

**MINISTRY OF TOURISM, ENVIRONMENT AND NATURAL
RESOURCES
FORESTRY DEPARTMENT**

**TRAINING WORKSHOP REPORT ON INTEGRATED LAND USE
ASSESSMENT PROJECT HELD AT BALUBA MOTEL, LUANSHYA
FROM 1ST TO 5TH DECEMBER, 2003**

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ACRONYMS

FAO	=	Food and Agriculture Organization
ILUA		Integrated Land Use Assessment
NGO	=	None Governmental Organization
PSRP	=	Public Service Reform Programme
YM	=	Ylva Melin
MS	=	Mats Sandewall
US	=	Ulf Soderberg
AB	=	Able Siampale
CP	=	Charlton Phiri
APM	=	Area production Model
FRA	=	Forest Resource Assessment
UNFCCC	=	United Nation's Framework Conventions on Climate Change
HA	=	Hectare
M	=	Meter
ZFD	=	Zambia Forestry Department
ZESCO	=	Zambia Electricity Supply Cooperation
ZDS	=	Zambia Survey Department
IUCN	=	International Union Conservation Network
GMA	=	Game Management area
ZAFFICO	=	Zambia Forests and Forestry Industry Cooperation
PFA	=	Protected Forest Area
GPS	=	Geographical Positioning System
GIS	=	Geographical Information System
NFA	=	National Forest Assessment
IPC	=	International Protocol on Conventions
NFI	=	National Forest Inventory
MTENR	=	Ministry of Tourism Environment and Natural Resources
IM	=	Information Management
DBH	=	Diameter at Breast Height

1.0 INTRODUCTION AND BACKGROUND

The Government of the Republic of Zambia through the Ministry of Tourism, Environment and Natural Resources (MTENR) has received financial and technical support from the Food and Agriculture Organization (FAO) of the United Nations to develop an integrated Land Use system that provides information to national and international users of natural and other resources, to design plan and implement policies, to improve administration system and support and motivate investment in the different sectors of the country.

The main purpose of the project is to improve the capacities of institutions in planning and implementing the integrated land use resource assessment, generating high quality information at reasonable cost and conducting long term monitoring of resources. In implementing this programme, the social, economic and environmental functions of the forests and trees within the land use system that is affected or affecting these resources will be taken into consideration.

The project's immediate objectives are as follows:

- Assist Land Use Institutions in developing and strengthening capacity to collect, compile, process and disseminate reliable and up to date information on land Use to Policy makers, through training of national, provincial and district staff in land Use assessments in line with new concepts and integrated approaches.
- Assist land Use Institutions in planning and carrying out pilot national land use assessments, develop up date and sound baseline information and set up a long term resource monitoring system

The assessment will cover a large array of biophysical and socio-economic variables with emphasis on the management and use of resources.

One of the main strategies to achieve the two objectives above is to conduct capacity building through training of selected staff from Key stakeholders in integrated land use assessment. Therefore, the Forestry Department planned to undertake three training workshops; the first one was the being held from 1st to 5th December 2003.

The objectives of the training workshop were fourfold:

- To give an overview and understanding for the methodology and process involved;
- To impart skills in Integrated Land Use Assessment which will lead to ability to plan and supervise the Integrated Land Use Assessment Project;
- To enable participants in the long run to be able to manage and conduct a project of this kind in the country;

- To get valuable opinions from the participants on how the Integrated Land Use can be planned, organized and implemented in Zambia in the cost effective way.

This report therefore, highlights the proceedings of the workshop that include highlights of topics presented, group work presentation, the way forward and conclusion.

2.0 OFFICIAL OPENING

2.1 Opening Remarks By the National Consultant of ILUA

The Chairperson – Principle Extension Officer- Copperbelt called the meeting to order and called upon the Project Consultant to give his opening remarks

The Consultant Mr. David Nkhata informed the participants to the Training Workshop at Baluba Motel that the Integrated Land Use Assessments (ILUA) project was initiated by the Forestry Department after realizing that information for decision making, policy formulation, local and international reporting was lacking, hence, the need to have up to date information. Therefore, the Government through the Ministry of Tourism, Environment and Natural Resources, Forestry Department, requested the FAO for, Technical and Financial assistance to develop an Integrated Land Use Assessment project that was to address the lack of up to date data on Land use and at the same time build capacity of the major stakeholders who will be involved in the collection of information on Land Use in the country.

The Consultant informed the workshop participants that the main purpose of the integrated land use assessment project was to improve the capacities of institutions in planning and implementation of the Integrated Land Use Assessment, generating high quality information at reasonable cost and conducting long term monitoring of the resources. He noted that in order to achieve the objective, the strategy adopted was to sub-divide the project into three phases. The first phase was a preparatory phase that included designing of the plan and training of the national teams that will be responsible for training and supervision of field crews. The second phase was carrying out assessments in selected areas through out the country and analysis of the data collected. The last phase was reporting of the results and deciding the way forward.

The Consultant reported that he was therefore happy to see that since the inception of the project in August 2003 a lot of progress had been made. The plan for implementing the Integrated Land Use Assessment had been prepared and submitted to FAO for funding, all stakeholders have been informed about the project, a Technical Steering Committee had been formed and has so far held its first meeting, Training Needs Assessments have been carried out and the first training was the one being held that day, and was to last for five days.

He went on to say that the Training workshop had drawn 43 participants from government ministries involved in land use, the private sector, and NGOs. The Swedish University, Department of Forest Resource Management and Geomatics were facilitating the training. He stated that it was hoped that those who will be trained in the first and second training sessions would train others (the field crew teams) in the third training. Thus the first and second trainings that were to be conducted was meant to come up with a National Team

In closing, the Consultant said that it was his hope that by the end of the training, participants would have achieved the stated objectives and a Team of Trainers formed.

2.2 Remarks by the Acting Director of Forestry

The Chairperson then called upon the Acting Director of Forestry to briefly address the participants. The Acting Director of Forestry welcomed the participants to the workshop and thanked them for responding favourably to the invitation. Special thanks also went to the training workshop Facilitators from Swedish University. He was very encouraged by the response and attendance from the invited stakeholders, which was a testimony of the importance that they attached to the training workshop.

The Acting Director of Forestry stated that Forest policies have a direct impact on all sectors. Therefore, for the country to solve problems that affect the wellbeing of the people, it required a coordinated effort by all stakeholders. He said he was aware that the Government has embarked upon a number of initiatives that were aimed at bringing about effective collaboration for economic development and he strongly believed that forestry could provide such an entry point. Projects such as ILUA could help in poverty alleviation because it was going to impact on all sectors. Therefore, the training workshop that was being attended by various stakeholders was a demonstration of the kind of spirit that the Forestry Department wants to promote in order to foster development in the nation.

Lastly, he wished all the participants a successful training workshop.

2.3 Key Note Address by the Guest of Honour, Director of Human Resources and Administration, Ministry of Tourism, Environment and Natural Resources

The Guest of honour welcomed the participants and Facilitators to the first training workshop for the Integrated Land Use Assessment project. She stated to the workshop participants that Zambia is well endowed in natural resources, with a forest cover of approximately 60% of the total land area. She said that natural resources are vital for economic and social development of the local population and the country in general. She further went on to say that it was as a result of this that the Government has given the Forestry sector priority in the Poverty Reduction Strategy Paper (PSRP). The Guest of Honour however observed that despite this great potential, Zambia's forest resources have continued to decline both in quality and quantity due to a combination of factors such as shifting cultivation and increased demand for wood based energy such as charcoal and firewood.

She observed that the deforestation rate as a result of some of the above stated factors, have reached alarming proportions. She bemoaned that whilst recognising that natural resources are on the decline, it was, however, sad to note that we, as a country, lack both

the technical and financial capacity to determine the extent of decline. This is because we do not have an up-to-date information base on land use as well as on the environment, considering that the last national inventory was carried out 39 years ago. This kind of situation makes planning, decision -making, policy formulation and monitoring of natural resources very difficult. She went on to say that it was thus the desire of her Ministry to develop a system that will provide information to national and international users of natural and other related resources, through the design, planning and implementation of policies, which will improve the administration system and support investment in different sectors in the country.

Capacity building was, therefore, needed in form of training of staff involved in integrated land use. In addition, the nation needed information that is related to the state and quality of natural and other resources in the country and the existing products destined for national and international markets. There was need also to design national policies and strategies for sustainable use and conservation of natural ecosystems and understand the relationship between resources and users of the resources.

It was in this regard that her Ministry requested the Food and Agricultural Organisation (FAO) which has vast experience in carrying out such assessments to assist the Zambian Government, both financially and technically, to carry out integrated land use and through an agreement with the Swedish University build capacity of national staff involved in integrated land use assessment.

She noted that this technical assistance comprises mainly the following:

- Building capacity in the Forestry Department and other related land use sectors such as agriculture, wildlife and water;
- Developing methodology to carry out Integrated Land Use Assessment through-out the country; and
- Establishing an information database system that will be used for planning, decision -making, policy formulation and reporting at both national and international levels.

The Guest of Honour said she was made to understand that the first National Awareness Workshop, which was held in October 2003 in Kabwe, came up with the methodology of carrying out the Integrated Land Use Assessment and also agreed that the next stage would be to train stakeholders in how to carry out the assessments. To that effect she was happy, therefore, to note that things were moving as planned in that within one month of that workshop, the training of stakeholders had commenced.

She went on to say that she was reliably informed that the training that the participants were to undergo has been organized in three phases. The main aim of such a training arrangement was to come up with a national team that will be responsible for training and supervising crew teams in carrying out assessments throughout the country.

It was therefore her sincere hope, that sustainability will be maintained so that assessments will be carried out successfully and will achieve the aspirations of the Zambian Government. She appealed to the participants to work very hard in the next five days to ensure that they acquire the skills needed in carrying out integrated land use assessments.

The Guest of Honour expressed her sincere gratitude to FAO and the Swedish University for the financial and technical assistance rendered to her Ministry. She was also grateful to the line ministries involved in land use for their co-operation in working together and carrying out the assessments.

Having said that she declared the training workshop officially opened.

