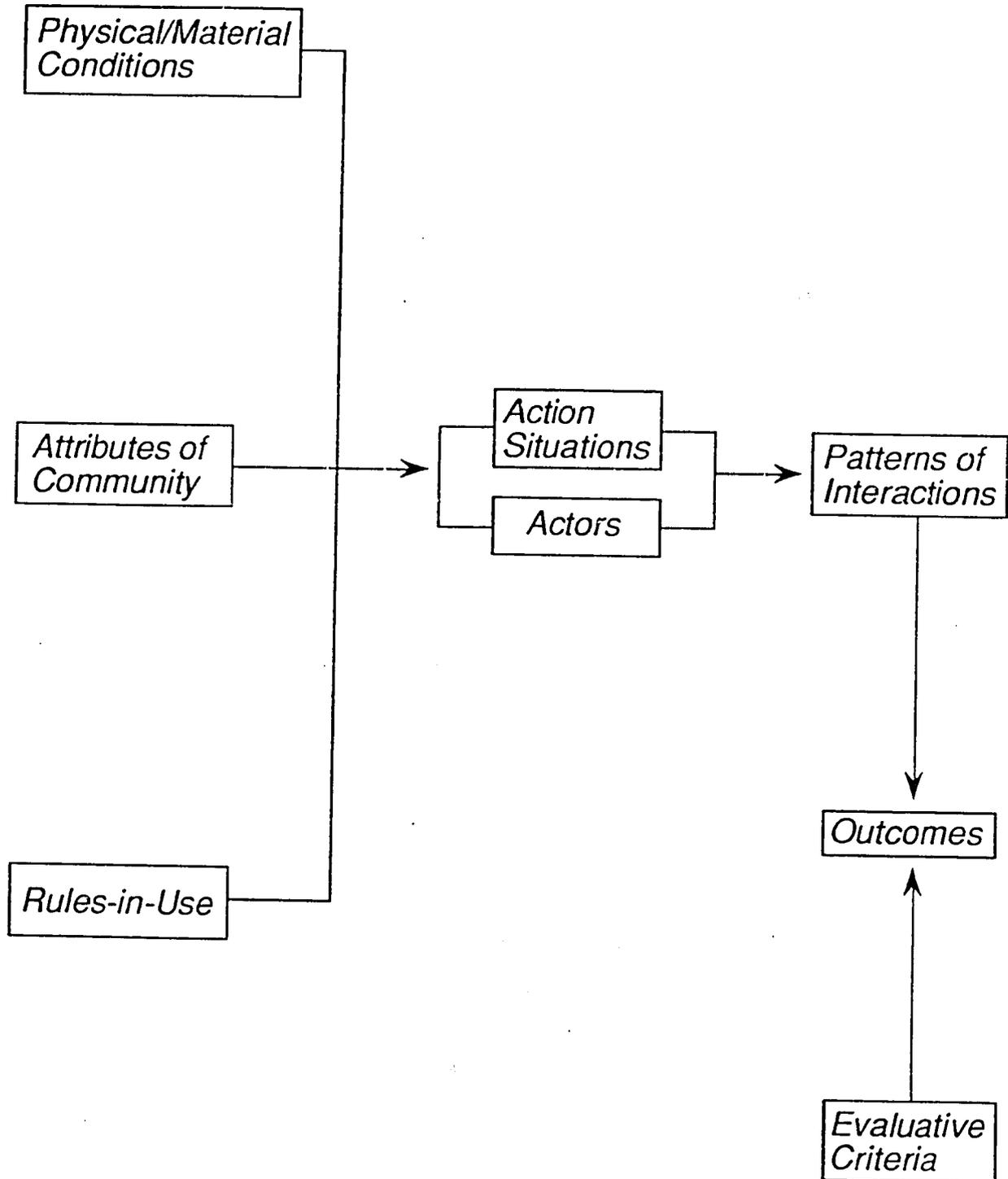


Figure 1

(From: IFRI Data Collection Instruction Manual, December 1993)

3

In the case of forestry:

The IAD framework links the characteristics of the physical world (forests) with those of the general cultural setting (the villages and harvesters that use forests), the specific rules that affect the incentives individuals face in particular situations (how forest products can be harvested, utilized, and maintained), the outcomes of these interactions (regeneration or deforestation), and the evaluative criteria applied to these patterns and outcomes (efficiency, equity and sustainability). (Ostrom, Huckfeldt, Schweik and Wertime, 1993, p. 5)

Fundamental to this institutional analysis approach is that all situations are viewed as being composed of the same essential elements:

- who the participants are;
- what positions they hold;
- what actions they take;
- what information they possess;
- what outcomes occur (as a result of the interactions of the above);
- how the actions and outcomes are linked; and,
- what benefits and costs are assigned to the actions and outcomes.

"Thus, while harvesting or marketing timber or thatch differ in many important ways, these diverse situations can all be described by identifying and analyzing how particular elements constituting the situations under analysis lead to the patterns observed." (Ostrom, Huckfeldt, Schweik and Wertime, 1993, pp. 7 and 8)

The characteristics of the elements are dependent on the physical attributes of the setting, the attributes of the community, and the rules-in-use which govern the action. The rules-in-use constitute one of three relevant tiers of governance and management actions: (1) operational level - rules affecting and concerning specific day-to-day actions, e.g. harvesting or planting; (2) collective choice - rules the group makes regarding an operational action, e.g. a forest association meeting deciding to ban harvesting of a particular product at a particular time; and, (3) constitutional choice - rules regarding how collective choice decisions will be made, e.g., when a forest association constitutes an executive committee to meet and make certain decisions.

Based on the above analytical framework, the IFRI database has been designed to provide an empirical foundation for systematic data analysis about:

- how institutions (i.e. sets of rules) affect the incentives (i.e. the individual's perception of rewards and penalties) facing forest users;

- how these incentives encourage forest users to engage in sustainable development or destructive use of forests;
- how forest users establish their own effective governance arrangements or continue to pursue independent strategies; and,
- how forest users are affected by government-driven development activities and policies. (Ostrom, Huckfeldt, Schweik and Wertime, 1993, p.5)

This monitoring plan, which is based on IFRI, will feed into and benefit from the same empirical foundation. The "database will assist in explaining and predicting the types of institutional arrangements that are most likely to lead to the establishment of sustainable forest systems in diverse ecological settings." (ibid.) The monitoring plan will help to monitor and determine whether these arrangements work, and what factors affect their success or failure over time.

### **C. Objective of the Monitoring Plan**

The objective of the monitoring plan is to provide a method to achieve a greater understanding of how and under what circumstances local autonomy increases the chances for sustainable governance and management of forest resources. The plan proposes to accomplish that objective through comprehensive, long-term monitoring of renewable natural resources, the communities, institutions and incentives associated with natural resources governance and management, and how these resources, institutions and incentives are affected by development programs, projects and policies.

The monitoring plan provides a method for collecting information on institutions and other incentive structures that affect how communities govern and manage natural resources. By analyzing these data, project managers and policy makers will be able to identify the variations in rules and incentives that lead to differences in practices, which in turn lead to sustainable or unsustainable natural resources governance and management. For example, why do some villages adopt sustainable forestry rules when similar neighboring villages resort to gross exploitation of their forest resources? What causes these variations? The monitoring plan describes how to collect data on the institutional bases for these variations. Analysis of this data will allow for generalizations, but it is important to note two significant caveats.

1. A long time frame is required for monitoring the kind of institutional changes and impacts that will be analyzed.
2. Institutional changes are multi-faceted and very location and time specific.

It is also important to note that any plan to monitor the management of natural resources should include not only collection of baseline data for the project site(s), but also for control areas outside of the project against which site changes can be compared. Changes in the project site have to be compared to what is happening outside of the project area under different institutional arrangements. In this respect, the monitoring plan described here does not only propose, for example, to measure changes in density of tree species and plant biodiversity within a project site, but also how those changes reflect and are caused by changes that occur in various institutional arrangements.

This generic monitoring plan and its detailed appendices include a training plan, instructions regarding how to draw a sample, how to define site selection criteria, how to utilize the data collection instruments, and a description of monitoring activities.

## II. DESIGN OF THE MONITORING PLAN

### A. Initial Research Required

In order to monitor whether a system of natural resource management enhances performance one needs to develop a method for systematically measuring and recording information about resource conditions and the physical and social variables thought to influence resource conditions. In regard to problems of deforestation and reduction of biodiversity, for example, a nation-wide monitoring program would include development of a sample of (1) forests located in diverse ecological zones of a country; (2) the institutional arrangements used in the governance and management of those forests; (3) forests in locations that have high population densities as well as low. In other words, one would want to develop a stratified random sample of forests that controlled for three strata: types of ecological zones, types of institutions, and population density. In each of the sites selected for study, one would then obtain information about the incentives (economic and otherwise) facing the users and the behavioral patterns of interaction among individuals using those forests.

In general, the type of information of most relevance for the physical conditions of a forest include data on complex variables such as:

- biodiversity;
- sustainability of current harvesting practices;
- economic value of forest stock and annual harvest; and
- erosion, insect and animal damage.

The type of information of most relevance to understanding the institutional arrangements would include:

- land and tree tenure of the forest;
- current governmental policies regarding harvesting on different types of forest land; and
- locally evolved rules related to forest users.

All of this information is required in order to establish baseline data and to determine sample size and monitoring site location. It is essential for determining whether positive or negative changes in a site are the norm; are directly caused by a specific program or policy; are occurring in other non-project sites and are the result of some other occurrence.

This section describes some of the basic questions that have to be asked in order to prepare for a monitoring plan, and for selection of the specific sites to be monitored.

1. Ecology, Environment and Geography

- What are the country's agricultural zones?
- What ecological areas have been distinguished?
- What is the country's land mass and how is it divided?
- What are the rainfall patterns?

2. Forests and Forestry

- What are the different uses of the forest?
- What species typify the forest and where are they found?
- What is the forestry policy? How has it changed?
- What patterns of forestation or deforestation are occurring?
- What are the users' perceptions of the forest regarding its importance and utility?

3. Rural Sociology and Anthropology

- What is the ethnic composition of the country?
- In general, how do traditional institutions govern and manage resources? Are those rules presently enforced?
- How do "official" management rules account for/accommodate traditional rule systems?

4. Land and Tree Tenure

- What are the basic patterns of land tenure?
- What forest property rights do users have?
- How are rights and tenure rules enforced? How are conflicts resolved?

- Are there any relevant land tenure conflicts and issues?
- What are the traditional land tenure patterns? How do the official government tenure laws accommodate/account for traditional laws?
- How does tree tenure affect use and management of forests?

#### 5. Political Administration

- What form does the government administration take?
- What is the status of local government and decentralized authority?
- What local government agencies are concerned with resource management issues?
- What is the general relationship between the national government, local government and community authorities?

#### 6. Traditional Structures

- What is the role of traditional institutions and governance structures (e.g., the role of elders)?
- What organizational forms and traditional governance organizations exist and are important?
- What NGOs are active and have influenced and stimulated organizational forms?

### **B. Design and Site Selection**

With the above basic information in hand, a monitoring plan can be designed based essentially on (1) the number of relevant ecological zones in the study area (whether that study area be an entire country, part of a country, or a specific project/program site); and (2) the types of institutional arrangements for resource management likely to occur within that study area.

To help answer these questions, a design matrix of the kind shown in Table 1 is useful. It is not possible to describe an exact formula by which to design a matrix which will lead to an exact description of sample size. It is possible, however, to describe several guiding principles for preparing a design matrix.

**Table 1 - Monitoring Plan Design Matrix**

Ecological Zones	Institutional Arrangements		
	Type A	Type B	Type C
Zone Type 1			
High Population	X Site(s)	X Site(s)	X Site(s)
Low Population	X Site(s)	X Site(s)	X Site(s)
Zone Type 2			
High Population	X Site(s)	X Site(s)	X Site(s)
Low Population	X Site(s)	X Site(s)	X Site(s)
Zone Type 3			
High Population	X Site(s)	X Site(s)	X Site(s)
Low Population	X Site(s)	X Site(s)	X Site(s)

**1. Determine the Row (Ecological Zones) and Column (Institutional Arrangements) Categories**

Defining the "Ecological Zones" of concern is likely to be complex. When deciding what those zones should be, it is helpful to consider what kinds of physical environmental problems people face and how they go about solving them. In other words, what are the various types of physical environmental constraints people face that might have affected the kinds of institutional arrangements they have developed to resolve those constraints. In Uganda, for example, it can be conceptualized that those living in the "Tall Grassland," "Short Grassland," "Semi-Arid Dry," and "Highlands" areas of the country, having faced different problems due to the different natures of their ecologies, have developed different institutions to resolve those problems. In Uganda listing these four zones makes sense; they describe four different areas where people typically face different kinds of problems.

If the project area of concern were just one part of Uganda, then only one ecological zone might have to be listed. In other places, classifications might very well differ. In the Sahel, for example, differences would perhaps be better described by latitude, or rainfall. All of these factors will affect the number of columns and rows included in the matrix.

**Population density** is often such an important factor in affecting forest condition that it will be important to control for in many countries. Forests located in regions characterized by a high population density are much more likely to have been degraded -- regardless of the ecological zone they are in -- than forests located in low population areas. To understand how forest institutions may make a difference in any particular ecological zone, it is important to include forests in that zone that are located in both high and low population density areas, if they exist.

Within a country or project area, one would want to include forests representing all major types of forest governance or **Institutional Arrangements**. In some places these may be simply related to ownership patterns, such as government ownership, communal ownership, and private ownership. But in other places, there may be distinct types of governance arrangements where the incentives differ rather substantially within an ownership type. For example, in many states of India, considerable experimentation with Joint Management of government owned forests has been undertaken. In such a setting, it would be important to control for two types of governmental forests: those which involved joint management and those which did not. Since there are many subtle difference among institutional arrangements, one cannot control for all of the distinct types of arrangements that may exist in a country. In many instances, one cannot even know that they exist until after one has completed site visits. Thus, in the design of the sampling plan, the key problem is to identify the major groupings of institutional arrangements used to govern forests in a particular country or project area so that sufficient numbers of each type of arrangements within each type of ecological zone (and near to high density or low density populations) that one is assured of being able to address the question: What difference in incentives, behavior, and forest conditions do these institutions make?

## 2. *Filling-In the Matrix*

The number of ecological zone rows, and the number of ownership arrangement columns determines the number of cells in the matrix. The number of cells in a matrix will essentially be multiplied by two because for each of the initial rows and columns one would like to find forests in both high density and low density regions. One would next need to develop, or utilize an existing, list of forests for the country or project area of concern. If there is little information about the presence and distribution of forests in a country, this census in and of itself could represent a substantial effort and generate a very useful overview of the distribution of forests that do exist. Obviously, there will be cells in the matrix that remain empty because there are no forests of that type in an area. One may find for example, that in a particular ecological zone that only low population regions exist. Or, one may find that particular types of institutional arrangements are absent in one ecological zone while present in the others.

Once the forests are located in a cell, one would select sample forests using some type of random device to select particular forests. An initial study might focus entirely on one ecological zone where the first step would be to obtain a good list of the forests in the zone

classified by institutional arrangement and population density. The second step would then be to draw a random sample from those forests in each cell of the particular row.

In addition to a stratified random sample of forests, one might also want to include three additional types of sites in a study:

- (1) Project sites;
- (2) Reference forests; and,
- (3) Natural experiments.

Project sites would include various efforts by governmental agencies, NGOs and others to enhance forest resources by reforestation or afforestation techniques or changes in the rules used for governing and managing forests. A study that compares a random sample of forests over time with project sites is a particularly strong design.

Reference forests would be forest preserves. Including them in a sample would allow for comparisons within an ecological zone between "undisturbed" forests and those forests which are utilized for any of a wide variety of uses.

Natural experiments would include a wide variety of efforts by officials and forest users to devise particular types of governance and management regimes. Such experiments might not be widespread and are unlikely to be included in a stratified random sample, but are particularly important for understanding how diverse institutions affect incentives and behavior. Some sacred forests, for example, have historical roots that extend way back in time and may provide considerable insight to how local groups have protected forest resources without external help. In other places, forest users may have developed interesting efforts to use lotteries or other methods for allocating rights to highly valued forest products.

### **3. *Stratified Random Sample***

Once the forests in question have been categorized according to the matrix, a stratified random sample can be conducted to randomly select forest study sites. Depending on the numbers of forests involved, this step could clearly be very straightforward, or very complex.

First a decision must be made as to the number of sites per cell that should be sampled. It may not necessarily be the same number of sites per cell for each cell in the matrix. Some cells may not have any possible sites (e.g. there may not be any type A ownership arrangements within ecological zone 2).

In addition, based on the preliminary research, additional factors might be weighed in order to determine the number of sites to be sampled per cell. For example, the actual physical size of the zone, different types of forests or topography within one ecological zone, and/or varying ethnic compositions, and/or various administrative and government units,

and/or different sizes of forests -- all of these factors may argue for more or less sampling within a cell and therefore determine the overall sample size.

#### **4. *Schedule***

Once the sample size is determined (based on the desired ecological and ownership diversity), a schedule can be projected based on how often each site needs to be sampled and returned to. If, for example, the design matrix were to indicate that 20 sites was the desired sample size, and it was determined that each site should be returned to every five years, then a logical rotation would dictate monitoring five different sites per year for four years, and returning to the first set of five in year six, and so on.

#### **5. *The Logic of Sampling Plan Design***

As stated previously, the above should be considered guiding principles for sample design, versus a specific formula. When determining the relevant column and row categories, and the size of the sample, and the schedule, a good degree of common sense must be used. Obviously if the potential sample size is small (only one or two possible sites per cell, with a limited number of cells), then these choices are simpler. As the size of the matrix and the number of possible sites increases, however, study design decisions must be based on a number of considerations such as the total number of forests, human action, population changes, and rate of change within the forest. Furthermore, the budgetary and management constraints of the team conducting the study cannot be ignored.

In simplest terms, what we have described is:

1. design a matrix based on ecological zones and institutional arrangements;
2. determine the number of forests within each matrix cell and how many sites need to be sampled for each of your cells (based on what kind of diversity and randomness required);
3. determine (based on the desire to monitor ecological and institutional changes) how often each of the sites needs to be monitored;
4. the number of sites and the frequency with which you return to them determines what the monitoring activities will be each year.

From a statistical viewpoint, what is ultimately desirable in regard to sample design is a degree of replication. It is best to be realistic about the variation in forests within ecological zones, and the variation in ownership arrangements; forests and social institutions are not test tubes with known contents and will never really be replicated. Nonetheless, the design matrix described provides a framework for at least controlling and replicating significant aspects of a site -- regional ecological type and general institutional arrangements. At the very least two sites for each cell is desirable. If more matrix cells are defined because additional ecological zones and institutional arrangements are described, then the

ability to replicate is reduced, or sites are revisited less often. These kinds of trade-offs can only be decided as a project progresses.

### **C. Data Collection Instruments and Structure of the IFRI Database**

The actual monitoring activities are conducted through the completion of the IFRI data collection forms. Their specific functions are described on the forms themselves (Appendix 1). The steps through which they are to be completed during the course of site monitoring activities are described in Section II E of this monitoring plan.

There are 10 data collection forms: Site Overview Form, Forest Form, Forest Plot Form, Settlement Form, User Group Form, Forest User Group Relationship Form, Forest Products Form, Forest Association Form, Governance Form, and Organizational Inventory and Inter-Organizational Arrangements Form. The forms, and the information each helps to collect, are listed on Table 2. The manner in which the forms correlate with the elements of the Institutional Analysis and Development framework (see Section I B) is portrayed in Figure 2.

The IFRI database is structured to reflect the many possible relationships that may exist between the many variables recorded through the data collection instruments. Data from diverse forestry situations will be collected in the IFRI database. To accommodate that diversity, the structure of the database has been designed to accommodate a variety of possibilities, rather than the generally expected situation. This flexibility allows for analysis when, for example, a settlement may contain more than one user group, and a user group may live in more than one settlement. Because of these multiple possible relationships the database is complicated, but it does provide the necessary functions demanded by the myriad elements involved in understanding and analyzing social forestry issues.

The structure of IFRI allows for capturing temporal elements. That is, it will be possible to examine how, over time, the sustainable, productive use of the forest, and the types and amounts of forest products harvested, vary with changes in rules. It also incorporates several units of analysis, including the forest, user group(s), and forest association(s).

# A FRAMEWORK FOR INSTITUTIONAL ANALYSIS

## Where Variables are Recorded in Database

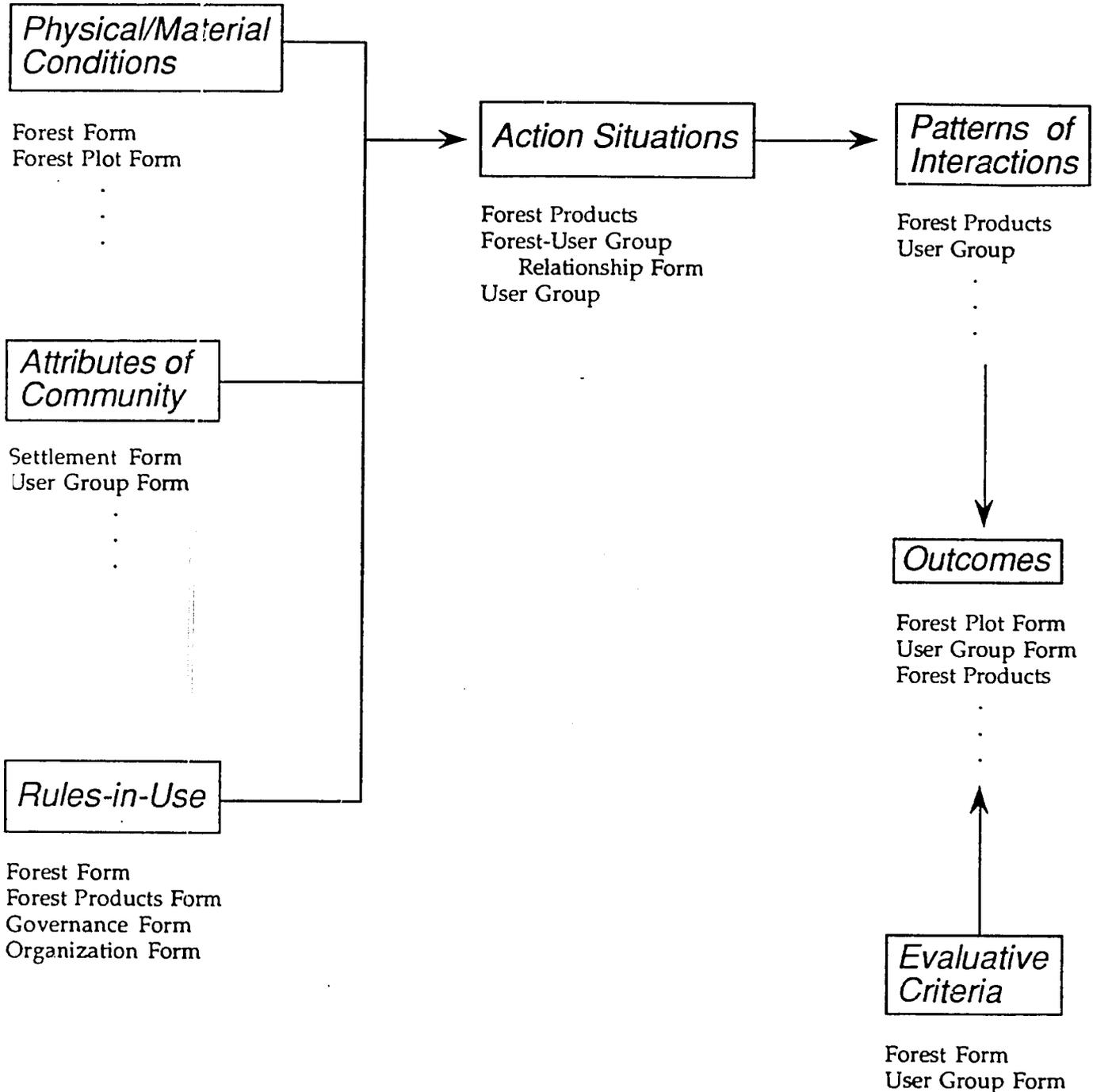


Figure 2

(From: IFRI Data Collection Instruction Manual, December 1993)

**Table 2 - Data Collection Forms and Information Collected**

<b>IFRI Form</b>	<b>Information Collected</b>
Site Overview Form	site overview map, local wage rates, local units of measurement, exchange rates, interview information
Forest Form	size, ownership, internal differentiation, products harvested, uses of products, species density, changes in forest area, appraisal of forest condition
Forest Plot Form	tree, shrub and sapling size, density and species type within 1, 3, and 10 meter circles for a determined number of plots at each site, and general indications regarding forest condition
Settlement Form	demographic information, relation to markets and administrative centers, geographic information about the settlement
User Group Form	size, socio-economic status, attributes of specific forest user groups
Forest User Group Relationship Form	products harvested by user groups and their purposes
Forest Products Form	details on three most important forest products (as defined by the user group), uses of products, temporal harvesting patterns, alternative sources and substitutes, harvesting tools and techniques, and harvesting rules
Forest Association Form	institutional information about forest association (if one exists at the site), including association's activities, rules, structure, membership, record keeping
Governance Form	information about organizations that make rules regarding a forest(s) but do not use the forest itself, including structure, personnel, resource mobilization and record keeping
Organizational Inventory and Inter-Organizational Arrangements Form	information about all organizations (harvesting or not) that govern a forest, including harvest and governance activities

#### **D. Selection of Indicators**

Monitoring is the periodic collection of qualitative and quantitative information and its analysis for comparison with baseline conditions, or to establish trends. In order to design a monitoring plan, it is necessary to define specific impact indicators that will be observed over the life of the monitoring exercise. Impact indicators measure change and can be analyzed to assess the effectiveness of a project in relation to its objectives. Negative and/or positive changes in these indicators will be taken as indicative of project, program or policy success or failure.

Once a design matrix has been developed and sites selected, indicators need to be articulated. Indicators are project and program specific and have to be determined based on the objectives of a specific project. As an example, some possible indicators and the forms they could be monitored through are listed in Table 3.

#### **E. Field Methodology**

Data for this monitoring plan, and the methodology by which that data is to be collected, can be divided into two categories. One is social data regarding the communities that use the forest, including economic, cultural, institutional, and political and administrative information. The second is physical data regarding the forest itself and the species within it. Specific data needs for each of the two categories of information are determined based upon the questions contained in the 10 data collection instruments.

Not all forms are applicable to all sites. For each site, a determination must be made as to which forms need to be completed. That decision is made based on existing conditions at the site; for example, whether or not a forest association exists and therefore whether or not that form needs to be completed.

The specific methods used to collect data for a site follow; Table 4 lists the data collection forms and the suggested methodologies by which they may be completed. Methodologies will vary depending on size and physical and social complexity of the site. At the sites upon which this methodology is based, the entire data collection exercise was completed within 12 working days by a team of approximately nine (five professionals and four technicians/laborers; see Section IV A for recommended team composition).

**Table 3 - Sample Indicators**

<b>IFRI Form</b>	<b>Sample Indicators</b>
1. Forest Form	<ol style="list-style-type: none"> <li>1. Changes in forest area.</li> <li>2. Changes in the species list.</li> <li>3. Alterations in the institutional rules and arrangements that govern use of and access to the forest, specifically types of penalties, types of fines, and use of fines.</li> </ol>
2. Forest Plot Form	<ol style="list-style-type: none"> <li>1. Plant species list for each sample plot.</li> <li>2. Number and types of trees within each plot.</li> <li>3. Tree sizes, both DBH and height.</li> <li>4. Soil types and changes in soil condition (e.g. soil erosion).</li> <li>5. Indications of forest disturbance.</li> </ol>
3. Settlement Form	<ol style="list-style-type: none"> <li>1. Changes in population density.</li> <li>2. Changes in settlement's economic status.</li> <li>3. Changes in the number of households located near the forest.</li> <li>4. Changes in the availability of close substitutes for forest products.</li> <li>5. Development of local organizations with mandates to manage and govern use of and access to the forest.</li> </ol>
4. User Group Form	<ol style="list-style-type: none"> <li>1. Changes in the nature and composition of the user group(s), including the changes in the number of groups.</li> <li>2. Increasing forest improvement activities by the user groups.</li> </ol>
5. Forest User Group Relationship Form	<ol style="list-style-type: none"> <li>1. Changes in the distance between the user group and where in the forest products are harvested.</li> <li>2. Changes in the items harvested and the amount of products harvested.</li> <li>3. Development of other sources of forest products.</li> <li>4. Increase in the percentage of user group needs met by the forest.</li> <li>5. Improvements in the forest condition as ranked by the user group(s).</li> <li>6. Improvements in members' attitudes to conservation.</li> <li>7. Improved resolution of conflicts within or between user group(s).</li> </ol>
6. Forest Products Form	<ol style="list-style-type: none"> <li>1. Changes in the items and quantities of products harvested.</li> <li>2. Changes in the end use of products.</li> <li>3. Changes in the quantities and prices of products sold.</li> <li>4. Improvements in the quantities available for subsistence.</li> <li>5. Increased availability of products.</li> <li>6. Changes in the cost of close forest product substitutes.</li> <li>7. Changes in the methods and tools used for harvesting.</li> <li>8. Changes in the development and enforcement of sets of rules and penalties regarding forest use.</li> </ol>

<b>IFRI Form</b>	<b>Sample Indicators</b>
7. Forest Association Form	<ol style="list-style-type: none"> <li>1. Changes in nature and composition of forest association.</li> <li>2. Increase in association's forest improvement activities.</li> <li>3. Changes in association's rules, and their enforcement.</li> <li>4. Alterations in the nature, composition and authority of the association's executive.</li> <li>5. Increased commitment to the association.</li> <li>6. Changes in composition of staff and officials and the nature of their duties.</li> <li>7. Changes in amount and source of finances.</li> <li>8. Changes in association's objectives.</li> <li>9. Improved mechanisms for resolving internal conflicts.</li> </ol>
8. Governance Form	<ol style="list-style-type: none"> <li>1. Changes in number, nature and composition of organization(s) involved in forest governance.</li> <li>2. Changes in organizations' activities.</li> <li>3. Increased/decreased conflicts between governance organizations and user groups.</li> <li>4. Improved level of organizations' commitment to forest(s) and user group(s).</li> <li>5. Changes in amount, source and expenditure of finances.</li> </ol>
9. Organizational Inventory and Inter-Organizational Arrangements Form	<ol style="list-style-type: none"> <li>1. Changes in organizations' activities.</li> <li>2. Changes in relationships between organizations.</li> <li>3. Improved conflict resolution mechanisms.</li> </ol>
10. Site Overview Form	<ol style="list-style-type: none"> <li>1. Changes in basic site parameters.</li> <li>2. Changes in ethnic composition of the community.</li> <li>3. Increased local wage rates.</li> </ol>

The methodologies for collecting baseline versus follow-on data are basically the same. The same forms are used, though some individual questions (as noted on the forms) do not have to be pursued during follow-on data collection. Repeated completion of each form is important in order to be able to analyze changes over time.<sup>4</sup>

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<sup>4</sup> It is important to acknowledge the risk of "research fatigue" that might develop in a community which is involved with monitoring changes in forest resource use. This may be particularly true in a forest undergoing relatively rapid change where it would be desirable to conduct social research on a repeated basis to monitor those changes. Researchers must be sensitive to the communities and use discretion in terms of varying their methodologies to suit the needs of those communities involved.

## 1. *Social Data Methodology*

Collection of social data at a site can best be described as a series of steps, but it must be noted that this is more for ease of description as opposed to an actual recipe for conducting research. Methods and needs will vary with each site; some of the steps will happen concurrently and others perhaps not at all. In general, data collection at a site should roughly followed the pattern described here.

**Table 4 - Data Collection Forms and Field Methodologies**

<b>Data Collection Forms</b>	<b>Suggested Field Methodologies</b>
Site Overview Form	To be completed by field team leader based on background information
Forest Form	Complete iteratively after community meeting and user group meetings
Forest Plot Form	Complete in field as plots are measured
Settlement Form	Complete iteratively after community meeting and user group meetings
User Group Description Form	Complete iteratively after community meeting and user group meetings (one form for each group)
Forest Association Form	Complete with assistance of association member(s)(only required if association exists)
Forest User Group Relationship Form	Complete iteratively after community meeting and user group meetings
Forest Products Form	Complete based on discussions with user group(s)
Forest Governance Form	Complete based on interviews with specific forest-related organizations
Organizational Inventory and Inter-Organizational Arrangements Form	Complete iteratively as discussions are held with harvesting and non-harvesting organizations

It is suggested that the data collection forms not be used as interview forms for any part of the social data collection exercise. They are rather to be used to inform the interviewers about kinds of information they should collect and categories of questions they should ask. Once the interviewer is familiar with the data collection forms, they can be completed by the researchers after informal discussions. After they are initially completed,

they should be reviewed and follow-up sessions held to fill information gaps. It is suggested that data collection be conducted in this method in an effort to de-formalize the interview sessions and to make them less intimidating to those being interviewed.

**Step 1:** An initial reconnaissance of the site is conducted. This one or two day reconnaissance allows for determining the boundaries of the forest, identification of the communities residing around it who represent potential user groups, preliminary introductions with those users, introduction to local government agencies (e.g., a District Forest Officer, the District Administrator, and the local political units), and acquisition of maps that describe the forest and the communities.

**Step 2:** Arrangements are made for a village meeting. At this meeting, researchers conduct several "participatory rural appraisal" type exercises in order to learn basic demographic information about the village, to discern how villagers use and manage the forest and the resources within it, and with whom they interact in regard to the forest and its use. Chief among these is an exercise whereby the residents draw a map that illustrates their community and the forest and identifies basic infrastructure. Another important activity is to conduct a "walking tour" of the community (either at this stage or subsequently). Walking around the community provides a chance both to ground truth the map, and to engage in informal interviewing. One of the main purposes of the initial meeting is to identify what products are taken from the forest, and which user groups harvest those products.<sup>5</sup>

**Step 3:** Having identified user groups, informal meetings are arranged to learn more about the users, the products they use, and what rules they themselves impose or are imposed upon them to manage use of these forest products. Key informants such as herbalists, elders, chiefs and community leaders, and religious leaders are all potentially useful points of contact. Interviews should be conducted with those government organizations that are involved in governing and managing the forest resources, whether or not they are actually users of the forest. These various interviews can likely be conducted during the course of two days.

(Concurrent with steps 1, 2 and 3, physical data can be collected for the forest itself. See the following section on Forest Data Methodology.)

**Step 4:** One or two days must be devoted to reviewing interview notes, having the monitoring team discuss them, completing data collection forms and identifying information gaps.

**Step 5:** One or two days is required for return interviews to fill data gaps and for final completion of data forms.

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<sup>5</sup> Potential sources for further information regarding PRA and PRA methodologies include the Intermediate Technology Development Group, the Community Forestry Unit of the FAO, the International Institute for Environment and Development, and the International Development Program at Clark University.

Note: An additional step (#6) which is especially useful during training periods is to prepare summary reports on the history of the community and of the forest, and descriptions of the forest species and products. These reports can be presented to the community in an effort to provide immediate feedback; they are also useful for preparing preliminary analysis.

## **2. Forest Data Methodology**

To avoid the virtual impossibility of trying to measure and record information on all the herbs, trees and shrubs within a particular forest, this plan uses a random forest plot sampling method to collect forest data. By this method plant species, their sizes, densities and abundance, are sampled in 30 randomly selected forest plots.

Thirty plots are suggested because research shows that in small forests, the variation in measurement of a trait (for example, trees per plot) will reach a statistically acceptable level when 30 plots have been sampled (i.e., the performance curve "flattens").<sup>6</sup> This system of random plotting greatly reduces the time required to collect statistically valid physical data about the forest, which can then be used to calculate species diversity, estimate the availability of local forest products, or to evaluate the forest for either conservation or utilization purposes. For example, at the first of the pilot study sites in Uganda - which was approximately 40 hectares in size - 30 plots of 10 meters radius each amounts to approximately 2.5 percent of the forest. Forest plot data at both the first and second pilot sites was collected within approximately five days (each).

Collection of forest data is described in detail on the Forest Plot Form, one of which is required for each of the 30 plots. The following briefly describes the steps required to complete those forms. Further details are provided on the forms themselves and in the IFRI Instruction Manual (Appendix 1).

**Step 1:** With the assistance of the community, owner(s) of the forest, and perhaps by walking and measuring boundaries, prepare a map of the forest.

**Step 2:** Overlay a grid on the map and designate a set of 30 random x-y coordinates as locations of forest plots. These coordinates must be selected through a random number table (see the instruction manual and Forest Plot Form for details).

**Step 3:** Team(s) of three (a monitoring team member, one forest technician skilled in the identification of local plant species, and a laborer) begin the forest plot data collection by locating the plot sites in the forest using compasses and a partial grid system to guide them.

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<sup>6</sup> The IFRI Instruction Manual (Section III.A.3/P) describes how to prepare a performance curve chart in order to determine the optimum number of forest plots that are required.

**Step 4:** Once the center of a plot is located, three concentric circles are marked. In the first circle (one meter radius), the amount of ground covered by herbs and seedlings is estimated and those species are identified and noted on the Forest Plot Form. In the next circle (three meter radius) shrubs and tree saplings are identified, and their heights and stem diameters measured. (Saplings are defined as young trees with a maximum stem diameter greater than 2.5 centimeters, but less than 10 centimeters). Trees are identified and measured (diameter at breast height -- DBH -- and height) in the third circle which has a radius of 10 meters. DBH is usually measured at 1.4 meters from the ground. DBH can be measured with tree calipers or a diameter-tape.

## **F. Data Analysis**

The IFRI Program lends itself to analysis of certain topics. For example, data could be used to monitor and analyze changes over time in the types and amounts of forest products harvested, the uses made of forest products, the harvesting tools and techniques used, and the methods used by group members to monitor or improve the forest. Examples of the types of studies the IFRI Program could facilitate include the following.

- The impact of alternative institutional arrangements on the provision and production of forest goods and services could be assessed. More precisely, a program could monitor: (a) who bears the costs of provision and production of forest goods and services; (b) how benefits are distributed among user groups; (c) what impacts the accountability of officials to user groups; and (d) what affects the ability of institutional arrangements to respond to ever changing environmental demands.
- Changes in biodiversity, disturbance, and forest structure, and the causes of those changes whether they be policy, program and/or naturally induced, could be assessed.
- The effects of population on the sustainability of forests can be studied.
- The effects of markets on the use of forests can be analyzed by monitoring the amounts of forest products harvested, their relative availability, their market prices, and the total value obtained.
- The effect of forest improvement activities (tree planting, boundary and fire line maintenance) on the quality of the forest could be monitored over time.

The above are intended as examples of the type of analysis that can be conducted with the data collected with the IFRI program. A specific data analysis plan should be developed for each monitoring or research program depending on the objectives of that program.

## **G. Correlation with the Natural Resources (NR) Framework**

To assist in monitoring the progress made towards achieving the Development Fund for Africa's Target 3.1 -- achieving sustainable increases in income and productivity through better management of natural resources -- ARTS/FARA has developed an analytical tool known as the Natural Resources (NR) Framework. The framework provides one way to catalogue natural resource management indicators (referred to as priority elements). The monitoring plan presented in this report provides a structure for monitoring many of the priority elements that the NR Framework describes, from an institutions, rules, and incentives point of view. Table 5 describes the NR Framework and shows how it and this monitoring plan intersect.

**Table 5 - Intersections Between the IFRI Monitoring Plan and the NR Framework**

<b>NR Framework Levels</b>	<b>NR Framework Priority Elements</b>	<b>Corresponding IFRI Data Collection Instrument</b>	<b>Relevant Element Monitored/ Measured Through IFRI Based Monitoring Plan</b>
Level V: Sustainable increases in productivity; improved food security (measuring increases in productivity)	<ol style="list-style-type: none"> <li>1. increases nationally</li> <li>2. increases by household</li> <li>3. increases by individual</li> </ol>	<p>Forest Form</p> <p>Forest-User Group Relationship Form</p> <p>Forest Products Form</p>	Productivity increases for individuals and communities (as measured by individual responses)
Level IV: Biophysical changes that produce sustainable increases in productivity (measuring biophysical changes)	<ol style="list-style-type: none"> <li>1. soils - fertility and moisture</li> <li>2. forests and range</li> <li>3. habitat, biodiversity and pest management</li> </ol>	<p>Forest Form</p> <p>Forest Plot Form</p>	Biophysical changes in forests
Level III: Adoption of practices that produce biophysical changes (measuring adoption of improved practices)	<ol style="list-style-type: none"> <li>1. private, on farm</li> <li>2. local community and NGO</li> <li>3. public - local</li> <li>4. public - national</li> </ol>	<p>Settlement Form</p> <p>User Group Description Form</p> <p>Forest Association Form</p>	Individuals' and communities' changes in behaviors and practices monitored and measured via individual and group responses
Level II: Conditions that lead to improved practices (measuring changes in policy)	<ol style="list-style-type: none"> <li>1. macro and sectoral economic</li> <li>2. land use policies</li> <li>3. market, financing policies</li> <li>4. technology development</li> <li>5. technology dissemination</li> </ol>	<p>Forest Governance Form</p> <p>Organization Inventory and Inter-Organizational Arrangements</p>	Relevant policies measured vis a vis their impact on individual and community decision making regarding resource use
Level I: Actions that establish conditions (measuring institutional changes)	<ol style="list-style-type: none"> <li>1. policy analysis and planning</li> <li>2. land use regulations</li> <li>3. credit and finance systems</li> <li>4. research systems</li> <li>5. extension systems</li> </ol>	<p>Forest Governance Form</p> <p>Organizational Inventory and Inter-Organizational Arrangements Form</p>	Relevant policies measured vis a vis their impact on individual and community decision making regarding resource use

### **III. TRAINING PROGRAM**

Conducting a monitoring plan of the type described by this plan will require training of the designated monitoring team. This section briefly describes what such a training session should include. The syllabus for the Uganda pilot training program is attached in Appendix 3 as an example. In addition, training information is included in the Instruction Manual. The content of the training sessions to a great extent would reflect the information contained in Sections I and II of this report, and therefore will only be summarized here.

#### **A. Training on Theory and the IFRI Database**

Theoretical training should include sessions on:

- the broad research questions underlying the IFRI research program;
- the various configurations of forests, communities and user groups;
- background to the IFRI research program; and
- a discussion of relational databases.

Training in the theory that supports the IFRI database could be conducted during several sessions that last approximately five hours over the course of several days, in a classroom setting. The information to be discussed during those sessions is described in Section I of this report.

#### **B. Data Collection**

All of the IFRI forms can be discussed and reviewed over the course of approximately 10 hours during several days. To facilitate those discussions, the forms are conceptually grouped into categories based on the premise that how people use forests depends on three factors:

1. what kind of uses are feasible given the types of forests available;
2. what are the needs of the people living near the forest; and,
3. what kinds of rules are present and are enforced to guide the use of the forest.

Thus, data is required about forests, people and rules, and the forms can be placed into three categories:

1. Forests - including the Forest Form, Forest Plot Form, and Forest Product Form;

2. People - this category includes the Settlement Form, User Group Form, and the Forest-User Group Relationship Form; and,
3. Rules - including the Forest Association Form, Governance Form, and the Organization and Inter-Organization Relationship Form.

The only form that does not fit into one of these categories is the Site Overview Form which is the basic site background and administrative form, which the team leader completes.

After a thorough review of the forms, their use is applied during field data collection sessions that span approximately five days. The content of the forms and the methodology by which they are used are discussed in Sections II C and E of this report.

### **C. Completion of Forms, Data Review, and Analysis**

Training on completion of data collection forms, and data review and analysis, takes place through several exercises. Interspersed with the field data collection, approximately three days can be set aside, away from the field site, where trainees and trainers discuss the results of interviews and data collection, review and complete forms, and identify and discuss information gaps. These sessions are followed by returns to the field for further interviews. At this time missing data is collected until at the end of approximately one week, all forms are satisfactorily completed.

These review sessions can also include initial data analysis through preparation of brief reports on the settlement and the forest. These reports serve not only to spark analysis and discussion, but also are presented to the forest users and those associated with its governance in an effort to provide immediate feedback from the research.

Finally, data and the training itself are reviewed and evaluated through an approximately one day session that focuses on final report preparation, completion of evaluation forms, and a discussion of future research directions. The review and analysis steps are discussed further in Section II E.

## IV. REQUIREMENTS

### A. Monitoring Plan Resources

Based on the Uganda pilot study as an example, the resources required to collect data for one site are as follows. These are approximates and are meant to serve as a guide for planning of a monitoring program.

Labor:

	Days
Team Leader	12
Research Assistant #1	12
Research Assistant #2	12
Research Assistant #3	12
Forest Technician #1	6
Forest Technician #2	6
Forest Laborer #1	6
Forest Laborer #2	6
Driver	12

(Research Project Director - Time determined by size of project, i.e. numbers of sites and numbers of teams)

Allowances (per diem and/or travel and meals allowances):

(To be determined based on site location, travel requirements, local rules and funding rules)

Other Costs:

Secretarial and Data Entry Support  
Communications costs  
Copying costs  
Office supplies  
Vehicle costs (fuel and mileage)

### Field Equipment:

(Equipment needed for 1 team; 1 item per team)

- 1 Clip Board
- 1 Calipers (to measure DBH of trees and shrubs)
- 1 15 meter to 25 meter tape (to measure concentric circles)
- 1 compass (for determining plot locations and slopes)
- 1 set of 6 marker flags (for marking concentric circles)
- 1 calculator (if tree is too big for calipers then measure circumference and divide by pi - 3.14)
- 1 Sunto Clinometer or Blume Leisse Clinometer (to measure height of trees and to measure slope in degrees or percentages)
- 1 Hypsometer (optional - for estimating height of trees)
- 1 Plant press (for samples of unidentifiable species)
- 1 Roll of surveying ribbon
- Pencils and sharpeners

The above is estimated to be sufficient to conduct site interviews and forest plotting (approximately 30 plots), complete data collection forms, and write field reports within a two-week (10 to 12 day) period, for one site. Assuming a monitoring plan would involve more than one site, then any estimate based on the above can basically be multiplied by the number of sites and the number of teams used to conduct the research for those sites. Also, it should be assumed that a Research Project Director will have to be hired to coordinate the activities of the multiple teams and multiple sites, and to manage overall data collection, entry and analysis.

## **B. How to Establish an IFRI-Based Monitoring Plan Program**

### ***1. Becoming Associated with the International Forest Resources and Institutions Research Program***

The IFRI Research Program is being conducted by a network of Collaborating Research Centers (CRCs) and individual scholars who design and conduct studies within different countries in collaboration with colleagues at the Workshop in Political Theory and Policy Analysis at Indiana University. The first set of Collaborating Research Centers have been established at the Forestry Department at Makerere University in Uganda and with the Nepal Forest Resources and Institutions Consortium organized in Nepal. Discussions have also been initiated with colleagues in Bolivia, Costa Rica, and Gujarat State in India about the establishment of CRCs in the near future.

An IFRI Collaborating Research Center (CRC) could be a research group associated with a university, a private association, a government research laboratory; or a consortium of individuals and agencies that have agreed to work together to collect, analyze, and archive IFRI data in a particular country or specific region of the world. Individual researchers who are working at a university or research institution, completing their doctoral research, or working independently may also be associated with IFRI in its early years of development. Anyone interested in initiating the process of developing an affiliation with the IFRI Research Program is encouraged to contact the Workshop for further information.

The Workshop is interested in being involved in the initial design of studies and monitoring activities using the IFRI database. Furthermore, the Workshop is interested in the plans made to ensure the liability, accuracy, and validity of the data obtained by a CRC since this data will, after the first year during which the CRC will analyze the data, be archived at the Workshop. The Workshop will integrate this data into the central database and conduct methodological analyses in consultation with scholars at the CRC from which the data was obtained. Two years after data collection is completed, data would be sent to all other CRCs so that each CRC will eventually have access to similar data collected by other centers and archived in the central database.

## **2. *Responsibilities of IFRI Participants***

From its initiation, the IFRI research program has been designed to be undertaken by a network of Collaborating Research Centers working together with colleagues at the Workshop. The initial responsibilities for designing the IFRI coding forms and database rested with colleagues at the Workshop in active communication with colleagues at locations likely to become CRCs, in addition to analysts from many different countries interested in helping to develop the very best research combining accurate forest measurement with accurate data about institutional, political, economic and social arrangements. The responsibility to design "user friendly" data entry applications has been undertaken at the Workshop so that data entry could be located very close to the sites where data collection has been undertaken. This facilitates rapid feedback of information to forest users and officials about each site as well as increased accuracy of the information contained in the database.

In the operational, rather than developmental, phases of this project, it is important to indicate the activities that are envisioned for participants and the mutual responsibilities of the Workshop, the individual CRCs, and the network. Thus, this section outlines envisioned future activities and relationships.

Responsibilities of the Workshop in Political Theory and Policy Analysis at Indiana University:

1. To be the central coordinator of activities of all CRCs and individual scholars participating in the IFRI research program.

2. To develop the IFRI data coding forms and database in consultation with many scholars and the initial set of CRCs with a firm foundation in the underlying Institutional Analysis and Development framework.
3. To make available to CRCs coding manuals, a field instruction manual related to data collection, a data entry manual, data analysis guidelines (planned in the future) and background papers that explain the purpose and initial results from the IFRI research program.
4. To archive and safely store data, maps, and related materials collected by each of the CRCs as soon as a CRC wishes to send the data to the Workshop but no later than a year after data collection is completed. In addition, the Workshop will carefully check all incoming data before uploading it into the central archive database and insure that corrections of archived data occur in a systematic, well-documented way.
5. Two years after data collection, to send data from one CRC to all other CRCs in the network.
6. To organize and conduct several types of training programs:
  - a. A semester long training program at Indiana University for key personnel associated with each of the CRCs to insure that multiple individuals in each CRC have had thorough training on the theoretical foundations of the research program, and on the data collection methods to be used for forest mensuration and the institutional and economic analysis.
  - b. To participate in some of the short-term (two week to one-month) training programs to be held by CRCs in their own countries or regions at the start of a new data collection period.
  - c. To participate in some of the field data collection aspects of on-going studies of each of the CRCs as part of a continuous training effort.
  - d. To be prepared to send staff to a CRC to help set up a reliable and robust data entry, archiving and retrieval system in each CRC.
7. To help CRCs preparing sampling plans for individual countries or regions of countries or evaluation programs related to specific projects located in the country or region.

8. To develop analysis techniques for use by CRCs and make technical papers describing these techniques and their substantive findings available to CRCs and other interested analysts.
9. To undertake general theoretical and policy directed analysis of data after it has been analyzed by researchers at the CRC.
10. To organize annual meetings of the Network of CRCs.
11. To modify the IFRI database annually after the Network meeting in light of decisions made by participants about small changes that are needed and to update the IFRI applications that all CRCs are using to reflect these changes.
12. To develop a Geographic Information System (GIS) application that can be related to the original database structure.
13. To keep informed of key literature and development of interest to all IFRI participants and make this information available to others.
14. To keep documentation submitted by a CRC about research designs for general and special projects for distribution to future users of the IFRI database.
15. To keep abreast of potential funding opportunities for all types of IFRI activities located at CRCs and at the Workshop.
16. To review and archive translations of IFRI coding forms into other languages.

Responsibilities of an IFRI Collaborating Research Center:

1. To select an individual or individuals at that Center who will take on the responsibility for:
  - a. Overall scientific direction of the research program.
  - b. The design of a sample of forests for a region or country included within the reference of a particular CRC.
  - c. Working with local donors and other funding sources to obtain funding for the IFRI research program in the CRC's country or region.
  - d. Hiring and supervising field staff and insuring the accuracy of the data entered into the IFRI database.

- e. Regular communication with the Workshop about plans for future data collection efforts, times when local training will be undertaken, research reports, problems faced in the field or with the database.
  - f. Supervision of the data entry, archiving, and retrieval of IFRI data.
2. To become thoroughly familiar with the conceptual foundations on which the IFRI database is built so that the CRC can direct field research and analysis based on a theoretical knowledge.
  3. To develop in consultation with the Workshop, other CRCs, and potential funders, one or more research designs and sampling plans for the country or region for which the CRC has responsibility and to provide thorough documentation about these designs to the Workshop.
  4. To develop specialized project research designs that involve the use of IFRI research instruments for project evaluation or to study particularly important sites not included in the IFRI sample for a country or region and to provide documentation about these studies to the Workshop.
  5. To train all staff who are hired to undertake field work, data entry or data analysis so that data contained in the IFRI database are as valid and reliable as feasible. This means that adequate time must be budgeted in proposals for "extensive training of field workers, sufficient time in each site to insure collection of reliable and valid data, and adequate staffing for data entry and checking.
  6. To send participants from time to time to do joint field work with one of the other CRCs and to receive participants from other CRCs who will participate in field work in the country or region.
  7. If necessary, to translate the IFRI coding forms, to undertake the initial translation, send the initial drafts of translated forms to the Workshop for review, and submit copies of translated forms to the Workshop to be sent to future users of data collected when using translated forms.
  8. To develop a library of maps, census materials, field notes, and related case studies that would be made available to visiting scholars who wanted additional background to work on individual sites.
  9. To coordinate IFRI activities with individual scholars in the country or region.

Responsibilities of the Network of Collaborating Research Centers:

1. Hold an annual meeting where the following items are placed on the agenda:
  - a. Research reports from the previous year's IFRI research.
  - b. Discussion of where future IFRI efforts should be devoted in light of research findings -- what are the important questions to be addressed through updated research designs or new coding forms that build upon prior work.
  - c. Proposals for additions, changes, deletions to the IFRI database.
  - d. Discussion of future individual and joint activities for the forthcoming year and longer term periods where relevant.
  - e. Discussion about proposals received from groups interested in becoming a CRC.
  - f. Discuss continued efforts to maintain consistency in data collection, entry, and analysis efforts across sites and CRCs.
2. To keep one another informed between meetings about recent initiatives started at a CRC that may be of interest to others.

**APPENDIX 1**

**IFRI DATA COLLECTION FORMS**

SITE OVERVIEW FORM

*This form has been designed to obtain information about the general characteristics of the site. It also includes other relevant data to be researched prior to the actual site visit.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001  
Name of site <ONAME>: Namungo  
Name of person filling out this form: Dr. Abwoli Banana  
Date of Site Visit: 9-21-93

Has this site been coded before in previous years? <OCODED>

- (1)  No  
(2)  Yes  
(3)  Uncertain  
(4)  Yes, with a new name *(If this response is checked, write new name in question B0.)*

A. TEAM AND SITE INFORMATION

A1. What is the beginning date of this site visit using the American calendar? (month-day-year)

<OSTRTVISIT> 9-13-93

A2. What is the ending date of this site visit using the English calendar? <OENDVISIT>

9-22-93

A3. Was the team at this site throughout the above time period? <OTMONSITE>

- (1)  No  
(2)  Yes

A4. What is the name of this IFRI Research Project: *(brief text)* <OPROJNAME>

*Initial pilot study funded by USAID, Makerere University, and Indiana University*

A5. Sampling frame information *(text)* <OSAMPFRAME>

*Site selected to represent one of four forest types.*

A6. What is the name of Team Leader? <OTMLEADER> Mr. Gombya-Sembajjwe

A7. What is the name of Forest Specialist? <OFORSPEC> Dr. Abwoli Banana

A8. What are the names of other team members and what are their skills? (*long text*) <OTeAMINFO>

Mr. J. Bahati - Forester  
Dr. C. Becker - Ecologist  
Ms. Cheryl Danley - Social Scientist  
Mr. David Green - Social Scientist  
Miss M. Kaporiri - Forester  
Mr. P. Kisito - Forester  
Mr. G. Mwambu - Forester  
Miss G. Nabanoga - Forester  
Miss A. Nakaweesi - Social Scientist  
Dr. E. Ostrom - Social Scientist

A9. What is the name of person(s) or source(s) consulted on botanical names? (*brief text*) <OBOTANSRC>

Mr. C. Lwanga, Mr. Sekindi, Mr. Matovu

A10. Please list the names of the people with whom discussions were held: *(long text)* <ODISCNAME >

*Mr. Namungo (forest owner)*  
*Mr. S Sengo M. (owner's son)*  
*Mrs. Namungo (owner's wife)*  
*Mr. Mutte J. B. (DFO-Mpigi)*  
*Miss Nalango Victoria Namusisi (DA)*  
*Mr. Lumansi (R.C. I. Chairman - Mbazzi)*  
*Mr. J. B. Musajjaakawa*  
*Mr. Kibrrango (farmer)*  
*Mr. M. Suubi H. (farmer)*  
*Mr. A. Musitwa (farmer)*  
*Mr. A. M. Kakembo (farmer)*  
*Mr. S. P. Kiguli (farmer)*  
*Mrs. Maria Nassaka-Namwandu (farmer)*  
*Miss Clare Namusoke (farmer)*  
*Mr. L. B. K. Sentyabire (farmer)*  
*Mr. Setumba J. (farmer)*

A11. Please describe the methods used in obtaining information, the locations of discussions, and efforts made to obtain information from diverse sources. *(long text)* <OINFMETHOD >

- 1. Discussion with DFO at his office*
- 2. Discussion with District Administrator*
- 3. Discussion with Mr. Namungo and his family*
- 4. PRA with Mbazzi residents at Mbazzi*
- 5. Data on forest by random sampling of the forest - 30 plots*

A12. Please provide a general description of the site. (long text) <OSITEDESC>

*It is a low land tropical moist rain forest occupying in the valley with a stream flowing through. The upper dry areas and the ridge are settled and cultivated. Namungo's forest is surrounded by Lwamunda Forest Reserve which is government owned, but a similar forest type. (See Site Overview Map.)*

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major* changes in the site since the last visit, and if so, what were they? (long text) <OHISTCHNG>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

*n/a*

B. DATA COLLECTION AND ORGANIZATION

B1. Is coding based on: <OCODEBASIS>

- (1)  Full IFRI forms in English
- (2)  Full translated forms (please write language and name of the translator on the line below:  
<OCODEOTH> \_\_\_\_\_)
- (3)  Authorized, shortened form

B2. From what sources have data been collected? <ODATASRCE>

- (1)  Field visits only
- (2)  From secondary sources only
- (3)  From both field and secondary sources

B2a. If data has been collected from secondary sources, please list these sources: (text) <OSECRCCE>

n/a

B3. Is Census data for settlements available? <OCENSAVAIL>

- (1)  No
- (2)  Yes

B3a. If yes, has Census data for settlements been: <OCENSUSE>

- (1)  Utilized in coding these forms
- (2)  Placed in paper files
- (3)  Set up as a separate computer readable file

B3b. If 2 or 3 in B3a above, describe where the files are located, what the file names are, and availability of the files. (text) <OCENSFILES>

*Preliminary census data is available in paper files up to county level. During the 1991 census, there were 78,584 females and 78,514 males in Mawokola County. The population figures for Mbazzi settlement are located in an Mbazzi RCI file for the residents of Mbazzi.*

B4. Has a household survey been conducted? <OHHSURVEY>

- (1)  No
- (2)  Yes

4/1

B5. How is household data stored? (text) <OHHDATAHOW>

*Are the data stored in paper form, on diskette, in a database, etc.? Who maintains the files? Where are the files located? Are they available?*

*n/a*

B6. Describe the field methods used (e.g., group interviews, PRA, one-on-one household surveying), the locations of discussions, reception of the team at the site, weather conditions, and harvesting activities during the site visit. (long text) <OFIELDINFO>

*Group interviews were held with members of Mbazzi R.C. 1, using PRA methods. Both men and women user groups of the settlement and the owner of the forest and his family were interviewed at different localities. The user groups were interviewed at a central settlement meeting place (under a mango tree), and the forest owner was interviewed at his home. Throughout the study, the weather was sunny, warm, and dry in the study area. There was harvesting of logs for timber and tree tops were cut for fuelwood. In the government forest reserve (Lwamunda) adjacent to Namungo's forest there was some harvesting without permission, involving cutting of trees for timber, building poles, firewood and charcoal burning.*

B7. What are the names of the forest(s), settlement(s), user group(s), and federated forest association name(s) (if applicable) for this site? *(long text)* <OALLNAMES>

*Namungo's Forest*

*Forest Reserves: Lwamunda Forest*

*User groups: Namungo's family, housewives of Mbazzi, men's user group, Namungo's Dairy Farm*

*Forest Association: Namungo's Dairy Farm*

*In the settlement are six subunits: Nsenene, Lwazzi, Kaasa, Mbazzi, Kayunga, and Kiwale*

*Bulamazzi Village uses mainly the forest reserve and was not a focus for this site.*

B8. Has this site been chosen for site verification? <OVERIFY>

- (1)   X   No  
(2)        Yes

B8a. If yes, describe the results of the site verification visit. *(long text)* <OVERRESUL>

*n/a*

*4/1*

C. GEOGRAPHIC AND LOCAL INFORMATION

- C1. What is the latitude of this site? <OSITELAT> 0° 15' N
- C2. What is the longitude of this site? <OSITELONG> 32° 15' E
- C3. What is the elevation of this site? <OSITELEV> 1,158 m

*Please give elevation in meters above sea level. If elevation varies, provide the average elevation.*

C4. Conversion of local units to metric units:

	Length/Distance	Area	Volume/Weight
Local Name <i>n/a</i>	<OLOCLength>	<OLOCArea>	<OLOcVol>
Conversion formula to metric units	<OMETLength>	<OMETArea>	<OMETVol>

C5. What is the local language spoken by most people in this site? <OLOCLANG> Luganda

C5a. If multiple local languages are spoken, list others used in this site. (text) <OLANGLIST>

*n/a*

C6. What is the format of the calendar used locally? <OLOCCALEN> English

C7. If a local calendar is used, please give the conversion formula to the American calendar, if available. (text) <OCALCONVRT>

*n/a*

*4/9*

C8. Dates entered on forms are all using the: <OFORMDATE>

*All dates entered with these forms should use only one of the following calendars.*

- (1)  Local calendar  
(2)  American calendar (month, day, year)

C9. What is the name of local currency? <OLOCCURREN> Uganda shilling

C9a. At the time of this data collection, what is the exchange rate of local currency to one U.S. dollars? <OEXCHRATE>  
1200 Uganda shillings per dollar

C10. What is the current standard wage labor rate per day in this site?

*Specify in local currency, e.g., 25 dollars, bahts, rupees, or francs per day.*

For women <OLABORFEM>: 1,000 Ug. sh. For men <OLABORMALE>: 1,000 Ug. sh.

C10a. What was the standard wage labor rate per day in this site five years ago?

*Specify in local currency, e.g., 25 dollars, bahts, rupees, or francs per day.*

For women <OLABFEM5>: 300 Ug. sh. For men <OLABMALE5>: 300 Ug. sh.

C11. Are there maps available depicting the topography of the site or components of the site? <OTOPOMAP>

- (1)  No  
(2)  Yes

C11a. If yes, where? (long text) <OTOPODESC>

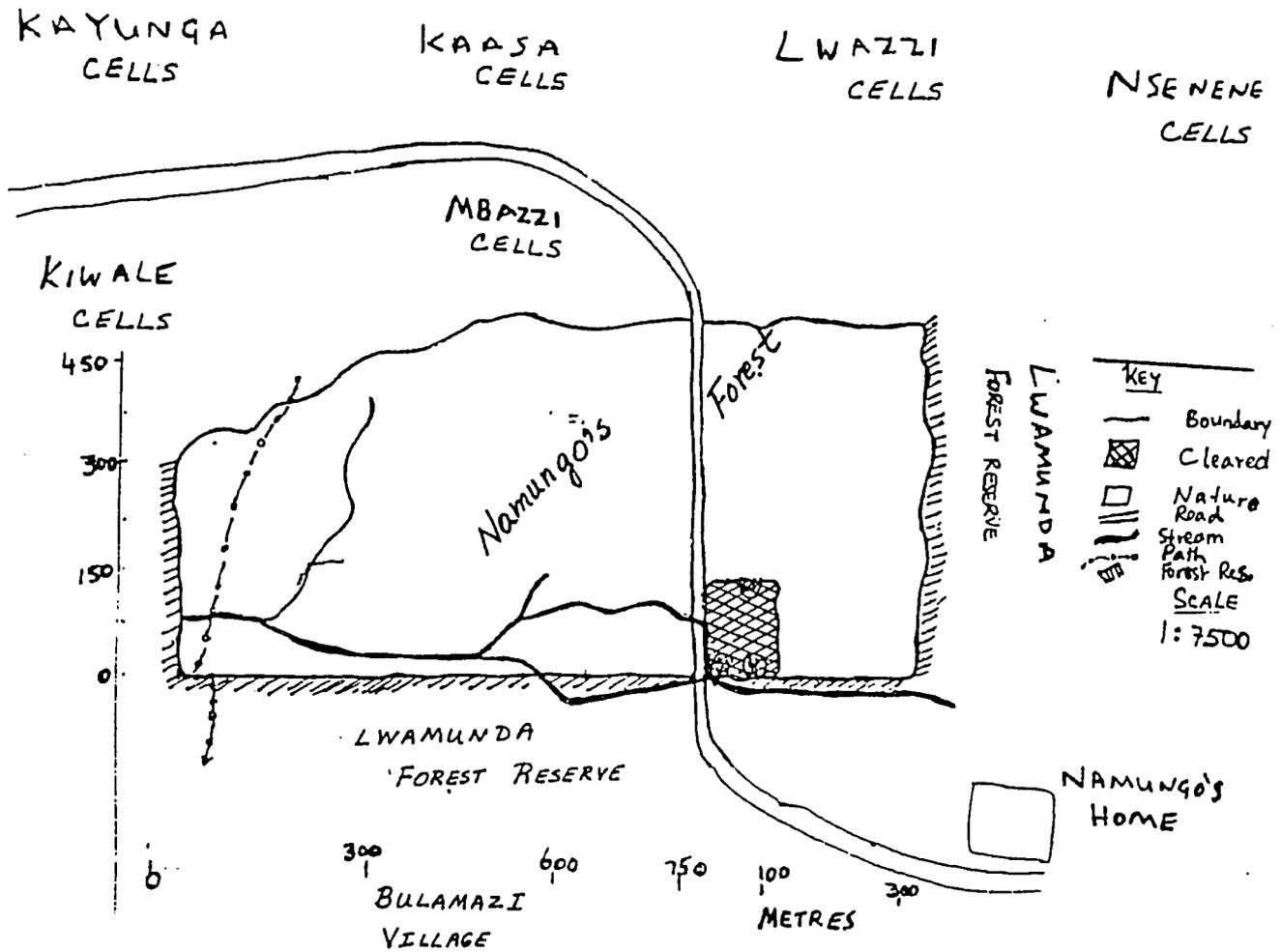
*Provide as much detail as possible, both on the location of the map and the map itself.*

*The map showing the location of Namungo's Forest and Lwamunda Forest is available at the DFO's office and at Makerere University.*

*Prof. Ostrom has taken a copy to Bloomington University, Indiana for copying and will be sent back to Makerere to be kept in archives of IFRI, located in the Dept. of Forestry.*

C12. Please draw a Site Overview Map.

On the Site Overview Map, supply any significant physical features of the area, such as a river, a lake or pond, trails, etc. Label all features. Draw the settlement boundaries and label within each settlement boundary the settlement name. If there is more than one forest, draw each forest boundary and label the forest name within each forest boundary. If the Site Overview Map provides a large enough picture of the forest boundaries (enough room to mark forest harvesting boundaries, forest plot locations), then trace an additional copy of this map. The extra copy can then be used as the outline for the Forest Feature Map in Form F, page 6.



D. POLICY AND LEGISLATION INFORMATION

D1. Are there or have there been any recent major policy shifts that affect the utilization of forests by local users?  
(long text) <OPOLSHIFT >

*A ban on harvesting of any form from the government tropical rain forest reserves was introduced which has led to excessive harvesting of logs and fuelwood on private tropical rain forests, in order to meet the ever-increasing demand. Another negative effect to the local users has been an increase in the wild pig population. The local users can not harvest them, and yet the animals damage their crops.*

D2. Are there any policies pending that may impact the forest user group/forest associations and/or governance relationships? <OPOLUGRP >

- (1)  No
- (2)  Yes, in a positive way
- (3)  Yes, in a negative way
- (4)  Yes, in both positive and negative ways

D2a. If yes, please describe. (long text) <OPOLDESC >

*The increased firewood production policy through establishment of woodlots of fast-growing species such as eucalyptus may make woodlots out of natural forests on private land.*

FOREST FORM

*This form has been designed to collect information about the vegetation in the forest area that the local community uses for its daily needs or for sale in a market. A forest is defined here as a surface area of at least .5 hectares, exploited by at least 3 households, governed by a similar legal structure.*

*The forest may be owned and managed by the community, by the local, state or national government, or by a private individual or corporation. More than one distinct group may have the right to gather products from the forest: users from more than one settlement, different groups within the same settlement, settled and nomadic groups are some possible combinations. In such cases, you will fill out more than one user group form for the same forest. It is also possible that the same group will have rights over more than one forested/vegetation area. Thus the same group may collect products (fodder, fuelwood, timber, green manure, and so forth) from two or more community, government, or private forests. In such cases you will fill out more than one forest form. On each forest form that you fill out, you will find questions about (1) the history of the forest, (2) the major physical characteristics of the forest including questions about its boundaries and size, (3) the product-species that are used from the forest, and (4) rules related to entering and monitoring the forest.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001  
 Name of forest <FNAME>: Namungo's  
 Name of district and subdistrict(s) (if applicable) <FLOCATION>: Mpigi  
 Name of person filling out this form: J. Bahati and Dusty Becker  
 Name of person(s) with whom discussions held: Mr. Namungo, Nelson Ssengo, Mzee Charles  
 Date of Site Visit (Month and Year): Sept. 18, 1993  
 Location of discussions (fields, home of respondent, place of business, etc.): forest and Namungo's home

Has this forest been coded before? <FCODED>

- (1)  No
- (2)  Yes
- (3)  Uncertain
- (4)  Yes, with a new name (If this response is checked, write new name in B0.)