3.0 COURSE CONTENTS (TOPICS COVERED)

- Introduction to ILUA – Ylva Melin (YM)
- Area Production Model (APM) – Mats Sandewall (MS)
- Introduction to forest/land use classification systems (MS & YM)
- Organization and Implementation of ILUA – (YM)
- Organization and Implementation, the Swedish Case
- Classification of Forestry system in Zambia – Abel Siampale (AB)
- Classification of Agriculture systems in Zambia – Charlton Phiri (CP)
- Establishment and Use of Permanent sample plots – Ulf Soderberg (US)
- Data Collection through Interviews – (MS)
- Remote Sensing – (YM & MS)
- Observation and Measurements – (MS & US)
- User Guide to the Area Production Model, APM Version 2.0 for WINDOWS 95 AND Windows NT
- Scenarios, Computer exercise with the Area Production Model – (YM)
- Information Management and Data Registration – (YM)
- Information Management and Data Registration – Swedish Case (US)

4.0 TOPIC PRESENTATION

4.1 Introduction to ILUA – Ylva Melin (YM)

The facilitator Ms Ylva Melin was the first person to open the workshop topic presentation by first giving to the participants the background and purpose of the Integrated Land Use Assessment in Zambia.

She said that her institution – Swedish University of Agricultural Sciences in the Department of Forest resource Management and Geomatics is responsible for National Forest Inventories in Sweden. The Department does carryout remote sensing, Biometrics, management planning, Forest resource analysis and environmental monitoring. To this regard the Department has gained vast experience and have thus been involved in International forest resource assessment in Laos, Vietnam, Ethiopia, Botswana, Burkina Faso, and have contributed expert personnel in Tanzania and now the were involved in capacity building in Zambia.

She explained that their role as Swedish University of Agricultural Sciences in the Integrated Land Use Assessment in Zambia was to assist in training, advisory, exchange of experiences and knowledge. She informed the participants that the planned training to be provided for capacity building was divided into three modules. The first training session that was taking place starting that day was for a Technical Team, targeting planning and supervising officers from different ministries, departments and institutions. The participants were to be taken through a number of topics and group exercises aimed at achieving the set objectives of the training workshop and at the end of the workshop various expectations of the participants would have been met.

The second and third training sessions scheduled for March to April 2004 will target the national Technical Team and Field Team Leaders respectively before the commencement of countrywide field assessment.

The Facilitator explained what the Forest Resource Assessment (FRA) programme was. She said FRA programme was a Technical unit within the Forest resource division at the Forestry Department, FAO headquarters. The unit is responsible for such components as Global assessment and also gives support to various national assessments. The objectives for support to National Assessment arise out of the fact that:

- Many countries often lack resources to carry out assessments;
- National policies often not well supported;
- International reporting demanding;
- Promoting multilateral co-operation and international partnerships for forest resources monitoring

The Facilitator told the participants that FRA team observations and conclusions from FRA 2000 was that:

- Basic facts are still missing or inaccurate for most countries and therefore country participation in FRA was the key to success;
- Information requirements are high and complex and cannot be satisfactorily met;
- There was little systematic information about the world's forests;
- Remote sensing is oversold;
- Field inventories were the way forward

Therefore FRA 2005 will be based on this new approach, and the three pilot countries are Cameroon, Guatemala and Philippines.

She explained that during the ILUA workshop held Kabwe from 14 – 16 October 2003, the situation in Zambia today can be summarized as follows:

- Zambia is rich in natural resources and the resources have potential to contribute positively to poverty reduction and economic development
- However, the natural resources are on the decline due to deforestation and unsustainable utilization of the resources
- Information on land use resources is lacking, making planning and decision-making difficult
- Capacity building is needed in ILUA

The Goal of the ILUA in Zambia is to provide background information for policy development and evaluation in relation to forestry and land use issues for example making of new legislation, initiation of certain programmes, e.g. To ensure fuel wood availability at national level, and for the purpose of international reporting (FAO/FRA, UNFCCC, etc). She said at Sub-national level ILUA's goal would be for provincial adjustment of national level policy and also as basis for initiation of sub-national programmes, e.g. clearing of forest areas for agricultural production.

4.2 Area Production Model (APM) – Mats Sandewall (MS)

The highlights of the topic presentation by the Facilitator were given as thus:

Introduction

The Facilitator explained that the APM is an aid to strategic planning of land use and forestry. It is a deterministic model. It estimates land use changes, but does not put these changes on map. It is not detailed enough to facilitate operational planning.

He said the APM deals with topics such as:

- Land use changes
- Agriculture production
- Bio mass energy balances – forest degradation
- Forest plantation
- Forest production

Basic planning concepts The highlights of the topic presentation by the Facilitator were given as thus:

The Facilitator explained that planning in a developing country environment is challenging, because the entire society is often in transition. Often there is a high pressure on the primary production, where an optimal solution is desired, not only to save money, but as often to save the environment. Planning to a great extent is to shape the future and therefore implies a process that guides our actions to the results we most desire

Levels of planning

In modern planning theory, planning is divided into three levels, or types of planning

- Strategic planning
- Tactical planning
- Operational planning

Each level has its own scope in terms of time perspective, area coverage, and thematic content. The perspective narrows down when moving from strategic planning towards operational.

Static and dynamic land use plans

The Facilitator explained that most countries have some form of land use plan, basically consisting of maps with delineated areas of different land use classes such as

- Agriculture land
- Grazing land
- Environmental (protective) forest land
- Farm forest land
- Etc.

He explained that such information should be considered as land use *plan* if the land use is stable, as it is in some industrialized countries. However, in most developing countries, the land use is changing at a fast rate. To handle this situation, there are two main approaches:

- i. *Making static land use plans*
- ii. *Making dynamic land use plans*

With the current rate of deforestation in many developing countries it implies that a *dynamic* land use planning approach is needed. Therefore the Area Production Model (APM) is a tool for this work. By using the dynamic approach, *simulating the future instead of waiting for it*, will be one step ahead of development. This creates a chance to influence the development and turn it in desired direction.

Integrated land use planning

The Facilitator explained that the long term planning of land use, agriculture and forestry requires integrated planning, coordinating different demands on the land, and therefore should not be left to a single government agency since forestry interacts with agriculture and other land uses.

The institutional frame for integrated land use planning may vary from country to country. A special agency may be responsible for coordinating the competing demands on the land. Alternatively, cooperation between forestry and agriculture authorities etc. can provide the basis for integrated land use planning. However, the coordinating function must be present, otherwise long term planning of land use and area production will not be very meaningful activity.

Modeling

The Facilitator explained that it is often difficult to pinpoint important factors in a complex reality, especially when there are many factors affecting the issue, or when results of future trends need to be approximated in order to make the right decision today. This is very true in forestry for example establishment of a plantation to supply fuel wood. It makes limited sense in establishing a high yielding plantation in an area without taking into consideration the current and future fuel wood needs. In case of fuel wood shortage in the area, the plantation is likely to be affected.

Therefore, there is need to use a tool that is capable of giving us some hints of what is likely to happen in the future, given the trends and developments we can foresee already today. Modelling is such a tool, often used in modern planning.

4.3 Introduction to forest/land use classification systems (MS & YM)

The highlights of topic presentation were

Introduction

This paper reflects considerable effort made to develop common terms and definitions that can be applied to forest resource assessment. The process began in Kotka III meeting, where a preliminary set of definitions was reviewed and edited by 32 experts from both the Developing and industrialized countries; and continued in the Team of Specialists meetings intended to harmonize definitions at the global level. In some cases compromises between, or adjustments of existing terms has been necessary.

Land Classifications

i. Land cover

The Facilitator gave the General classification saying an hierarchic scheme has been defined for classification of land cover. The scheme focuses on *forest* and *other wooded land* and does not distinguish sub-classes within, for instance, agricultural land. The general classification is defined below

<u>Land cover class</u>	<u>Definition</u>
Total area	Total area (of country), including area under inland water bodies, but excluding offshore territorial waters.
Forest	<p>Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity <i>in situ</i>. May <u>consist</u> either of closed forest formation where trees of various storeys and undergrowth cover a high proportion of the ground; <u>or</u> open forest formation with a continuous vegetation cover in which tree crown cover exceeds 10 percent. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 10 percent or tree height of 5 meters are included under forests, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest.</p> <p><u>Includes:</u> forest nurseries and seed orchards that constitute an integral part of the forest; forest roads, cleared tracts; firebreaks and other small open areas; forests in national parks, nature reserves and other protected areas such as those of specific scientific, historical, cultural or spiritual interest; windbreaks and shelterbelts of trees with an area of more than 0.5 ha and width of more than 20m; plantations primarily used for forestry purposes, including rubberwood plantations and cork oak stands.</p> <p><u>Excludes:</u> Land predominantly used for agricultural practices</p>

Other wooded land Land either with a crown cover (or equivalent stocking level) of 5 - 10 percent of trees able to reach a height of 5 m maturity *in situ*; or a crown cover (or equivalent stocking level) of more than 10 percent of trees not able to reach a height of 5 m at maturity *in situ* (e.g. dwarf or stunted trees); or with shrubs or bush cover of more than 10 percent

Other land Land not classified as forest or other wooded land as defined above. Includes agricultural land, meadows and pastures, built-on areas, barren land, etc.

Inland water Area occupied by major rivers, lakes and reservoirs.

He said that it is important to note that the definition of forest applied in FRA 2000 has a minimum crown cover requirement and may be quite different from a legal definition of forest (or forest land) (i.e. legal definitions may designate an area to be forest under a Forest Act or Ordinance without regard to the presence of forest cover.

The Facilitator explained that the general forest definition above refers both to natural forests and forest plantations. However, area statistics on forest plantations provided by countries should reflect the actual forest plantations resources, excluding replanting, because this is not an addition to total plantation area.

Natural forests are forests composed of indigenous trees and are not planted by man. In other words excludes plantations. He said that natural forests are further classified using the following criteria:

- forest formation (or type): closed/open
- degree of human disturbance or modification
- species composition

The Facilitator went further to elaborate the subdivisions of natural forests according to Forest formation: Closed/Open. He explained that the division between *closed* and *open forests* is more ecological (referring to climax vegetation of a particular location), than current physiognomic features, thus not characterized only by the percentage crown cover.

He explained that the FRA 2000 forest classification has the primary objective to allow standardized and comparable reporting on the world's forest and is not meant to replace existing national classifications. National inventories and the terms and definitions used by them have specific purposes and are geared to suit the country's ecological setting and/or functions and the use of the forests. Therefore in order to make the 2000 assessment process transparent, the country's classification and its relationship to the FRA 2000 classification will be reported.

The FRA 2000 will attempt to report not only on the quantity of forest but also on the condition of forests. The latter aspect will be reflected in the distinction between undisturbed natural forest, disturbed natural forest and semi-natural forest.