How many Forest Plot Forms were completed? <FPLOTNUM> 30

A. HISTORY

Please give approximate age even if a rough estimate of natural, mature forest. In natural, mature forests, the age should be that of the oldest live trees.

A1. Approximately how old is this forest? <FHOWOLD> 300 (in years) ←  
 (natural, mature forest)

*This will usually be a rough estimate. What is important is whether this is a recently established or planted forest or a natural forest that has existed for a long time. These data should be treated as categorical (e.g., young, climax, ancient).*

A2. Was this forest originally established as a plantation or forest reserve? <FPLANTED> **Mark only one answer.**

- (1)  No
- (2)  Yes

A2a. Who established or created the forest? <FINITWHO> **Mark only one answer.**

- (1)  Government agency or officials
- (2)  A non-governmental agency <FINITNGO>: \_\_\_\_\_
- (3)  Local residents or farmers by using their own labor and capital
- (4)  Local residents or farmers by hiring workers
- (5)  Local communal or forest association
- (6)  No one in particular, e.g., a "natural" forest

4

A2b. Why and how was this forest system initiated? (long text) <FINITWHY >

*In other words, why was the forest system first put into place and by what means? If the forest is natural, please indicate successional stage (e.g., climax forest), and an indication of to what extent its trees have been harvested.*

*This is a natural forest that was left largely undisturbed until the mid-1800s. It became the property of the family of Stanslus Mugwanya at the turn of the century. The current owner's mother settled in the area in 1939 and was allocated 10 acres. The owner began discussions about purchasing the land that had not been gazetted nor cleared from the Mugwanya family. He gained complete title in 1979. Other than minor timber harvesting and the customary rights to firewood, craft materials, and wildlife, the forest has been left relatively undisturbed.*

A3. Was there donor assistance when this forest system was established? <FINITDON>

*Mark only one answer.*

(1)  No

(2)  Yes, who <FINITDWHO>: \_\_\_\_\_

A4. Has there been any reforestation/improvement project related to this forest? <FIMPROV>

*Mark only one answer.*

(1)  No

(2)  Yes

A4a. If yes, describe briefly who initiated it, when, and what was done. (long text) <FIMPROVWWW>

*Please include information on thinning and selective harvesting. If selective harvesting is currently practiced, what size classes are being cut and how many trees of which species are being removed on a per year basis? (An estimate is adequate.)*

Please complete the last part of this history section after undertaking the forest plot measurements and after a discussion with several older forest users who are familiar with the earlier condition of the forest.

A5. Please list any plant species that were harvested from this forest approximately 5 years ago that are no longer available, and list the reasons for their disappearance. {F\_SPECIE} <F\_NUMYEARS> = 5

Name of Species		Reason for disappearance <F_REASON>
Botanical name <F_BOTNAME>	Local name <F_LOCNAME>	
<i>could not remember</i>		<p>← In A5, A6, and A7, please check the spelling of local and botanical names with the spellings in the master list of plant species in C2. They should match.</p> <p style="text-align: center;">↓</p>

A6. Please list any plant species that were harvested from this forest approximately 10 years ago that are no longer available, and list the reasons for their disappearance. {F\_SPECIE} <F\_NUMYEARS> = 10

Name of Species		Reason for disappearance <F_REASON>
Botanical name <F_BOTNAME>	Local name <F_LOCNAME>	
<i>could not remember</i>		

A7. Please list any plant species that were harvested from this forest approximately 15 years ago that are no longer available, and list the reasons for their disappearance. {F\_SPECIE} <F\_NUMYEARS> =15

Name of Species		Reason for disappearance <F_REASON>
Botanical name <F_BOTNAME>	Local name <F_LOCNAME>	
<i>Canarium schweinfurthii</i>	miwafu	timber cutting
<i>Mitrogyna stipulosa</i>	nzingu	timber cutting
<i>Cordia millenii</i>	mikebo	canoe making for fishing
<i>Maesopsis eminii</i>	musizi	timber cutting

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major changes* in the forest system since the last visit, and if so, what are they? (long text)  
<FHISTCHING>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

n/a

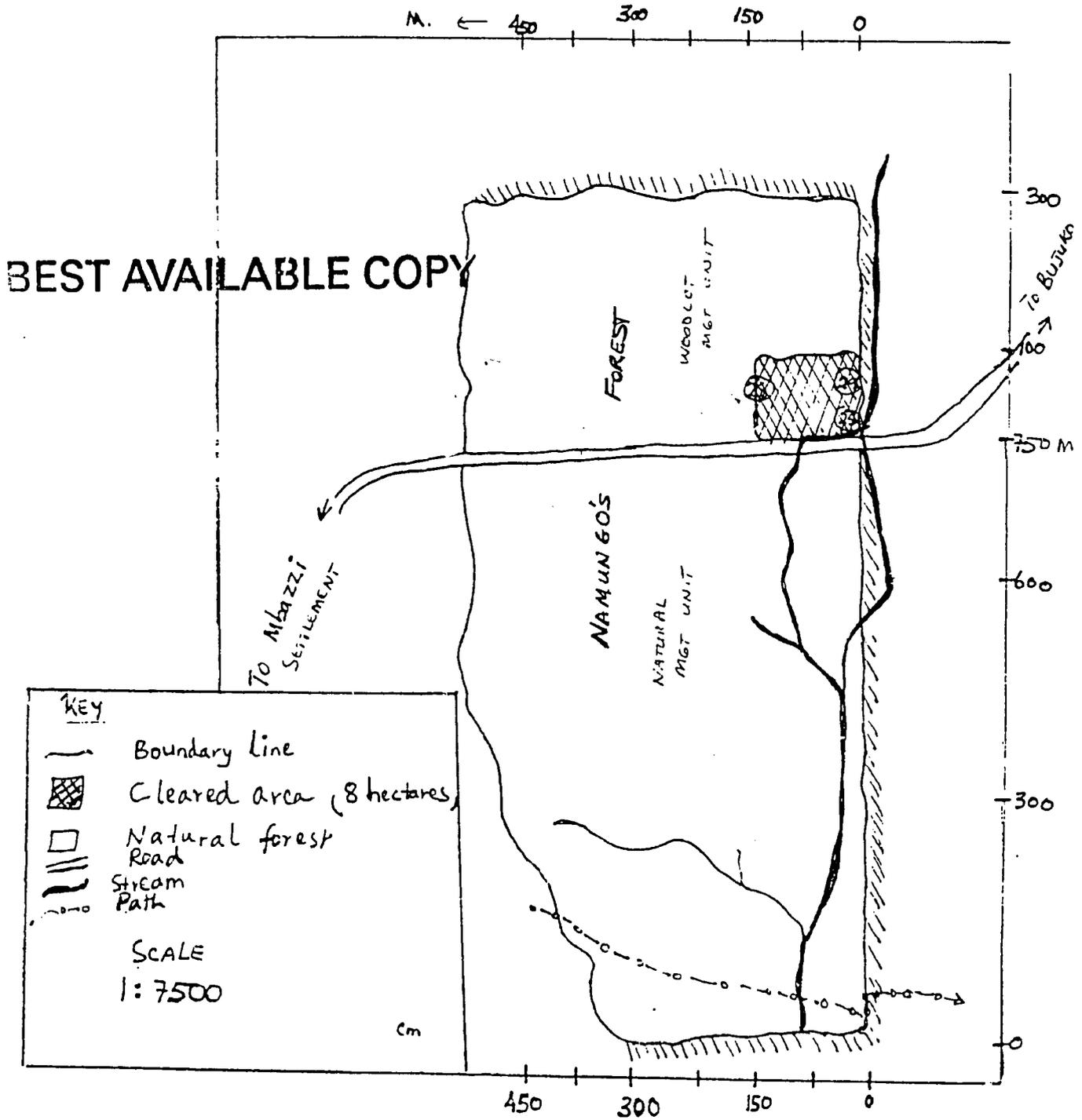
←Please do not answer until second visit to the site and only if major changes occurred.

B. FOREST SYSTEM GENERAL INFORMATION

B1. Forest Feature Map.

Draw a map of the forest. If the site overview map drawn in the Site Overview Form provides a large enough picture of the forest boundaries, simply trace or copy that map and use it here. If the Site Overview map does not provide enough detail to be able to identify this particular forest's harvesting boundaries, forest plot locations, etc., then do not trace the site overview map, rather, draw a map of the individual forest here, and label all important features (e.g., streams, trails, forest management units or plots, temples and sacred areas, and important locations for overlooking the forest). If plantation(s) is depicted on the map, please indicate on the map the year in which it was planted, and the types of species planted.

This map will be used later to identify harvesting boundaries when completing the Forest-User Group Relationship Form.



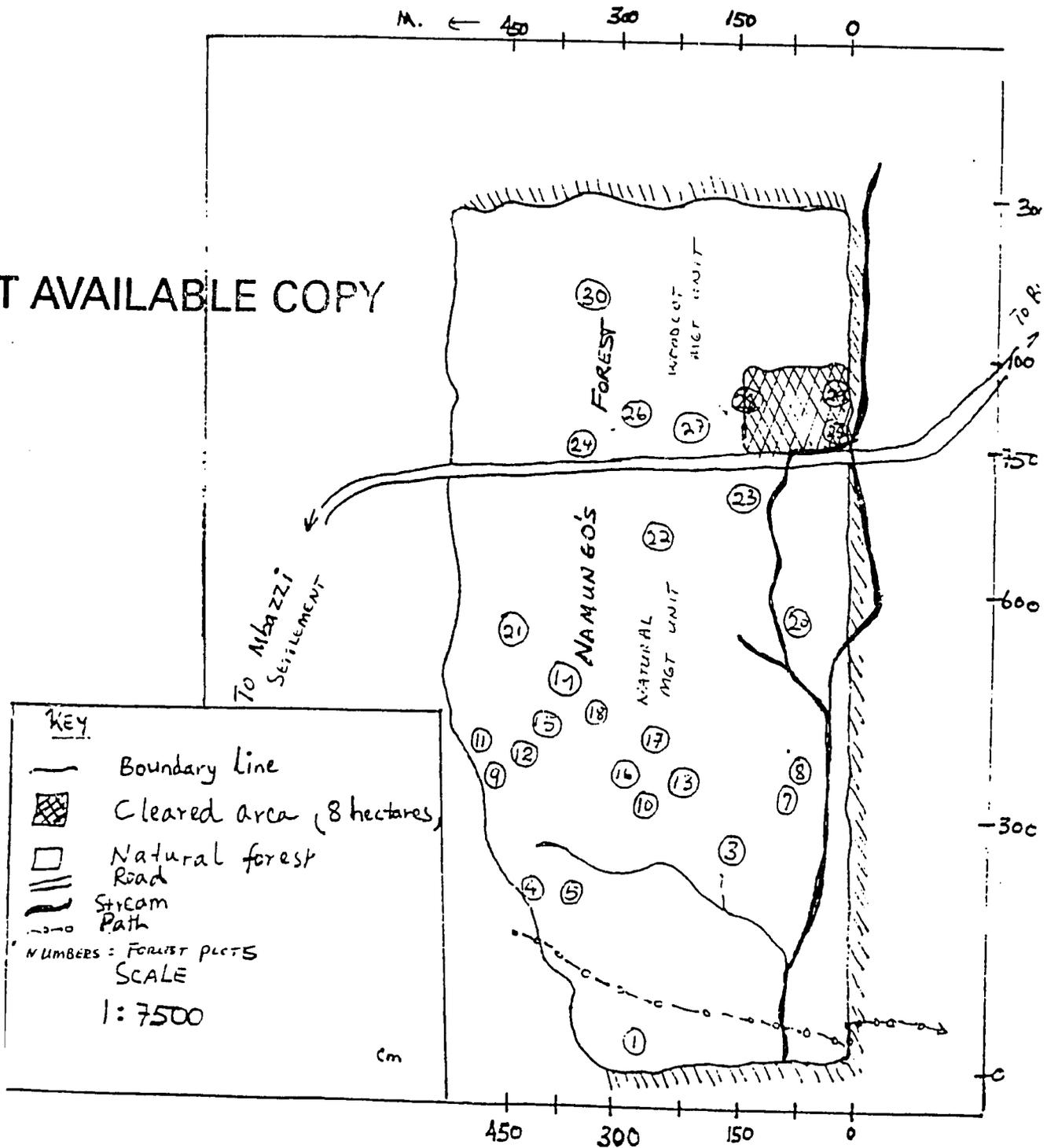
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B1a. Forest Plots Map.

Trace the Forest Feature Map drawn on page 6 to develop forest plot locations.

Follow the instructions given in the Data Collection Instruction Manual in Section III.A.3., Form P Guidelines, on how to obtain a random sample of plots. This includes the construction of a grid, the development of Plot Identification Numbers, and the selection of plots to visit. The randomly chosen plots to visit should be marked on this map. Thus, this Forest Plots Map will be used in conjunction with the Forest Plot forms.

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B1b. On this page, please describe the sampling logic and method used to determine the number of plots drawn for this forest, any stratification used, and any other information that others will need in doing analysis based on this sample of plots. *(long text)* <FSAMPLE>

B2. What is the size of the forest? <FSIZE>

*Please write the area in terms of hectares, or some local unit of area if area in hectares is not known. If you use a local unit, find out how many local units of area is equal to a hectare.*

40 hectares      If area is not known in hectares, supply the number *and* the  
(local) unit of measurement here \_\_\_\_\_

B3. Has this forest been divided into forest management units? <FUNIT>

*Mark only one answer.*

- (1)        No  
(2)   X   Yes

*If no, skip to question B4.*

B3a. If yes, how many? <FUNITNUM>   2  

B3b. Please draw the boundaries of these units (and label them within the boundaries) on the Forest Feature Map developed above, and write the year in which each forest management unit was planted.

*Refer to the map in question B1.*

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B3c. Are these units approximately equal in size? <FUNITEQUAL>

*Mark only one answer.*

- (1)   X   No  
(2)        Yes

B3d. Are the boundary of these units related to ecological regions (such as catchment areas)? <FUNITBOUND>

*Mark only one answer.*

- (1)   X   No  
(2)        Yes

B3e. Are any of these units permanently distinguished from others for special uses? <FUNITDIFF>

*Mark only one answer.*

- (1)        No  
(2)   X   Yes

B3e1. If yes, please describe. *(long text)* <FUNITDESC>

*The smaller unit 2 (8 hectares) is set aside for eucalyptus planting.*

B3f. Is there a system of regeneration and harvesting that rotates through these units? <FUNTCYCLE>

*Mark only one answer.*

- (1)   X   No  
(2)        Yes

B3f1. If yes, please describe. (*long text*) <UNITDESC>

*(maybe in future)*

B3f2. List the names and numbers of these units as used by the users of the forest or assigned by the field team.  
(*text*) <UNITINFO>

*01 Main forest*  
*02 Eventual eucalyptus plantation*

←If users of the forest or forest owner do not have a name for these units, please assign a name.

*21*

B4. What is the topography of the land on which this forest is located? <FTOPOGRAPH>

*Mark only one answer.*

- (1)  Primarily flat
- (2)  Mostly flat with some rolling terrain
- (3)  Primarily rolling terrain
- (4)  Mostly rolling terrain with some steep portions
- (5)  Primarily steep

B4a. If (5) is marked above, what is the steepness of the slope in degrees (if known)? <FSTEEP> \_\_\_\_\_

B5. Who is the legal owner of the land on which this forest is located? <FOWNLAND>

*Mark only one answer.*

- (1)  A national government
- (2)  A regional (or state) government
- (3)  A local government
- (4)  A settlement(s) or village(s)
- (5)  A section or quarter of a settlement or village
- (6)  A private individual(s) or family
- (7)  A private corporation(s)
- (8)  A cooperative
- (9)  A religious order or temple
- (10)  No one (completely open access)
- (11)  Other types of owners or multiple types of ownership (describe): <FOWNOTH>  
\_\_\_\_\_

B5a. What is the official legal designation of this forest? (*brief text*) <FDESIGNATE>

*For example, government reserve forest, community forest, government park, etc.*

*private forest*

B6. Does the legal owner of this forest also hold the rights to harvest all of the forest products from this forest?  
<FOWNRIGHTS>

*Mark only one answer.*

- (1)  No (*please designate who owns rights to the harvest of particular forest products on the Forest-User Group Relationship form, question A2*)
- (2)  Yes

B7. Can the owner of the forest land sell all or part of the forest land to other individuals or groups? <FOWNSELL>

*Mark only one answer.*

- (1)  No
- (2)  Yes, parts of the forest land
- (3)  Yes, all of the forest land

B8. What is the vegetation type of the forest that is being investigated? <FVEGTYPE> A3

*From the partial list of vegetation classifications contained in Appendix 1—Form F Guidelines (Section III.A.2) of the Data Collection Instruction Manual, write the number and letter combination that corresponds to the type most characteristic of this forest.*

B8a. If there is no appropriate vegetation type is listed in Appendix 1—Form F Guidelines (Section III.A.2) of the Data Collection Instruction Manual, or if there is more detailed information available than listed in Appendix 1—Form F, please write out the general forest type or further information here. (*brief text*) <FVEGDESC>

*Medium altitude, Piptedeniastrium-Albizia-Celtis type.*

← These are the dominant genera.

B9. Has the density of trees on the forest land changed in the past five years? <FTREEDENS>

*Mark only one answer.*

- (1)  No, it has remained the same  
(2)  Yes, it has increased  
(3)  Yes, it has decreased

B9a. If yes, list the 3 most important reasons cited by users as the reasons for change in the density of trees. <FTREEDENS Y>

- (1) Extraction of *Canarium schweinfurthii* and *Funtumia elastica* by Kira Sawmill to make plywood.  
(2) Over pitsawing/power sawing of *Cordia millenii* to make canoes.  
(3) Excessive removal and cutting of *Mitrogyne stipulosa*.

B10. Has the density of shrubs and bushes on the forest land changed in the past five years? <FBUSHDENS>

*Mark only one answer.*

- (1)  No, it has remained the same  
(2)  Yes, it has increased  
(3)  Yes, it has decreased

B10a. If yes, list the 3 most important reasons cited by users as the reasons for change in the density of the shrubs/bushes. <FBUSHDENS Y>

- (1) They are clearing unit 2 (8 hectares) for eucalyptus planting.  
(2) Clearing along the eastern boundary with the forest reserve.  
(3) \_\_\_\_\_

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B11. Has the density of the ground cover on the forest land changed over the past five years? <FCOV DENS>

Mark only one answer.

- (1)  No, it has remained the same  
(2)  Yes, it has increased  
(3)  Yes, it has decreased

B11a. If yes, list the 3 most important reasons cited by users as the reasons for change in ground cover. <FCOV DENS Y>

- (1) Clearing along the eastern boundary with the forest reserve  
(2) Clearing of unit 2 (8 hectares) for eucalyptus planting  
(3) \_\_\_\_\_

B12. Has most of the vegetation in the forest been planted or is it a result of natural growth? <FVEG ORIGIN>

Mark only one answer.

- (1)  Yes, most of the woody vegetation has been planted and the forest is a result of initial plantations and/or tree nurseries made by the forest department and/or local users  
(2)  Yes, people have planted woody vegetation, but their efforts have been aided by natural regeneration and seeding  
(3)  People plant woody vegetation sometimes, but most vegetation occurs as a result of natural growth  
(4)  People seldom plant woody vegetation, and the forest is a result of natural growth

B13. During the last five years, has there been any change in the area over which vegetation exists/existed? <FVEG CHANGE>

*As opposed to earlier questions which asked about the density of vegetation, this question simply asks if the area of forest changed. Changes may have come about because of encroachments, excessive use, changes in legislation about land use patterns and so forth. Mark only one answer.*

- (1)  No, the forest area has remained the same  
(2)  Yes, the area of the forest has increased  
(3)  Yes, the area of the forest has decreased

B14. If the forest area has increased, what are the reasons for the increase in the area? <FINCREASE\_>

Multiple answers may be applicable. *n/a*

- (1)  Because of local, regional, or national legislation to bring more area under woody vegetation  
(2)  Because of informal woody vegetation planting locally  
(3)  Because of local efforts to protect a larger area  
(4)  Other reasons (describe) <FINCOTH> : \_\_\_\_\_

B15. If the forest area has decreased is it primarily because of: <FDECREASE>

Mark only one answer. *n/a*

- (1)  Overuse of forest products?  
(2)  Clearing for agriculture?  
(3)  Encroachments on forest land?  
(4)  Other reasons (describe) <FDECOTH> : \_\_\_\_\_

- B16. Are there points within the forest where the main flow of forest products can be controlled? (Examples of such points may be a place from which most of the forest area can be seen/surveyed; a path which users must take to extract products from the forest; a stream that users must cross to reach the forest and so forth.) If there are such points, describe them. *(long text)* <FFLOWCTRL>

*No, the forest is easily accessible from all sides, but it could be patrolled because it is small.*

- B17. If multiple harvesting processes are used within the forest (e.g., wood cutting, livestock grazing, nut, fruit and honey gathering), do any of the techniques for harvesting one product interfere with the availability of another product; or make harvesting another product more difficult? Explain in detail. (One example of interference may be that if there are tree species from which both fruits and fodder can be used, then lopping the trees for fodder may reduce the amount of fruits available from the trees; similarly, multipurpose tree species, if chopped for firewood, cannot provide fodder, or fruits). *(long text)* <FINTERFERE>

*By clearing part of the forest for eucalyptus planting some of the products (both timber and nontimber products) especially for handicraft would have been cut. Also, wild game diversity has been reduced, but wild pigs have increased in number.*

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C. PRODUCTS/SPECIES THAT ARE USED FROM THE FOREST

C1. What forest products/species are being harvested from this forest? <FPRODUCTS\_>

*Please note that products "harvested" could include such non-consumptive products as area for sacred worship. Multiple answers may be applicable.*

- (1)   X   Trees
- (2)   X   Bushes
- (3)        Grasses
- (4)        Leaves on ground
- (5)   X   Climbing leaves
- (6)   X   Soils
- (7)        Stones
- (8)        Minerals
- (9)   X   Water
- (10)   X   Animals
- (11)        Areas for sacred worship
- (12)        Recreation
- (13)   X   Other (describe) <FPRODOTH>: \_\_\_\_\_

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C2. What are all the plant species in the forest that have been collected/used? C2 will be the master list of plant species found in the forest. Plant species include trees, grasses, shrubs, leaves, fruits, nuts, flowers, and so forth. On the following table, name the species (local and botanical names, if possible). What is the reason why the species is important? What are the most important uses of the species? (If the "use" column(s) is/are not used, this will indicate that the species is not "harvested.") If the researcher can find no present use, record abundance only.

This will be the master spelling list for plant species.

Master List of Plant Species (F\_ORGAN) <F\_TYPE> = "P" (PLANT)

Name of Species		Reason why it is important <F_IMPORT>	Is it abundant? Mark "1" for No, "2" for Yes <F_ABUNDANT>	Use <F_USES>	Use <F_USES>	Use <F_USES>
Botanical <F_BOTNAME>	Local <F_LCNNAME>					
<i>Macaranga monandra</i>	<i>mwokyanyama</i>	firewood	2	sale	home use	
<i>Tabernaemontana holstii</i>	<i>kitwekyankima</i>		1	← Marking "1" here will indicate that the species is rare.		
<i>Bosqueia phoberos</i>	<i>mugwi</i>		1			
<i>Flacoutia indica</i>	Unknown B	← Notice that information is missing here. This should be checked by the team leader and completed.	1			
<i>Celtis mildbraedii</i>	<i>lufugo</i>		1			
<i>Teclea nobilis</i>	<i>nzo</i>		1			
<i>Trichilia prieuriana</i>	<i>sesambya</i>	poles	2			
<i>Albizia zygia</i>	<i>nongo 3</i>		1			
<i>Lepturus sp.</i>	Unknown A		1			
<i>Kafromomum sanguineum</i>	<i>kitungulu</i>		1			

continued on following page



C3. What are all of the animals that are found in the forest? C3 is the master list of animals found in the forest. Animals include elephants, monkeys, birds, fish, and so forth. On the following table, name the species (local and scientific names, if possible). What is the reason why the species is important? What are the most important uses of the species? (If the use column(s) is/are not used, this will indicate that the species is not "harvested.") If the researcher can find no present use, record abundance only.

Master List of Animal Species {F\_ORGAN} <F\_TYPE> = "A" (ANIMAL.)

This will be the master spelling list for animal species.

Name of Species		Reason why it is important <F_IMPORT>	Is it abundant? Mark "1" for No, "2" for Yes <F_ABUNDANT>	Use <F_USES>	Use <F_USES>	Use <F_USES>
Scientific <F_BOTNAME>	Local <F_LOCNAME>					
Unknown C	mbizzi (wild hog)	food	2	home consump		
Unknown D	musu (edible rat)	food	1	home consump		
Unknown E	bush back	food	1	home consump		

continued on following page



C4. What are all of the inorganic (and non-plant organic species) that are found in the forest? C4 will be the master list of inorganic (and non-plant organic species) and products found in the forest. Inorganic products include minerals, stones, water, and so forth. Non-plant organics include such species as mushrooms. On the following table, write the name of the product (local and botanical names, if possible). What is the reason why it is important? What are the most important uses of the product? (If the use column(s) is (are) not used, this will indicate that the product is not "harvested.") If the researcher can find no present use, record abundance only.

This will be the master spelling list for inorganic products.

Master List of Inorganic Products and Nonplant Organics {F\_INORG}

Name of the product <F_PRODNAME>	Reason why it is important <F_IMPORT>	Is it abundant? Mark "1" for No, "2" for Yes <F_ABUNDANT>	Use <F_USES>	Use <F_USES>	Use <F_USES>
<i>water</i>	<i>domestic use, livestock, poultry</i>	<i>2</i>	<i>drinking</i>	<i>bathing</i>	<i>construction</i>
<i>sand</i>	<i>building/plastering</i>	<i>1</i>	<i>construction</i>		
<i>stones</i>	<i>building</i>	<i>1</i>	<i>construction</i>		

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D. RULES RELATED TO ENTRY

These rules are not product specific.

Note that these rules are *forest specific*, not product specific.

D1. Which of the following attributes must local residents have in order to enter this forest for recreational, religious, or other non-consumptive uses: <FRESATTRI\_>

Multiple answers may be applicable.

- (1)  Anyone (literally anyone) can use this forest for non-consumptive uses
- (2)  Anyone who is a citizen of this country
- (3)  Anyone who is a citizen of this state or district
- (4)  Anyone who lives in a nearby village
- (5)  Anyone who has joined particular organizations
- (6)  Anyone who is a member of a particular ethnic group or caste
- (7)  Anyone who is a member of a particular extended family
- (8)  Anyone who has shares in a particular enterprise
- (9)  Other (describe) <FRESOTH> : \_\_\_\_\_

D2. If more than one group uses this forest, are rules for using this forest well defined between different groups? That is, are there rules that specify the actions that different groups follow? <FRULEDEFIN>

Keep in mind that the rules may not be written down, but may still have strong force because individuals in the different groups recognize the rules. Mark only one answer.

- (1)  No
- (2)  Yes

D2a. If yes, do the different groups follow the prescribed rules? <FRULEFOLL>

Mark only one answer.

- (1)  No
- (2)  Yes -- Generally

D3. If mobile groups use this forest, indicate the length of time for which they gather products from the forest (in months) <FMOBILETIM> : n/a

D4. Describe here any further information you have about the structure of rights of various individuals or groups to the general use of the forest. Code information about harvesting rules on the relevant forest product form. (long text) <FUSERIGHTS>

User groups are allowed to harvest firewood, medicinal plants, craft items, wild games, local construction poles, and water.

E. RULES RELATED TO MAINTAINING AND MONITORING THE FOREST

*These rules are not product specific.*

E1. Do rules restrict any of the following kinds of changes that may occur in the forest? If so, please describe.

Change	Mark "1" for No, "2" for Yes	If yes, please describe <FRESTRICT>:
Maintenance/improvement	<FMAINT> 2	(Which organization(s) define this rule or rules?) <i>the owner (Mr. Namungo)</i>
Infrastructure changes (roads, bridges, ditches, etc.)	<FINFRA> 2	<i>the owner (Mr. Namungo)</i>
Types of seedlings or seeds that may be planted	<FSEEDS> 2	<i>the owner (Mr. Namungo)</i>
Amount of wild game that could be trapped or killed in order to control degradation of the forest	<FWILDGAME> 2	<i>The hunters decide on type of game to harvest</i>
When fires may be started	<FFIREWHEN> 2	<i>The forest dept. at district level decides depending on the dry season when fires should be started.</i>
Where fires may be started	<FFIREWHERE> 2	<i>Fires are always started outside the cleared firebreaks on forest boundaries to prevent grassland fires entering the forest.</i>
Methods of weeding in relationship to the product	<FWEEEDING> 2	<i>the owner (Mr. Namungo)</i>
Other (describe here) <FRULEDESC>: <i>exploitation of timber</i>	<FRULEOTH> 2	<i>the owner (Mr. Namungo)</i>

E2. What type of penalties are imposed on users if they break a maintenance or monitoring rule related to this forest the first time? How about the second time? How about if they break a maintenance or monitoring rule many times?

For each column, check the relevant rows that apply. Multiple answers in a column may be applicable.

Penalties	First time <FPENTYPE1_>	Second time <FPENTYP_2_>	Many times <FPENTYPEN_>
(1) Verbal chastisement	✓		
(2) A cash fine less than the equivalent of one day's work			
(3) A cash fine equal to one day's work			
(4) A cash fine greater than one day's work but no more than one week's work			
(5) A cash fine greater than one week's work <i>equal to penalty committed</i>		✓	
(6) Temporary restriction on harvesting rights from this forest			
(7) Required labor input			
(8) Public apologies			
(9) Permanent suspension of harvesting rights from this forest			
(10) Discretionary decision by local user group			
(11) Discretionary decision by government office			
(12) Other (describe here): <FTYPEOTH_> <i>RC court</i>	✓	✓	✓

E3. Who decides what kind of penalty is appropriate when a maintenance or monitoring rule about this forest is observed to be broken the first time? How about the second time? How about when a maintenance or monitoring rule is observed to be broken many times? {F\_PENDEC}

Multiple answers may be applicable.

Who	First time <FPENWho1_>	Second time <FPENWho2_>	Many times <FPENWhoN_>
(1) A guard patrolling for a local forest association	✓		
(2) A guard patrolling for a government forestry department			
(3) A vote of members of this user group at a meeting			
(4) A vote of members of this user group and other authorized users of this forest at a meeting			
(5) An official of the user group			
(6) A government official in an administrative setting			
(7) A judge in a formal court setting			
(8) An official from another association (name the association):			
(9) Other (describe here): <FWHOOTH> RC Court		✓	✓

E4. Are harvesters of forest products from different user groups readily observed by each other while harvesting? <FOBSERVED >

*Mark only one answer.*

- (1)  No  
(2)  Yes

E5. If a fine is imposed, who collects the fine? <FFINEIMP >

*Mark only one answer.*

- (1)  The guard who apprehends a rule breaker  
(2)  An official of the user group  
(3)  An official for the forest association  
(4)  An official for a forestry department  
(5)  A local government officials  
(6)  A national government official outside forestry department  
(7)  An official from another association (name the association) <FOFFICIAL >  
RC officials collect the fine and pass it to Mr. Namungo

E6. How is this fine used? <FFINEUSED\_ >

*Multiple answers may be applicable.*

- (1)  A general source of revenue to local user group or association (*Association*)  
(2)  A general source of revenue for local government  
(3)  A general source of revenue for forestry department  
(4)  A general source of revenue for national government (the fine is deposited in some form of a general fund and does not come back to the forestry department)

E7. To what extent are these penalties observed and enforced if imposed? <FCOMPLY >

*Mark only one answer.*

- (1)  No one complies with the penalties imposed on them  
(2)  Few users comply with the penalties imposed on them  
(3)  About half the users comply with penalties imposed on them  
(4)  Most users comply with penalties imposed on them  
(5)  Almost all users fully comply with penalties imposed on them

E8. What type of records are kept concerning penalties imposed and compliance with them? <FRECORDS >

*Mark only one answer.*

- (1)  No records or only scanty records kept  
(2)  Forest guards keep a notebook  
(3)  User group keeps a notebook  
(4)  Local forestry association keeps record books  
(5)  Government officials keep record books  
(6)  Other

E8a. If records are kept, are these records accessible? <FRECACCESS>

*Mark only one answer.*

- (1)  No  
(2)  Yes

F. FORESTER'S APPRAISAL OF THE OVERALL CONDITION OF THE FOREST

*This section should be completed by the person on a field team with professional training in forestry after all of the forest plots data has been compiled and substantial time has been spent in the forest.*

*In your best judgment, given the topography and ecological zone in which this forest is located, how would you judge the following attributes of this forest:*

F1. The density of vegetation in this forest is: <FVEGDENSE>

*Mark only one answer.*

- (1)  Very sparse  
(2)  Somewhat sparse  
(3)  About normal for this ecological zone  
(4)  Somewhat abundant  
(5)  Very abundant

F2. The species diversity in this forest is: <FSPECIEDIV>

*Mark only one answer.*

- (1)  Very sparse  
(2)  Somewhat sparse  
(3)  About normal for this ecological zone  
(4)  Somewhat abundant  
(5)  Very abundant

F3. The commercial value of the forest is: <FVALUECOM>

*Mark only one answer.*

- (1)  Substantially above normal  
(2)  Above normal  
(3)  Normal  
(4)  Below normal  
(5)  Substantially below normal

F4. The subsistence value of the forest is: <FVALUESUB>

*Mark only one answer.*

- (1)  Substantially above normal  
(2)  Above normal  
(3)  Normal  
(4)  Below normal  
(5)  Substantially below normal

F5. The type of conservation measures adopted in relation to this forest are: < FCONSERVE >

*Mark only one answer.*

- (1)  Too restrictive, more could be harvested from the forest without endangering its sustainability over time
- (2)  About the right level of conservation
- (3)  Too lax, if harvesting continues at this rate, the sustainability of the forest is endangered.
- (4)  Non-existent

F6. Please comment on your estimate of the most serious problems that the forest users and those responsible for managing are facing this forest during the next five years. *(long text)* < FPROBLEMS >

*Because of general vegetation reduction, most water points (streams) have started drying up during dry season. Also, there is a problem of wild pigs crop raiding the surrounding villages. The harvesting of building poles should be restricted to nonreserved species (noncommercial timber trees) as they would affect future supply of commercial timber.*

F7. Please comment on your estimate of the greatest opportunities that are facing the forest users and those responsible for managing this forest during the next five years. *(long text)* < FOPPORTUN >

*Sustained yield of forest products (both timber and nontimber) would be enhanced.*

*To Mr. Namungo, revenue collected especially from marketing of round timber species would greatly improve.*

*The planting of eucalyptus in part of the forest as an enrichment planting would be introducing a tree species that is fast growing on high demand, and would be sold at much shorter rotation than natural trees.*

*Proper marking of the boundary with both the forest reserve and the surrounding village would facilitate proper patrolling and control of illegal harvesting.*

FOREST PLOT FORM

*This form has been designed to obtain information about the condition or state of the forest based on observing (and monitoring) tree growth, forest composition and species diversity, vegetative cover, presence of livestock, soil quality, and pest damage in randomly selected forest plots.*

*A forest plot is defined as three concentric circles of 1, 3, and 10 meter radii centered on a randomly selected point in the forest. Ground cover and seedlings are sampled in the smallest circle, shrubs and tree saplings in the middle-sized circle, and trees in the largest circle.*

*Responses on this form should be based on the observations that the field researcher makes in a specific forest. For each of the random plots, one Forest Plot Form should be filled out.*

*If more than one Forest Form has been completed (as indicated in the Site Overview Map), then this process must be repeated for each forest.*

*Using the Forest Plots Map drawn in the Forest Form (B1a), the field researcher should record below the Plot Identification Number which corresponds to this Forest Plot (remember, not every plot in the grid on the Forest Plots Map should be measured, just those randomly selected).*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001  
Name of forest <FNAME>: Namungo's Forest  
Name of person filling out this form: Mr. Sekindi Serevest  
Date of Site Visit (Month and Year): 9/16/93  
Plot Identification Number <PPIN>: 23

A. CONDITIONS OF THE PLOT

A1. Describe the soil within the forest plot. (long text) <PSOIL>

*If possible, include a description of the location of the plot topographically, surface and depth of humus layer, and the A and B horizons: color, texture, and hardness of soil. The soil color will give the researcher an indication of the level of soil drainage. Please make a note beside the color of the soil about soil drainage. Is it well-drained, drained, or poorly-drained soil? Please describe the hardness of the soil. In dry to moist (not wet) soil, is it hard, firm, easily crumbled, or loose? Please refer to Tables 4, 5, and 6, and Figures 13 and 14 in Section III.A.3. of the Data Collection Instruction Manual.*

Preparation of soil sample hole: *Soil was easy to dig, except for some large holes.* ←See Tables 4, 5, and 6, and Figures 13 and 14 in Section III.A.3. of the Data Collection Instruction Manual.

Location of plot topographically: *toeslope*

Surface description and depth of humus layer: *2 to 3 cm of decaying leaves;  
many ants noted*

Depth of A and B horizons: *A horizon = 2 cm; B horizon = 3 cm*

Color/soil drainage (A and B horizons): *A horizon = 10 yr. 6,4 well-drained; B horizon = 10 yr.  
5,5 well-drained*

Texture (A and B horizons): *A horizon = sandy loam; B horizon = silt loam*

Hardness of soil (A and B horizons): *A horizon = moist, loose; B horizon = moist, firm*

A2. Is there evidence of active soil erosion in the forest plot? <PEROSION >

Mark only one answer.

- (1)  No  
(2)  Yes, minor erosion: surface vegetation and humus layer is absent  
(3)  Yes, major erosion: large gulleys are present in barren soil.

A3. Is there evidence of livestock use within the forest plot? <PLIVESTOCK >

Mark only one answer.

- (1)  No  
(2)  Yes

A4. Is there evidence of extreme damage by insects/pests within the forest plot? <PINSECTS >

Mark only one answer.

- (1)  No  
(2)  Yes

A5. Is this plot located within a section of the forest that is set aside for specific forest management practices?  
<PLOCATION >

This question refers to question B3 on the Forest Form. Mark only one answer.

- (1)  No  
(2)  Yes

A5a. If yes, how many years has it been since this section of the forest was subject to a major harvesting effort? (Please use whole numbers.) <PYEARS > n/a years

A5b. If yes, what is the name of this unit as listed on the Forest Form, B3f2? <PMGMTNAME >

n/a

Information for the following three questions is required for each plot so that eventually it may be recorded on a GIS map of the forest. Information about the species and sizes of trees may be related to the elevation of the plot, the direction toward which the plot faces (e.g., primarily south facing or northeast facing), and the steepness of the plot (normally measured in terms of the number of meters rise over a ten meter distance, expressed as a percentage). A clinometer is typically used for measuring slope (steepness).

A6. Plot elevation (in meters). <PELEVATION > :

1180 m

A7. If the plot is on a slope, what direction does the plot face? <PORIENT >

Mark only one answer.

- |   |           |                              |           |
|---|-----------|------------------------------|-----------|
| (1) <input type="checkbox"/>            | North     | (5) <input type="checkbox"/> | South     |
| (2) <input checked="" type="checkbox"/> | Northeast | (6) <input type="checkbox"/> | Southwest |
| (3) <input type="checkbox"/>            | East      | (7) <input type="checkbox"/> | West      |
| (4) <input type="checkbox"/>            | Southeast | (8) <input type="checkbox"/> | Northwest |

A8. What is the steepness of the slope in degrees? <PSTEEP> 0°

A9. Provide any other observations that pertain to plot conditions, e.g., tree falls, charcoal burning evident, fire damage, storm damage, etc. (text) <PCONDITION>

*undisturbed forest*

**B. GROUND COVER AND SEEDLING INFORMATION**

B1. What are the different ground cover plant species in the plot? What percent of different species are there in the plot? To obtain the names of all the species, the field researcher may ask the residents of the village the local name(s) of the species and cross-check the local name with the botanical name. The botanical name may be obtained by talking with local foresters or by consulting with botany departments at local universities. {P\_GCOVER}

*Starting at the center of the plot, create a circle with a 1 meter radius. For each woody seedling or herbaceous plant species in this area, answer the questions below. Remember that seedlings are defined as young trees or shrubs with a stem diameter less than 2.5 centimeters or a height less than 1 meter. For any species with a cover value less than 1%, please write 0.5 in the last column.*

Name of Species		Is the species a woody seedling or an herbaceous plant? Write "S" for seedling or "H" for herbaceous plant. <P_TYPE>	What percent of the 1 meter circle does this species cover? <P_PERCENT>
Botanical <P_BOTNAME>	Local <P_LOCNAME>		
<i>Leptasus sp.</i>	<i>Unknown A</i>	H	2
<i>Afromomum sanguineum</i>	<i>kitungulu</i>	H	1
↓ Remember to use "sp." whenever the genera is known, but the species is unknown.			↓ Writing 0.5% prevents over-estimation of rare or widely dispensed species.

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D. TREE INFORMATION

D1. Record the local and botanical names of each tree found in the circle of 10 meter radius. For each tree record its DBH and height in metric units, and age in years. {P\_INFO} <P\_TYPE> = "T"

*Starting at the center of the plot, create a circle with a 10 meter radius. For each tree species in this area, answer the questions below. Remember to record only those trees with a DBH greater than or equal to 10 centimeters.*

**Please check spellings of the local and botanical names with the Master List of Plant Species in Form F, question C2. They should match.**

Name of Species		DBH of the tree (centimeters) <P_CIRCUM>	Estimated height of the tree (meters) <P_HEIGHT>
Botanical <P_BOTNAME>	Local <P_LOCNAME>		
<i>Tabernaemontana holstii</i>	<i>kitwekyankima</i>	14 cm	11 m
<i>Bosqueia phoberos</i>	<i>mugwi</i>	13 cm	19 m
<i>Flacoutia indica</i>	Unknown B	13 cm	13 m
<i>Macaranga monandra</i>	<i>mwoikyanyama</i>	11 cm	12 m
<i>Trichilia prieuriana</i>	<i>sesambya</i>	12 cm	6 m
<i>Celtis mildbraedii</i>	<i>lufugo</i>	36 cm	14 m



SETTLEMENT FORM

*This form has been designed to capture historical, demographic, socio-economic and geographical information on a particular settlement. Here "settlement" is defined as a collection of households located in or around one or more forests, especially because there is a relationship between the households and the forest(s). There may be a number of settlements utilizing a particular forest or forests, and therefore, one of these forms would be completed for each settlement studied.*

*Many of the questions ask for specific numbers (e.g., number of individuals in settlement, average number of times individuals go to market). Try to get as accurate a response as possible. If the group of individuals being questioned disagree on the number, continue discussion until a sense of convergence toward a reliable estimate is gained.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001  
Name of settlement <SNAME>: Mbazzi  
Name of district and subdistrict(s) (if applicable) <SDNAME>: Mpigi  
Name of forest(s) used <FNAME>: Namungo's, Lwamunda Forest Reserve  
Name of person filling out this form: P. Kisito and Anne Nakaweesi  
Name of person(s) with whom discussions held: General Assembly  
Date of Site Visit (Month and Year): 9-16-93  
Location of discussions (fields, home of respondent, place of business, etc.): open village meeting place  
Has this settlement been coded before? <SCODED>  
(1)  No  
(2)  Yes  
(3)  Uncertain  
(4)  Yes, with a new name (If this response is checked, write new name in B0.)

A. HISTORY

The closest approximation should be noted here.

A1. What year did this settlement come into being? <SYEAR> 1830

*Enter the full year (for example, 1871). If unknown, provide as close an approximation as possible.*

A1a. How did this settlement come into existence? (long text) <SEXISTENCE>

*If factual information is available, report here; if not available, skip this question and go to A2.*

*A few people could trace their history back to 1830s but lack specific facts. The majority traced their history to around 1900.*

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A2. Are there any myths or stories that are prevalent about how this settlement came into existence? What are they? (text)  
<SMYTH>

*N/a*

A3. What have been the major changes that the settlement has seen in the course of its existence (major changes with regard to population, economic activity, etc., as the result of war, droughts, disease, market price changes, development projects, changes of jurisdiction, etc.)? (long text) <CHANGE>

*Population expanded between 1933-40, dropped around 1982, then increased after 1986. There is observed decrease in crop yields and decrease in head of cattle.*

← Try to explore all of the possibilities here: change in standard of living, effects of war, agro-forestry project, disease, etc.

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A3a. What do the local residents see as causes of these changes? (long text) <SCAUSES>

*Population increase in 1933 was due to introduction of cotton growing and later coffee in 1940. Between 1982-85, a number of residents were killed, while others ran away from the village and are just returning. Decrease in yield is attributed to over-cultivation, change in rainfall patterns, and war.*

A4. Are any published or written records available about the history of the settlement? <SRECORD>

*Mark only one answer.*

- (1)   X   No  
(2)       Yes

A4a. If yes, where are they available? Please try to provide the location and/or the citation, and be as specific as possible.  
(long text) <SWHERE>

n/a

A5. The term "household" is used to mean various groupings in different cultures. Please give the local definition of how the concept of a household is used in this settlement. Give an example of the set of adults and children likely to be considered one household. How many generations might be grouped within this concept? How many adult siblings and/or wives might be considered one household? Has this concept changed, or the average number of individuals likely to be considered one household changed, during the past 20 years? (long text) <SHOUSEHOLD>

*Definition: Household refers to a man with his wives, children, and relatives under the man's care and staying in the same homestead.*

*The size of the households ranged from 15-70 individuals around the 1950s, with few households. Later the size reduced with more households. During the war (probably for security reasons) households decreased and size increased. The trend reversed after the war with more households, ranging from 4-5 individuals. There are several widows living alone in Mbazzi.*

←Please cross check this information with A6-A9, and with B1 on this form.

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- A6. Estimated number of households (as defined in A5) 20 years ago <SHouse20> 40
- A7. Estimated number of households (as defined in A5) 15 years ago <SHouse15>: 40
- A8. Estimated number of households (as defined in A5) 10 years ago <SHouse10>: 10
- A9. Estimated number of households (as defined in A5) 5 years ago <SHouse5>: 35

B0. MAJOR CHANGES SINCE LAST SITE VISIT

- B0. Have there been any *major* changes in the settlement since the last visit, and if so, what were they? (long text)  
<SHISTCHNG>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

*n/a*

B. DEMOGRAPHIC

B1. What is the current population of this settlement in terms of households (as defined in A5), nuclear families, and individuals?

*Please refer to A5 for the definition of household. Nuclear family refers to a unit consisting of parents and their children only.*

Households <SHOUSEPOP>: 50

Nuclear Families <SFAMPOP>: 60

Individuals <SINDPOP>: 203

←Note the difference between the nuclear family definition and household definition in A5.

B2. How far is the most frequently used market by most residents in this settlement? <SMARKET>

*Market refers to a location where the residents of the settlement can buy articles of daily necessity as well as sell some of their products such as fodder, fuelwood or agricultural crops. If there are a number of markets in the vicinity, pick the one that is the most used or the closest.*

0 kilometers

If distance is not known in kilometers, supply the number *and* the (local) unit of measurement here: \_\_\_\_\_

B3. Where is this market (in a village, town, etc.)? (long text) <SMKTWHERE>

*Try to be as specific as possible. For example, if this market is in a village, specify the village name and also specify that it is a village. Additionally, specify the direction this market is from the settlement.*

*in Mbazzi*

B3a. On average, how frequently do most residents of the settlement go to a market? <SMKTFREQ>

*Mark only one answer.*

- (1)  Almost every day
- (2)  Two to four times a week
- (3)  Once a week
- (4)  Once every two weeks
- (5)  Once a month
- (6)  Once a season
- (7)  Once a year

B3b. How do most residents of the settlement travel to the market? <SMKTTRAVEL>

*Mark only one answer.*

- (1)  Walk
- (2)  Bicycle
- (3)  Motorcycle
- (4)  Bus
- (5)  Animal-drawn carts
- (6)  Car/Truck
- (7)  Other (describe) <SMKTTRAOth> : \_\_\_\_\_

B3c. On average, how long does it take a resident to walk to the market?

*Even if residents do not walk to the market, obtain as close an estimate as possible for the time it would take to walk to the market. Please provide the time estimate in minutes for both the driest and the wettest season.*

Minutes in the driest season <SMKTTRADRY> : 10 min.  
Minutes in the wettest season <SMKTTRAWET> : 10 min.

←If the answer here is given in hours, please translate into minutes.  
1 hr. 30 min. = 90 minutes

B4. How far is an administrative center from the settlement? <SADMIN>

*An administrative center refers to a location where some government officials reside or where there is a government office that interacts to at least some extent with the settlement residents. If there are a number of administrative centers in the vicinity, pick the closest one.*

5 kilometers      If distance is not known in kilometers, supply the number *and* the (local) unit of measurement here: \_\_\_\_\_

B4a. How frequently do most residents of the settlement travel to the administrative center? <SADMFAQ>

*Base the response on the primary traveller's average for all households. Mark only one answer.*

- (1)  Almost every day
- (2)  Two to four times a week
- (3)  Once a week
- (4)  Once a fortnight (two weeks)
- (5)  Once a month
- (6)  Once a season
- (7)  Once a year

B4b. How do most residents of the settlement go to the administrative center? <SADMTRAVEL>

Mark only one answer.

- (1)  Walk
- (2)  Bicycle
- (3)  Motorcycle
- (4)  Bus
- (5)  Animal-drawn carts
- (6)  Car/truck
- (7)  Boat
- (8)  Other (describe) <SADMTRAOTH>: \_\_\_\_\_

B4c. How long does it take most of the residents to reach the administrative center by walking from the settlement?

Even if residents do not walk to the administrative center, obtain as close an estimate as possible for the time it would take to walk to the administrative center. Please provide the time estimate in minutes for both the driest and the wettest season. If more than one day is required to walk to this center, convert days including time spent resting and sleeping to minutes. For example, a trip that takes one-half day to complete prior to a visit to an administrative center would be written as 240 minutes.

Minutes in the driest season <SADMTRADRY>: 90 min. (180 minutes round trip)  
Minutes in the wettest season <SADMTRAWET>: 90 min. (180 minutes round trip)

B4d. In general, how frequently do most residents interact with government officials? <SINTERACT>

This question should be answered from the point of view of all settlement residents, not just a primary few who may interact more frequently. Mark only one answer.

- (1)  Very often; government officials live in the settlement
- (2)  Quite often; government officials visit the settlement almost every day, or residents visit the administrative center almost every day
- (3)  Often; either government officials visit the settlement or residents visit the administrative center
- (4)  Sometimes; neither government officials visit the settlement often, nor do residents travel to administrative centers
- (5)  Seldom; possibly once a month
- (6)  Rarely; maybe once in two or more months
- (7)  Very rare; once or twice a year

### C. SETTLEMENT SOCIAL ECONOMIC STATUS

C1. How do most residents of the settlement derive most of their basic income? <SINCOME>

Mark only one answer.

- (1)  Subsistence farming
- (2)  Herding
- (3)  Operating or owning commercial farms or commercial enterprises
- (4)  Harvesting products from the forest
- (5)  Wage labor or employed staff
- (6)  Other

C1a. If (1) or (2) is checked for question C1, for how many months of a year do most residents of the settlement consume their own food crops? <SCONSUME> 12 months

C1b. Describe the economic activities of most residents of this settlement and their dependence on the forest for inputs into their major activities. (long text) <SECONACT>

*men = charcoal, pitsawing, firewood, hunting*  
*women = crafts material (mainly palm and marantacloa)*

← Cross check this information with Form G, Section III.A.7.

C2. List the 3 most predominant ethnic groups/castes of this settlement.

*Provide the group name and a percentage of that group in the settlement if possible.*

Ethnic group/caste		Percentage of settlement	
<SETHNIC1>	<i>Baganda</i>	<SPERCENT1>	<i>95</i>
<SETHNIC2>	<i>Banyankole</i>	<SPERCENT2>	<i>3</i>
<SETHNIC3>	<i>Bakiga</i>	<SPERCENT3>	<i>2</i>

**D. GEOGRAPHY**

D1. What are the general climatic features of the region in which the settlement is located?

*Provide season, seasonal average temperatures, amount of precipitation, and any other information that may be appropriate. Use annual information only if seasonal information is not available. Be sure to write "annual" under the season column if annual information is used. Temperature should be given in centigrade and precipitation should be given in millimeters.*

Season (or Annual)	Average temperature (centigrade)	Average precipitation (mm)
<SSEASON1> <i>Wet</i>	<STEMP1> <i>20 ° C</i>	<SPRECIP1> <i>1,000</i>
<SSEASON2> <i>Dry</i>	<STEMP2> <i>23 ° C</i>	<SPRECIP2> <i>750</i>
<SSEASON3>	<STEMP3>	<SPRECIP3>
<SSEASON4>	<STEMP4>	<SPRECIP4>

Try to identify by using an atlas or checking at a meteorological bureau prior to discussing with the settlement ←

D1a. Describe the dominant soil within the settlement.      *(long text)* <SSOILS>

*If possible, include a description of the location of the plot topographically, surface and depth of humus layer, and the A and B horizons: color, texture, and hardness of soil. The soil color will give the researcher an indication of the level of soil drainage. Please make a note beside the color of the soil about soil drainage. Is it well-drained, drained, or poorly-drained soil? Please describe the hardness of the soil. In dry to moist (not wet) soil, is it hard, firm, easily crumbled, or loose? Please refer to Tables 4, 5, and 6, and Figures 13 and 14 in Section III.A.3. of the Data Collection Instruction Manual.*

Preparation of soil sample hole:      *soil was easy to dig, except for some large tree roots*

Location of plot topographically: *toeslope*

←See Tables 4, 5, and 6, and Figures 13 and 14 in Section III.A.3. of the Data Collection Instruction Manual.

Surface description and depth of humus: *2-3 cm. of decaying leaves; many ants noted.*

Depth of A and B horizons: *A horizon = 2 cm; B horizon = 3 cm.*

Color/soil drainage (A and B horizons): *A horizon = 10 yr. 6,4 well-drained; B horizon = 10 yr. 5,5 well-drained*

Texture (A and B horizons): *A horizon = sandy loam; B horizon = silt loam*

Hardness of the soil (A and B horizons): *A horizon = moist, loose; B horizon = moist, firm*

D2. If there is a specific name for the vegetation around the settlement, state the name. <SVEGTYPE>          C1    

*From the partial list of vegetation classifications contained in Appendix 1—Form F, Section III.A.2, of the Data Collection Instruction Manual, write the letter and number combination that corresponds to the type most characteristic of this settlement.*

- D2a. If there is no appropriate vegetation type listed in Appendix 1—Form F, Section III.A.2, of the Data Collection Instruction Manual, or if there is more detailed information available than listed in Appendix 1—Form F, please write out the general vegetation type or further information here. *(brief text)* <SVEGDESC>

*n/a*

- D3. Are there large variations in the slope and vegetation around the settlement? <SVARY>

*The term "variations" here means clearly visible characteristics that may distinguish one area from another area around the settlement. Example: There could be a steep upward slope with conifers on the north side of the settlement and a downward slope with no vegetation on the east and south sides of the settlement. Mark only one answer.*

- (1)   X   No  
(2)        Yes

- D4. Describe the topography of the area around the settlement: *(text)* <SIOPOGRAPH>

*low lying, gentle slopes*

- D5. What is the average elevation of the settlement? <SELEVATION>

*Specify the distance from sea-level.*

  1,158   meters

If distance is not known in meters, supply the number *and* the (local) unit of measurement here: \_\_\_\_\_

- D6. Is the settlement nucleated or dispersed? <SDISTRIBUT>

*Here "nucleated" means that the households in the settlement are more or less concentrated in and around a central location. "Dispersed" means that the households are scattered or spread out so that there may not be a central location. Mark only one answer.*

- (1)        Nucleated  
(2)   X   Dispersed  
(3)        Other (describe the type) <SDISTOTH>: \_\_\_\_\_

D7. On average, how many residents of the settlement reside in or very close to the forest(s)? What is the average distance residents of the settlement live from the forest? How long on average does it take the residents of the settlement to reach the forest by walking? {SETTOFOR}

*For each forest the settlement relies upon, please enter the appropriate number of residents in column 2. "Very close" is defined as within 5 kilometers of the forest. For each resident group identified above, provide the average distance in kilometers from the particular forest they reside near in column 3. If information in kilometers is not available, write the number and (local) unit of measurement in column 4. Please write the time estimate in minutes for both the driest and the wettest season in column 5.*

Name of the forest(s) <FNAME>	Number <LRESIDENTS>	Kilometers <LDISTANCE>	Number and (local) unit of measurement (if not in kilometers)	Minutes	
				Driest season <LTRAVELDRY>	Wettest season <LTRAVELWET>
Namungo	50	1.5 km		60 min.	60 min.
Lwamunda Forest Reserve	75	1.5 km		60 min.	60 min.

D8. Are there any other settlement-owned resources apart from the forest resource that are located in or close to the settlement, and which settlement residents use regularly? <SRESOURCE\_>

*Multiple answers may be applicable.*

- (1)  Irrigation resource (specify the type, such as tubewell irrigation, well irrigation, or canal irrigation)  
<SRESIRRIG>: \_\_\_\_\_
- (2)  Pastures
- (3)  Drinking water streams
- (4)  Fishery resource (may be a lake)
- (5)  Other (describe) <SRESOTH>: \_\_\_\_\_

D9. Do any kind of local organizations exist that regulate the use of the other resources by settlement residents? <SORGREG>

*Other resources may include a commonly owned/controlled drinking water source, pastures, irrigation water and so forth. Mark only one answer.*

- (1)  No
- (2)  Yes

D9a. If yes, specify any organizations (recognized as a formal or informal organization) that have interest in the other resources. *(long text)* <SORGDESC>

*n/a*

USER GROUP FORM

*This form has been designed to capture information about any user group that makes consumptive and/or non-consumptive use of a particular forest or forests. A user group is defined as a group of users who share the same customary and/or legal rights to products from the same forest(s). A user is defined as anyone who makes consumptive or non-consumptive use of the forest(s).*

*One user group form should be filled out for each user group sharing similar rights to the same forest(s).*

*Give the formal name of the user group if it has one. If there is only one user group in a settlement, the name of the user group may correspond with the name of the settlement. If there is more than one user group, without formal names, the field researcher needs to assign a name to each user group using an asterisk by the name to denote that the name has been assigned by the field researcher.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001

Name of user group <UNAME>: Namungo's family

Name of settlement(s) where most individuals in this user group live <SNAME>: Mbazzi

Name of forest(s) used: Namungo's forest

Name of person filling out this form: Mr. George Mwambu & Ms. Cheryl Danley

Name of person(s) with whom discussions held: Mr. Ssengo-Nelson

Date of Site Visit (Month and Year): Sept. 18, 1993

Location of discussions (fields, home of respondent, place of business, etc.): Home and farm

Has this user group been coded before? <UCODED>

- (1)  No
- (2)  Yes
- (3)  Uncertain
- (4)  Yes, with a new name (If this response is checked, write new name in B0.)

A. HISTORY

*Fill out this section if this is the first field visit. If the structure of the group has changed over time, a new user group form should be filled out on subsequent visits. However, if the structure has not changed, but sections of the history need to be updated, add additional information below on subsequent visits.*

A1. Briefly describe this user group. (long text) <UDESCRIBE>

**←Remember that the word "group" does not necessarily mean formal organization. It means those individuals sharing the same customary or legal rights to products from the forest(s).**

*Note. Begin with a general description and add more details. Some of the details may include where the group lives, cultivation of similar crops or following similar occupations. Specify what makes this group distinct from other user groups if there is more than one group that uses the forest. Please include whether the group lives at this location permanently or is a transhumant (pastoral or herder) group.*

*This user group is made up of Namungo's family. The family also owns a company; Kawombo Dairy Farm. Ssengo-Nelson, the son of Mr. Namungo lives and works on the property along with his family and about 10 workers. Firewood is used for home use and for sale occasionally. The forest unit is directly under management of Mr. Namungo.*

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- A2. When was this user group first formed? <UYEAR> 1939 (year) **←Give an approximate date if known. If unknown, leave a blank space.**
- A3. What was the most important reason for forming this group? <UREASON1 >

*Mark only one answer.*

**←Be sure to mark only one answer when this instruction is highlighted.**

- (1)  Provide primary individual products for member use on subsistence level
- (2)  Provide primary products for members' livestock
- (3)  Provide income for members on subsistence level (through sale of forest products)
- (4)  Provide social interaction for members while carrying out a individual task
- (5)  Provide income for the group on commercial, national level through production
- (6)  Provide income for the group on commercial, regional level through production
- (7)  Provide income for the group on commercial, local level through production
- (8)  Religious purposes
- (9)  Governmental Program
- (10)  International Project
- (11)  Location
- (12)  The group was never self-consciously formed, users simply have similar rights
- (13)  Recreation
- (14)  Other (describe) <UREAS1OTH>: \_\_\_\_\_

- A3a. What was second most important reason for forming this group? <UREASON2 >

*Mark only one answer.*

- (1)  Provide primary individual products for member use on subsistence level
- (2)  Provide primary products for members' livestock
- (3)  Provide income for members on subsistence level (through sale of forest products)
- (4)  Provide social interaction for members while carrying out an individual task
- (5)  Provide income for the group on commercial, national level through production
- (6)  Provide income for the group on commercial, regional level through production
- (7)  Provide income for the group on commercial, local level through production
- (8)  Religious purposes
- (9)  Governmental Program
- (10)  International Project
- (11)  Location
- (12)  The group was never self-consciously formed, users simply have similar rights
- (13)  Recreation
- (14)  Other (describe) <UREAS2OTH>: \_\_\_\_\_

- A4. Is the group's present structure the same as it was in the beginning? <USTRUCTURE >

*Mark only one answer.*

- (1)  No
- (2)  Yes

A5. How has the user group changed over time? (long text) <UHowCHANGE>

*In the space provided, please describe the kinds of changes that the user group has gone through. For example, the group could have gotten bigger, maybe because of new families in the settlement or because two user groups were united to form one group. Another example could be the change in composition of the user group—from being dominated by one caste or ethnic group to less or no dominance from this caste or ethnic group. In addition, if this group has recently achieved formal status, describe some of the important reasons for this change in status.*

*In the beginning, Namungo's mother came in 1939. Namungo himself had 8 sons and 12 daughters. Now only his mother, wife, one son, daughters, and grandchildren live on the property. He started only with 10 acres from his mother. Then from 1964 through the 1970s, he bought land. Now he has about 218 acres.*

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major* changes in the user group since the last visit, and if so, what were they? (long text)  
<UHISTCHNG>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

*n/a*

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**B. CHARACTERISTICS OF THE USER GROUP**

B1. Identify the nature of the user group. Does it have any kind of a structure or organization that frames rules and determines the activities of the group with respect to use of the forests? <UNATURE >

*If any of the answers 2 through 7 are checked, be sure to complete a Forest Association Form.  
Mark only one answer.*

- (1) X A user group that is identifiable without formal organization (*no Forest Association Form filled out*)
- (2) \_\_\_\_\_ A user group that is organized as a cooperative
- (3) \_\_\_\_\_ A user group that is organized as a non-profit organization
- (4) \_\_\_\_\_ A user group that is organized as a for-profit organization
- (5) \_\_\_\_\_ A user group that is organized as a family or clan
- (6) \_\_\_\_\_ A local organization created with focus limited primarily on the forest
- (7) \_\_\_\_\_ Other <UNATUREOTH > : \_\_\_\_\_

- B2. What is the number of individuals in the user group? <UINDNUM > 15
- B2a. How many individuals in the user group are female? <UINDFEMALE > 3
- B2b. How many children in the user group are female? <UCHILD FEM > 0
- B2c. How many individuals in the user group are male? <UINDMALE > 12
- B2d. How many children in the user group are male? <UCHILDMALE > 2
- B3. What is the number of households (as locally defined) in this group? <UHHNUM > 1
- B3a. How many women headed households (as locally defined) in this group? <UHHFEMALE > 0

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B4. When, and how, do individuals in the user group interact?

When	On tasks within the forest(s): <i>Check only one answer per line in this section.</i>				On tasks outside the forest(s): <i>Check only one answer per line in this section.</i>			
	(1) Year round	(2) Seasonally	(3) Occasionally	(4) Never	(1) Year round	(2) Seasonally	(3) Occasionally	(4) Never
(1) Cooperative harvesting	<UHARVIN>				<UHARVOUT>			
(2) Cooperative processing	<UPROCIN>				<UPROCVOUT>			
(3) Cooperative marketing/sales	<UMKTIN>				<UMKTOUT>			
(4) Financial contracts	<UCONTRIN>				<UCONTRVOUT>			
(5) Monitoring/sanctioning	<USANCTIN>				<USANCTVOUT>			
(6) Maintenance	<UMAINTIN>				<UMAINTVOUT>			

C. USER GROUP RELATION TO FORESTS IN GENERAL

C1. Approximately how many households (as locally defined) in this user group have members who work outside the settlement? <UHOUT> 1 ←See definition of household in Form S Guidelines (Section III.A.4.), and on question A5 of Form S.

*For this question, include all individuals in the user group who work outside the settlement—whether in cities, in local towns, or in other settlements.*

*Mr. Namungo is a Local Administrator at subcounty level (RCIII Chairman).*

C2. How many individuals in the user group work outside the settlement? <UINDOUT> 0

C2a. How many of these individuals are women? <UINDOUTFEM> 0

C3. How many of the individuals in the user group (men and women) are employed in full time jobs? <UINDOUTFUL> 0

C4. How many of the individuals in the user group who work outside the settlement AND who are employed full time LIVE locally? <UINDOUTLOC> 0

←  
Note that C2, C2a, C3, C4, C6, and C7 specifically refer to individuals.  
←

*Locally refers to people who return to their homes on a daily basis.*

C5. For family members of the user group who do not live locally, indicate the manner in which they primarily may help their families or relatives in the user groups:

C5a. Send remittances to their relatives <UINDREMIT>

*Mark only one answer.*

- (1)  No  
(2)  Yes

C5b. Help people find jobs <UINDJOBS>

*Mark only one answer.*

- (1)  No  
(2)  Yes

C5c. Help people to procure agricultural inputs (seeds, technology, fertilizers, other) <UINDAGR>

*Mark only one answer.*

- (1)  No  
(2)  Yes

C5d. Help relatives and acquaintances when they visit the settlement <UINDHELP>

*The help could be in the form of cash. Mark only one answer.*

- (1)  No  
(2)  Yes

C5e. Other means? <UINDOTH>

*Mark only one answer.*

- (1)  No  
(2)  Yes

C5e1. If yes, describe. (text) <UINDDESC>

C6. How many individuals in this user group depend significantly on the forest for their own subsistence?  
<UINDSUBSIS> 15

C7. How many **individuals** in this user group depend significantly on the forest for their family income arising from commercial activities? <UINDCOMM> 0

*Commercial activities could be basket-weaving, carpentry, tea-stalls or restaurants, charcoal making, and so forth.*

C8. How many **households** (as locally defined) in this user group depend significantly on the forest for their own subsistence? <UHHSUBSIS> 1

←See definition of household in Form S Guidelines (Section III.A.4.) and on question A5, Form S.

C9. How many **households** (as locally defined) in this user group depend significantly on the forest for their family income arising from commercial activities? <UHHCOMM> 0

*Commercial activities could be basket-weaving, carpentry, tea-stalls or restaurants, charcoal making, and so forth.*

C9a. Describe these commercial activities as related to both individuals and households (as locally defined). (long text)  
<UCOMMDESC>

*Specify activities by gender and general age group—youth, adult, elder.*

D. LIVESTOCK

D1. Approximately how many types of animals are owned by the individuals of this user group? {U\_ANIMAL}  
Check animal and state approximate number to the right. **Blanks in this question will be interpreted as an unknown answer. It is likely there are goats owned by this user group but the number is unknown.**

Type of Animal <U_ANTYPE>	How many? <U_ANNUM>	Rank top 3 in importance (1 is most important) <U_ANRANK>	How many graze in the forest? <U_ANGRAZE>	How many are enclosed in an area but are fed fodder which is cut inside the forest? <U_ANFODDER>
(1) Cattle	70	1	0	0
(2) Water buffalos	0	0	0	0
(3) Sheep	8	3	0	0
(4) Goats				
(5) Camels	0	0	0	0
(6) Donkeys and mules	0	0	0	0
(7) Horses	0	0	0	0
(8) Poultry	195	2	0	0
(9) Rabbits				
(10) Pigs	0	0	0	0
(11) Other (describe): <U_ANOTH>				

←Note that when asked "how many," this is a total sum for the user group.