5.0 GROUP WORK No. 1: CLASSIFICATION SYSTEMS PLENARY SESSION

This section presents the group discussion on the Classification systems of different land uses in Zambia comparing to those of FRA/FAO classification system as they were presented to the plenary session. There were eight exercise questions and thus eight groups, each group dealing with a different question on the classification systems. The objective of the exercise was to harmonize the FRA/FAO classification system with the systems used in Zambia. The way the groups presented their findings varied from one to another. This is reflected in the layout and contents of each presentation

Group 1: Forest – Scrutinize the different forest classes of the Zambian system and consider how each class can be classified according to FRA.

FOREST CLASSES	
FRA	ZFD
Closed Forest	Closed Forests
Open Forest	Open Forests
Other Wooded Land ➤ Dwarf or stunted trees or shrubs	Termitaria & Bushes
Criteria: ➤ 0.5ha	?
➤ ≥ 5m height of trees	?
➤ > 10% crown cover	19% crown cover
<p>Comments: Zambia should</p> <ul style="list-style-type: none"> ➤ set their minimum area of classification to 0.5ha ➤ maintain minimum tree height of 5m ➤ for reporting purposes 10% crown cover should be used ➤ termitaria and bushes should be reclassified as other wooded land for FRA purposes 	

Salient Issues from the Presentation

- The major concern that arose from this presentation was, how can the forest land Classifications under FAO be fitted or harmonized with the Zambian Forestry Department, Forest Land classification.

It was agreed that when reporting, the report should be adopted to the requirements of the Institution i.e. FAO or Zambian.

Group 2: Other wooded land – Analyze what existing classes in the Zambian system would be classified as other wooded land according to FRA.

Analysis:

By Zambian classification system it would be classified as “No Forest Area” which ranges from 0 – 19% crown cover. The classification is characterized by the following:

- Grasslands
- Individual Trees
- Dambo areas with isolated trees
- Plains with isolated shrubs
- In certain cases wetlands are included

Characteristics of a wooded land according to FAO classification:

- Crown cover of 5 – 10%
- Tree height of about 5m at maturity

Characteristics attributes are:

- Shrubs: generally woody plants which grow from 0.5 – 5m height
- Fallow: woody vegetation under 5m height derived from clearing of original forest
- Wooded grasslands: trees cover between 5 – 10% of the area and height may reach 5m at maturity

Salient Issues from the Presentation

- No comment

Group 3: Other land/Natural (Barren land, Grassland, Marshland) - Analyze what existing classes in the Zambian system would be classified as Other Land/Natural according to FRA

Existing Classes in Zambia:

- I. Swamps
- II. National Game Parks
- III. National Heritage sites (e.g. Fossil forests)
- IV. Copper mining areas
- V. Game Ranching areas
- VI. Eco-tourism areas
- VII. Quarry Mining areas
- VIII. ZESCO Pylon areas
- IX. Mountain Ranges
- X. Natural Fallows

Other Land/Natural (Barren land, Grassland, Marshland)

Salient Issues from the Presentation

- No comment

Group 4: Other land/Cultivated land (Annual crop, Perennial crop, Pastures) - Analyse what existing classes in the Zambian system would be classified as Other land/Cultivated land according to FRA

Cultivated Land/Arable Land

1. Upland
 - Perennial - Permanent
- Shifting
 - Annual - Permanent
- Shifting
2. Wetland
 - Flood plains
 - Dambos
3. Pastures
4. Marginal - Hilly
- Deep sands

Salient Issues from the Presentation

- The participants wanted to know what is considered as shifting cultivation. Does the area presently being cultivated considered or is it the area which is under fallow.

Group 5: Other land/Built up area - Analyze what existing classes in the Zambian system would be classified as ‘Other’ land/Built up area according to FRA

In the Zambian classification systems (Land classification system) the “other land/built up areas” can be referred to as:

- Peri-urban (Municipalities)
- Urban (cities, settlement or industries)
- Titled land (Commercial farms)

Salient Issues from the Presentation

- The participants observed that the group should have defined what the ‘built’ area was, before they state what these areas are:

Group 6: Protected areas – Is it possible to apply the IUCN categories for nature protection in Zambia.

Yes it is very possible to apply the IUCN categories for nature protection in Zambia. In Zambia there are several categories of protected areas namely:

- Gazetted Forest Estates (Forest Reserves)
- National Parks
- Game Management Areas (GMAs)
- National Heritage Sites (Monuments)
- Bird Sanctuary

Salient Issues from the Presentation

- It was observed that IUCN definitions of protected areas, are not different from the Zambian situation. However, there are some differences in forest classification between IUCN and Zambia in that the forests are classified the way they are by law.

Group 7: Land ownership – Is the FRA land ownership classification applicable in Zambia

Yes, the FRA Land ownership classification is applicable in Zambia. For example:

- State/Public ownership – belongs to state or other public bodies (National & Local Forests)
- Private ownership – titled land owned by individuals, families, companies or cooperatives (Plantations, Game Ranches, Farms)
- Owned by indigenous and tribal people – Customary Land under the jurisdiction of traditional rulers in independence countries like Zambia.
- Owned by industries (Plantations)
- Owned by other Private Institutions (Cooperatives, Religious, Educational bodies)
- Owned by other Public institutions (Local Authorities)

Salient Issues from the Presentation

Two comments arose from this presentation

- Class 4 ZAFFICO does not own land. All plantation is on state land
- The kind of land categories specified under FRA, do they exist in Zambia?

Group 8: Forest area available for wood supply – Is the classification for forest area available for wood supply applicable in Zambia

Yes, Zambia has forest areas for wood supply. These are:

- Protected Forest Areas (PFAs)
- Forest Reserves
- Open Areas (customary)

Access to forest products is by

- Licenses
 - Casual Licences for domestic use
 - Commercial licences (i.e. commercial use)
- Free Collections

Salient Issues from the Presentation

- The participants wanted to know the definition of a forest reserve. Whether Local and National Forests can be called forest reserves?

6.0 TOPIC PRESENTATION

6.1 Organizations and Implementation of ILUA – (YM)

The Facilitator stated that the objective of this topic presentation was to describe and discuss different options for setting up the organization of an NFA, and to point out key issues for implementing the activities. He said that the presentation was based mainly on their own experiences and discussions with colleagues in other countries where similar activities have been undertaken.

Introduction, National Forest Assessment (NFA)

National Forest Assessments (NFAs) provide data for analyses of sustainable forestry and land use within a country, which are used as a basis for policies and strategies on management and conservation of natural resources. NFA also generate data for reporting in accordance with national and international agreements and conventions like FAO's Forest Resource Assessments and the United Nation's Framework Conventions on Climate Change (IPC 1996). In addition, NFAs often provide valuable data for research on issues related to sustainable forestry.

The success of NFA in a country depends on many factors

- Stakeholders within the country should perceive a need for data about forests and other resources in order to analyze different options regarding adequate land use or preservation of nature. This an important basic requirement
- How the NFA organization is set up and how it implements the NFA
 - It is important to establish links between the NFA organization and the user of information during the planning stage of NFA
 - It is also crucial to develop and maintain the correct mix of competences for implementing the NFA

NFA Organization

The Facilitator emphasized that there was no simple and clear cut answer to the question *how* and NFA should be organized in a country. However he pointed out that the NFA should operational over a longer period of time, and thus needs the establishment of a permanent organization. He said in the case that the NFA is only carried out within a shorter period, consultants may be hired to conduct the assessment. NFA organizational issues assumes that the organization be responsible for both data acquisition and analyses. This is often a suitable arrangement, where people that use the data also have the chance to oversee the procedures used for acquiring them, and thus gain insight into data quality issues, which are important for correct interpretation of results.

He went on to explain the role of the NFA, which is the provision of national level data, and sub-national data valid for larger areas. Whilst, the acquisition of local level data should be the task of other government bodies, forest owners or contractors.

He explained that in many cases a simple and straightforward design approach is favoured over a complex but theoretically efficient design. Thus, the organization of the NFA and the competence level of people likely to work with the NFA need to be considered during the design phase.

The Facilitator pointed out another important design issue which concerns whether or not NFA should be carried out continuously (i.e. every year), averaging data over several years when estimating the current state of some feature, or if the NFA should be carried out only at certain intervals in time. He said that from the organizational point of view, there are many arguments that favour a continuous approach. On the other hand there may be drawbacks in running a continuous inventory as well. One example is the increased difficult of implementing changes in the NFA. There is of course also an aspect of costs and priorities. He said in many developing countries, for example, the issue is simply a matter of doing the best possible work within given project resources and time.

The Facilitator outlined the key issues in establishing an NFA organization as being

- Links to users of data and information
- Links to competence within the fields of resource assessment and modeling
- The NFA organization needs and adequate mix of competences to work well

Components of the NFA organization

The Facilitator elaborated on what structural components are important within an NFA organization, assuming that the data acquisition and analysis activities be carried out by the same organization.

He explained that depending on the resources available, the organization may either be single integrated entity or it may be larger and split on different units. He said in the latter case there are different options available for the division into units, and the proposal below should be seen as one among many different options:

- Unit responsible for data acquisition
 - Field staff may be hired on a permanent basis

- Alternatively, field staff is hired only for actual field data collection
- Another possibility is to assign the entire field data collection to contractors (although this may increase the risk for varying data quality between years).

However, in all cases there is a need for a permanent core unit responsible for planning of data acquisition. This unit typically would be responsible for hiring field staff, acquiring materials, planning the field campaign, conducting check assessments, and evaluating and enhancing the data acquisition part of the NFA.

- Unit for analyses
 - The main responsibility would be to conduct various kinds of analyses based on data as well as dissemination of results. This unit will need to maintain a close communication with stakeholders to be able to respond to external needs.
- Technical unit
 - Core people in this unit will be computer specialists that work in close cooperation with people from other units

Implementation of an NFA

The Facilitator explained that the phase of implement an NFA typically starts with the planning of data acquisition and comprises a series of activities ending with data analysis and dissemination of results. He said that the cycle of implementing an NFA may be presented as comprising the following steps, focusing on an NFA mainly on field sampling

- i. Conversion of theoretical design into practice
- ii. Manual for the inventory
- iii. Data capture procedures
- iv. Acquisition of materials
- v. Hiring and training of staff for the data acquisition
- vi. Data collection
- vii. Check assessments
- viii. Data control and compilation of databases
- ix. Dissemination of results

Concluding remarks

The Facilitator concluded by emphasizing that the most important message with this topic presentation is that NFA organization and implementation are very important matters to consider. Strict routines need to be established in all phases in order to avoid surveyors – or analysis-induced errors in data that dramatically may reduce the usability of information from NFA. For example, varying systematic error levels between years may lead to severely erroneous policy conclusions. Such errors thus must be avoided – through careful set up of the organization and through rigorous implementation of the NFA.