D2. Why is the top-ranked animal in the question above seen as most important? For example, the water buffalo could be seen as most important because it provides milk, is used for plowing, and provides dung for fertilizer and fuel. (text)  
<UANTOPWHY>

*cattle, for production of milk, then for beef*

D3. How many individuals in the user group own livestock? <UINDANOWN> 1

D3a. How many individuals in the user group graze their animals in the forest? <UINDANGRAZ> 0

D4. Do other grazing areas exist outside the forest? <UGRAZEOUT>

Mark only one answer.

- (1)  No
- (2)  Yes

D4a. If yes, where do these grazing areas exist? {U\_GRAZE} <U\_GRAZAREA> <U\_GRAZRANK>

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Rank in order of availability. 1 = available most of the year, 2 = available parts of the year, and 3 = available infrequently. Multiple answers may be applicable.

- (1)  Agricultural plots that are privately owned
- (2)  Agricultural plots that are communally owned
- (3)  Common pasture lands
- (4) 1 Private pastures
- (5)  Foraging in the neighborhood (next to the house, in a neighbors compound, etc.)

←Note that this question requires a number not a checkmark.

D5. Do the users think it is more advantageous to feed the animals inside the forest? <UANFEEDIN>

Mark only one answer.

- (1) X No
- (2)  Yes

D5a. Why? (text) <UANFEEDINY>

*It is easier to control the dairy cattle for more milk when they are in fenced, private pastures.*

E. USER GROUP FOREST IMPROVEMENT ACTIVITIES

E1. Have individuals in this user group undertaken any of the following activities, and if so, how frequently?

Mark only one answer per column.

Note that each column in this type of question must have one and only one checkmark. A blank column will be interpreted as an unknown response.

Activity Frequency	Planted seedlings? <UPLANTSEED>	Planted trees? <UPLANTTREE>	Planted bushes? <UPLANTBUSH>	Built fences or other barriers to protect parts of the forest? <UFENCE>	Cleared undergrowth (burning or pulling)? <UCLEAR>
(1) Done once a year					
(2) Done every several years					
(3) Done about every five years					
(4) Done about once every ten years					
(5) Rarely done				✓	✓
(6) Never done	✓	✓	✓		

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E2. During the past year, have individuals in this user group undertaken any of the following activities:

Activity	Mark "1" for No, "2" for Yes	If yes, describe: <UActDesc>
Attempted to remove encroachments (e.g., vines, twigs, branches, etc.) from the forest?	<URMENCROA>  1	
Created a nursery to distribute seedlings?	<UNURSERY>  1	
Removed leaf or needle litter from the forest floor?	<URMLEAF>  1	
Sought help from external authorities to improve vegetation growth?	<UGETHelp>  1	
Reduced harvesting levels for medicinal plants?	<UREDHarvst>  1	

E3. During the past year, have individuals in this user group adopted individual technologies that reduce their need for forest products? Such as:

Activity	Mark "1" for No, "2" for Yes	If yes, describe: <UTEchDesc>
Adopting more efficient wood burning stoves?	<USTOVES>  1	
Using pressure cookers?	<UCOOKERS>  1	
Adopting other individual technology that reduces the need for forest products?	<UNewTEch>  1	

E4. During the past year, have individuals in this user group invested in new technologies that improve the productivity of the forest(s)? Such as:

Activity	Mark "1" for No, "2" for Yes	If yes, describe: <U <sub>NEWDESC</sub> >
Adopting improved bee keeping techniques?	<UBEE>  1	
Planting seedlings that alter species mix?	<UALTERMIX>  1	
Other technology for improving the productivity of the forest?	<UIMPVTECH>  1	
Are there any other methods that the user group is following to protect, maintain, or improve the forest resource?	<UOTHMETH>  1	

E5. Has any individual in this group acted as a leader (entrepreneur), investing time, energy and perhaps money, in trying to work out coordinated strategies within the group concerning maintenance, investment in up-grading the forest, or harvesting forest products? <ULEADER>

*Mark only one answer.*

- (1)   X   No  
 (2)        Yes

E5a. What are the types of activities undertaken by this individual? (*long text*) <ULEADERACT>

*n/a*

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**F. USER GROUP SOCIAL ECONOMIC STATUS**

F1. Name the ethnic groups in the user group and the number of individuals within each ethnic group. {U\_SES} <U\_GRPType> = "ETHNIC"

*Multiple answers may be applicable.*

<u>Ethnic group name</u> <U_GRPNAME>	<u>Number of individuals</u> <U_GRPNUM>
<u>Baganda</u>	<u>15</u>
_____	_____
_____	_____
_____	_____

←If exact number(s) is/are unknown in F1, F2, and F3, give approximate numbers.  
←

F2. Name the religious groups in the user group and the number of individuals within the each religious group. {U\_SES} <U\_GRPType> = "RELIGION"

*Multiple answers may be applicable.*

<u>Religion name</u> <U_GRPNAME>	<u>Number of individuals</u> <U_GRPNUM>
<u>Christian</u>	<u>15</u>
_____	_____
_____	_____
_____	_____

F3. Name the castes (or other social hierarchy that is specific to country) in the user group and the number of individuals in each caste. {U\_SES} <U\_GRPType> = "CASTE"

*Multiple answers may be applicable.*

<u>Name</u> <U_GRPNAME>	<u>Number of individuals</u> <U_GRPNUM>
<u>n/a</u>	_____
_____	_____
_____	_____
_____	_____

F4. How do individuals in the user group define wealth? (text) <UDEFWEALTH>

*Having a lot of land which could support a plantation and cattle, and capability of supporting other people responsibly.*

←These definitions (F4 and F5) should be obtained by individuals in the user group.  
←

F5. How do individuals in the user group define poverty? (text) <UDEFPOV>

*Not having land and not taking care or responsibility over other people.*

*10*

F6. Given the local definition of wealth, is there a great difference in wealth among households (as locally defined) in the user group? <UWEALTHDIF>

Mark only one answer.

- (1)        No  
(2)   X   Yes

F6a. If yes, describe: (long text) <UWLTHDESC>

*Mr. Namungo has land, cattle, etc., but his workers do not have their own homes or land, nor does his son, who works on the farm.*

F6b. If yes, how many households (as locally defined) in the user group are usually regarded as being wealthy?  
<UHHWEALTHY>       1      

F6c. If yes, how many households (as locally defined) are usually regarded as being poor?  
<UHHPOOR>                   

F7. How many individuals in the user group are literate? <UINDLIT>                   12                  

*Here "literacy" is defined as possessing basic reading and writing skills. Information on this question could probably be best obtained from the local teacher or postman.*

F8. How many individuals have passed primary school? <UPRIMEDU>                   12                  

F9. How many individuals have passed high school? <USECEDU>                   3                  

F10. How many individuals are college educated? <UCOLLEDU>                   2                  

*10*

- F11. Describe the occupational structure of the individuals who are part of this user group. For example, what proportion farm on their own land, are tenants, or are landlords; what proportion gain their livelihood through small-scale commercial operations; what proportion gain most of their livelihood from cutting wood or making charcoal?  
(long text) <UOccDESC>

*They are all agricultural laborers. Only Namungo owns his own land. The other households are made up of workers on his land. Namungo sells milk, some beef, eggs, and timber from his forest.*

- F12. List the most common combinations of occupations: (brief text) <UOccCOMB>

- F13. How many households (as locally defined) in the user group own agricultural land? <UHHOWNLAND> 1

- F13a. Please provide the local definition of "to own" and comment on gender of ownership. <UDEPGENDER>

- F14. How many households (as locally defined) in the user group own agricultural land, but the land is not sufficient to meet their subsistence needs? <UHHINSUFF> 0

- F15. For how many months of a year do most households (as locally defined) in the user group consume their own food crops? <UHHEATCROP> 12 months

- F16. How many households (as locally defined) in the user group have surplus food? <UHHSURPLUS> 1

F16a. Of these households (as locally defined), the surplus food is primarily: <UHHSURPRIM >

*Mark only one answer.*

- (1)  Grains  
 (2)  Root crops  
 (3)  Animals

F16b. How many households (as locally defined) sell food grain? <UHSELLGRN > 0

F17. What are the three most frequent kinds of houses lived in by this user group? <UHOUSE1 > <UHOUSE2 > <UHOUSE3 >

*In the appropriate cells, please enter "1" for most frequent, "2" for the second-most frequent, or "3" for the third-most frequent kinds of houses. There will be no more than three cells filled out on this table.*

House	Concrete, tile, good wood or stone shingles	Corrugated or sheet metal, waped shingles	Thatch, straw, or other vegetation	Roll roofing, polyethylene sheets, or salvaged material	Roofs with large holes
Stone, concrete, brick	(1) <u>2</u>	(2) <u>1</u>	(3)	(4)	(5)
Mudbrick	(6)	(7)	(8) <u>3</u>	(9)	(10)
Grass, stick, waddle	(11)	(12)	(13)	(14)	(15)
Other (describe): <UHOUSEOTH > _____	(16) Please describe:				

F18. What type of fuel do most individuals in the user group utilize for cooking? <UFUELCOOK >

*Mark only one answer.*

- (1)  Electricity or gas  
 (2)  Oil  
 (3)  Wood  
 (4)  Charcoal  
 (5)  Small sticks or scrap wood  
 (6)  Weeds, leaves, dung

F19. Does this user group include the owner(s) of the forest (if privately owned)? <UOWNFOREST >

*Mark only one answer.*

- (1)  No  
 (2)  Yes

F20. Are there some individuals in this user group that are responsible for making rules about the forest? <UMAKERULE >

*Mark only one answer.*

- (1)  No  
 (2)  Yes

F21. Are there some individuals in this user group who do not participate in rule making? <UNORULE>

*Mark only one answer.*

- (1)  No  
(2)  Yes

F21a. If yes, how would you describe these individuals who do not make rules? Are these individuals primarily from one religious group, one ethnic group, one gender? (*text*) <UNORULDESC>

*They are all employees or family members.*

F22. During the last two years, have individuals in this group faced any issues that have engendered conflict within the user group? <UCONFLICT>

*Mark only one answer.*

- (1)  No  
(2)  Yes

F22a. If yes, please describe the nature of this conflict: (*long text*) <UCONFDESC>

F22b. During the past year, would you say that the level of conflict within the group has: <UCONFLEVL>

Mark only one answer. *n/a*

- (1)  Increased
- (2)  Remained the same
- (3)  Decreased

F22c. During the past year, would you say that the level of conflict has been: <UEFFECT>

Mark only one answer. *n/a*

- (1)  Disruptive of normal activities
- (2)  Disruptive upon occasions
- (3)  Channeled in ways that are not disruptive of normal activities

G. GENERAL QUESTIONS

G1. What are the cultural views of the individuals in this user group about the forest? Individuals see the forest as:  
<UFORVIEW>

Mark only one answer.

- (1)  Sacred
- (2)  Economic resource
- (3)  Both
- (4)  Other (describe) <UVIEWOTH>: \_\_\_\_\_

G1a. In what ways do these views affect the use of the forest? (*long text*) <UVIEWDESC>

*The owner cuts timber which is sold, but also recognizes the importance of sustainable yield.*

The Forest Association Form (Form A) is not completed for Namungo's family because it is a nascent user group. However, Form A is included here so that the research team may review the questions that have been highlighted for clearer interpretation.

IFRI FORM A

MAY 1994

### FOREST ASSOCIATION FORM

*This form has been designed to obtain information about any forest association related to one or more forests through the activities of one or more user groups. A forest association is defined as one or more user groups with rules, policies, and/or guidelines, some of which they have developed for themselves or have evolved over time.*

*This form has also been designed to obtain information about any federated forest associations related to one or more forests through the activities of two or more forest associations. A federated forest association (or parent organization) is defined as two or more forest associations that work together to accomplish some joint activities and/or objectives with rules, policies, and/or guidelines, some of which have been developed by the federated association for itself or have evolved over time.*

Research ID <RID>: \_\_\_\_\_ Country ID <CID>: \_\_\_\_\_ Site ID <SID>: \_\_\_\_\_

Name of User Group/Forest Association; or

Name of the Federated Forest Association <ANAME>: \_\_\_\_\_

Names of User Groups if Federated Forest Association; or

Names of Federated Forest Associations if Group of Federated Forest Associations <AFEDGRPS>: \_\_\_\_\_

Name of Forest Association leader <ALEADNAME>: \_\_\_\_\_

Name of Forest(s) <FNAME>: \_\_\_\_\_

Name of person filling out this form: \_\_\_\_\_

Name of person(s) with whom discussions held: \_\_\_\_\_

Date of Site Visit (Month and Year): \_\_\_\_\_

Location of discussions (fields, home of respondent, place of business, etc.): \_\_\_\_\_

Has this Forest Association been coded before <ACODED>:

- (1) \_\_\_\_\_ No
- (2) \_\_\_\_\_ Yes
- (3) \_\_\_\_\_ Uncertain
- (4) \_\_\_\_\_ Yes, with a new name *(If this response is checked, write new name in B0.)*

Is this a <AFED>:

- (1) \_\_\_\_\_ User Group/Forest Association
- (2) \_\_\_\_\_ Federated Forest Association
- (3) \_\_\_\_\_ Group of Federated Forest Associations
- (4) \_\_\_\_\_ Uncertain

#### A. HISTORY

A1. How did this forest association first come into being? *(long text)* <AEXISTENCE>

*Provide as much detail as possible.*

A2. Who initiated the initial formation of the forest association? <AINITWHO\_>

*Multiple answers may be applicable.*

- (1)  User group
- (2)  Non-government program (local)
- (3)  Non-government program (international)
- (4)  Local government program
- (5)  Regional government program
- (6)  National government program
- (7)  International government program
- (8)  Other (describe) <AINITOTH>: \_\_\_\_\_

A3. What year was this forest association established? <AYEAR> \_\_\_\_\_

A3a. Did the forest association obtain official legal status at the time of formation? <ALEGFORM>

*Mark only one answer.*

- (1)  No
- (2)  Yes

A3b. If no, has it obtained official legal status since? <ALEGSINCE>

*Mark only one answer.*

- (1)  No
- (2)  Yes

A3b1. If yes, what year? <ALEGYEAR> \_\_\_\_\_

A4. How many years has this forest association had its present structure and process? <ASTRUCT> \_\_\_\_\_

A5. What have been the major changes in the character and rules of this forest association since its origin? (*long text*)  
<ACHANGES>

*List them in the order that they happened. Also discuss the reasons forest association members give for the change. Please pay attention to external and internal factors behind changes. Here "external" means any factor that was outside of the association and over which the association had no control; "internal" means within the association and over which the association may have had control. The changes may have come about if the central government altered legislation; when an influential leader of the association changed; if there were major natural disasters; if there were major changes in local conditions such as the construction of a road or the emergence of a market; if there were changes in harvesting technology; you will have to use your judgement to decide what the major changes were in the association.*

**←Notice that this question asks for major changes since the forest association's origin at the time of the first visit only.**

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A6. Is the history of the forest association recorded? <AHISTORY >

*Mark only one answer.*

- (1)  No  
(2)  Yes

A6a. If yes, how is the history recorded and where are such records available? (text) <AHISTDESC >

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major* changes in the forest association since the last visit, and if so, what were they? (long text)  
<AHISTCHNG >

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

←Question B0 will only be completed during the follow-up visits to the site.

B. ACTIVITIES CARRIED OUT BY THE ASSOCIATION

←Notice that this says for which activities (a series of related actions).

B1. The following table asks questions about the activities carried out by the association.

Which of the following activities has this association coordinated (C); for which has it passed rules (P) and/or modified rules (M); for which has it not (N) done any of the above. Circle all Cs, Ps, or Ms that apply. If the association has not done any of the above, circle N only.	During the past year:	During the five years prior to this past year:
Plant seeds, seedlings, etc.	<ASEEDS1_> C P M N	<ASEEDS5_> C P M N
Other maintenance	<AMAIN1_> C P M N	<AMAIN5_> C P M N
Harvest forest products	<AHARVEST1_> C P M N	<AHARVEST5_> C P M N
Distribute forest products to local users	<ADIST1_> C P M N	<ADIST5_> C P M N
Sell forest products	<ASELL1_> C P M N	<ASELL5_> C P M N
Distribute revenue from sale of forest products	<AREVENUE1_> C P M N	<AREVENUE5_> C P M N
Determine timing of the harvest of forest products	<ATIMING1_> C P M N	<ATIMING5_> C P M N
Determine quantity of forest products harvested	<AQUANT1_> C P M N	<AQUANT5_> C P M N
Determine type of technology used to harvest forest products	<ATYPTECH1_> C P M N	<ATYPTECH5_> C P M N
Determine who is authorized to harvest forest products	<AWHOAUTH1_> C P M N	<AWHOAUTH5_> C P M N
Determine type of use that can be made of forest products (including religious uses)	<ATYPEUSE1_> C P M N	<ATYPEUSE5_> C P M N
Sell rights to harvest forest products which users can trade with others	←Transferable rights. C P M N	<ARIGHTS5_> C P M N
Rent non-transferable rights to harvest forest products	<ARENT1_> C P M N	<ARENT5_> C P M N
Monitor forest condition	<AMONCOND1_> C P M N	<AMONCOND5_> C P M N
Monitor conformance to rules	<AMONRULE1_> C P M N	<AMONRULE5_> C P M N
Sanction rule breakers (e.g., fines, punishment)	<ASANCT1_> C P M N	<ASANCT5_> C P M N
Arbitrate disputes among local users	←This means: has the forest association coordinated, passed, or modified rules about arbitrating disputes among users. C P M N	<ADISPUTE5_> C P M N
Interact with higher authorities	C P M N	<AINTER5_> C P M N

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B2. How many members of the forest association know about the rules that guide the forest association? <AKNOWRULES >

*The researcher should talk with a number of users of the forest association prior to answering this question. This answer should reflect the results of the researcher's general survey among users and not the opinion of the leaders of the forest association. Mark only one answer.*

- (1)  Almost no one
- (2)  A few people
- (3)  Half the people
- (4)  Almost everyone
- (5)  Everyone

B3. In the researcher's estimation are the rules used by the user group:

B3~ Easy for the harvesters to understand? <ARULEEASY >

*Mark only one answer.*

- (1)  No, very complex, difficult to understand
- (2)  Relatively complex, but can be understood through learning and experience
- (3)  Yes, easily understood

← Questions in B3 should be answered only after in-depth discussions are held with users of the forest association. The answers here are based on the researcher's perceptions.

B3b. Clear as to what behavior demonstrates following and breaking the rules? <ARULECLEAR >

*Mark only one answer.*

- (1)  No
- (2)  Yes

B3c. Flexible in dealing with times of emergency or unusual problems facing particular members of the user group? <ARULEFLEX >

*Mark only one answer.*

- (1)  No
- (2)  Yes

B3d. Perceived by members of this user group as fair? <ARULEFAIR >

*Mark only one answer.*

- (1)  No
- (2)  Yes

B3e. Perceived by members of this user group as legitimate? <ARULELEGIT >

*Here "legitimate" is used to describe the rules as being recognized and accepted as rightful, to be respected as law. These rules can be customary (de facto) or established by law (de jure), but they have to be perceived as legitimate to be accepted by the members of the user group. Mark only one answer.*

- (1)  No
- (2)  Yes

**C. GOVERNANCE AND STRUCTURE**

Many forest associations have some form of an executive committee or a general representative body that is smaller (and usually meets more frequently) than the assembly of all individuals of the user group. If there is an executive committee and this committee represents the users on a regular basis, please fill out the executive committee questions. If there is a general representative body (not a formal committee) that represents a user group, fill out the general representative body questions. If there are both types of representative bodies present for this association, choose the representative body that is most active in rulemaking and making decisions. Skip to Part 2, C18, if there is neither a general representative body nor an executive committee.

**PART 1. EXECUTIVE COMMITTEE OR GENERAL REPRESENTATIVE BODY**

C1. Is there a: <AGOVTYPE>

Mark only one answer.

- (1)  General Representative Body for this Association
- (2)  Executive Committee for the Association

C1a. How many members comprise this executive committee or general representative body?

	Female	Male
Number	<AFEMALE>	<AMALE>

C1b. Have women been members of the executive committee or general representative body of the association?  
<AFEMMEM>

Mark only one answer.

- (1)  No
- (2)  Yes, but only currently
- (3)  Yes, previously in the past five years
- (4)  Yes, currently and in the past five years

C1c. Has a woman ever been the leader of the executive committee or general representative body of the association?  
<AFEMLEAD>

Mark only one answer.

- (1)  No
- (2)  Yes, but only currently
- (3)  Yes, previously in the past five years
- (4)  Yes, currently and in the past five years

Questions C2 through C17a apply for cases of one-member committees as well as multiple-member committees.

C2. How are most of the members of the executive committee or general representative body of the association selected? <ASELECT>

*Mark only one answer.*

- (1)  Elected by members in elections held regularly
- (2)  Elected by members in elections held irregularly
- (3)  Inherited (e.g., from father to son, mother to daughter, etc.)
- (4)  Appointed by a local village head or chief or village elders
- (5)  Appointed by a local government
- (6)  Appointed by a national or regional government

C3. How often does the executive committee or general representative body of the association meet? <AMEET>

*Mark only one answer.*

- (1)  Once a week
- (2)  Twice a month
- (3)  Once a month
- (4)  Once every three months
- (5)  Once every six months
- (6)  Once a year
- (7)  Every other year
- (8)  Very irregular intervals
- (9)  Not applicable

C4. How long a period, term, or mandate can the executive committee or general representative body of the association serve?

*If the executive committee or general representative body does not have a president, vice president, secretary, or treasurer, please check the last line. Check only one answer per line.*

Official	(1) Life	(2) Fixed period, re-elected	(3) Fixed period, not elected	(4) Variable, subject to vote
President <APRES>				
V. President <AVICE>				
Secretary <ASEC>				
Treasurer <ATREAS>				
Most members of the E.C. or GR body <AMEMB>				

C4a. If the president of the forest association (or equivalent title) serves the association for a fixed period of time (column 2 in C4), please record the number of years in which he or she serves per term. <APRESTERM> \_\_\_\_\_ years

C4a1. If the next most important official serves the association for a different period of time than the president, please record the number of years he or she serves per term. <AVICETERM> \_\_\_\_\_ years

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C5. How many different individuals have led the forest association since the inception of the association?  
<ADIFFLEAD> \_\_\_\_\_

C5a. Please list the names of individuals who have been president or have led the forest association and the name(s) of the next most important official(s) who has (have) served the association since its inception. (Please add details here about the next most important official selection.)  
(long text) <APRESNAMES>

C6. Has a forest user held a position on the executive committee or general representative body of the association?  
<AUSERMEM>

*Mark only one answer.*

- (1) \_\_\_\_\_ No, never
- (2) \_\_\_\_\_ Yes, always
- (3) \_\_\_\_\_ Yes, sometimes

C7. In the past decade, has there been any competition for any position on the executive committee or general representative body? <ACOMPETE>

*Mark only one answer.*

- (1) \_\_\_\_\_ No
- (2) \_\_\_\_\_ Yes, always
- (3) \_\_\_\_\_ Yes, in some elections

C8. Is it possible for users to remove the members of the executive committee or general representative body?  
<A!REMOVEUSE>

*Mark only one answer.*

- (1) \_\_\_\_\_ No
- (2) \_\_\_\_\_ Yes

C9. Can an external or higher level authority remove the members of the executive committee or general representative body? <AREMOVEEXT>

*Mark only one answer.*

- (1)  No
- (2)  Yes, with complaints from other harvesters (villagers)
- (3)  Yes, at the discretion of the external or higher level authority
- (4)  Yes, but only with substantiated evidence about wrongdoing of the executive

C10. How are most members of the executive committee or general representative body paid? <APaidMEMB>

*Mark only one answer.*

- (1)  Receive no pay or material compensation
- or* The primary source of their pay or material compensation is:
- (2)  Funds from the general budget of the association
- (3)  Allocated extra shares of forest products
- (4)  Obligations to forest association are reduced
- (5)  Receive voluntary contributions from other members
- (6)  Funds from local or external government
- (7)  Funds from a development agency
- (8)  Some other means (describe) <APaidMOTH>: \_\_\_\_\_

C11. Do the members of the executive committee or general representative body own assets or capital whose operation depends on obtaining forest products from the forest (e.g., furniture factory that needs wood, or shop that needs fuelwood), and if so, how much? <AOWNASSET>

*Mark only one answer.*

- (1)  No
- (2)  Yes, the amount needed is below average of other users
- (3)  Yes, the amount needed is average compared to other users
- (4)  Yes, the amount needed is higher than the average taken by other users
- (5)  Yes, and the amount is very high compared to other users

C12. Do most members of the executive committee or general representative body reside in or near the forest(s) which the association governs? <ARESIDE>

*Mark only one answer.*

- (1)  No, most of the members of the executive committee or general representative body live more than 5 kilometers from the forest
- (2)  Yes, most of the members of the executive committee or general representative body live between 1 to 5 kilometers from the forest
- (3)  Yes, most of the members of the executive committee or general representative body live within 1 kilometer from the forest

C13. On average, what is the education level of the members of the executive committee or general representative body?  
<AEDULEVEL>

*Mark only one answer.*

- (1)  It is very low
- (2)  It is low
- (3)  It is average
- (4)  It is high
- (5)  It is very high

C14. If relevant to the region, do most members of the executive committee or general representative body belong to the same ethnic group as most of the villagers? <AETHNIC>

*Mark only one answer.*

- (1)  No
- (2)  Yes

C14a. If no, state the ethnic category of most members of the executive committee or general representative body  
<AETHNICCAT> : \_\_\_\_\_

C15. If relevant to the region, do most of the members of the executive committee or general representative body belong to the same religion as most of the villagers? <ARELIG>

*Mark only one answer.*

- (1)  No
- (2)  Yes

C15a. If no, state the religion of most of the members of executive committee or general representative body <ARELIGTYPE> :  
\_\_\_\_\_

C16. If relevant to the region, do most of the members of the executive committee or general representative body belong to the same caste (if appropriate) as a majority of the villagers? <ACASTE>

*Mark only one answer.*

- (1)  No
- (2)  Yes

C16a. If no, name the caste of most of the members of the executive committee or general representative body  
<ACASTEYPE> : \_\_\_\_\_

C17. Does any member of the executive committee or general representative body hold leading positions in other collective or governmental bodies? <ALEADER>

*Mark only one answer.*

- (1)  No
- (2)  Yes

C17a. If yes, state positions held by the members of the executive committee or general representative body in different bodies. (brief text) <ALEADERPOS>

**PART 2. GENERAL MEMBERSHIP OF THE FOREST ASSOCIATION**

C18. Are meetings held in which all members of the forest association are eligible to participate? <AMFETALL>

*Mark only one answer.*

- (1)  No
- (2)  Yes

C18a. How frequently are these meetings organized? <AMEETFREQ>

*Mark only one answer.*

- (1)  Once a week
- (2)  Twice a month
- (3)  Once a month
- (4)  Once every three months
- (5)  Once every six months
- (6)  Once a year
- (7)  Every other year
- (8)  Irregular intervals

C18b. Are these meetings very well attended? <AMEMATTEND>

*Mark only one answer.*

- (1)  Almost all members attend
- (2)  About half the members attend
- (3)  Few members attend

C18c. Describe the decisions made in general membership meetings of the forest association in comparison to the decisions made in meetings of the executive committee or general representative body. What types of decisions are made and how different are they? (*text*) <ADECDISC>

C19. Can members of the association call a general meeting when they want to discuss a special problem such as the extreme lack of rainfall or the breaking of association rules by members of the executive committee or general representative body? <ACALLMEET>

*Mark only one answer.*

- (1)  No
- (2)  Yes

C19a. If yes, has a special meeting been called during the last five years? <ACALLMEETS>

*Mark only one answer.*

- (1)  No  
(2)  Yes

C20. Has the executive committee or general representative body of the association changed the rules of the association as a result of suggestions made by members of the forest association? <ARULESUG>

*Mark only one answer.*

- (1)  No  
(2)  Yes

C20a. If yes, describe an example of such a change in rules. *(text)* <ARULEDESC>

C21. Has the executive committee or general representative body of the association changed the allocation of forest products among users as a result of suggestions made by the members of the forest association? <AALLOCUG>

*Mark only one answer.*

- (1)  No  
(2)  Yes

C21a. If yes, describe an example of such a change and state how the change affected the distribution among members of the forest association. *(text)* <AALLOCDESC>

D. RECORDS AND SUPERVISION

D1. Are records of any kind maintained by the association? <ARECMAINT>

*Mark only one answer.*

- (1)  No  
(2)  Yes

D1a. If yes, please check all that apply on the following table.

*If a cell is not checked on this matrix, this information will be interpreted as unknown. "N/A" should be written in the cell if the question is not applicable.*

Are the following kind of records maintained by the association or submitted to any higher authority?	(1) Records are maintained	(2) Records are submitted to parent organization	(3) Records are submitted to government
Records about the identity of the office-bearers <AIDENTITY_>			
Records of meetings and resolutions in meetings <ARESOLUTE_>			
Records of income and expenditures incurred by the association <AFINANCE_>			
Records of contributions in kind (labor, grain, etc.) or cash, made by users of the forest <ACONTRIB_>			
Records monitoring the condition of the forest <AMONITOR_>			
Records about the amount of products harvested from the forest <AAMOUNT_>			
Records about distribution of forest products among the users <ADISTRIB_>			
Records about whether those who do not follow rules are punished <APUNISH_>			
Records about conflicts of the association with individuals or other associations <ACONFLICT_>			
Records about how conflicts are resolved <ARESOLVED_>			
Records about the different ways in individuals break rules <ABREAK_>			
Records about the types of punishments that are imposed <APUNTYPE_>			
Other kinds of records <ARECOTH_>: _____			
<AOTHREC_>			

D1b. If records are maintained, are they available for examination by others? <AEXAMINE>

*Mark only one answer.*

- (1)  No, they are available only to officials of the association or parent organization
- (2)  Yes, they are available to the general public
- (3)  Yes, but only to members of the forest association
- (4)  Yes, but only to officials in the parent organization
- (5)  Yes, but only to government officials

D2. If the association maintains records of its accounts, are the records audited? <AAUDIT>

*Here "audit" means a formal examination of financial records by a competent and neutral person or organization to determine honesty and correctness of record-keeping. Mark only one answer.*

- (1)  No
- (2)  Yes

D3. Are the activities of the association supervised by a higher organization? <ASUPER>

*Mark only one answer.*

- (1)  No
- (2)  Yes, by the parent organization of the association
- (3)  Yes, by officials appointed by the government
- (4)  Yes, other (describe) <ASUPEROTH> : \_\_\_\_\_

**E. STAFF AND OFFICIALS**

*The following questions are about officials who make day-to-day decisions for the forest and who enforce rules created to utilize and manage the forest(s). Examples of these types of officials could be guards, forest watchers, accountants, record-keepers, business managers, and secretaries.*

E1. How many individuals work for this organization?