6.2 Organization And Implementation of ILUA in Zambia - Ylva Melin

In addressing this issue the Facilitator explained the topic using several questions

- How do we organize an ILUA?
 - Ambition of the ILUA
 - ILUA on continuous or temporary basis
 - Components of the ILUA organisation
 - Implementation of the ILUA

- How do we organize an ILUA?
 - No simple clear cut answer to this question
 - ILUA should be operational over a longer period of time

If so then the country should ask themselves whether establishment of a permanent organisation was the best option or not

The ambition of the ILUA

The ambition of the ILUA may provide data for:

- National level analyses of sustainable land use
- National and sub-national analyses of sustainable land use
- National, sub-national, and local level analyses of sustainable land use

She explained that any ambitions should be set in relation to types of analyses being based on ILUA data:

- Assessment of current state in terms of areas of different land-use categories and available forest resources;
- Assessment of trends, i.e. estimating changes between the current and past conditions;
- Model based scenario analyses.

She went further to explain that the organization responsible for both data acquisition and analyses should always be aware that people using data may oversee the procedures for acquiring them. It was therefore very important for the organization to:

- Gain insight into data quality issues
- Important for correct interpretation of results

She said that where there are separate organisations responsible for data acquisition and analyses there is always likely to be weak link between data capture and analyses.

The other important question that she said should be addressed was ‘How often the ILUA shall be carried out?’

- Continuously, every year?
- Certain intervals in time?

She explained that if it was decided that the ILUA will be implemented continuously, every year then it means that the time allocated to training is likely to decrease considerably. It will be possible to maintain continuity in the inventory with regard to

methods and assessment techniques used. This reduces the risk of obtaining varying levels of surveyor induced systematic errors in the ILUA results between different points in time.

If the organisation is going to run the ILUA on non-continuous basis then it is important to consider linking it to a

- Permanent organisation e.g University, research institute etc; or
- Stable organisation
 - Concentrate on data acquisition during some periods and data analyses during other periods

Key issues in establishing an ILUA organization

- Links to users of data and information from the ILUA
 - Most important stakeholders should be involved from the very beginning
 - Link to users is very important
- Links to competence within the fields of resource assessment and modeling
 - If permanent staff is limited –knowledge exchange with universities, institutes and similar organisations
 - Competence in steering groups or reference groups

Components of the ILUA organisation

The assumption is that the ILUA should be responsible for strategic forestry and land-use planning at national and sub-national level. Then the organisation may be a single integrated entity or larger entity split on different units.

- Unit responsible for
 - data acquisition;
 - Hiring field staff
 - Acquiring materials
 - Planning the field campaign
 - Conduct check assessment
 - Evaluating and enhancing the data acquisition part of the ILUA
- Unit responsible for analyses comprising of:
 - Experts within relevant land use subject fields
 - Statisticians
- Technical unit composed of:
 - Computer specialists
 - Others

She further explained that in such a situation allocation of resources should be done in such a way that resources are given to different units separately.

Implementation of ILUA

The Facilitator explained that the process is such that from planning of data acquisition to data analyses and dissemination of results. However, sometimes the process differs slightly if the assessment is run on a continuous basis or not. For example

- Certain time intervals
 - Data acquisition may extend over several years –analyses dissemination
- Continuous basis
 - Cycle of data acquisition and analyses –analyses will be based on average data from the last 3-5 years

The cycle of implementing ILUA is:

- i) Conversion of theoretical design into practice
- ii) Development or up-dating of manuals for the inventory
- iii) Development or up-dating of data capture procedures
- iv) Acquisition of materials needed for the sample surveys
- v) Hiring and training of staff for the data collection
- vi) Data collection
- vii) Conduction of independent check assessments
- viii) Data control and compilation of databases
- ix) Analyses
- x) Dissemination of results

Conversion of theoretical design into practice

This is usually done by conducting:

- Field sampling: This involves determining the actual sample sizes and the distribution of sample plots over the area to be surveyed
- Stratification
 - Digital maps and GIS - straightforward
 - Maps available in paper format – lot of work to determine land areas and plotting the sample plots. Start long time before field sampling starts

Manual for the inventory

Should be ready in good time before actual fieldwork. The Manual should provide unambiguous routines and definitions for the assessment to assure good data quality

Data capture procedures.

Field forms are most used method for data capture. However, this may require a subsequent step of registering data on computer media before analyses, though this:

- May be expensive
- May introduce error in the data
- Straight forward method

Normally the use of Field computers is very good for

- Simplified field work

- Checks for valid values and simple plausibility checks of data
- Large resources are required for developing the system, maintaining it, training of staff

Acquisition of materials

- Traditional instruments
- Digital instruments –reduce the risk for errors – technical problems may occur e.g. calipers, and equipment for determining distances

Hiring and training of field staff for the data acquisition

Field staff can be hired on temporary basis. This means that part of the crew will be new every year and therefore there will be need for repeated and consistent training of field staff. This is important to maintain the competence of staff on a stable level

Data collection

When carrying out data collection the field teams should before hand to

- Check who owns the land
 - Need to obtain permit for accessing the land
 - Information may be important in the analyses
- Keep continuous contact with the field teams by appointing specific people that will visit the field teams during their work
- Acquired instruments like GPS
- When establishing a permanent plot it is important to use agreed upon Discreet marks for future followup

Check assessments

- Number of trees on a plot and tree diameter
 - Possible to assess the actual errors
- Land use classes
 - Subjectivity – the check shows the variability between different crews rather than the deviation of the ordinary team from the true value

Data control and compilation of databases

Analyses

- Advise: Certain standard results from the inventory cycle every year
 - Integrated analyses including scenario analyses are very demanding
 - Concentrate on different analyses different years
- Dissemination of results
 - Major results to major stakeholders

Concluding remarks

In concluding her presentation the Facilitator emphasized that Organisation and implementation are very important matters to consider. Strict routines need to be established in all phases to avoid errors in data collection.

6.2.1 Organizations and Implementation, the Swedish Case - ULF SÖDERBERG

The following were the highlights of the presentation

The facilitator started by first giving the background information on the organization and implementation of the NFI. He explained that the first NFIs that was undertaken in his country was basically meant to answer two import questions:

- What is the growing stock?
- What is the increment?

He said the first inventory in the country was conducted from 1923-1929. It was a

- County-wide strip inventory
- Conducted by appointed national committee
- Field crews consisted of 10 persons

The second inventory was conducted between 1938-1952. The design of this second NFI inventory was a Combination of strip and plot inventory

He explained that in 1943 the responsibility for the NFI was transferred to the National Forest Research Institute and in 1953 the tract system was introduced where 1/10 of the tracts for the entire country each year was assessed.

The 6th NFI (1983-1992) was meant to address several issues:

- Timber supply demand
- Environmental changes
- Utilization of forests; damages caused by moose, energy issues
- Increasing demands on the forest resource from other than forestry

During this 6th NFI of 1983-1992, the

- Permanent tracts (plots) was introduced
- Intensified inventory of felling and actions of regeneration
- Detailed site inventory (vegetation and soil sampling)
- Increased inventory on mire and uncultivated pasture

The Facilitator explained that the country has been changing aims for NFI over time. From 1920 the major aim was to know 'What are the forest resources was'. After the information was collected the government then decided to improve the state of forests through Subsidies.

The 1940 NFIs was aimed at knowing the status of regeneration in order to ascertain the Cutting level. Those NFIs of 1980 was purely for environmental and ecological considerations, the 1990 NFI addressed issues of Biodiversity. This later led to the change of the country's Forestry Act and forestry practices, in order to address issues carbon sequestration.

Every NFI that was undertaken in Sweden had set objectives to achieve. These inventories were normally done annually and composed of:

- *15-17 field teams
- *1-2 field control teams
- *2-3 field inspectors
- *1.750 tracts field inventoried
 - = 7.000 permanent and 9.900 temporary plots
 - = 190.000 trees callipered
 - = 24.000 sample trees

The total inventoried area for volume estimates was 225 hectares. This corresponds to 0.01 *pro mille* of total forestland area in Sweden.

- Coefficient of variation was approx. 0.5%.

Total costs of NFI was approximately SEK 21 000.000

Salient Issues from the Presentation

- The participants expressed their concern that there was need to have field pre-test of the questionnaire and instruments. The Facilitator agreed that this was very important and it was possible if the country can come up with a time schedule, which can take care of this matter together with the other activities, which need to be implemented in time.
- The questionnaire being presented was new (first of its kind) for integrated Land use Assessment

6.3 Classification of Forestry system in Zambia – Abel Siampale (AB)

Mr. Siampale made a topic presentation on the Classification of Forestry Systems in Zambia and the following were the highlights.

Introduction

More than fifty percent (50%) of the total land area in Zambia is covered by forests and woodlands with an estimated area of about 44.6 million hectares. Zambia's forest area consists of Forest reserves, Game Management Area, National Parks and Customary land. Forest reserves are gazetted areas directly under government control. Forestry Department looks after a total area of about 7.2 million hectares of forests

The vegetation of Zambia

Mr. Siampale explained that according to Storrs, 1995 the country's vegetation is classified into four major categories. These are Closed Forests, Open Forests, Termitaria and Grasslands. The Closed Forests are limited in extent covering only about 3.5% of the country's land area. The Open Forest or *Savannah Woodlands*, which are the dominant vegetation type, occur in four types. These are Miombo, Kalahari, Mopane, and Munga woodlands. The most extensive is Miombo Woodland, covering over 42% of the total land area.

Miombo Woodland

The Miombo Woodland is two storied woodland with an open or lightly closed canopy of semi-evergreen trees 15–21m high characterized by *Brachystegia*, *Isorbelina*, *Jubernardia* and *Marquesia macroura* species. There may or may not be a vaguely defined lower storey. The undergrowth consists of either a dense grass/suffrutex layer 0.6m – 1.3m high or dense evergreen thicket 1.3m – 3.6m high. Suffrutices are very marked feature of Miombo Woodland.

Kalahari Woodland

The Kalahari Woodland embraces all woodlands on Kalahari Sands. The vegetation is derived from the partial destruction of dry deciduous *Baikiaea* forest. It forms a catenary regression from *Baikiaea* forest. It forms a catenary regression from *Baikiaea* forest to suffrutex savanna to grassland on Kalahari Sands. Five stages are distinct in composition namely *Guibuortia* woodland, *Burkea-Erythrophleum* woodland, *Burkea-Diplorhynchusi* scrub, *Diplorhynchus* scrub and *Parinari* Suffrutex savanna.

Mopane Woodland

The Mopane woodland is one-storied woodland with an open deciduous canopy 6-18 m high. The dominant *Colophospermum mopane* is pure or almost pure. Scattered elements of Munga woodland occur in places represented chiefly by *Acacia nigrescens*, *Adansoniia digitata*, *Combretum imberbe*, *Kirkia accuminata* and *Lannea stuhlmannii*.

Munga Woodland

The Munga woodland usually called savanna woodland, is a park-like, 1-2 storied deciduous woodland with scattered or grouped emergents to 18m high, characterized by *Acacia*, *Combretum* and *Terminalia* species. The undergrowth is absent, patchy or very dense and thicket-like, 1.3 – 4.5 m high, semi deciduous or deciduous.

Termitaria Woodland

Termitaria woodland is found scattered throughout Zambia whenever soil is not pure sand. All the basic physiognomic vegetation types – forest, woodland, thicket, scrub and grassland – can be found on Termitaria woodland. Termitaria occurs all over the country except on Kalahari sands proper, some very sand plateau soils, montane and swamp forests and flood plain grassland.

Vegetation Classification in Zambia under Forestry Department

Below are the five types of vegetation classifications in Zambia based on percentage canopy cover:

- The main pattern of ***high dense*** forest with canopy cover of 80% and above
- The ***medium dense*** forest with canopy cover of 60 – 79%
- The ***low dense*** forest with a canopy cover of 40 – 50%
- The ***open forest*** class with a canopy cover of 20 – 39%
- ***No forest*** class with canopy cover of 0 - 19% (these are extensively degraded or depleted forest areas including grasslands, bare locks, build-up areas, etc).

6.4 Classification of Agriculture systems in Zambia – Charlton Phiri (CP)

The presenter Mr. Charlton Phiri presented Classification of Agricultural Systems in Zambia and below are the highlights of his presentation

Purpose of Carrying a Land Classification:

He explained that as far as Agriculture is concerned, land can be divided into two main ways:

- i. for land capability – which provides an assessment of the overall suitability of the safe, long term use of the land for agricultural practices appropriate for the climate (and economic condition of the area)
- ii. for crop suitability – which provides an assessment of the soil a piece of land for the cultivation of specific crops regardless of economic conditions

He said that Classification of Agricultural land in Zambia is based on Land Classes. The classes are primarily divided into:

- arable
- marginal arable
- grazing and
- unsuitable

Arable Land

This is land suitable for intensive use on a sustainable economic basis. The highest long-term production will be obtained under a suitable crop rotation.

The class symbols for good arable land are C1 and S1 while those for a moderately good arable land are C2 and S2. Response to improvements in management is high.

Marginal Arable Land

Marginal land does not support a long-term intensive use of the land for arable_crops without great risk of poor yields in dry or wet years. Its class symbols are C3 and S3 and are referred to as poor arable lands because of their severe limitations for cultivation, which either greatly increases the cost of production due to, cost of erosion control or reduced yields due to marginal levels.

Grazing Land

This class includes land that is not suitable for sustained arable cropping, but suitable for grazing. For example, Gw indicates land suitable for grazing, but not for arable cropping due to wetness. Gs, Gd, Gr, Gg indicate land suitable for grazing but not for arable cropping due to steep slopes, shallow soils, rocks, gravelly or stony topsoil respectively. However, this land may be grazed during and shortly after the rains, while Gw is too wet for grazing during the rains, and thus suitable for winter grazing only.

Unsuitable Land

The class symbol is U. This class includes land with too severe limitation for arable cropping or grazing. It may be used for wildlife, recreation, building sites or other non-

agricultural uses. For example, class Uw indicates land remaining permanently wet and therefore unsuitable for arable cropping or grazing at any time of year. This land is the very wet streamline area within the dambo landscape unit. The subclass Uw may be suitable for special uses like fishing, water points, collection of thatching materials, and even for rice cultivation. Land unsuitable for arable cropping or grazing due to very steep slopes, rocks, gravely soils will be classified as Us, Ur, Uz respectively. Such a land may be usable for forestry, recreation, watershed protection and engineering purposes.

Possibilities of Upgrading of Land Classes

Mr. Charlton Phiri explained that there are certain actions that one can undertake to improve land suitability and thus upgrade the land class. He said it should be noted that land in classes C2, S2, C3, and S3 can sometimes be made as highly productive for general agricultural crops as land in classes C1 and S1, but this requires more effort and consequently, more expenditure which reduces the profitability and may be uneconomic. He explained that with very intensive management, it may be possible to obtain high yields and high economic returns from selected crops (e.g. vegetables), grown on low class soils, including class S4 soils (with for example, kraal manuring and irrigation).

It is also possible to re-classify land in a higher class after permanent improvements have been made which reduce or eliminate the natural limitation on which the original classification was based by such improvements like provision of major soil works, drainage, irrigation, land leveling, etc. Such works may bring some previously non-arable land into arable land category. However, classes like Us, Ur or Uz generally cannot be upgraded, as there is no economic feasibility of a removal of their limitations.

Lastly Mr. Phiri gave a summary of Agriculture Land Classification as follows:

Arable Land

- Good arable land
- C1 – Deep, very gently sloping, clayey soils

Moderately good/marginal arable land

- C2s – Deep gently sloping clayey soils
- C2s – Moderately deep, gently sloping, sandy soils

Grazing Land

- Gdz shallow, gravelly soils suitable for wet season grazing

Unsuitable Land

- Uw. Permanently wet dambo land.

6.5 Overview of Options for Resource Assessment – (US) ULF SÖDERBERG

The Facilitator started by listing the main methods used in Forest Resource Inventory as being:

- Remote sensing
- Field data collection
- Interviews
- Combinations

He then went further to elaborate how information is collected through:

- Remote sensing
- Satellite information
- Aerial photos
- Radar information
- Laser information

Satellite information

Aerial photographs

- Photo interpretation
- Land use/cover classification
- Area estimates
- Crown cover
- Volume estimates

Field data collection

Any one of these several methods can be employed in field data collection

- Total enumeration
- Subjective assessment
- Sampling
 - Many methods used in sampling

Interviews

This can be done through

- Personell interviews
- Questionnaires

Combination of methods

Most of the mentioned methods can be combined in different types of sampling designs

6.6 Sampling Design – (US)

The following were the highlights from the Facilitator's presentation

Sources of information

- Field measurements and observations
- Interviews with local people, land owners/ users or key external informants

Interviews are conducted to collect information on the following

- Perception of forest changes
- Main forest products
- Forest related problems
- Socio economic information

The Facilitator explained that the Sampling design adopted should be such that one is able to capture the relevant data on the following

Tract information

- Tract location
- Crew, owner, informant list
- Population information
- Proximity to infrastructure
- Tract access

Land cover classes

Plot (250m x 20m)

- Tree measurements
- Land cover classification
- General information (legal status, environmental problems)
- Stand management and structure
- Information on forest and tree uses

Subplots

- Small diameter trees
- Topographic data
- Edaphic (soil) data

Other necessary tree variables

7.0 GROUP WORK 2: ORGANISATION, IMPLEMENTATION AND SAMPLING DESIGN AND PLENARY SESSION

This section presents the group discussion on the Organisation, Implementation and Sampling Design in Zambia and the groups' discussions were presented to the plenary session. There were eight exercise questions and thus eight groups, each group dealing with a different question on the organisation, implementation and sampling design. The objective of the exercise was for participants to come up with suggestions on how best the exercise can be organized and implemented in Zambia. The way the groups presented their findings varied from one to another. This is reflected in the layout and contents of each presentation

GROUP 1: What does the composition of a field team look like according to the Field manual? Is this applicable in Zambia? Do we have human resources for such disposition?

Composition according to field manual

1. Crew Leader
2. Assistant Crew Leader
3. Workers
 - Measuring distances
 - Open ways for access
 - Provide common/Local names of tree species
 - Inform about access to tract
 - Provide information about forest uses and management
 - Carry equipment

Zambian situation

- (a) Forest Management section
 - Team Leader
 - Compass man
 - Enumerator
 - Botanist (expert/Local people)
 - Diameter reader/taker
 - Tree height reader
 - Chain men (2)
 - Arrow Taker & Placer
- (i) Forest Research
 - Team Leader
 - Assistant Team Leader
 - Enumerator
 - Botanists

- Diameter Reader/Taker
- Tree height Reader/Taker
- Helper (Carries equipment)

Is the human resource available for the structure in the field Manual

Yes, however there is still need to train more people/officers and identify officers for ILUA application.

Salient Issues from the Presentation

- The participants were very concerned, because the constituted team presented did not include stakeholders from other key disciplines, and therefore wanted to know what kind of team that will be constituted in order to collect integrated data.

The participants also felt that there was need that qualified persons be identified as members of the Teams to collect the needed data.

Group 2: How would you organize fieldwork if you were a field team leader?

- (i) Understand task at hand
 - set requirements
 - objectives
- (ii) Methodology
 - Come up with the composition of the crew
 - Size
 - Skill
 - Involve all relevant stakeholders
- (iii) Administrative issues
 - Provide information to all relevant stakeholders on the task
 - Logistics guided by budget
 - Transport – fuel/lubricants
 - Organise equipment
 - Organise instruments
 - Financial resources
- (iv) Debriefing of field staff
 - Appraising field staff
- (v) Field operations/execution
- (vi) Supervising and monitoring
- (vii) Receiving field work results
- (viii) Analysis

- (ix) Reporting

Salient Issues from the Presentation

- No comment

Group 3: How do we ensure high quality of data collected in the field?