Total number of people hired by the association		Total number of people who volunteer labor
Full time	Part time	
<AFULL>	<APART>	<AVOL>

E2. Describe the type of activities undertaken by most of the full-time employees, e.g., planting, protecting, enforcing, maintaining records. (text) <AEMPFULL>

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E3. Describe the type of activities undertaken by most of the part-time employees, e.g., planting, protecting, enforcing, maintaining records. *(text)* <AEMPART>

E4. How are guards paid? <APaidGARD\_>

*Multiple answers may be applicable.*

- (1)  Through collections from members' households
- (2)  Through wages from the general fund of the association
- (3)  Through fines collected from individuals that guards detect
- (4)  Through funds received from an external government
- (5)  Through funds received from a development agency
- (6)  Through special levies from members
- (7)  Through extra shares in the forest products
- (8)  Other (describe) <APaidGOTH>: \_\_\_\_\_

E5. How are guards selected to watch over the forest? <ASELGuard>

*Mark only one answer.*

- (1)  By election
- (2)  By appointment
- (3)  By lots

E6. How many forest guards are on duty at different times or seasons of the year? {A\_GrDuty}

Season option <A SEASType>	Name of the season <A SEASName>	Number of guards <A SEASNum>
(1) Season 1 (e.g., spring)		
(2) Season 2		
(3) Season 3		
(4) Season 4		
(5) Other times		

F. RESOURCE-MOBILIZATION AND ACCOUNT KEEPING

F1. What were the major financial sources for this forest association during the **most recent year**, e.g., product sales, voluntary contributions, entry fees, fines, own taxes, external government or development agency transfers, etc. Mark each of the sources from which funds were received by this forest association. <ASRCE1\_>

*Multiple answers may be applicable.*

- (1)  Voluntary contribution of funds
- (2)  Membership fee
- (3)  Payments that substitute for labor input
- (4)  Fines
- (5)  National or regional government
- (6)  Development agency
- (7)  Sales of forest products from the forest
- (8)  Own taxes
- (9)  Special levies
- (10)  Aid from external NGOs
- (11)  Aid from indigenous NGOs
- (12)  Foreign government
- (13)  Other (describe) <ASRC1OTH>: \_\_\_\_\_

F1a. Enter the number (1-13) listed in F1 that was the *single most important* source of financial support for the forest association. <ASRC1MOST> \_\_\_\_\_

F1b. What is the total financial budget of this forest association for the most recent year data is available? <ABUDGET>  
\_\_\_\_\_

F1c. What percentage of the total financial budget is the single most important source of financial support for this forest association? <ASRC1PRCNT> \_\_\_\_\_ %

F1d. What is the "most recent year" for which this data is available? <ASRC1YEAR> \_\_\_\_\_

*Specify full year, e.g., 1991; if the budgetary year is not the equivalent of the calendar year, use the last year of the budgetary year.*

F1e. How many person-days of labor were contributed to the activities of the association in the above year? <ALABOR1>  
\_\_\_\_\_

F2. On average, over the past five years, what is the single most important financial source for the forest association? <ASRCE5>

*Please note that response (8) "own taxes" refers to taxes raised by a general purpose government. Regular levies by other kinds of associations should be referred to as (2) "membership fee." Mark only one answer.*

- (1)  Voluntary contribution of funds
- (2)  Membership fee
- (3)  Payments that substitute for labor input
- (4)  Fines
- (5)  National or regional government
- (6)  Development agency
- (7)  Sales of forest products from the forest
- (8)  Own taxes
- (9)  Special levies

- (10)  Aid from external NGOs
- (11)  Aid from indigenous NGOs
- (12)  Foreign government
- (13)  Other (describe) <ASRC5OTH>: \_\_\_\_\_

F2a. Over the past five years, what is the average amount of the single most important financial source for the forest association? <ASRC5AMT> \_\_\_\_\_ (local currency)

F2b. In total, how many person-days of labor were contributed to the activities of the association in the past five years? <ALABOR5> \_\_\_\_\_

F3. If the association did not receive any funds from external agencies and had to rely on contributions from members or its user group, or other funds raised locally, could it support all its expenditures? <ASUPPORT>

*Mark only one answer.*

- (1)  No, it could not meet its expenses if no funds were received from external sources
- (2)  Yes, it could support expenditures with a combination of sales of products and contributions from members
- (3)  Yes, it could support itself by sales from forest products
- (4)  Yes, it could support its expenditures by contributions from members alone

F4. What is the largest item on which the association spends its income? <ASPENDMOST>

*Mark only one answer.*

- (1)  Salaries of officials
- (2)  Salaries of hired personnel
- (3)  Court cases
- (4)  Account keeping
- (5)  Fees paid to specialized staff or contractors
- (6)  Expenses on the community (e.g., school building)
- (7)  Monitoring the forest resource
- (8)  Guarding the forest resource
- (9)  Maintaining the forest resource
- (10)  Improving the forest resource
- (11)  Travel and entertainment of the officials of the forest association
- (12)  Other (describe) <ASPENDOTH>: \_\_\_\_\_

F5. Is any of the income of the association supposed to be used only for specific purposes? <ASPECPURP>

*Mark only one answer.*

- (1)  No
- (2)  Yes

F6. Does any other organization determine how the forest association spends or earns income? <AEXTSPEND>

*Mark only one answer.*

- (1)  No
- (2)  Yes

G. RULE MAKING IN THE ASSOCIATION

G1. Does the association have a written statement of its mission and objectives? <AWRITTEN>

*Mark only one answer.*

(1)  No

(2)  Yes

G1a. If yes, what was the process of formation of the statement of mission for the association? (text) <AWRITDESC>

G1b. If G1 is yes, who created or wrote most of this statement? <AWRITWHO>

*Mark only one answer.*

(1)  Local users

(2)  Local users with the help of some external authorities

(3)  Government officials (local, regional or national)

(4)  A non-governmental organization (local)

(6)  A non-governmental organization (international)

(7)  The parent organization of the local association

(8)  Other (describe) <AWRITOTH>: \_\_\_\_\_

G1c. Are the rules of this forest association based on an original set of rules provided by a government agency?  
<AORIGRULE>

*Mark only one answer.*

(1)  No

(2)  Yes, the rules are identical to many other forest associations

(3)  Yes, but there is considerable variation from forest association to forest association

G1d. If G1 is yes, do users or officials of the association have the power to change the statement of mission for their association? <AWRITUSER>

*Mark only one answer.*

(1)  Neither users nor officials have the power to change

(2)  Only officials of the association have the power to change

(3)  Only users have the power to change

(4)  Yes, users together with officials

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G1e. If G1 is yes, if users can change the statement of mission, what rule must be used? <AWRITE>

*Mark only one answer.*

- (1)  Simple majority
- (2)  Extraordinary majority
- (3)  Unanimity
- (4)  Decision made by association executive or council

G1f. If G1 is yes, has the statement of mission and objectives for the association ever changed? <AWRITE>

*Mark only one answer.*

- (1)  No
- (2)  Yes

G2. Is the association a corporate body in the sense of being able to sue or be sued? <ASUE>

*This question tries to determine the legal standing of the association; whether it is legally liable or responsible to a court of law; whether someone can take the association to court in a lawsuit. Mark only one answer.*

- (1)  No
- (2)  Yes

#### H. INTERNAL RELATIONS

H1. Do internal conflicts exist within this association? <AINTCONFL>

*Mark only one answer.*

- (1)  No
- (2)  Yes

H1a. Are any mechanisms available for resolving these conflicts? <ACONFLMECH>

*Mark only one answer.*

- (1)  No
- (2)  Yes

H1b. How do internal conflicts in the association get resolved? (long text) <ACONFLRES>

*For example, conflicts may be resolved by face-to-face discussion at association meetings, special meetings with association officials, arbitration, decisions taken by a majority, through consensus, by council members and executive voting, by decisions of courts, by decisions of higher government officials, decisions of superior officials that do not belong to the particular association but are officers in a higher organization, etc.*

H2. Have there ever been any problems in selecting officials for the association? <ASELPROB>

*Mark only one answer.*

- (1)  No, never
- (2)  Yes, frequently
- (3)  Yes, sometimes

H3. How are the rules created by the association enforced? Are they enforced by: <AENFRULES\_>

*Multiple answers may be applicable.*

- (1)  Members of the user group(s)?
- (2)  External officials appointed by the government?
- (3)  Officials appointed by the forest association?
- (4)  Officials of the forest association?
- (5)  Other ways? (describe) <AENFOTH> \_\_\_\_\_

H4. How does this organization perceive itself in terms of relating to other forest-governing structures? <ARELATE>

*Mark only one answer.*

- (1)  Not cooperating
- (2)  Cooperating, but independent of other organizations rules and regulations
- (3)  Cooperating jointly in determining rules/regulations

H4a. Please describe: *(long text)* <ARELATDESC>

I. PERFORMANCE

II. Are there any individuals of the forest association who have been systematically disadvantaged in this period because of the rules of the association? <AWORSEOFF>

- (1) \_\_\_\_\_ No  
(2) \_\_\_\_\_ Yes

IIa. If yes, please describe. *(long text)* <AWORSEDESC>

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I2. Have the relatively worse off individuals of the forest association been cut out of their benefits from this forest or substantially harmed? <ACUTOUT >

- (1) \_\_\_\_\_ No
- (2) \_\_\_\_\_ Yes

I2a. If yes, please describe. *(long text)* <ACUTDESC >

I3. During this period has the disparity between the relatively worse off and the relatively better off individuals changed, and if so, how? <ADISTANCE >

- (1) \_\_\_\_\_ No
- (2) \_\_\_\_\_ Yes

I3a. If yes, please describe. *(long text)* <ADISTDESC >

FOREST-USER GROUP RELATIONSHIP FORM

*This form has been designed to obtain information about the relationship of the use of a particular forest to the user group named in the User Group form. One form must be filled out for each forested area treated as a separate forest by this user group.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001  
 Name of forest used <FNAME>: Namungo's forest  
 Name of user group <UNAME>: Namungo's Family  
 Name of person filling out this form: Mr. George Mwambu and Ms. Cheryl Danley  
 Name of person(s) with whom discussions held: Mr. Ssengo-Nelson  
 Date of Site Visit (Month and Year): Sept. 18, 1993  
 Location of discussions (fields, home of respondent, place of business, etc.): home, farm

A. USER GROUP RELATION TO FOREST

A1. On average, how far do the individuals in the user group live from this forest? <GDISTANCE >

*Mark only one answer.*

- (1)  Individuals live within a kilometer from this forest
- (2)  Individuals live between one and five kilometers from this forest
- (3)  Individuals live more than five kilometers from this forest
- (4)  Individuals live more than ten kilometers from this forest

A2a. What are the forest products that the user group harvests?

**←Please remember to try to also elicit information here about products that users may not consider products such as using space in the forest for a sacred area.**

*Please mark only one check per column.*

Check if this product:	Trees <GTRES>	Bushes <GBUSH>	Grasses <GGRASS>	Leaves		Soils, Stones, Minerals <GSSM>	Water <GWATER>	Wildlife <GWLIFE>	Other <GOTHER>
				On Ground <GLGROUND>	Climbing <GLCLIMB>				
(1) is harvested and user group has right to harvest	✓				✓	✓	✓		
(2) is not harvested, but user group has a right to harvest this product		✓	✓	✓				✓	
(3) is not harvested, and user group does not have a right to harvest this product									

A2b. What are the three most important forest products that the user group harvests from this forest?  
 Please fill out one Forest Product Form, for at least the most important product but for no more than three forest products, per forest. Please refer to the letter codes at the bottom of the page when filling out the "Part Harvested" columns.

	Trees	Part Harvested *	Bushes	Part Harvested *	Grasses	Part Harvested *	Leaves		Soils, Stones, Minerals	Water	Wildlife	Other
						On Ground	Climbing					
Most important product harvested (please check only one) <GProd1Type> <GProd1Sect>	<input checked="" type="checkbox"/>	A										
Why is it most important? <GProd1Why> <i>For firewood, because you eat everyday</i>												
What is the name of the major species from which this product is harvested? <GProd1Spec> <i>Macaranga monandra</i>												
Who owns the rights to the harvest of this product? <GProd1Own> <i>owner if for sale, otherwise all family members</i>												
If privately owned, what is the gender of the owner(s)? <GProd1Sex> (1) ___ Female (2) <input checked="" type="checkbox"/> Male (3) ___ Both												
Second-most important product harvested (please check only one) <GProd2Type> <GProd2Sect>:										<input checked="" type="checkbox"/>		
Why is it second-most important? <GProd2Why> <i>because water is a necessity (for cows)</i>												
What is the name of the major species from which this product is harvested? <GProd2Spec>												
Who owns the rights to the harvest of this product? <GProd2Own> <i>owner</i>												
If privately owned, what is the gender of the owner(s)? <GProd2Sex> (1) ___ Female (2) <input checked="" type="checkbox"/> Male (3) ___ Both												
Third-most important product harvested (please check only one) <GProd3Type> <GProd3Sect>:	<input checked="" type="checkbox"/>	A										
Why is it third-most important? <GProd3Why> <i>they get income and use in home construction</i>												
What is the name of the major species from which this product is harvested? <GProd3Spec> <i>namukago (bot. name unknown)</i>												
Who owns the rights to the harvest of this product? <GProd3Own> <i>owner</i>												
If privately owned, what is the gender of the owner(s)? <GProd3Sex> (1) ___ Female (2) <input checked="" type="checkbox"/> Male (3) ___ Both												

\* For the "Part Harvested" columns, enter only one of the following letters: A = all or most of tree, bush or grass; B = bark; F = flowers; H = higher sections (e.g., branches, limbs); L = leaves; N = nuts and fruits; O = other; R = roots; and T = trunk or main section.

\* Please note the letter codes below for filling in "Part Harvested" column.

A3. For the following table, first write the name of each of the three most important products in the appropriate cell. Then, for each of these products, write "1" in the relevant cell(s) if it is used by most households in the user group primarily for subsistence; write "2" if it is used by most households primarily for commercial sale; and write "3" if it is used by most households for subsistence and commercial use equally. {G\_Prods}

For the following table, the columns are the products, and the rows are the uses. Also, some of the cells in this table will not be filled out, depending on local uses.

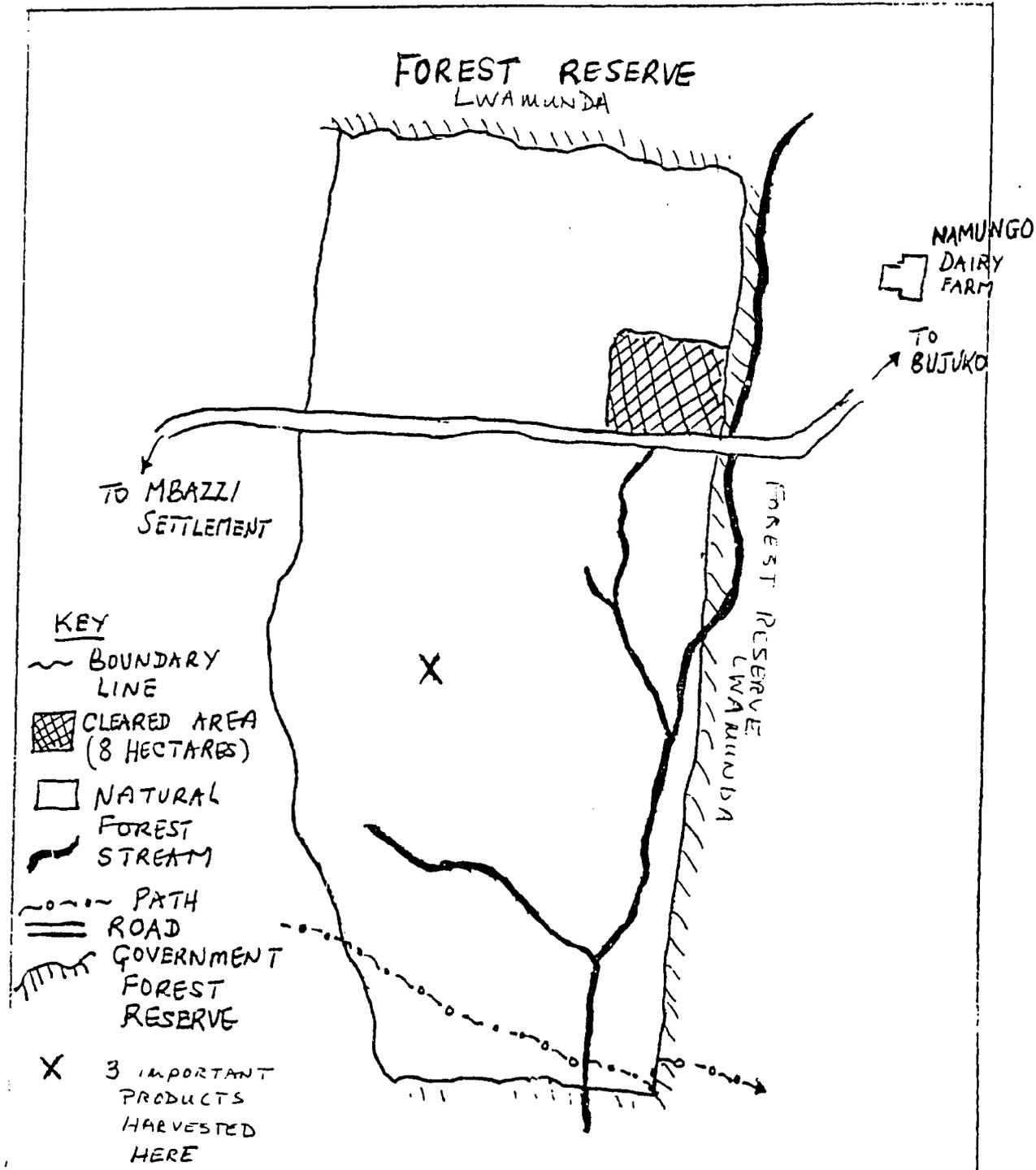
<G_PRODUSE>	Product 1 <G_PROD RANK > =1	Product 2 <G_PROD RANK > =2	Product 3 <G_PROD RANK > =3
	Name: <i>Trees: Macaranga monandra</i> <G_PROD1NAME>	Name: <i>Water</i> <G_PROD2NAME>	Name: <i>Trees: namukago</i> <G_PROD3NAME>
	<G_WHYIMP>	<G_WHYIMP>	<G_WHYIMP>
(1) Fuelwood	1		
(2) Charcoal			
(3) Housing			3
(4) Fencing			1
(5) Furniture			
(6) Tools, Toys, and Household Implements			
(7) Manure			
(8) Food			
(9) Fodder			
(10) Clothing			
(11) Medicine			
(12) Handicrafts			
(13) Other **		1	

\*\* Home and animal production

- A4. Trace or copy the "Forest Feature Map" developed in the Forest Form (question B1) on tracing paper if possible so it can be overlaid. Identify the areas in this forest where the three most important products identified above are harvested.

On the map that you traced, you should identify (as accurately as possible) established harvesting boundaries, whether formally or informally established. If there are any landmarks used as boundary markers, identify these landmarks. Identify any features of this forest that may be of special importance to the user group (e.g., heavily used trails). For additional mapping information, please refer to the IFRI mapping instructions (see Section IV.B.4.).

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A5. For this group, what other benefits does this forest provide? (long text) <GBENEFITS>

*sand, stones, materials for crafts (mats)*

A6. Have individuals in this group tried to limit usage of this forest by harvesting forest products from other communal or government forests? <GREGULATE>

*Mark only one answer.*

- (1)  No  
 (2)  Yes

A6a. If yes, what kinds of other forests have been used more intensively so as to limit usage of this forest listed on the front of this form? <GOTHFOREST>

*Mark only one answer. n/a*

- (1)  Other communal forests to which this group does not have legal rights  
 (2)  Government forests  
 (3)  Private forests  
 (4)  All of the above

A6b. If yes, for which products? (text) <GOTHPRODS>

*n/a*

A7. Are there other user groups who harvest from this forest? <GOTHUG>

*Mark only one answer.*

- (1)  No  
 (2)  Yes

A7a. If yes, do these groups have use rights to harvest from this forest? <GOTHRIGHTS>

*Mark only one answer.*

- (1)  No  
 (2)  Yes  
 (3)  Some do have use rights and others do not

A7a1. If (2) or (3) for the above question A7a is marked, please provide the name(s) of the group(s) and fill out a User Group Form for each of these groups:

*Mbazzi housewives*  
*Mbazzi men's user group*

A7a2. If (1) or (3) for the above question A7a is marked, please describe the extent of illegal harvest of products by others who do not have legal rights. *(long text)* <GOTHUGDESC>

A8. Describe how individuals in the user group interact with other groups using this forest. (long text) <GINTERACT>

*The owner allows user rights for the workers on his farm, and men and women of Mbazzi settlement are allowed to take out fuelwood of dead trees.*

*They have no legal rights to charcoal and timber. However, there is evidence of harvesting timber and charcoal illegally.*

A9. What percentage of the user group's needs does this forest supply?

*An estimate for this question will need to be made based on conversations with a number of different individuals. Multiple answers may be applicable.*

User Group's Need	Percent
Need for fodder <GFODDER >	0
Need for fuelwood <GFUELWOOD >	100
Need for housing timber <GTIMBER >	100
Need for biomass, green manure as farming inputs <GBIOMASS >	0
Need for food <GFOOD >	
Other <GNEEDOTH >	
Describe "other" <GNEEDDESC >	

←Notice that this response is a percentage.

A10. How do most individuals in the user group rank the condition of this forest? <GCONDITION>

*Mark only one answer.*

- (1)  Very sparse
- (2)  Somewhat sparse
- (3)  About normal for this ecological zone
- (4)  Somewhat abundant
- (5)  Very abundant

A11. How do most individuals in the user group feel about the type of conservation measures adopted in relation to this forest? <GCONSERVE>

*Mark only one answer.*

- (1)  Too restrictive, more could be harvested from this forest without endangering its sustainability over time
- (2)  About the right level of conservation
- (3)  Too lax, if harvesting continues at this rate, the sustainability of this forest is endangered.

A12. Please comment on the user group's estimate of the most serious problems that they and those responsible for managing this forest are facing during the next five years. (*long text*) <GPROBLEMS>

*Poaching trees for timber and charcoal. This problem exists now.*

A13. Please comment on the user group's estimate of the greatest opportunities that they and those responsible for managing this forest are looking forward to during the next five years. (*long text*) <GOPPORTS>

*Clearing a portion (Unit A in Figure 10) of the indigenous forest to plant eucalyptus which seems to have a higher market potential.*

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major* changes in the relationship between the forest and the user group since the last visit, and if so, what were they? (*long text*) <GHISTCHNG>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

*n/a*



FOREST PRODUCT FORM

*This form has been designed to obtain information about the forest products of most importance to a user group, and the rules that guide the harvesting of that product. This form should be filled out for at least the most important forest product but no more than a total of three forest products, per forest.*

*Note, however, that if the rules that guide the harvest of this product or products are the same for all forests used by this particular user group, use one form per product only.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001  
Name of this forest product <RNAME>: fuelwood  
Name of this forest product species <RSPECIES>: Macaranga monandra  
Name of forest(s)\* where this forest product is harvested <FNAME>: Namungo's forest  
*If this product is harvested from more than one forest and each of the forests has the same customary rights to harvesting this product, please note the name of the other forest.*  
Name of the user group whose harvesting activities are described on this form <UNAME>: Namungo's family  
Name of person filling out this form: Ms. Cheryl Danley and Mr. George Mwambu  
Name of person(s) with whom discussions held: Mr. Ssengo-Nelson  
Date of Site Visit (Month and Year): Sept. 18, 1993  
Location of discussions (fields, home of respondent, place of business, etc.): home and farm

A. HISTORY

A1. What is the most important origin of the product rule that the user group uses? <ROIGIN>

*Mark only one answer.*

- (1)  They have evolved over a long period of time, and there are no stories about their origins (customs)
- (2)  The rules were created by the forefathers of the user group and there are myths or stories about this origin
- (3)  Rules were created in an informal meeting of the user group
- (4)  Rules were created by a formal user group organization
- (5)  Rules established by national or regional (e.g., a state or province) legislation
- (6)  Rules were created by an organization outside the village

A2. Are the rules that are actually used in practice the same as the formal rules for this product? <RINUSE>

*Mark only one answer.*

- (1)  No
- (2)  No, rules-in-use vary substantially from formal rules
- (3)  Yes, rules-in-use conform closely to formal rules
- (4)  Yes, rules-in-use conform broadly to formal rules

← Observation of the user group's harvesting patterns will be necessary to accurately answer this question.

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major* changes in the rules about this forest product since the last visit, and if so, what were they? (long text) <RHISTCHNG>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

*n/a*

B. DESCRIPTION OF THE FOREST PRODUCT

B1. What is the nature of the group's current legal claim to the harvesting of this forest product? <RLEGCLAIM>

*Mark only one answer.*

- (1)  *De jure* (by right, as established by law)
- (2)  *De facto* (as exists, not necessarily by legal establishment)
- (3)  *De jure and De facto* (they have a formal right and they are exercising it)
- (4)  Contrary to formal law

B1a. Describe: (long text) <RLEGDESC>

*Namungo is the forest owner and his family is using the forest.*

B2. How is this product used (or sold) by individuals in this group? <RUSED>

*Mark only one answer.*

- (1)  Primarily used for consumption by individuals' families
- (2)  Primarily used for animal consumption
- (3)  Primarily used for animal bedding
- (4)  Primarily used as biomass to enrich nutrients in the soil of farming plots
- (5)  Primarily used for household construction
- (6)  Primarily used to produce other products for household consumption
- (7)  Primarily used to produce other products for sale
- (8)  Primarily sold in a local or nearby market held in the settlement area
- (9)  Primarily sold in an external market
- (10)  No single primary use (*do not check this answer unless there really are several equally important uses of this forest product*)

B3. What percent of the product harvested by this group is: {R\_PROUSE} <R\_OPTION> <R\_PERCENT>

*Multiple answers may be applicable.*

- (1)  60 % Used for the subsistence of individuals or their animals
- (2)  40 % Sold in a market held in the settlement area
- (3)  % Sold in an external market
- (4)  % Used as input to farming systems (e.g., bedding or enhancement)

B4. How long is this forest product available for harvesting? <RAVAIL>

*Mark only one answer.*

- (1)  Up to one week each year
- (2)  Two weeks each year
- (3)  One month each year
- (4)  Two months each year
- (5)  One-quarter of the year
- (6)  One-half of the year
- (7)  Three quarters of the year
- (8)  All year round
- (9)  Every other year
- (10)  Every 3rd year
- (11)  Every 4th year
- (12)  Every 5th year
- (13)  Every 10th year or more

B5. When do the individuals in this user group actually harvest this forest product? <RWHENHARV>

*Mark only one answer.*

- (1)  Up to one week each year
- (2)  Two weeks each year
- (3)  One month each year
- (4)  Two months each year
- (5)  One-quarter of the year
- (6)  One-half of the year
- (7)  Three quarters of the year
- (8)  All year round

- (9)  Every other year
- (10)  Every 3rd year
- (11)  Every 4th year
- (12)  Every 5th year
- (13)  Every 10th year or more

B6. If available all year round, is the quantity of this forest product (that will be available for harvest) relatively constant from season to season? <RCONSTSEAS>

*Here, the responses for variation (little, moderately, dramatically) should be seen as presented in an increasing order of magnitude so that "moderately" in response (3) represents the approximate middle from "little" to "dramatically." Mark only one answer.*

- (1)  Quantity of forest product available does not vary from season to season
- (2)  Quantity of forest product available varies a little from season to season
- (3)  Quantity of forest product available varies moderately from season to season
- (4)  Quantity of forest product available varies substantially from season to season
- (5)  Quantity of forest product available varies dramatically from season to season

B6a. If the quantity of forest product varies dramatically from season to season (response 5 in the previous question), then: <RVARY>

*Mark only one answer. n/a*

- (1)  Maximum quantity available in a season is twice the minimum in other seasons
- (2)  Maximum quantity available in a season is five times the minimum in other seasons
- (3)  Maximum quantity available in a season is ten times the minimum in other seasons

B6b. If the availability of this forest product varies *at least* a little from season to season (response 2, 3, 4, or 5 in question B6 checked), which month during the year is it most available? <RMONTH>

*Convert from local calendar if and when different. Please refer to general instructions in manual.*

*Mark only one answer. n/a*

- |                                       |  |
|---------------------------------------|--|
| (1) <input type="checkbox"/> January  | (7) <input type="checkbox"/> July      |
| (2) <input type="checkbox"/> February | (8) <input type="checkbox"/> August    |
| (3) <input type="checkbox"/> March    | (9) <input type="checkbox"/> September |
| (4) <input type="checkbox"/> April    | (10) <input type="checkbox"/> October  |
| (5) <input type="checkbox"/> May      | (11) <input type="checkbox"/> November |
| (6) <input type="checkbox"/> June     | (12) <input type="checkbox"/> December |

← See Form O  
Guidelines, Section  
III.A.1, for conversion of  
local calendar.

B7. If not available all year round, is the beginning of the season when this product is normally available for harvest accurately predicted within: <RPREDICT> *n/a*

*This question tries to obtain information about the predictability of having a product to harvest. That is, how certain the user group can be about the availability of the product for harvest. Mark only one answer.*

- (1)  A one-week period
- (2)  A two-week period
- (3)  A one-month period
- (4)  A two-month period
- (5)  A three-month period
- (6)  A four-month period

- (7)  A five-month period
- (8)  A six-month period
- (9)  Not predictable

B8. Is the quantity of the forest product that will be available for harvest relatively constant from year to year?  
<RCONSTYEAR>

*Here, the responses for variation (little, moderately, dramatically) should be seen as presented in an increasing order of magnitude so that "moderately" in response (3) represents the approximate middle from "little" to "dramatically." Mark only one answer.*

- (1)  Quantity of forest product available does not vary from year to year
- (2)  Quantity of forest product available varies a little from year to year
- (3)  Quantity of forest product available varies moderately from year to year
- (4)  Quantity of forest product available varies substantially from year to year
- (5)  Quantity of forest product available varies dramatically from year to year

B9. What is the unit used to measure the quantity of this forest product taken from the forest (e.g., bundle, headload, basket, etc.)? <RUNIT> tractor-trailer load

B9a. Can this unit be converted to a standard metric unit for weight, area, length, or volume? <RCONV>

*For example, a typical basket of fodder leaves usually weighs x pounds which can be converted to y kilograms.*

*Mark only one answer.*

- (1)  No
- (2)  Yes

B9b. If yes, how? (brief text) <RCONVHOW>

*For straight pieces, the volume estimate is almost equal to the volume of the tractor-trailer. Volume = 1 x 2 1/2 x 4 meters = 9 cubic meters*

B10. What is the monetary value for a unit of this product, in local currency?

In the settlement area <RVALSETTLE>: Uganda shillings 60,000  
 In the nearest market <RVALMARKET>: \_\_\_\_\_  
 In a market to which one can walk in one day's time <RVALWALK>: \_\_\_\_\_

B11. What is the total amount of these units that individuals in this user group, as a whole, harvested?

	Local Unit	Metric Unit
Last year (the 12 months preceding the day of data collection) <RAMTYEARA>:	<u>17 trailer loads</u>	_____
The year before last year <RAMTYEARB>:	_____	_____
The year before that <RAMTYEARC>:	_____	_____

*14/10*

B12. What was the least quantity of these units harvested by any household (with individuals in this user group) last year?  
<RQTYLEAST> 17 tractor-trailer loads

B12a. How many households harvested this quantity of these units? <RHHLEAST> 1

B13. What was the greatest quantity of these units ever harvested by any household (with individuals in this user group) last year? <RQTYMOST> 17 trailer loads

B13a. How many households harvested this quantity of these units? <RHHMOST> 1

B14. What are the closest substitute(s) for this forest product that the individuals in this user group could obtain? (text)  
<RSUBST>

1. charcoal
2. fuelwood from another location
3. kerosine stove

←Use the definition of household established in question A5 of Form S.  
←

B14a. Is the most easily obtained substitute readily available in:

Location	Mark "1" for No. or "2" for Yes
The forest(s) this group is using	<RFORST> 2
Another community's forest(s)	<ROTHCOMM> 1
Government forest(s)	<RGOVFOR> 2
Through agro-forestry production	<RAGROFOR> 1
Through agricultural production	<RAGRIPRO> 1
In local markets (a local market is one held in the settlement where the user group resides while using this forest or in a nearby settlement that holds regular market days)	<RLOCALMKT> 2
In external markets (external markets are those located in villages, towns, or cities located away from the user group settlement)	<REXTERMKT> 2

B15. How costly is the most easily available substitute? <RSUBSTCOST>

**Mark only one answer.**

- (1)        It is easily affordable by almost all individuals in this group
- (2)        It is easily affordable by most individuals in this group
- (3)        It is easily affordable by about half the individuals in this group
- (4)   X   It is easily affordable by only a few individuals in this group
- (5)        It is easily affordable by almost no one in this group

C. HARVESTING TECHNOLOGY (TOOLS AND TECHNIQUES/METHODS)

C1. Describe the technology used by most individuals in this group to harvest this forest product. (text) <RTECHDESC>

*The individuals could use axes, saws, fire, etc. to harvest this forest product. Please describe any and all such methods and tools used for harvesting this product.*

*They use a combination of axes, cross-cut saws, and power saws.*

←Technology = tools and methods.

C2. The primary source of this technology is: <RTECHPRIME>

*Mark only one answer.*

- (1)  Local indigenous knowledge
- (2)  Indigenous technology developed by other user groups and adopted by this group
- (3)  Research and extension services provided by government and/or other external organizations
- (4)  Private vendors

C3. Where can individuals in this user group find the tools that are used in this technology? <RFINDTOOL\_>

*Multiple answers may be applicable.*

- (1)  Tools are made by users themselves
- (2)  Tools easily found in local markets in this region
- (3)  Tools easily found in a major city in this country
- (4)  Tools provided by NGOs
- (5)  Tools provided by government officials
- (6)  Tools provided by donor organization(s)
- (7)  Other (describe) <RFINDOTH>: \_\_\_\_\_

C4. Do the tools used by most individuals in this group help in limiting the quantity of this forest product that can be harvested? <RTOOLLIMIT>

*Example: A small knife that cannot cut through more than a small plant, a rope of uniform length used by all individuals when tying fodder bundles. Mark only one answer.*

- (1)  Quantity not limited at all
- (2)  Quantity minimally limited
- (3)  Quantity moderately limited
- (4)  Quantity greatly limited

C5. Do different individuals in the group use different technologies for harvesting products from the forest? <RDIFFTECH>

*Mark only one answer.*

(1)  No

(2)  Yes

C5a. If yes, please describe different technologies in use and the reason for their use of different technologies:  
(long text) <RDIFFDESC>

*n/a*

C6. Have individuals in this user group changed their technology of harvesting within the last five years? <RCHNGTECH>

*Mark only one answer.*

(1)  No

(2)  Yes

C6a. If yes, state the approximate year of change, what the reason was for the change, and give a brief description of the change. <RCHNGDESC>

*A power saw acquired in 1991 is now used for felling and cross-cutting trees—which is faster than was the case with the axes only.*

- C7. Do users have price support contracts or guaranteed purchase agreements for the selling of resource units or commodities produced by resource units? <RCONSUPP>

*This question tries to obtain information about the certainty of selling forest resource units/products or commodities/items produced from these resource units/products to one or more buyers. That is, information about any secure arrangement between individuals in the user group or the user group as a whole and one or more buyers.*

*Mark only one answer.*

- (1)  No  
(2)  Yes

- C7a. If yes, describe the type of contract or agreement used, including the parties of the contract, the price levels, and whether the contract is currently operating: (text) <RCONDDESC>

*Have, but rarely because of poor honoring of such contracts by the other parties.*

D. RULES FOR THIS PRODUCT

- D1. Do harvesting, processing or selling rules exist that affect the harvesting level of this product? <RRULEEXIST>

*Mark only one answer.*

- (1)  No — do not answer any more questions on this form  
(2)  Yes

- D2. Are there restrictions on harvesting this forest product in regard to the quantity of forest product that can be harvested? <RQUANTITY>

*Mark only one answer.*

- (1)  No  
(2)  Yes

D2a. If there are restrictions as specified above, how is the total quantity to be harvested during a year determined?  
<RDETERMINE>

*Mark only one answer.*

- (1)  An estimate of the total availability each year (quantity will vary from one year to the next)
- (2)  A fixed upper limit (quantity does not vary from year to year unless the rule itself is changed)
- (3)  Historical use patterns (upper quantity remains constant from year to year)
- (4)  Other (describe) <RDETEROTH>: only amount for home use has to be harvested

D2b. If there are restrictions as specified above, how is this total quantity distributed among individuals in the user group.  
<RDISTUSER>

*Mark only one answer.*

- (1)  Every household assigned an equal quantity
- (2)  Each household assigned a specified quantity based on ownership of animals (example, a household with 10 animals is assigned a quantity limit that is higher than a household with 1 animal)
- (3)  Each household assigned a specified quantity based on ownership of land (example, a household with 10 hectares is assigned a quantity limit that is higher than a household with 1 hectare)
- (4)  Each household assigned a specified quantity based on number of individuals in the household
- (5)  Each household assigned as specified quantity based on gender
- (6)  Each household is assigned a specific quantity based on prior customary usage
- (7)  Each household is assigned a specific quantity based on an auction of rights to a particular quantity
- (8)  Each household is assigned a specific quantity based on their contributions to maintenance or protection of forest
- (9)  Specific quantities assigned on some other basis

D2c. If there are restrictions as specified above, can *rights* to a particular quantity of this forest product be: <RRESTRICT\_>

*Multiple answers may be applicable.*

- (1)  Inherited by offspring
- (2)  Sold to some other individual of the user group
- (3)  Sold to some other resident of settlement
- (4)  Sold to an outsider (without prior approval of user group-forest association or government official)
- (5)  Sold to an outsider (with prior approval of user group-forest association or government official)

D3. Besides or in addition to restrictions on the quantity of this product that can be harvested, are there restrictions on harvesting this forest product in regard to:  
*Describe the restrictions that apply. Write a "0" if the restriction is not used. If such a restriction is used, indicate whether the restriction is gender specific, noting "1" for female, "2" for male, or "3" for both in the appropriate column.*

Restrictions	Restricted? "0" for no, "1" for female, "2" for male, "3" for both	If a restriction applies, describe: <RResDesc>
The location within the forest where this forest product can be harvested	<RLOCATION> 0	
The use of various types of technology	<RTECH> 0	
The time period during which the forest product can be harvested	<RTIMING> 0	
The characteristics of the product itself (examples could include not cutting trees or bushes until they are a particular size, not cutting grasses until seeds have matured and dropped, etc.)	<RCHARACTER> 0	
The type of transport that can be used to remove this forest product from the forest (e.g., only human transport, or only one horse, or no motor vehicle, or similar rules)	<RTRANSPORT> 0	
The rights of individuals to harvest alone (does an individual always have to harvest with others in a group)	<RINDIV> 0	
The processing of the harvested product	<RPROCESS> 0	
The sale of the harvested product	<RSELLPROD> 0	
The sale of harvesting rights to the product	<RSELLRIGHT> 0	
Any other regard not mentioned above (please describe any important rules that have not have been mentioned or covered in the above questions)	<RRESOTHER> 3	Restrictions on sale by the workers



F. PENALTIES

In the next questions the term "fine" includes either a cash fine or a requirement to provide a certain amount of a commodity, such as rice. If a commodity fine is involved, ascertain the value of the amount of the commodity required in relation to the wage for a day's work.