- (i) Well trained personnel
- (ii) Maintain the same field team “experience comes by doing the same thing”
- (iii) Need for collect tools and equipment and well trained personnel in the field
- (iv) Well motivated field teams in terms of protective clothing, monetary
- (v) Well defined terms of reference i.e. responsibility, time frame etc
- (vi) Adequate time frame in which to complete the work
- (vii) Need for effective communication for field officers
- (viii) Staff knowledgeable about the area of study
- (ix) Strict/ close supervision of field staff
- (x) Clearly defined objectives for data collection
 - Sampling design
 - Sampling intensity
 - Sampling error

Salient Issues from the Presentation

- The participants wanted to know how good quality information can be collected. The presenter said that good quality information could be collected only when a clear and well-defined sampling method is devised. Sampling intensity and sampling error should be determined, so is the sample size.

Group 4: The last step in the implementation of the assessment is to disseminate results. Suggest how we can disseminate the information – How? To whom? When?

- (a) How?
 - Draft copy of results first circulated for comment
 - Production of final copy
 - Hold awareness meetings, workshops, use electronic and public media
- (b) To whom?
 - Relevant government institutions
 - Local authorities

- Traditional rulers
 - Local communities
 - Relevant international organisations
- (c) When
- Within two months

Salient Issues from the Presentation

- No comment

Group 5: Do you see any practical difficulties to collect the data required in the field? In that case what data and what difficulties?

No.	Difficulties	Type of Data
1.	Inaccessibility (steep hill and water bodies)	All physical measurements
2.	Sensitive areas (Natural Parks, forest reserves, Grave yards etc)	Physical measurements & utilisation data
3.	Limited resources (Financial & material resources)	Quantitative & qualitative data
4.	Hazardous areas (Landmines areas, mining areas etc)	Quantitative & qualitative data
5.	Language used for effective communication with locals	
6.	Lack of publicity – brings about suspicions e.g. working in an area during election	

Salient Issues from the Presentation

- The participants were of the suggestion that adequate publicity be done in advance to avoid suspicions especially during election time

Group 6: In the ILUA the field teams have to contact the land owners and identify stakeholders before field work starts. How should that work be organised?

- (i) Desk work
- Available data
 - Identify data needs
- (ii) Area of interest
- Know the extent
- (iii) Identify Local Leadership
- Available structures
 - Government institutions

- Local leaders (Chiefs)
 - NGOs etc
- (iv) Visits to the area
- Awareness raising (introduction of subject)
- (v) Identify resource uses
- Specific disciplines i.e. Forestry, Agriculture, water resource. Landowners etc
- (vi) Focused Group meetings
- Develop plan of operation
- (vii) Determine required resources
- Equipment/tools
 - Materials
 - Finances
 - Others
- (viii) Conduct data collection (fieldwork)

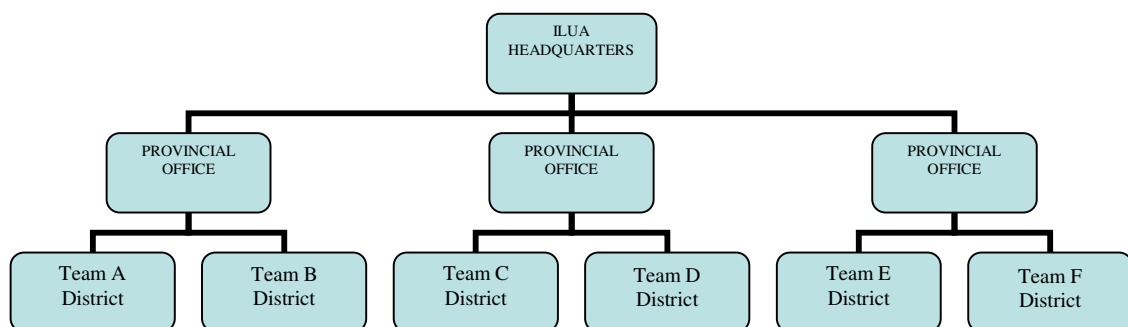
Salient Issues from the Presentation

- The participants wanted to know at what stage were the objectives to be identified. The Presenter said this would depend on the type of inventory. It can be done during the awareness raising meetings or these could have been set already, if the inventory is Departmental or institutional driven.

Group 7: A lot of teams are going to work at the same time in the field during the inventory in different places. How can a satisfactory communication be maintained with

ILUA

Headquarters?



- Teams A, B, C, D, E, etc will report to the Districts
- Districts report to Provincial Offices

- Provincial offices report to ILUA National Headquarters

Salient Issues from the Presentation

- The participants were sceptical of the effectiveness of the suggested communication arrangement, as it seemed to entrench beauracracy. The presenter defended their idea by stating that maybe the concern that could have been expressed would have been about the means of communication that will be used.

Group 8: What kinds of maps are needed for field work? How should the tract location be organised on the maps?

Kinds of maps needed:

- Topographic maps (scale 1:50,000 & 1:100,000)
- Orthophoto maps, Aerial photos, Satellite images
 - Orthophoto is a map produced from a rectified aerial photograph.

Organisation of tract locality

- Stratify using homogenous cover
- Tracts should be systematically located

Salient Issues from the Presentation

- The participants wanted to know how recent were the aerial photos stocked by Forestry Department? The presenter said that the photo may be as old as 1990s, but they give very accurate information (data). He went to say that there has been very little change in forest cover since then and if any anything they are just localised in certain areas and hence, the photos were still valid. Where there are significant changes ZDS will advice a person to get satellite images, because it is very difficult to undertake aerial photos on a small area.

8.0 TOPIC PRESENTATION

8.1 Establishment and Use of Permanent sample plots – (US)

The Facilitator explained the cardinal issues that are considered in the Establishment and Use of Permanent Sample Plots as being

- Location on map
- Coordinates
- Permanent marking of plot
- Sketch with reference points
- Bearing and distance to reference points

The Facilitator went further to give an Example on the Marking of permanent plot. He said one should decide on how this should be done

- Hidden permanent marking or not?
- No marking of trees

Use of permanent plots

The facilitator said Permanent Sample plots are normally used for:

- Estimation of state and changes of different parameters
- Gives estimates of changes with much higher accuracy than other methods
- Especially important for
 - changes in areas of land use
 - growth
 - vegetation changes
 - cuttings
- After several re-measurements permanent plots form a good basis for growth and yield studies
- Can serve different monitoring purposes, e.g. forest health

8.2 Data Collection through Interviews – (MS)

The highlights of the presentation were

Introduction

The facilitator explained that during the past two decades, essentially all members of the international community have reformed their national laws and policies in accordance with the principles on international environmental treaties, such as the Convention on Biological Diversity, The Convention to Combat Desertification and the United Nations Framework Convention on Climate Change. All FAO member governments now officially promote sustainable use of their tree and forest resources. Nevertheless, most governments have very limited information about the effects of their recent changes in public policy concerning forestry and rural development in general.

To find answers to these questions policy makers need monitoring programmes that go beyond the normal inventories of the biophysical resource and take into account the resource *users* as well. This because the effects of public policy on forest condition cannot be explained without a thorough understanding of how forest users' decisions react to public policies. Hence, information about forest users provides a link between forestry policies and observable outcomes on the landscape. The challenge is to make sure that the information that is gathered about forest users is both valid and reliable. With this in mind, then the question is "how should the NFA organise its interview component so that accurate data is produced?" This is the question that this topic sort to answer.

Background

The Facilitator Mr Mats Sandwell started by giving the general background to Data Collection through Interviews, what is supposed to be done under ILUA and aspects of data collection through interviews. He said that the objective of this exercise is the collection of data on forest use and user conditions through interaction with local stakeholders. He said that in the NFA interview component, the field personnel document what goods and services are derived from the sampled site; what the relative importance of each of those are for different people; who has the right to harvest what products, when and how they harvest; what their end use and purposes are; and whether the users perceive the demand for and supply of these products to be stable, increasing or decreasing.

To capture this information, field personnel conduct interviews with local forest users who either extract resources from the site measured, or who have information about the products extracted. After interviewing several key informants for each site, the field team interprets the information obtained and enters the information onto a form He further went to state how it is done saying that you only interviews people who are knowledgeable of the area on their perception of forest changes, main forest products, problems in relation to each land use section of the sample plot and general data and information on the area.

The Facilitator stated that there are several methodological challenges in ensuring that these interview variables are measured in a consistent and accurate manner across the entire country. When conducting interviews, it was important that the interviewer should know ***WHEN TO INTERVIEW, WHO TO INTERVIEW, KNOWING WHO TO INTERVIEW AND WHAT TOOLS TO USE FOR INTERVIWS.***

He went on to say that during interviews it was important to know ***WHAT TO ASK, WHO TO ASK and HOW TO ASK.*** He also presented some suggested interview techniques that could be used. During the process of data collection there is also need to verify data quickly through cross-checking and triangulation, direct observation, joint field walks and joint analysis of aerial photos. To control the quality of NFA data, each NFA team should, during the fieldwork phase, test their data for their degree of (1) Representativity; (2) Reliability, and (3) Validity.

The validation tests may very well answers I show that the methods used in the NFA are both reliable and valid, but until such tests are actually carried out, the quality of NFA information will remain unknown. The three types of tests mentioned above will make it possible to define the level of uncertainty that is associated with the NFA findings.

9.0 GROUP WORK 3: DATA COLLECTION THROUGH INTERVIEWS PLENNARY SESSION

This section presents the group discussion on the Data Collection through Interviews to see whether the techniques used are applicable to the Zambian conditions. The groups' findings were presented to the plenary session. There were eight exercise questions and thus eight groups, each group dealing with a different question on Data Collection through Interviews. The objective of the exercise was to harmonize the suggested techniques of Data Collection through Interviews to the Zambian conditions and make suggestions to modify. The way the groups presented their findings varied from one to another. This is reflected in the layout and contents of each presentation

Group 1: In the field manual it is described how the inventory work should be preformed. Is this applicable in Zambia? Do you see any difficulties? Which in that case?

Description of interview work

- (i) Identification of interviews
 - External Key informants
 - Forest and tree users (individual/Focus groups)
- (ii) Data collection from interviewees:
 - Before going into the field
 - Data collection in the field

How?

- Participatory analysis of aerial photos and maps
- Direct observation
- Carrying out interviews within the tract itself
- Stakeholder identification analysis exercise

Applicability in Zambia

- Yes, the above outlined issues are applicable in Zambia

Any difficulties? Yes

- Outdated aerial photos and maps
- Accessibility to project area
- Language barrier
- Identifying right informants especially in the selected projects

- Limited resources for operations (logistics etc)

Salient Issues from the Presentation

- The workshop felt that the issue of outdated maps should not be a problem, because this will help the local people to remember the past situation and be able to tell the interviewer, how the process has reached to the present situation

Group 2: Who is going to identify the key informants? Who is going to do the interviews?

- (a) The Team Leader through the existing local institutions e.g. Agriculture Extension Officers, Teachers, Community Officers, Traditional Rulers etc

Key informants should not be biased;

- Political affiliation
- Gender
- Status in society

- (c) The interviews will be done by the trained crew

NB: Characteristics of the crew:

- Gender balanced
- Conversant with local language
- Composed of member with relevant skill (integrated)

Salient Issues from the Presentation

- The participants to the workshop recommended that an integrated team be constituted before the identification of the key informants

Group 3: Outline the procedures of the field team in relation to the interviews, who should do what and when?

- (i) Outline the purpose of the interview and structure questionnaire
- (ii) Introductory meetings with Local Leaders (Field Team)
- (iii) Make appointment with the community for a meeting (representative)
- (iv) Carry out group interviews (as per situation)
- (v) Carry out segregated interviews with men, women and youths (interviewers)
- (vi) Carry out a transect walk and direct observations (group & interviewers)
- (vii) Field team reports to core-team
- (viii) Physical check by the team

NB: Repeat process if necessary

Salient Issues from the Presentation

- No comment

Group 4: The field manual is a first proposal to be adjusted after Zambia's needs. Is any important information missing in the interview part?

Additional Information

- (1) Tract Location
 - Agro-ecological zones
 - Locality
 - Chief
 - Village
 - Name of Area

- (2) Population
 - Ethnic group found in an area
 - Male, Female
 - Number of Households/Size of Households
 - Male headed, Female headed
 - Literacy level

- (3) Products and services identification and their uses
 - Processing
 - Quantity collected
 - Marketing information
 - Markets
 - Income per household/product
 - Most important economical product

- (3) User conflict resolution
 - Court
 - Chief
 - Village headman
 - Other mechanisms

Salient Issues from the Presentation

- The participants felt that during conflict resolution the Lands Tribunal should also be involved.

Group 5: Information about products and services and related information is registered on one of the proposed field forms in the field manual (Page 49-53). Consider if anything should be added or modified.

- i. Sensitive service/product in bush meat

- ii. Add? Social infrastructure e.g. schools, roads
- iii. Add? Other man-made or natural features
- iv. Add: Other services/products (such as bush meat)
 - Bush meat sensitive product to stand out on its own or be fitted into the above

Salient Issues from the Presentation

- Inspection should be conducted by the integrated team

Group 6: Please evaluate the attach proposal and field form for registering for agriculture management and life stock management

Agricultural Management

- A. General Field Form – F5a
 - Geographic location
- B2. Agriculture Management
 - The Form is applicable
 - Area undercover, Lima, Ha, Acre
- B1. Forest Management
 - Applicable
- B3. Fishery Management
 - Water bodies
 - Lakes
 - Swamps
 - Rivers
 - Dams
 - Nutrients
 - Chicken droppings

Livestock Management

Omissions other poultry

- Rabbits
- Guinea pigs
- Turkey
- Pigeons

Salient Issues from the Presentation

- It was recommended that the field form should be made available to all participants for further analysis and comments

Group 7: Please discuss the reliability of information and methods used for assuring quality in the information collected in the interviews.

Reliability of information collected in interviews depends on:

- Well defined set of objectives, sampling methods, data collection methods and source of information

Interview methods in the manual are:

- i. Structured
- ii. Semi structured (taking notes)
- iii. Open ended interviews

Methods for assuring quality in information collected

- i. Direct observation
- ii. Use of tools such as aerial photos
- iii. Follow up questions
- iv. Joint field walks

Salient Issues from the Presentation

- Semi-structured interviews have an advantage in getting information there and then, so long as the rightful personnel is chosen to interview specific target groups
- On the reliability of information – one should ensure that they choose the appropriate informants
- Emphasis on the confidentiality of the interview could bring about a free interaction and enable you to obtain dependable data
- Ensure that sensitive issues are discussed towards the end of the interview

Group 8: Please discuss how to approach all stakeholder groups and not only the talkative ones.

- i. Identification of stakeholder groups with help of the chief and other community leaders
- ii. Arrange for meetings with respective stakeholder groups
- iii. When conducting interviews, use Participatory Rural Appraisal tools such as
 - Participatory mapping
 - Matrices

Salient Issues from the Presentation

- No comment

10.0 TOPIC PRESENTATION

10.1 Remote Sensing – (YM & MS)

Introduction

The Facilitator explained that GIS and Remote Sensing are diversified technical areas under very fast development. Both techniques are very useful in integrated land use assessments. By remote sensing, information can be acquired at low cost in comparison to field surveys. Using GIS techniques, geographic information can be efficiently stored and analyzed.

She further explained what the abbreviations GIS was, saying it was simply Geographical Information System which is used for:

- Handling of geographical information as a means for the
 - Production of maps
 - Storage of information
 - A means for simple updating of geographic information
- Geographic analyses in
 - Land use management planning
 - Nature conservation

However, a GIS does not solve all the problems

Remote sensing is used for collection of information at a distance by means of

- Aerial photographs
- Satellite images
- Laser
- Radar

Geographic data bases

The Facilitator explained that the collection of data using this technology can be collected in several data bases, such as:

- Points
- Lines
- Areas
- Attribute data

Examples of these are:-

- sample plots, key biotopes
- Road network, watercourse, power line
- Land property, district, forest stands

There are two main types of GISs

- GISs based on lines and polygons
- GISs based on raster data

She explained that GIS has been introduced and is being used within many areas (disciplines)

- Private companies (Forestry)
- Authorities on national, sub-national and districts levels
- Science

Remote sensing: Short history

The use of Aerial photos has been in use since the 1920s, which is the oldest method for collecting information at a distance. The use of Satellite images started way back in the 1980s. While the use of Laser and Radar is a recent technology since the 2000s.

Aerial photographs can be used to collect information for:

- Land cover and land use assessment
- Stand delineation
- Measurement/interpretation of
 - i. stock of timber
 - ii. mixture of tree species
 - iii. site quality
 - iv. parameters of conservation biology

She further explained that there are different types of films used in aerial photographs

- Panchromatic (black/white)
- Infrared colour
- Common colour films
- Electronic cameras are under development

The extraction of information from Aerial photographs is done by

- Visual interpretation (of land cover and land use)
- Measurements using the stereoscopic principles e.g. of tree heights
- There are also modern techniques that are currently being developed where automatic routines for air photo analyses are implemented

The Facilitators however, explained that there are advantages and disadvantages associated with the use of Aerial photographs or Satellite images

10.2 Observation and Measurements – (MS & US)

The Facilitators started first giving the definitions of Measurement and Observation was

Definitions

Measurement: is a value for a particular parameter obtained using an instrument

Observation: is an assessment (classification) of a parameter sometimes with the help of measurements.

He explained that general aspects that have to be considered first before one embarks on carrying out any measurements. He said that there should be:

- Clear definitions and measurement rules
- Training should be conducted for the staff who will be involved in collecting measurements. For example, measuring the diameter of trees
 - In which height the dbh is to be measured (1.3m)
 - How to proceed in special cases when 1.3m is an impossible height to measure
 - Which measurement device to use and what to observe while using it
 - What measurement unit to be taken and to what accuracy

Another Example: Forest classification is often not completely defined what forest is

- Min crown cover, min width, min height
- How to measure crown cover?
- How to measure stand width?

He explained that in any measurement process one should aim at collecting the accurate data as possible with minimum errors. However there are several sources of errors, among them:

- Peculiarities of the object to be measured
- Inaccuracy of the measuring device
- Physical or topographical influences
- Uncertainties in the measuring procedure
- Imperfection of human sense

Types of errors

- Random errors
- Systematic errors (bias)

Borderline trees

- Is the tree inside or outside the plot?
- Very important to do it correctly
- Clear definition needed, often the virtual center-axis of the tree is used as criterion
- Risk for bias in strip inventory, (require right angle from the center line)

Slope correction

- Plot area refers to map (horizontal) plane
- Areas and lengths on slopes must be adjusted (bigger)
- Correction factors given in manuals

11.0 GROUP WORK 4: GENERAL ISSUES ABOUT THE ILUA PLENARY SESSION

This section presents the group discussion on the General Issues about the ILUA in Zambia as they were presented to the plenary session. There were eight exercise questions and thus eight groups, each group dealing with a different question on the classification systems. The objective of the exercise was to examine the various issues proposed and suggest ways how the project can be implemented in the Zambian context. The way the groups presented their findings varied from one to another. This is reflected in the layout and contents of each presentation

Group 1: The plan is to organise a follow up training (5 days) before the commencement of the field work. What kind of training do you need in the training in March?

- i. Recap
 - Sampling methods
 - Data entry
- ii. Instruments/equipment
- iii. Measurement procedures
 - Type of data
 - Data recording formats (forms)
 - Accuracy specifications
- iv. Data storage and processing
 - package to use
- v. Formation of groups and identification of skills
- vi. Stakeholder analysis
 - infrastructure
 - skills

Salient Issues from the Presentation

- In addition to the curriculum provided, data interpretation and dissemination should be included.
- The training should be field oriented, in order to learn how to use and field test the equipment
- It was suggested that the next training should have a training period of ten days

Group 2: What shall we do to assure that the teams use the same standard observations in the field?

- The same methodology design should be used (e.g. size of sample plots)
- Sampling methods must be uniform (e.g. systematic, stratified or etc)
- Data collection material must be the same (e.g. questionnaire)
- Measuring instrument should be uniform (e.g. GPS and measuring tapes)
- The field crews must receive uniform training
- Respective Team crew leaders should supervise, monitor and verify data on regular basis

Salient Issues from the Presentation

- The Training aspect should be organised in such a way that the data collected does not deviate from place to place. The training modules to be developed should aim at reducing the variations in the work standard.
- The training structure should be provided to the participants to make comments

Group 3: At page 48 in the field manual there is a classification of silviculture practises. Is this applicable in Zambia?

Yes, points noted are:

- Improvement; e.g. pruning and thinning
- Release of desirable superior trees; e.g. plantation and indigenous species
- Release of Lianas (climbers) e.g. *Lantana camara* in plantations, mutemwa in Zambia Teak forests
- Enhancement: enrichment planting
- Sanitary cutting: removal of unhealthy trees

Additions to the field manual:

- Early burning
- Coppice management

Salient Issues from the Presentation

- No comment

Group 4: On pages 45-46 in the field manual, there is a classification standard for the stand origin and the canopy structure of the stand. Are these applicable in Zambia?