F1. What type of penalties are likely to be imposed on users if they break a harvesting rule related to this product for the first time? <RPEN1\_>

Multiple answers may be applicable.

- (1)  A fine less than the equivalent of one day's work
- (2)  A fine equal to one day's work
- (3)  A fine greater than one day's work but no more than one week's work
- (4)  A fine greater than one week's work
- (5)  Temporary restriction on harvesting right for this product
- (6)  Temporary restriction on any harvesting from this forest(s)
- (7)  Required labor input
- (8)  Public apologies
- (9)  Permanent suspension of harvest rights for this product
- (10)  Permanent suspension of any harvesting from forest(s)
- (11)  Other (describe) <RPEN1OTH>: first warned

F2. What type of penalties are likely to be imposed on users if they break a harvesting rule related to this product a second time? <RPEN2\_>

Multiple answers may be applicable.

- (1)  A fine less than the equivalent of one day's work
- (2)  A fine equal to one day's work
- (3)  A fine greater than one day's work but no more than one week's work
- (4)  A fine greater than one week's work
- (5)  Temporary restriction on harvesting right for this product
- (6)  Temporary restriction on any harvesting from this forest(s)
- (7)  Required labor input
- (8)  Public apologies
- (9)  Permanent suspension of harvest rights for this product
- (10)  Permanent suspension of any harvesting from forest(s)
- (11)  Other (describe) <RPEN2OTH>: taken to RC I court

F3. What type of penalties are likely to be imposed on users if they break a harvesting rule related to this product many times? <RPEN3\_>

Multiple answers may be applicable.

- (1)  A fine less than the equivalent of one day's work
- (2)  A fine equal to one day's work
- (3)  A fine greater than one day's work but no more than one week's work
- (4)  A fine greater than one week's work
- (5)  Temporary restriction on harvesting right for this product
- (6)  Temporary restriction on any harvesting from this forest(s)
- (7)  Required labor input
- (8)  Public apologies

- (9)  Permanent suspension of harvest rights for this product
- (10)  Permanent suspension of any harvesting from forest(s)
- (11)  Other (describe) <RPN3OTH>: taken to RC III court (higher court)

F4. Who initially decides what kind of penalty is appropriate when a harvesting rule about this product is observed to be broken? <RDECIDE >

*Mark only one answer.*

- (1)  A guard patrolling for a local forest association
- (2)  A guard patrolling for a government forestry department
- (3)  A vote of individuals in this user group at a meeting
- (4)  A vote of an executive committee of the user group
- (5)  A vote of individuals in this user group and other authorized users of this forest(s) at a meeting
- (6)  An official of the user group
- (7)  A local government official in an administrative setting
- (8)  A regional government official in an administrative setting
- (9)  A national government official in an administrative setting
- (10)  Government officials in consultation with individuals in user group

F5. If a fine is imposed, who collects the fine? <RCOLLECT >

*Here, collecting a fine does not imply or include keeping the amount collected. Mark only one answer.*

- (1)  The guard who apprehends a rule breaker
- (2)  An official of the user group or forest association
- (3)  An official for a forestry department
- (4)  A local government official
- (5)  A national government official outside forestry department

F5a. How is this fine used? <RFINEUSED >

*Mark only one answer.*

- (1)  A general source of revenue to local association
- (2)  A general source of revenue for local government
- (3)  A general source of revenue for forestry department
- (4)  A general source of revenue for national government (is deposited in some form of a general fund and does not come back to the forestry department)

F6. To what extent are these penalties complied with if imposed? <RCOMPLY >

*Mark only one answer.*

- (1)  No one complies with the penalties imposed on them
- (2)  Few users comply with the penalties imposed on them
- (3)  About half the users comply with penalties imposed on them
- (4)  Most users comply with penalties imposed on them
- (5)  Penalties are fully complied with when imposed

F7. What type of records are kept concerning penalties imposed and complied with? <RRECTYPE>

*Mark only one answer.*

- (1)  No records or only scanty records kept
- (2)  Forest guards keep a notebook
- (3)  User group keeps a notebook
- (4)  Local forestry association keeps record books
- (5)  Local Government officials keep record books
- (6)  Regional Government officials keep record books
- (7)  National Government officials keep record books
- (8)  Other (describe) <RRECOTH>: \_\_\_\_\_

F7a. Are these records accessible to all individuals in the users group? <RACCESS>

*Mark only one answer.*

- (1)  No
- (2)  Yes

F8. If the users do not pay fines, what alternatives are open to the authority that imposes the fines? <RALTERN\_>

*Multiple answers may be applicable.*

- (1)  Private reprimand and request to fully comply with penalty
- (2)  Public reprimand and request to fully comply with penalty
- (3)  Shunning within user group
- (4)  Shunning within the village
- (5)  Confinement within village boundaries
- (6)  Confinement in local jail (*for a non-family user*)
- (7)  Taking user to court
- (8)  Other (describe) <RALTERNOTH>: worker may be sacked; property confiscation  
for a non-family user

F8a. If response 7 is checked above, describe court case and action taken: (*long text*) <RCOURTS>

*Case taken to RC (Resistance Council) courts who then decide the appropriate action.*

F9. If users may lose their harvesting rights to this product, how can these rights be restored? (text) <RRESTORE>

*Through negotiations with the forest owner.*

F10. During the past two years have external government officials been called upon to enforce penalties against individuals in this user group? <REXTENF>

*Mark only one answer.*

(1)   X   No

(2)        Yes

F10a. If yes, describe the incident(s): (text) <REXTDESC>

F11. During the past two years have government officials been called upon to enforce penalties against someone else, outside this user group? <ROUTENF>

*Mark only one answer.*

(1)   X   No

(2)        Yes

F11a. If yes, describe the incident(s): (text) <ROUTDESC>

F12. During the past two years, have government officials accepted commodities or currency to avoid imposing a fine for an infraction? <RBRIBES>

*Mark only one answer.*

- (1)   X   No  
(2)        Yes

F12a. If yes, describe such incidents: *(text)* <RBRIBEDESC>



FOREST GOVERNANCE FORM

*This form has been designed to obtain information about any organization that makes rules about or influences the utilization of the forest (harvesting, maintenance, forest guarding, etc.), but does NOT use the forest. This could be a district or regional office of a national government ministry, a multi-national organization, private voluntary organization, or non-governmental organization. If this is a national or multi-national organization, this form is only meant to gather data about a local or regional office of the organization.*

*One Forest Governance Form should be completed per organization.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001  
Name of this Organization <VNAME>: District Forestry Office  
Name of Forest(s): Namungo's forest, Lwamunda Forest Reserve ←Be sure to write the name of the forest over which this organization governs.  
Name of person filling out this form: Mr. David Green  
Name of person(s) with whom discussions held: Mr. John Mutte  
Date of Site Visit (Month and Year): 9-17-93  
Location of discussions (fields, home of respondent, place of business, etc.): business office (DFO)  
Has a Forest Governance Form been completed *before* for this organization? <VCODED>  
(1)  No  
(2)  Yes  
(3)  Uncertain  
(4)  Yes, with a new name (If this response is checked, write new name in B0.)

A. HISTORY

A1. Briefly describe this organization. (long text) <VORGDESC>

*This is a district office of Ministry of Energy, Minerals, Water, and Environment Protection responsible for administration and management of government reserved forests, and enforcement of all activities associated with forestry in the district.*

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A2. How many years has this organization had its present structure? <VYEARS> 26 year(s)

*Note to field researcher: Changes may have come about if the central government altered legislation, when an influential leader of the organization changed, if there were major natural disasters.*

A3. What is the relationship of the territorial jurisdiction of the organization to that of the smallest general purpose government or administrative unit? <VTERJURI>

← Territorial jurisdiction means the area in which the organization has the right to implement policy.

Mark only one answer.

- (1)  The smallest general purpose government or administrative unit is totally within (either smaller than or the same as) the territorial jurisdiction of the organization
- (2)  The smallest general purpose government or administrative unit is partially outside (larger than or partly inside and partly outside) the territorial jurisdiction of the organization

A4. Please answer the following forest-specific questions for this organization only in relationship to the forests utilized by user groups in the settlement(s) included in this site. {GovToFor}

*For the first column below, write the name(s) of the forest(s) with which this organization is involved. The names on this list should correspond to the names of the forest on each forest form. For the second column, indicate how many years this organization has been involved in the governing of this forest. If unknown, please enter their best estimate. For the third column, indicate where the organizational office is located in relationship to the forest by placing a check by "1" for within 1 kilometer of the forest, "2" for within 10 km of the forest, "3" for within 50 km of the forest, "4" for within 100 km of the forest, or "5" for more than 100 km from the forest. For the last column, write the name(s) of the organization(s) as posted on relevant forms with which this organization perceives that it interacts.*

Name of the forest <FNAME>	How many years has this organization been involved in the governing of this forest? <TYEARS>	Where is the organizational office located in relationship to the forest? <TWHERE>	With which organizations does this organization perceives that it interacts with regard to this forest? <TINTERACT>
Namungo's Forest	<u>26</u> year(s)	1 <input type="checkbox"/> < 1 km 2 <input type="checkbox"/> within 10km 3 <input checked="" type="checkbox"/> within 50km 4 <input type="checkbox"/> within 100km 5 <input type="checkbox"/> > 100km	None  ← The information in this column should be obtained by asking open-ended questions about the different organizations with which this organization interacts, and asking about organizational relationships with this organization. Note that this is the perception of the people interviewed at the organization, not the perception of the researcher.
Lwamunda Forest Reserve	<u>26</u> year(s)	1 <input type="checkbox"/> < 1 km 2 <input type="checkbox"/> within 10km 3 <input checked="" type="checkbox"/> within 50km 4 <input type="checkbox"/> within 100km 5 <input type="checkbox"/> > 100km	None  ← The information in this column should be obtained by asking open-ended questions about the different organizations with which this organization interacts, and asking about organizational relationships with this organization. Note that this is the perception of the people interviewed at the organization, not the perception of the researcher.
	_____ year(s)	1 <input type="checkbox"/> < 1 km 2 <input type="checkbox"/> within 10km 3 <input type="checkbox"/> within 50km 4 <input type="checkbox"/> within 100km 5 <input type="checkbox"/> > 100km	None  ← The information in this column should be obtained by asking open-ended questions about the different organizations with which this organization interacts, and asking about organizational relationships with this organization. Note that this is the perception of the people interviewed at the organization, not the perception of the researcher.
	_____ year(s)	1 <input type="checkbox"/> < 1 km 2 <input type="checkbox"/> within 10km 3 <input type="checkbox"/> within 50km 4 <input type="checkbox"/> within 100km 5 <input type="checkbox"/> > 100km	None  ← The information in this column should be obtained by asking open-ended questions about the different organizations with which this organization interacts, and asking about organizational relationships with this organization. Note that this is the perception of the people interviewed at the organization, not the perception of the researcher.

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major* changes in the governance of the forest(s) since the last visit, and if so, what were they?  
(long text) <VHISTCHNG>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*



**B. GOVERNANCE AND STRUCTURE**

B1. The following table asks questions about the activities carried out by this organization.

Which of the following activities has this association coordinated (C); for which has it passed rules (P) and/or modified rules (M); for which has it not (N) done any of the above. Circle all Cs, Ps, or Ms that apply. If the association has not done any of the above, circle N only.	During the past year:	During the five years prior to this past year:
Plan: seeds, seedlings, etc.	<VSEEDS1_> <input checked="" type="radio"/> C   P   M   N	<VSEEDS5_> <input checked="" type="radio"/> C   P   M   N
Other maintenance	<VMAINT1_> <input checked="" type="radio"/> C   P   M   N	<VMAINT5_> <input checked="" type="radio"/> C   P   M   N
Distribute forest products to local users	<VDIST1_>            C   P   M <input checked="" type="radio"/> N	<VDIST5_>            C   P   M <input checked="" type="radio"/> N
Sell forest products	<VSELL1_>            C   P   M <input checked="" type="radio"/> N	<VSELL5_> <input checked="" type="radio"/> C   P   M   N
Distribute revenue from sale of forest products	<VREVENUE1_>        C   P   M <input checked="" type="radio"/> N	<VREVENUE5_>        C   P   M <input checked="" type="radio"/> N
Determine timing (season) of the harvest of forest products	<VTIMING1_>        C   P   M <input checked="" type="radio"/> N	<VTIMING5_> <input checked="" type="radio"/> C   P   M   N
Determine quantity of forest products harvested	<VQUANT1_> <input checked="" type="radio"/> C   P   M   N	<VQUANT5_> <input checked="" type="radio"/> C   P   M   N
Determine type of technology used to harvest forest products	<VTYPTECH1_> <input checked="" type="radio"/> C   P   M   N	<VTYPTECH5_> <input checked="" type="radio"/> C   P   M   N
Determine who is authorized to harvest forest products	<VWHOAUTH1_> <input checked="" type="radio"/> C   P   M   N	<VWHOAUTH5_> <input checked="" type="radio"/> C   P   M   N
Determine type of use that can be made of forest products (including religious uses)	<VTYPEUSE1_> <input checked="" type="radio"/> C   P   M   N	<VTYPEUSE5_> <input checked="" type="radio"/> C   P   M   N
Sell rights to harvest forest products which users can trade with others	<VRIGHTS1_>        C   P   M <input checked="" type="radio"/> N	<VRIGHTS5_>        C   P   M <input checked="" type="radio"/> N
Rent nontransferable rights to harvest forest products	<VRENT1_>            C   P   M <input checked="" type="radio"/> N	<VRENT5_>            C   P   M <input checked="" type="radio"/> N
Monitor forest condition	<VMONCOND1_> <input checked="" type="radio"/> C   P <input checked="" type="radio"/> M   N	<VMONCOND5_> <input checked="" type="radio"/> C   P <input checked="" type="radio"/> M   N
Monitor conformance to rules	<VMONRULE1_> <input checked="" type="radio"/> C   P <input checked="" type="radio"/> M   N	<VMONRULE5_> <input checked="" type="radio"/> C   P <input checked="" type="radio"/> M   N
Sanction rule breakers (e.g., fines, punishment)	<VSANCT1_> <input checked="" type="radio"/> C   P   M   N	<VSANCT5_> <input checked="" type="radio"/> C   P   M   N
Arbitrate disputes among local users	<VDISPUTE1_> <input checked="" type="radio"/> C   P   M   N	<VDISPUTE5_> <input checked="" type="radio"/> C   P   M   N
Interact with higher authorities	<VINTER1_> <input checked="" type="radio"/> C   P   M   N	<VINTER5_> <input checked="" type="radio"/> C   P   M   N

B2. If there are conflicts between the rules created by this organization and those of forest association(s), please describe these conflicts. *(long text)* <VRULECONFL >

B2a. Are any mechanisms available for resolving these conflicts? *(long text)* <VCONFLMECH >

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B3. How do internal conflicts in the organization get resolved? (*long text*) <VCONFLRES>

B4. Indicate how members of a user group express their needs and concerns about the forest(s) to officials of this organization. <VEXPRESS\_>

*Multiple answers may be applicable.*

- (1)  Formal petitions
- (2)  Formal hearings
- (3)  Demonstrations
- (4)  General meetings
- (5)  Illegal exchanges with officials
- (6)  Other (describe) <VEXPRESOTH>: personal visits

B5. How does this organization carry out most of the functions assigned to it? <VFUNCTION>

*Mark only one answer.*

- (1)  The office-holders directly carry out tasks
- (2)  The office-holders appoint/hire individuals to assist them in their functions.
- (3)  The office-holders create committees that carry out tasks or assist the officials.
- (4)  Other (describe) <VFUNCTOTH>: \_\_\_\_\_

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B6. Are the forest decision-making positions (the position of the officials) filled by users? <VPosUser>

*Mark only one answer.*

- (1)  No
- (2)  Yes, through direct or indirect elections by users
- (3)  Yes, appointed by the organization with active advice by users
- (4)  Yes, appointed by the organization without active advice by users
- (5)  Yes, through inheritance
- (6)  Other (describe) <VPosOTH>: \_\_\_\_\_

B7. Can an external or higher level authority remove the decision-maker(s) in this organization? <VRemoveExt>

*Mark only one answer.*

- (1)  No
- (2)  Yes, at the discretion of the external or higher level authority
- (3)  Yes, with substantiated evidence of wrongdoing
- (4)  Yes, with complaints from other users

B8. Can users remove the decision-makers? <VRemoveUse>

*Mark only one answer.*

- (1)  No
- (2)  Yes, during elections that are held regularly
- (3)  Yes, in elections that are held irregularly
- (4)  Yes, through referenda or in arenas where criticisms are voiced

B9. Are the activities of this organization supervised by a higher authority? <VSupervise>

*Mark only one answer.*

- (1)  No
- (2)  Yes, by the parent organization (national or regional)
- (3)  Yes, by the parent organization (international)
- (4)  Yes, by higher level governmental officials
- (5)  Yes, other (describe) <VSuperOTH>: \_\_\_\_\_

B10. Does this organization provide information to forest users on a regular basis? (e.g., silvicultural techniques, relationships among tree and grass species, etc.)? <VInfoProv>

*Mark only one answer.*

- (1)  No
- (2)  Yes

B10a. If yes, what type of information? (text) <VInfoType>

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C. OFFICIALS AND FUNCTIONARIES

C1. In the last 5 years, how many leaders (officials) has this organization had?

	Female	Male
Number	<VFEMALE> 0	<VMALE> 2

C2. How many individuals work for this organization?

Total number of people hired by the organization		Total number of people who volunteer labor
Full-time	Part-time	
<VFULL> 42	<VPART> 0	<VVOL> 0

C3. Describe the types of activities undertaken by most of the full-time employees, e.g., planting, protecting, enforcing, maintaining records. <VEMPFULL>

*There are 12 professionals and 30 guards. All 42 split their time across four activities: planting/other maintenance, protecting, enforcing, and maintaining records and accounts.*

C4. Describe the types of activities undertaken by most of the part-time employees, e.g., planting, protecting, enforcing, maintaining records. <VEMPART>

C5. Do the decision makers of this organization own assets or capital which utilize products from the forest(s), e.g., furniture factory that needs wood, and if so, how much? <VOWNCAP>

**Mark only one answer.**

- (1)  No
- (2)  Yes, the amount utilized is below average in this location
- (3)  Yes, the amount utilized is average in the location
- (4)  Yes, the amount utilized is above average in the location
- (5)  Yes, the amount utilized is very high in the location

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D. RESOURCE-MOBILIZATION AND ACCOUNT KEEPING

D1. What were the major financial sources for this organization during the most recent year, e.g., product sales, voluntary contributions, entry fees, fines, own taxes, external government or development agency transfers, etc. Mark each of the sources from which funds were received by this organization. <VSOURCE\_>

*Response (8) "own taxes" refers to taxes raised by a general purpose government. Regular levies by other kinds of organizations should be referred to as (2) "membership fee." Multiple answers may be applicable.*

- (1)  Voluntary contribution of funds
- (2)  Membership fee
- (3)  Payments that substitute for labor input
- (4)  Fines
- (5)  National or regional government
- (6)  Development agency
- (7)  Sales of forest products from the forest
- (8)  Own taxes
- (9)  Special levies
- (10)  Aid from external NGOs
- (11)  Aid from indigenous NGOs
- (12)  Foreign government (which one?) <VSOURCEGOV> \_\_\_\_\_
- (13)  Other (describe) <VSOURCEOTH>: \_\_\_\_\_

D1a. Enter the number (1-13) listed in D1 that was the *single most important* source of financial support for this organization. <VSRCEMOST> 12

D1b. What is the total financial budget of this organization for the most recent year data is available?  
<VBUDGET> 33 million Uganda shillings

D1c. What percentage of the total financial budget is the single most important source of financial support for this organization? <VSRCEPRCNT> 85 %

D1d. What is the "most recent year" for which this data is available? <VSRCEYEAR> 1994

*Specify full year, e.g., 1991; if the budgetary year is not the equivalent of the calendar year, use the last year of the budgetary year.*

D1e. If the organization did not receive any aid from external agencies, could it support its expenditures? <VSUPPORT>

*Mark only one answer.*

- (1)  No
- (2)  Yes, it could

D2. Does the organization maintain records of its accounts? <VRECMMAINT>

*Mark only one answer.*

- (1)  No
- (2)  Yes

D3. If yes, are the accounts audited or supervised in any manner? <VAUDIT>

*Mark only one answer.*

- (1)  No  
(2)  Yes

E. COLLECTIVE- AND CONSTITUTIONAL-CHOICE PROCESSES

E1. Does the organization have a charter of mission and objectives? <VCHARTER>

*Mark only one answer.*

- (1)  No  
(2)  Yes

E2. If yes, what was the process of formation of the statement of mission for this organization? (*long text*) <VCHARTDESC>

*The DFO is governed by the Forest Act and Forest Law which is an act of Parliament.*

E3. Is the organization a corporate body in the sense of being able to sue or be sued? <VSUE>

*Mark only one answer.*

- (1)  No  
(2)  Yes

E4. How are the rules that are created by the organization enforced? Are they enforced by: <VENFRULE>

*Mark only one answer.*

- (1)  Members of the organization itself?  
(2)  Members of the user group (if not members of the organization)?  
(3)  External officials appointed by a government?  
(4)  Officials selected by the forest harvesting group?  
(5)  Other ways? (describe) <VENFOTH>: \_\_\_\_\_

ORGANIZATIONAL INVENTORY AND  
INTERORGANIZATIONAL ARRANGEMENTS FORM

*This form has been designed to obtain information about the inter-relationships between all organizations, harvesting or non-harvesting, that govern a particular forest. This form will also record, briefly, the activities they carry out with regard to the forest.*

Research ID <RID>: 001 Country ID <CID>: UGA Site ID <SID>: 001

Name of Forest <FNAME>: Namungo's Forest

Name of person filling out this form: Abwoli Banana

Name of person(s) with whom discussions held: Mr. Namungo, Mr. Mutte J.B.

Date of Site Visit (Month and Year): 9-21-93

Location of discussion (fields, home of respondent, place of business, etc.): Home, Office

Has this organizational inventory and interorganizational arrangements structure been coded before? <ICODED>

- (1)  No
- (2)  Yes
- (3)  Uncertain
- (4)  Yes, with a new name (If this response is checked, write new name in B0.)

A. PARTICIPANTS, POSITIONS, ORGANIZATIONS, AND THEIR RELATIONSHIPS

A1. Please list the names and types of the organizations which engage in activities that are related to this forest (planting/other maintenance, protecting, harvesting, processing/producing, selling, enforcing) by using the list provided on page 2. If there is more than one organization of a particular type, list each one with a subscript ranging from 1 to n (example: if more than one user group is organized as a cooperative, then the types would be written as N<sub>1</sub> and N<sub>2</sub>). If there are several forests located close to one another, one of these forms should be completed for each forest.

Type of  
Organization  
(see next page)  
<IORGTYPE>

Name of Organization <INAME>

1. L Namungo's family
2. M<sub>1</sub> Mbazzi Men's User Groups
3. M<sub>2</sub> Housewives of Mbazzi
4. G District Forest Office
5. F Resistance Council, RC1
6. B District Administrator's Office
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

If more than 10 organizations, continue list on a separate sheet of paper and attach to this page.

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**ORGANIZATIONAL INVENTORY LIST**Governmental Organizations (Not Specifically Related to Forests)

- A = The Aid Agency of a Foreign Government (e.g., NORAD)
- B = A regular agency of a national government other than forestry
- C = A regular agency of a state government other than forestry
- E = A regular agency of a district government other than forestry
- F = A regular agency of a local government other than forestry

Forest-Specific Governmental Organizations

- G = A forestry agency of the national government
- H = A forestry agency of a state government
- I = A forestry agency of a district government
- J = A forestry agency of a local government
- K = A unit of local government with a limited focus primarily on forests (van panchayat)

Community-Based Entities or Organizations

- L = A local, communal entity with multiple activities including forestry
- M = A local, forest-specific, informal entity
- N = A local, forest-specific formal entity (not-for-profit private voluntary organization)
- O = A local firm, company, or corporation organized for profit

Private Organizations Organized External to this Forest (Organizational "home" is not near the forest)

- P = A for-profit regional or national firm, company or corporation
- Q = A for-profit multinational firm, company or corporation
- R = A not-for-profit regional or national organization (private voluntary organization)
- S = A not-for-profit multinational organization (private voluntary organization)
- T = A cooperative operating in many locations
- U = A Labor or Employee Union
- V = Other type of organization

## A2. Type of Activity

Mark the appropriate letter code of the organization in the column or columns representing the activity or activities that is undertaken and in the rows indicating the levels at which the organization operates. If a User Group Form is being completed for an organization, please circle its entry in the matrix. When there are multiple organizations involved in any particular activities or level of decision making related to that activity, include all relevant organizations. If there are multiple organizations of the *same* type, use subscripts to refer to them. In other words, if there is one National Government Forestry Agency and one formal community-based association that engage in collective-choice actions (make policies) about harvesting forest products you would write  $G_1$  and  $N_1$  in the second row, 4th column (R2, C4). Or, if there are two local user groups (that are cooperatives) harvesting from this forest, you would enter  $N_1$  and  $N_2$  in the 1st row, 4th column (R1, C4).

Level of Activity	C1 Planting other maintenance	C2 Protecting forest	C3 Enforcing Rules	C4 Harvesting/ Using	C5 Processing/ Producing	C6 Selling
R1 Operational Activities	<IR1C1>  <i>L</i>	<IR1C2>  <i>L</i>	<IR1C3>  <i>L</i>	<IR1C4>  $M_2$ $M_1$ <i>L</i>	<IR1C5>  $M_2$ <i>L</i>	<IR1C6>  $M_2$
R2 Collective- Choice Activities	<IR2C1>  $G$ <i>L</i>	<IR2C2>  <i>L</i>	<IR2C3>  $B$ <i>L</i>	<IR2C4>  $G$ <i>L</i> $F_1$	<IR2C5>  <i>L</i>	<IR2C6>  <i>L</i>
R3 Constitutional- Choice Activities	<IR3C1>  <i>L</i>	<IR3C2>  <i>L</i>	<IR3C3>  <i>L</i>	<IR3C4>  <i>L</i>	<IR3C5>  <i>L</i>	<IR3C6>  <i>L</i>

Definitions:

**operational activities:** the day-to-day decisions and actions made by users of a forest and others as to when, where, and how to withdraw products or otherwise use the forest or how to improve the condition of the forest, the monitoring of actions by others and imposition of sanctions and rewards, and the exchange of information about the forest. (Examples include harvesting of wood or thatch, planting trees, guarding the forest, assigning a fine, filling out a report.)

**collective-choice activities:** the policy making activities of users, their officials, and others, or an external authority about operational activities. (Examples include the activities of an elected council deciding when the forest will be open for harvesting for a particular product or which harvesting technique will be authorized.)

**constitutional activities:** Basic decision making about who is eligible to use a forest and how future collective choice decisions will be made. (Examples include the decisions at an annual meeting about the setting up of a council to meet more regularly and determining what actions such a council could take.)

←Read Section I.D.  
for a more thorough  
understanding of  
operational,  
collective-choice,  
and constitutional-  
choice actions.

**harvesting/appropriation activities:** the day-to-day consumptive and non-consumptive appropriation from the forest by forest users. Consumptive appropriation is the harvesting of products in the forest for subsistence needs, for commercial purposes, for transfer to others. Consumptive appropriation could be cutting forage for animals, timber collectors cutting timber for sale to a furniture manufacturer, or firewood gatherers cutting firewood for the settlement. Non-consumptive appropriation means using the forest for worship, birdwatching, or taking a walk in the forest.

B0. MAJOR CHANGES SINCE LAST SITE VISIT

B0. Have there been any *major* changes in the inter-relationships of the organizations since the last visit, and if so, what were they? (long text) <IHISTCHNG>

*Do not complete if this is the first visit to this site to record information for the IFRI database.*

B. INTERORGANIZATIONAL ARRANGEMENTS

B1. Is there any coordination among organizations which govern this forest? <ICOORDORG>

- (1)  No
- (2)  Yes

**←Do the organizations which govern this forest coordinate resources, personnel, or information on any activities?**

B1a. If yes, please describe. (long text) <ICOORDDESC>

*Do they make policy together, loan funds, exchange information, etc.?*

*The DFO has limited control over the harvesting operations. For example, any harvesting of trees for commercial use requires a permit.*

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B2. How do organizations for this forest generally relate to each other? (long text) <IRELATEORG>

Please describe how the organizations relate to each other and if there are any incipient (becoming apparent) conflicts among the organizations which govern this forest.

*There is little cooperation between the DFO's office and Namungo's family. The family thinks that the DFO's office is failing to protect the forest reserve which has common boundary with their forest, and eventually, encroachers will start using his forest illegally.*

33. Are there currently conflicts between organizational policies and what the users would like in terms of forest governance? <ICONFLICTS>

- (1)  No
- (2)  Yes

33a. Please explain: (long text) <ICONFLDESC>

*The men usually illegally harvest Mr. Namungo's products, but conceal the evidence. In the future, there may be a big conflict.*

C. INTER-USER GROUP ARRANGEMENTS

*Ask only if there are multiple user groups.*

C1. Do any of the user groups have advantages over all other groups for harvesting forest products? <IADVANSER>

- (1)  No  
 (2)  Yes

C1a. If yes, please describe. *(long text)* <IADVANDESC>

*The family owns the forest and has more rights to harvesting forest products than other user groups.*

C2. Do harvesters from different user groups cooperate with each other? <ICOOPUSERS>

- (1)  No  
 (2)  Yes

C2a. If yes, please describe, with respect to using the forest, farming, housebuilding, sharing information, etc. *(text)*  
 <ICOOPDESC>

C3. Do conflicts among user groups affect the overall use of the forest? *(long text)* <ICONFLUSE>

**APPENDIX 2**

**SAMPLE IFRI MONITORING PLAN: UGANDA**

The attached appendix was prepared by the Uganda IFRI team based on the guidelines contained in the report, "A Plan to Monitor the Impact of Institutions and Incentives on Management of Natural Forests." It is presented here as an example of how the guidance contained in the monitoring plan can be followed to develop a monitoring or research plan for a specific setting. This appendix is also available, in an expanded version, as a complete social forestry research proposal from the Department of Forestry at Makerere University in Kampala, Uganda.

A PROGRAM TO STUDY AND MONITOR THE IMPACT OF  
INSTITUTIONAL ARRANGEMENTS AND INCENTIVES  
ON FOREST RESOURCES IN UGANDA.

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MARCH, 1994

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**A PROGRAM TO STUDY AND MONITOR THE IMPACT OF  
INSTITUTIONAL ARRANGEMENTS AND INCENTIVES ON  
FOREST RESOURCES IN UGANDA**

**1. INTRODUCTION**

Uganda's forest resources are an essential foundation for the country's current and future livelihood and growth. The current area under natural forests in Uganda is 63,460 km<sup>2</sup> (FAO 1993). These forests are interspersed among agricultural areas, and most are located in gazetted forest reserves. The rate of deforestation, however, is alarming. The 1992 Uganda National Environmental Action Plan (NEAP) estimated that deforestation is occurring in Uganda at the rate of 500 km<sup>2</sup>, while the Food and Agricultural Organization of the United Nations (FAO, 1993) estimated deforestation at 650 km<sup>2</sup> annually. If deforestation were to continue unabated, most of the forested area of Uganda would disappear within the coming century. Allowing these forests to dissipate would bring considerable hardship to Uganda given that it is heavily dependant on its forests for timber, agricultural, and energy production. Over nine-tenths of Uganda's energy requirement, for example, is generated by forests (Republic of Uganda, 1993). Forests also support wildlife and other forms of biodiversity vital for the country's future heritage as well as for generating foreign exchange through a tourist industry focused on the diverse flora and fauna of Uganda.

The primary causes of forest loss are clearing for agriculture, pit sawing and logging for lumber, charcoal and firewood production. According to the NEAP, there is a lack of policy vis a vis state control over tree cutting on freehold, leasehold, common, and customary-held land. The NEAP also states that some officials are of the opinion that the government does not have enough authority over private forests and that this has resulted in deforestation.

The international response to deforestation in many parts of the world is reflected in the resolutions passed at the 1992 U.N. Conference on the Environment and Development (The Earth Summit) in Rio de Janeiro. Massive investments in large reforestation projects have been stimulated by international donors. The cost of reforestation is very high, however. It is estimated that a total of USA \$7.8 billion is required to reforest 10 million hectares of degraded forest area in the Philippines alone (Korten, 1993).

The Government of Uganda has addressed this problem by initiating an annual tree planting program in which the forest department, through its forest rehabilitation project, raise tree seedlings for planting on degraded forest reserves. Similarly many NGOs

and individuals are actively involved in raising seedlings and tree planting on private degraded areas. Though these measures are expensive their success is questionable due to low survival rates of the seedlings planted. One of the factors leading to the disappointing results of these massive investments is that many of these projects have not adequately involved local forest users and village residents in planning efforts.

A program to study and monitor how various types of institutional arrangements affect the incentives and behavior of forest users is particularly relevant in Uganda at the present time. This is because the Government of Uganda is committed to a process of increasing the participation of citizens in the making of decisions that affect how community resources are used. The Uganda NEAP (1992) advocates greater decentralization and transfer of small local forest reserves to local authorities, and/or revenue sharing of forest resources with communities. Such arrangements have been implemented with some degree of success in Niger (FAC 1992), Nepal (CEDA, 1991), and India (Arnold and Steward, 1989).

The Uganda NEAP identified several specific areas of environmental and natural resource management concern. The following are forest related:

1. deforestation and resultant soil erosion;
2. loss of biodiversity;
3. an energy crisis which is characterized by extensive felling of trees for firewood and charcoal, wood fuel shortages, and a lack of alternatives to wood;
4. inadequate information on environment and natural resources; and,
5. lack of a comprehensive land use policy and an inadequate legal framework for land tenure.

It may be instructive to see how the monitoring program described in this plan will provide essential information to address some of these issues.

- \* **Deforestation:** the monitoring plan not only measures the rate of deforestation or reforestation in a sample of forests in Uganda, but also the institutional arrangements used to govern forests, to control access to its resources, and to affect the incentives of those who use or manage forests.
- \* **Biodiversity:** changes and or differences in tree and plant species will be systematically measured in the

sample forests. These changes will be used to monitor how forest users respond to institutional arrangements and show how population density changes over time affect biodiversity.

- \* **Harvesting of firewood and charcoal:** information on amount, end use, and value of firewood and charcoal obtained from the forests will be collected; this will help to highlight the effect of use of firewood on the rate of deforestation.
- \* **Effects of policies and diverse land and tree tenure:** information is to be collected on rules regarding, for example, the use of wetlands and grazing grounds as they fall within a community's forested resources; and, how rules, incentives and policies serve to promote either careful stewardship of resources or their rapid exploitation.
- \* **Environmental and natural resources information:** by working directly with local institutions such as Makerere University, research organizations, and administrative units, the monitoring plan developed here will build local capacities for data collection, review, analysis and dissemination.

#### Forests as Common Pool Resources

Most forests in Uganda and elsewhere in Africa are common pool resources (FAO, 1993a,b). Common pool resources are goods (and services) from which it is costly but not impossible to exclude potential consumers (Ostrom 1990); and at the same time, consumption of the resource is both subtractive (what one person consumes is no longer available for others) and potentially rivalrous. A common pool resource may be owned privately, publicly or by a communal organization. When no one has clear property rights to a common pool resource it is considered to be an "open access" resource. Hardin's (1968) work on the tragedy of the commons shows that over-exploitation of natural resources is inevitable where a highly valued resource is left as an open access resource.

In recent times the reduction in availability of forest resources has been accelerated. Privatization and encroachment, as well as government appropriation, have been the main processes taking resources out of common use. Increasing pressures on what is left have frequently led to its progressive degradation. Concurrently, traditional methods of access control, usufruct allocation, and conflict resolutions have become widely ineffective or have disappeared, undermined by political, economic and social changes within a village and nations (Arnold 1993).

Although deforestation is taking place at an alarming rate, the broad policy goal of the government of Uganda is that the use of renewable natural resources should be sustainable (within the resources capacity for renewal) for the benefit of the present and future generations. The specific forest conservation and management objective is to manage the nation's public and private forest lands in a sustainable manner for the full range of goods and services, and to promote increased forest production by the private sector.

In light of the above, the government has implemented a number of technical assistance programs for environmental protection in several critical areas such as forests, land use and management, wetland management and GIS. However, the most important areas of environmental monitoring and impact assessment have not yet received adequate attention (NEAP,1992). The purpose of the monitoring and impact assessment plan proposed here is to fill this gap.

## **2. OBJECTIVES OF THE PLAN**

The overall objective of this monitoring and assessment plan is to develop, over-time, a data collection, storage and analysis program that can be used to interrelate the sociological and institutional conditions affecting a forest, to the physical conditions of that forest.

The specific objectives of the plan are:

1. To determine: (a) the effects institutions have on incentives facing forest users, (b) how these incentives encourage forest users to engage in sustainable or unsustainable development of forests, (c) how forest users are affected by government driven activities and policies.
2. To contribute essential information needed by public officials, researchers and citizens of Uganda in order to develop policies of sustainable long term development.
3. To obtain similar information from collaborating centers in other countries allowing analysis of diverse policy options of importance to Uganda.
4. To acquire teaching and training materials for Community Forestry courses both at professional and technical level and in-service training.

### **3. UGANDA IFRI COLLABORATING RESEARCH CENTER**

The Uganda International Forestry Resources and Institutions (IFRI) Center was established in February 1993 and is located in the Department of Forestry at Makerere University. The Center proposes to monitor forest conditions and the institutions that manage a representative sample of forests in Uganda each year; immediate feedback will be provided to officials and forest users interested in each of the forests monitored.

The center proposes to publish a series of policy reports each year to document the current conditions of the forest in different ecological zones of the country, and to evaluate the impact of diverse policies and institutions on rates of deforestation, on biodiversity, and on the sustainability of forests in Uganda.

The Center will be prepared to undertake special studies of particular types of projects intended to improve forest conditions and to compare the performance of these projects with other types of management efforts in similar ecological zones. In the long term, the Center proposes to return to each forest in its sample every second year so that a systematic, long-term record is established concerning forest use and forest conditions throughout Uganda. Since the Center is part of an international network of other Centers located in other countries, it will receive detailed information about forest conditions in other countries that it can relate to policy questions relevant to Uganda.

William Gombya-Ssembajjwe is the Leader of the Center and Dr. Abwoli Banana is the Co-Leader. Professionally trained Faculty and graduate students with the Department of Forestry at Makerere University will undertake the systematic measurements of forest conditions and of demographic, social, and institutional patterns for each of the forest in the sample. In addition to the information being used in widely circulated policy reports, it will be also used to support the teaching of community forestry course at the University and training of in-service Forest Officers.

### **4. WORKING RESEARCH AND MONITORING HYPOTHESES**

This plan proposes to analyze and monitor the effects of institutions on user groups and (1) the incentives they face; (2) their self-driven governance arrangements; (3) government driven policies on forest use; and, (4) forest resource sustainability. All analysis will be based on the working hypotheses suggested by Ostrom et al. (1993) as listed below.

1. Local forest users participate in and have continuing authority to design the institutions that govern the use of the forest.
2. The individuals most affected by the rules that govern the day-to-day uses of a forest system are included in the group that can modify rules.
3. The institutions that govern a forest system minimize opportunities for free-riding, shirking and corruption, through effective procedures for monitoring the behavior of forest users and officials.
4. Forest users who violate rules governing the day-to-day uses of a forest system are likely to receive graduated sanctions from other users, from officials accountable to these users or both.
5. Rapid access is available to low-cost arenas to resolve conflict between users or between users and their officials.
6. Monitoring, sanctions, conflict resolution, and governance are organized in multiple layers of nested enterprises.
7. The institutions that govern the forest system have been stable for a long time and are understood by the users.
8. Markets for forest products are distant.
9. Population growth rate is low.
10. Population pressure in the surrounding area is low.

## **5. REQUIRED BACKGROUND INFORMATION ON UGANDA**

### **5.1 Location, climate and population**

The total area of Uganda is 236,000 km<sup>2</sup>, composed of 194,000 km<sup>2</sup> of land and 42,000 km<sup>2</sup> of open water and swamp. It lies between one degree south and four degrees north of the equator and 30 and 35 degrees east. Most of the center of the country lies at an altitude between 900 and 1500 meters. The south is characterized by flat-topped hills and broad swampy valleys. The north consists of rolling plains with some hills and mountains. The west has two large lake troughs (L. Albert, Edward and George) with the Ruwenzori Mountain range and Bugoma and Budongo forests in between. The east is an arid plain.

The country generally receives between 1015 mm and 1525 mm of rain per year with the mountain areas and the areas around Lake Victoria receiving the most rain. The north-eastern portion of the country - Karamoja - is the driest part with a rainfall ranges from 510 mm to 1050 mm per year. The annual average temperatures range from 20 -30 degrees centigrade.

In 1990 the population of Uganda was 16.7 million, having increased from 12.6 million in 1980. This population includes 36 recognized nationalities, basically divided between people of Bantu origin in the south, and those of Sudanic/Nilotic and Nilo-Hamitic origin in the north. Those in the south are mainly agriculturalists while those in the north are mostly pastoralist. The population density (persons per km<sup>2</sup>) distribution is as follows: Central Region, 138; Eastern Region, 148; Northern Region, 38; and, Western Region, 92. The over-all country population density is 85.

## 5.2 Ecological Zones

The National Agricultural Research Organization (NARO) has characterized Uganda as having four agro-ecological zones: tall grasslands, short grasslands, semi-arid/dry lands and highlands. In each of these zones, the following vegetation types can be found:

### 1. Tall grasslands

These are characterized by elephant grass (**Pennisetum purpureum**) and four types of closed canopy low land forests: (a) **Parinari** forests in the west; (b) **Celtis-Chrysophyllum** forests in the west and around lake Victoria; (c) **Cynometra-Celtis** forests, also in the west; and (d) **Piptadeniastrum** forests around Lake Victoria.

### 2. The short grasslands

This ecological zone is characterized by tussock grasses and wooded savanna **Combretum** forest types mainly found in northern and eastern Uganda.

### 3. Semi-arid

This ecological zone is characterized by savanna grassland vegetation. This zone occupies the plains and plateaus in the north-eastern part of the country (Karamoja), characterized by a long and severe dry season. The second part of this zone occupies the plains in the central (Luwero) and south-western (Mbarara). This zone is characterized by **Acacia** tree species and **Cymbopogon afronardus**, and **Hyparrhenia spp.** grasses.

#### 4. The Highlands

The highlands include three separate areas: Mount Elgon in the east; the Ruwenzoris in the west; and Kigezi-Ankole in the south west. There are also four Montane forests: (a) upper Montane (3050 to 3300 meters); (b) Bamboo forests (2450 to 3050 meters); (c) moist lower Montane forests (1500 to 2450 meters); and (d) dry lower montane forests (2000 to 3050 meters) (Hamilton 1984).

#### 5.3 Land Tenure

There are basically four types of land tenure in Uganda:

1. customary tenure based on communal and clan/family rights - this pattern predominated over 70 percent of the land until 1974 and emphasized *rights* to land use;
2. freeholds - which included freeholds, adjudicated free holds, and native free holds;
3. mailo - this unique modified form of freehold was developed through the Buganda Agreement of 1900 between the British Government and the Kingdom of Buganda; and,
4. leaseholds - both private and public (or statutory).

In 1900 the Kingdom of Buganda and the British Government agreed to the mailo system (a system of modified freehold) under which the Buganda King, notables and others received and divided the best land, and the British crown took the rest. Some of the British crown land located in swampy valleys and on mountains became forest reserves. Freeholds were common in Toro and Ankole, while leaseholds and customary tenure covered the rest of the country. In 1975 the government's Land Reform Decree made all land public. All freeholds and mailo land became leaseholds with limited tenure of 49 years for individuals and 200 years for religious organizations and 99 years for companies. To a large degree the law was never implemented, but it has served to confuse the Ugandan land tenure situation.

The current land tenure situation in Uganda is at variance with what goes on in practice and what is legally binding. The 1975 Land Reform Decree No. 3 which declares all land to be public land subject to leasehold from the Land Commission is not closely followed, either by the land administrators or the land owners. Instead the land tenure system that existed prior to the decree - a mixture of customary tenure, private mailo lands, freehold, and leasehold -- continues to be practiced. In a number of respects this "unofficial" tenure system fails to provide the full measure of tenure security needed to meet sustainable resource management objectives (NEAP 1992).

Furthermore, there is no comprehensive national land use policy, and the existing national land-use planning process needs strengthening. In the absence of a comprehensive land use policy, de facto land use is largely determined by policy, programs and incentives in the dominant agricultural sector. Agricultural sector policy promotes the increased production of both export and food crops but does not explicitly encourage agricultural intensification. This combination implicitly fosters deforestation through extensive land clearing to increase agricultural production (NEAP 1992).

#### **5.4 Political Administration**

The current form of decentralized administration was mandated by the present (National Resistance Movement) government through the Resistance Councils and Committees Statute of 1987. There are currently 39 districts, 220 counties, and approximately 800 sub-counties. The districts are led by a District Administrator (DA) who is appointed by the President.

Paralleling the administrative system is a five-tiered system of elected resistance councils and executive committees - RC1 (community), RC2 (parish), RC3 (sub-county), RC4 (county), and RC5 (district). Each RC at every level includes an Executive Committee of nine members who have specific responsibilities (Chairman, Vice-Chairman, Secretary, Secretary for Youth, Secretary for Women, Secretary for Information, Secretary for Mass Mobilization and Education, Secretary for Security, and Secretary for Finance).

The RC1 includes all residents of a village. The higher level RCs include all Executive Committee members from the RC at the level immediately below them. The members of the Executive Committee are elected by the RC members. RC5, RC4 (Municipalities), and RC3 Executive Committee members are paid; RC2 and RC1 Committee members are volunteers.

In general, the RCs are responsible for local policy making, particularly with regard to development planning and implementation. In addition, the RC3 and RC4 Executive Committee members are part of the District Development Committees. As of 1992, the Ministry of Local Government and its Decentralization Secretariat focused their efforts on drafting a new decentralization law (the Local Governments Bill) in order to harmonize previous decentralization statutes and further strengthen local government.

Decentralization has taken place in the various ministries including Ministry of Natural Resources and Local Administration. The proposed National Environment Management Authority will have direct links to the districts, which are responsible for developing their own environmental plans.

Thirteen districts have already been decentralized. As a part of the decentralization effort, a District Environment Officer has been posted to each of these 13 districts. The government has also encouraged the creation of District Environment Sub-Committees, and designation of one member to be responsible for environmental matters.

## **5.5 Forest Policy**

Forest policy in Uganda is characterized by the many changes that have occurred during the course of the country's political development.

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, A.C. 1987).

The Forest Act was passed in 1964. It 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 concerns, rather it was as part of a general political move towards centralization based on the belief that this would lead to more rational and efficient administration.

Other widely applicable provisions of the Act included: no one may reside, cultivate or graze livestock in a reserve without the written permission of a Senior Forest Officer; 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; 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; 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.

In 1974 a Forest Policy Statement emphasized the direct monetary value of forest products and downgraded a concern with protective forestry which had been expressed in a 1948 statement. This statement marked the government's direct involvement in extractive forest industries.

In 1988 the National Resistance Movement government revised forest policy to re-emphasize protective forestry. The current policy upgrades the protective and conservatory roles of the forests; 20 percent of the forest estate will be designated as strict Nature Reserves, 30 percent as Buffer Zones, and the remaining 50 percent will be subjected to normal timber concessions on a sustainable basis.

In 1992 the Tree Planting Agenda was launched; pit sawing on reserves was banned; poaching of timber became illegal, and an inventory of forest resources was begun.

## **6. METHODOLOGY**

### **6.1 Research Design and Site Selection.**

In order to monitor whether a system of natural resource management enhances performance one needs to develop a method for systematically measuring and recording information about resource conditions and the physical and social variables thought to influence resource conditions. In regard to problems of management of natural resources, specifically deforestation and reduction of biodiversity, for example, a monitoring program would include the development of a sample of (1) forests located in diverse ecological zones; (2) the institutional arrangements used in the governance and management of those forests; (3) population density.

#### **6.1.1 Development of Design Matrix**

With the background information collected it is possible to develop a design matrix to facilitate the determination of sample size, and selection of sample sites. In this case, as an example, a design matrix for the entire country of Uganda is presented (Table 1). It would also be possible to develop an appropriate matrix for a specific program area within Uganda.

Based on the background research conducted, the matrix uses the NARO defined agro-ecological zones for the **Ecological Zone** rows, and the predominant ownership arrangements as the **Institutional Arrangement** columns. Furthermore, each row is further divided to account for high and low population density areas.

#### **6.1.2 Completion of the Matrix and Selection of Sites**

For each cell, a list of all forests present must be developed. The exact number of forests that fit into each cell will of course depend entirely on the study area to be monitored. The first step in the monitoring plan may in fact have to be development of a forest census for the area in question. Once the list is developed and the matrix is completed, forest sample sites will be randomly selected for each cell. The actual

selection should be conducted based on use of a stratified random sampling device. The actual number of sites selected will vary depending on the geographic area and the total size of the sample, and related factors such as the number of sites in each cell, ethnic and cultural variations, varying political and administrative units, and budgetary constraints. However, where a unique and important forest exists and has not been randomly selected, it can be included in the study as a comparison forest outside the stratified random sample. In those cells where forests are quite heterogeneous more sites can be selected.

**Table 1. Design Matrix.**

<b>Ecological Zones</b>	<b>Institutional Arrangements</b>		
	Government Reserve	Communal	Private
Tall Grasslands			
Low Density Population	2 sites	2 sites	2 sites
High Density Population	2 sites	2 sites	2 sites
Short Grasslands			
Low Density Population	2 sites	2 sites	2 sites
High Density Population	2 sites	2 sites	2 sites
Semi-arid			
Low Density Population	2 sites	2 sites	2 sites
High Density Population	2 sites	2 sites	2 sites
Highlands			
Low Density Population	2 sites	2 sites	2 sites
High Density Population	2 sites	2 sites	2 sites

In this example an elementary sample, one that would not account for likely complications, unique forests and extreme heterogeneity, would be 48 sites. That sample size is based on 12 cells, each multiplied by two to account for differing population densities, for a total of 24, with each having an initial replication of two sites for each variable, for a total of 48.

### **6.1.3 Schedule of Sampling**

Given 48 sites, it is proposed that all sites be visited within two years (24 each year), and each site is returned to every two years, and each site is sampled a total of five times during the life of a 10 year program.

### **6.2 Selection of Indicators**

Monitoring is the periodic collection of qualitative and quantitative information and its analysis for comparison with baseline conditions, or to establish trends. In order to design a monitoring plan, it is necessary to define specific impact indicators that will be observed over the life of the monitoring exercise. Impact indicators are those that assess the effectiveness of a project in relation to its objectives. Negative and/or positive changes in these indicators will be taken as indicative of project, program or policy success or failure.

The indicators that will monitor a project's success in meeting its objectives have to be selected specifically on a project by project basis. Assuming, however, that the general objective of forestry and natural resource management projects will be to improve the sustainable management of the resource, Table 2 lists sample indicators that could measure progress towards that objective. These sample indicators are meant to provide examples of the types of indicators that can be measured by this IFRI-based monitoring plan. They are listed along with the data collection instruments through which information can be collected to monitor changes in those indicators.

In an actual project setting, a series of objectives would be stated, and these and/or other indicators would be articulated in order to measure the progress made in reaching those objectives.

**Table 2. Proposed Indicators.**

IFRI FORM	PROPOSED SAMPLE INDICATORS
1. Forest Form	<ol style="list-style-type: none"> <li>1. Changes in forest area.</li> <li>2. Changes in the species list.</li> <li>3. Alterations in the institutional rules and arrangements that govern use of and access to the forest, specifically types of penalties, types of fines, and use of fines.</li> </ol>
2. Forest Plot Form	<ol style="list-style-type: none"> <li>1. Plant species list for each sample plot.</li> <li>2. Number and types of trees within each plot.</li> <li>3. Tree sizes, both DBH and height.</li> <li>4. Soil types and changes in soil condition (e.g. soil erosion).</li> <li>5. Indications of forest disturbance.</li> </ol>
3. Settlement Form	<ol style="list-style-type: none"> <li>1. Changes in population density.</li> <li>2. Changes in settlement's economic status.</li> <li>3. Changes in the number of households located near the forest.</li> <li>4. Changes in the availability of close substitutes for forest products.</li> <li>5. Development of local organizations with mandates to manage and govern use of and access to the forest.</li> </ol>
4. User Group Form	<ol style="list-style-type: none"> <li>1. Changes in the nature and composition of the user group(s), including the changes in the number of groups.</li> <li>2. Increasing forest improvement activities by the user groups.</li> </ol>

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IFRI FORM	PROPOSED SAMPLE INDICATORS
5. Forest User Group Relationship Form	<ol style="list-style-type: none"> <li>1. Changes in the distance between the user group and where in the forest products are harvested.</li> <li>2. Changes in the items harvested and the amount of products harvested.</li> <li>3. Development of other sources of forest products.</li> <li>4. Increase in the percentage of user group needs met by the forest.</li> <li>5. Improvements in the forest condition as ranked by the user group(s).</li> <li>6. Improvements in members' attitudes to conservation.</li> <li>7. Improved resolution of conflicts within or between user group(s).</li> </ol>
6. Forest Products Form	<ol style="list-style-type: none"> <li>1. Changes in the items and quantities of products harvested.</li> <li>2. Changes in the end use of products.</li> <li>3. Changes in the quantities and prices of products sold.</li> <li>4. Improvements in the quantities available for subsistence.</li> <li>5. Increased availability of products.</li> <li>6. Changes in the cost of close forest product substitutes.</li> <li>7. Changes in the methods and tools used for harvesting.</li> <li>8. Changes in the development and enforcement of sets of rules and penalties regarding forest use.</li> </ol>

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IFRI FORM	PROPOSED SAMPLE INDICATORS
7. Forest Association Form	<ol style="list-style-type: none"> <li>1. Changes in nature and composition of forest association.</li> <li>2. Increase in association's forest improvement activities.</li> <li>3. Changes in association's rules, and their enforcement.</li> <li>4. Alterations in the nature, composition and authority of the association's executive.</li> <li>5. Increased commitment to the association.</li> <li>6. Changes in composition of staff and officials and the nature of their duties.</li> <li>7. Changes in amount and source of finances.</li> <li>8. Changes in association's objectives.</li> <li>9. Improved mechanisms for resolving internal conflicts.</li> </ol>
8. Governance Form	<ol style="list-style-type: none"> <li>1. Changes in number, nature and composition of organization(s) involved in forest governance.</li> <li>2. Changes in organizations' activities.</li> <li>3. Increased/decreased conflicts between governance organizations and user groups.</li> <li>4. Improved level of organizations' commitment to forest(s) and user group(s).</li> <li>5. Changes in amount, source and expenditure of finances.</li> </ol>
9. Organizational Inventory and Inter-Organizational Arrangements Form	<ol style="list-style-type: none"> <li>1. Changes in organizations' activities.</li> <li>2. Changes in relationships between organizations.</li> <li>3. Improved conflict resolution mechanisms.</li> </ol>
10. Site Overview Form	<ol style="list-style-type: none"> <li>1. Changes in basic site parameters.</li> <li>2. Changes in ethnic composition of the community.</li> <li>3. Increased local wage rates.</li> </ol>

### 6.3 Data collection

The basic monitoring activities are to be conducted through the completion of the IFRI data collection forms. Their specific functions are described on the forms themselves, and in the IFRI

Instruction Manual. Table 3 summarizes the types of information and data each form helps to collect.

**Table 3. Data Collection Forms and Information Collected.**

IFRI FORM	PURPOSE OF THE FORM; INFORMATION COLLECTED
Forest Form	<ul style="list-style-type: none"> <li>• Size of Forest</li> <li>• Forest Ownership</li> <li>• Products Harvested</li> <li>• Uses of Products</li> <li>• Forest Condition</li> </ul>
Forest Plot Form	<ul style="list-style-type: none"> <li>• Plant Identification</li> <li>• Plant Measurements</li> <li>• Plant Composition</li> <li>• Forest Structure</li> <li>• Forest Soils</li> </ul>
Settlement Form	<ul style="list-style-type: none"> <li>• Demographic Information</li> <li>• Markets</li> <li>• Administrative Centers</li> <li>• Geography</li> <li>• History</li> </ul>
User Group Form	<ul style="list-style-type: none"> <li>• Size, Socio-economic Status of User Group(s)</li> <li>• Homogeneity/Heterogeneity of User Group(s)</li> <li>• Shared Beliefs in the Group(s)</li> </ul>
Forest User Group Relationship Form	<ul style="list-style-type: none"> <li>• Products Harvested by User Group(s)</li> <li>• Product End Use(s)</li> <li>• User Groups Relationship to Forest</li> <li>• Relationship between User Groups</li> </ul>
Forest Products Form	<ul style="list-style-type: none"> <li>• Three Most Important Forest Products (as Defined by the User Group)</li> <li>• Uses of Products</li> <li>• Harvesting Patterns</li> <li>• Alternative Sources</li> <li>• Close Substitutes</li> <li>• Harvesting Tools and Techniques</li> <li>• Harvesting Rules and Penalties</li> </ul>
Forest Association Form	<ul style="list-style-type: none"> <li>• Forest Association(s)</li> <li>• Association's Activities, Rules, Structure and Membership</li> <li>• Record Keeping</li> </ul>

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IFRI FORM	PURPOSE OF THE FORM; INFORMATION COLLECTED
Governance Form	<ul style="list-style-type: none"> <li>• Organizations that make Rules Regarding a Forest(s) but do not Use the Forest</li> <li>• Structure, Personnel, Resource Mobilization and Record Keeping</li> <li>• Relationship of Organization to Forest User Group(s)</li> </ul>
Organizational Inventory and Inter-Organizational Arrangements Form	<ul style="list-style-type: none"> <li>• All Organizations (Harvesting or Not) that Govern a Forest, including Harvest and Governance)</li> </ul>
Site Overview Form	<ul style="list-style-type: none"> <li>• Site Overview</li> <li>• Team Leaders' Information</li> <li>• Units of Measurement</li> <li>• Exchange Rates</li> <li>• Policy and Legislation</li> </ul>

Data for this monitoring plan, and the methodology by which data are to be collected, can be divided into two categories. Data regarding the communities that use the forest, including economic, cultural, institutional, political and administrative information will be categorized as a social component. Data regarding the forest itself and the species within it will be categorized as a physical component. Specific data needs for each of the two categories of information are determined based upon the questions contained in the 10 data collection instruments.

### 6.3.1 Social Data Methodology

**Step 1:** An initial reconnaissance of the site is to be conducted. This one or two day reconnaissance allows for determining the boundaries of the forest, identification of the communities residing around it who represent potential user groups, preliminary introductions with those users, introduction to local government agencies (e.g. a District Forest Officer, the District Administrator, and the local political units), and acquisition of maps that describe the forest and the communities.

**Step 2:** Arrangements to be made for a village meeting. At this meeting, researchers will conduct several "participatory rural appraisal" type exercises in order to learn basic demographic information about the village, how they use and manage the forest and the resources within it, and with whom they interact in regard to the forest and its use. Most important among these, is an exercise whereby the residents draw a map that illustrates

their community and the forest and identifies basic infrastructure. Another important activity is to conduct a "walking tour" of the community (either at this stage or subsequently). Walking around the community provides a chance both to ground truth the map, and to engage in informal interviewing. One of the main purposes of the initial meeting is to identify what products are taken from the forest, and which user groups harvest those products.

**Step 3:** Having identified user groups, informal meetings will be arranged to learn more about the users, the products they use, and what rules they themselves impose or are imposed upon them to manage use of those forest products. Interviews should be conducted with those government organizations that are involved in governing and managing the forest resources, whether or not they are actually users of the forest.

**Step 4:** One or two days must be devoted to reviewing interview notes, having the monitoring team discuss them, completing data collection forms and identifying information gaps.

**Step 5:** One or two days is required for return interviews to fill data gaps and for final completion of data forms.

### **6.3.2 Forest Data Methodology**

To avoid the virtual impossibility of trying to measure and record information on all the herbs, trees and shrubs within a particular forest, this plan uses a random forest plot sampling method to collect forest data. By this method plant species, their sizes, densities and abundances, are to be sampled in at least 30 randomly selected forest plots.

Thirty plots are suggested because research shows that in small forests, the variation in measurement of a trait (for example, trees per plot) will reach a statistically acceptable level when 30 plots have been sampled. This system of random sampling greatly reduces the time required to collect statistically valid physical data about the forest, which can then be used to calculate biodiversity, estimate the availability of local forest products, or to evaluate the forest for either conservation or utilization purposes.

Collection of forest data is described in detail on the Forest Plot Form, one of which is required for each of the 30 plots.

**Step 1:** With the assistance of the community, owner(s) of the forest, official maps provided by Forest Department and perhaps by walking and measuring boundaries, prepare a map of the forest.

**Step 2:** Overlay a grid on the map and designate a set of 30 random x-y coordinates as locations of forest plots. These

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coordinates are selected by using random number table (see the instruction manual and Forest Plot Form for details).

**Step 3:** Team(s) of three (a monitoring team member, one forest technician skilled in the identification of local plant species, and a laborer) begin the forest plot data collection by locating the plot sites in the forest using compasses and a partial grid system to guide them.

**Step 4:** Once the center of a plot is located, three concentric circles are marked. In the first circle (one meter radius), the amount of ground covered by herbs and seedlings is estimated and those species are identified and noted on the Forest Plot Form. In the next circle (three meter radius) shrubs and tree saplings are identified, and their heights and stem diameters measured. (Saplings are defined as young trees with a maximum stem diameter greater than 2.5 centimeters, but less than 10 centimeters). Trees are identified and measured (diameter at breast height -- DBH -- and height) in the third circle which has a radius of 10 meters. DBH is usually measured at 1.4 meters from the ground. DBH can be measured with tree calipers or a diameter-tape.

## **7. DATA ANALYSIS AND REPORTS**

By taking these measures in a systematic manner for a sample of forests and doing so every second year, useful information will be collected about:

- i) Sustainability of the forest(s);
- ii) Changes (and their causes, whether they be policy, program and/or naturally induced changes) in biodiversity, disturbance, and forest structure over time;
- iii) Effect of population on the sustainability of the forest(s);
- iv) The effects of markets on the use of the forest(s);
- v) Effects of institutional incentives on sustainability;
- vi) The quantity and total value of the products harvested with time; and,
- vii) The effect of forest improvement activities on the quality of the forest.

These will be among the important variables used for analysis, and they are incorporated within the IFRI database structure. The initial site study will form the baseline study as well. The data from subsequent studies will be used to monitor the changes

over time in the way the user group relates to the forest, in the types and the amount of products harvested, in the uses made of the forest products, in the harvesting tools and techniques and in the methods used by the group members to monitor or improve the forest.

Data collected about the trees in the sample plots and the level of human disturbance on the plots will be compiled to assess the physical and biological conditions of the forest. It will be assumed that disturbances measure current use, while structure and biodiversity of the forests reflect both past and present use patterns. Biodiversity in the forest will be estimated by  $ds$ , an inversion of Simpson's dominance index given by:

$$ds = N(N-1)/\text{sum of } ni (ni-1)$$

The distribution of size classes (DBH), total basal area and Importance Values (IV) of trees will be calculated. Importance value is a unitless score that can be used to rank dominance of each tree species. IV combines relative density, relative dominance (basal area), and relative frequency for each species.

The impact of alternative institutional arrangements involved in the provision and production of forest goods and services will be evaluated. In particular the impact will be assessed by analyzing (a) who bears the costs of provision and production of forest goods and services, (b) how benefits are distributed among user groups, (c) the accountability to the user groups concerning the developments and use of forests by the officials concerned, (d) the ability of institutional arrangements to respond to ever changing environmental demands (adaptability).

Total amounts of forest products harvested, their market prices and the total value obtained will be determined. Standard statistical procedures will be used to assess whether there are significant differences across sites and over time.

The effects, if any, of the forest improvement activities, such as tree planting, boundary and fire line maintenance, will be reflected in changes in the forester's appraisal of the condition of the forest on subsequent visits.

Preliminary reports can be provided to officials and forest users interested in each of the forests studied. A series of policy reports will be issued each year documenting the current conditions of the forests in different agro-ecological zones.

At the end of the first two years of the monitoring program, a detailed study report will be made and issued to the donors, government, and to the IFRI headquarters.

## Expected Results

The physical condition of the forest(s) is likely to reflect local rules in use, incentives, and the actions taken by the forest users towards the forest(s) under different institutional arrangements.

The monitoring plan will also allow for analysis of:

1. The changes, if any, in biodiversity.
2. Relative availability and cost of forest products with time.
3. Effects of introduced technologies on sustainability of the forest.

In addition to the major policy and research products of this monitoring program, several important additional products will be generated. These include:

1. A list of forests in Uganda;
2. A species check list;
3. A species use list; and,
4. Up to date information on distribution and abundance of plant species that may be endangered or assumed extinct.

## **8. IMPACT OF THE MONITORING PROGRAM**

This program will greatly enhance the accuracy and extent of information about forest conditions, rates of deforestation, biological diversity, and the effects of various types of institutional arrangements on forest conditions in Uganda. Given the general absence of reliable and extensive data on these essential factors, it will lead to a clear understanding of how various institutional arrangements affect incentives forest users face, and how forest users relate to the forest(s). This information will be used by researchers and scholars to make more quantitative models of sustainability of forests.

It will be used by policy makers in helping to frame future forest and land use policies. It will also be used for teaching both at graduate and undergraduate levels, and in-service training of professional and technical staff. With better understanding of how institutional arrangements affect incentives facing forest users, policy makers in the area of environmental management will be able to make informed policies for sustainable management of forest resources in the country.

The methodology developed in this program could be used as a guideline for NEAP or the proposed Environment Management Authority to carry out monitoring activities in other environment related areas such as wetlands, rangelands and water resources of the country.

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**APPENDIX 3**

**'RAINING SYLLABUS**

## TRAINING PROGRAM SYLLABUS (SAMPLE)

### **Day 1**

9:00 to 10:00                    Introductions

10:30 to 12:00                Broad Research Questions Underlying IFRI  
Research Program

12:00 to 1:30                    Lunch Break

1:30 to 3:30                    Forest Forms:  
Forest Form and Forest Plot Form

4:00 to 5:00                    Forest Plotting Techniques (practicum)

### **Day 2**

9:00 to 12:00                People and their Relationships to  
Forests Forms:  
Settlement Form, User Group Relationship  
Form, Forest-User Group Form

12:00 to 1:30                    Lunch Break

1:30 to 3:30                    Types of Sites and Configurations of  
Forests, Settlements, and User Groups

4:00 to 5:00                    Forest Product Form

### **Day 3**

9:00 to 12:00                Rules Relating People and Forests Forms:  
Forest Association Form, Governance Form

12:00 to 1:30                    Lunch Break

1:30 to 2:30                    Relational Databases

2:30 to 3:30                    Organizational and Inter-Organizational  
Relationship Form; Site Overview Form

3:45 to 5:00                    Discussion of Field Work Plans and  
Schedule

### **Day 4**

8:00 to 12:00                Site work - forest plotting (first site  
as a large group, and then break into  
smaller groups to do additional plots)

12:00 to 1:30                    Lunch Break

1:30 to 5:00                    Initial, large group community meeting

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**Day 5**

8:00 to 5:00

Full Day in Field - Continuation of Forest Plotting; Scheduled User Group Meetings; Scheduled Governance Meetings

**Day 6**

8:00 to 5:00

Full Day in Field - Continuation of Forest Plotting; Scheduled User Group Meetings; Scheduled Governance Meetings

**Day 7**

R and R

**Day 8**

8:00 to 5:00

Full Day at Training Site - Review field work to date; review data and information collected; begin to fill-in forms and identify information gaps

**Day 9**

8:00 to 12:00

Half Day at Training Site - Review field work to date; review data and information collected; begin to fill-in forms and identify information gaps; begin drafting field reports

1:30 to 5:00

Half Day in Field - interviews to complete data requirements

**Day 10**

8:00 to 12:00

Half Day at Training Site - Complete forms; complete first draft field reports

1:30 to 5:00

Half Day in Field - Reporting to users and others associated with governance of the forest

**Day 11**

8:00 to 5:00

Final review of all data; review and evaluation of training; final preparation of field reports; discussion of future research directions