- i. Stand origin
 - Natural (seeds) – applicable
 - Plantation (artificial)) – applicable
 - Coppice (natural) - applicable

- ii. Stand structure
 - Single layer (e.g. Mopane, Munga) - applicable
 - Two layer vegetation (e.g. miombo, *Baikiaea*, munga) - applicable
 - Three layer vegetation (e.g. montane, riparian, swamps) - applicable
 - More than three layers – Not applicable

Salient Issues from the Presentation

- No comment

Group 5: Please discuss how this project may contribute to the poverty alleviation in Zambia.

This project may/might not have a direct effect in contributing to the poverty alleviation in Zambia. However, the project shall be able to provide:

- i. An integrated database that will represent all sectors. This will in turn help avoid duplication of allocation of resources. These resources can be channelled to other needy areas.

- ii. With data in one place, it will be easy to make national policy decisions on sustainable natural resources availability and usage

- iii. Resulting from an integrated database, it is possible to manage resources sustainably, and therefore attract investment in the natural resources sector e.g. tourism, etc

Salient Issues from the Presentation

- No comment

Group 6, 7& 8: There are a lot of logistical problems to consider in an extensive project like the ILUA.

Group 6: Please discuss how to make the field operations to run smoothly in cooperation among central, provincial and district authorities.

- Provide sufficient logistics at all levels

- Establish ILUA teams at Central, Provincial and District levels (teams to elect own leaders)
- The system must have a two-way communication arrangement
- Incentives must be provided

Salient Issues from the Presentation

- The ILUA project should have a lead institution through which the resources will be channelled through and for accountability. Forest Department was agreed upon to be the lead institution

Group 7: Please discuss the required transport organisation for the field work. (Personnel transport, supply of materials, communication etc.)

Each crew will require the following:

- One 4 x 4 vehicle
- One motorcycle
- Two bicycles
- One vehicle for Provincial administration (Team)

Requirements for field work

i. Personnel:

- Inventory crew with a set of all inventory equipment to be able to carryout the field assessment
- Administrative staff – act as facilitator for field work

ii. Transport:

- 1 vehicle per crew
- 2 bicycles per crew
- 1 motor cycle per crew
- Fuel and lubricants
- Spares (tyres, tubes, etc)

iii. Supply of materials

- Stationery (inventory form)
- First aid kit
- Protective clothing
- Water proof bags
- Torches

- Knives/machetes
 - Camping equipment (e.g. tents, mosquito nets)
 - Cooking utensils
 - Field manuals
- iv. Communication
- Radios

Salient Issues from the Presentation

- First Aid training required
- For the purpose of continuity, there will be no need of recruiting permanent staff for the project that will later be laid off. So the project shall depend on the integration element to move the programme/project and the capacity building on materials and other facilities will help the project to progress smoothly.

Group 8: Please discuss what your expectations are from the ILUA HQ.

- i. The ILUA headquarters will co-ordinate and execute the project according to approved plans and budgets
- ii. The ILUA will ensure that there is full participation of other key institutions that have direct valuable input in the ILUA project
- iii. The ILUA headquarters will ensure that all project requirements are procured timely for the project to be executed smoothly
- iv. The ILUA headquarters will collaborate with other projects both locally and internally to enhance networking (exchange of ideas)

Salient Issues from the Presentation

- No comment

12.0 TOPIC PRESENTATION

12.1 Modelling for Estimation and Monitoring – (US)

13.0 GROUP WORK 5 – ILUA ISSUES PLENARY SESSION

This section presents the group discussion on the Classification systems of different land uses in Zambia comparing to those of FRA/FAO classification system as they were presented to the plenary session. There were eight exercise questions and thus eight groups, each group dealing with a different question on the classification systems. The

objective of the exercise was to harmonize the FRA/FAO classification system with the systems used in Zambia. The way the groups presented their findings varied from one to another. This is reflected in the layout and contents of each presentation

Group 1: Please discuss the advantages and disadvantages with field forms and data loggers.

i. FIELD FORMS

Advantages	Disadvantages
<ul style="list-style-type: none"> • Cheap 	<ul style="list-style-type: none"> • Bulky i.e. storage problems
<ul style="list-style-type: none"> • Does not require high technical skill 	<ul style="list-style-type: none"> • Introduction of errors high when transferring data from: <ul style="list-style-type: none"> ○ source to forms, ○ from forms to another media
<ul style="list-style-type: none"> • No technical complications 	<ul style="list-style-type: none"> • Time consuming in data recording and processing

ii. DATA LOGGERS

Advantages	Disadvantages
<ul style="list-style-type: none"> • Handy 	<ul style="list-style-type: none"> • expensive
<ul style="list-style-type: none"> • Errors are minimised 	<ul style="list-style-type: none"> • Requires high technical skills
<ul style="list-style-type: none"> • Data capture and processing quick 	<ul style="list-style-type: none"> • Can develop technical fault whilst in the field
<ul style="list-style-type: none"> • Easy storage 	<ul style="list-style-type: none"> • Risk of complete data loss

Salient Issues from the Presentation

- Purchasing of the software is expensive hence an assessment should be made on the preparedness of the institution to keep updating the software.

Group 2: How can the data flow be managed from the data collection in the field to the central database?

- i. Data collection from the field
- ii. Data verification by the supervisors/Control Team
- iii. Batching (organising data according to sample plots/area in blocks)
- iv. Registration of batches before dispatching
- v. Transferring the data to the central data base by:

- E-mail
 - Posting
 - By hand
- vi. Registration or hand over to the central data base
 - vii. Scanning/data entry
 - viii. Data processing
 - ix. Data analysis
 - x. Presentation of draft report
 - xi. Dissemination of final report

Salient Issues from the Presentation

- No Comment

Group 3: If you are responsible for organising a check assessment in the ILUA, what do you have to think of?

- Come up with a check list of valuables e.g. height, diameter, farm size, crop production, livestock/HH
- Take random sample of the plots and check the facts given
- Carry out visual observation and direct measurements as well as oral interviews of local and external informants
- Logistics of how to reach the external informants

Salient Issues from the Presentation

- The teams should formulate a way of carrying out triangulation to ensure that the information obtained is accurate.

Group 4: As a field team leader you are responsible for recruiting members to the field team. How would you organise this task?

- i. Identification of institutions
 - Forestry Department
 - Agriculture – Land use
 - Statistical office
 - Wildlife

- Survey Department
- Water Affairs

ii. Identification of Skills

- Forestry inventory
- Land use planning
- Statistician/Biometrician
- Land surveying and mapping
- Wildlife specialist
- Sociologist
- Local language interpreter/community representative
- Cooperative and other relevant institutions

iii. Orientation Training

- Type of data to be captured
- Use of equipment and handling
- Use of field forms
- Define specific rolls
- Objectives of ILUA project
- Objectives of the survey

Salient Issues from the Presentation

- There should be an appropriate way of selection of stakeholders to ensure that useful information is obtained for use in planning as a nation
- Proper planning will enable us to reduce on the down time
- Include - Water Affairs
- Surveys and mapping

Group 5: What would you like to do to adjust the field manual after (to suite) Zambia needs?

The manual should be subjected to:

- Scrutiny by key stakeholders (Agriculture land Use Dept., ZAWA, Forestry Dept., CSO)
- The adjusted manual should be sent to the Secretariat for the compilation of the final manual to suit the Zambian needs

NB: The group feel that work on the revision of the manual should be completed by the end of December, 2003; and that the Consultant and Secretariat give us a feed back by 15th January, 2004.

Salient Issues from the Presentation

- Consultation of stakeholders to make adjustment to the field manual should be done at the earliest possible time and ensure that the appropriate people are invited to do the job.
- The field forms should be adjusted at the same time so that it contains the rightful information
- Thematic mapping to be undertaken and Land use maps produced depending on the national requirements. The end product to be decided on by the nation

Group 6: There are often obstacles in the information flow from information needs to policy development. What problems can you foresee in Zambia?

Obstacles to information flow:

- i. Lack of Political will
- ii. Disregard of Local Knowledge (Top down approach)
- iii. Administrative problems
- iv. Financial constraints

Salient Issues from the Presentation

- Incorporation of local (indigenous) knowledge
- Administrative – information should be demand driven instead of the usual top down approach to reduce RED Tape
- Logistical arrangements should be water tight to ensure efficiency
- The involvement of the Royal Establishment like in the Western Province should be a must if any progress is to be made

Group 7: A lot of information is going to be collected within the ILUA. Will you be able to answer the most important questions in the country with this information?

The group said Yes, and the reasons given were the following

- i. Information collected will help answer:
 - Forestry related issues

- Land related questions
- Wildlife related issues
- Agricultural related questions
- Water related questions and their relationship

These questions will be answered through the creation of the ILUA database

Salient Issues from the Presentation

- No comment

Group 8: What are the most important land use changes in the future? Can this be addressed in ILUA?

Expected land use changes in future

- i. Encroachments into forests changes the forest to settlements and farmland
- ii. Shifting cultivation change agricultural land to bare land
- iii. To address deforestation, bare land will be converted to plantations
- iv. Bare land to converted to quarry to support the construction industry
- v. Game Management Areas (GMAs) to farm land and settlements due to population growth
- vi. Natural causes
- vii. Other land uses to change to mining, ranching, etc

Can ILUA address the changes?

The answer was Yes for the following reasons:

- The information provided from ILUA will provide a basis for monitoring the land use changes
- ILUA information will be used by Policy makers to address the land use changes

Salient Issues from the Presentation

- No comment

14.0 TOPIC PRESENTATION

14.1 The Area Production Model

The following were the highlights of the presentation by Dr. Sandewall. He explained that the Area Production Model was developed in the 1980s by Professor Nils-Erik Nilsson of Swedish University of Agricultural sciences, (SUAS). It has been used in a number of places by FAO, as South-east Asia and South America. It was one of the computerized models for production/consumption studies

He said this version is based on the one presented in the field document *User guide to the area production model*.

The Facilitator explained that, the type of questions that could be answered by the model are as follows:

- What land area could be used for forest production on long-term basis under specified assumptions regarding the development of the agriculture sector?
- What afforestation efforts would be needed on that land in order to satisfy a prospected demand for industrial wood, fuelwood, environmental functions, and nature conservation?
- At what time would the existing forest resources be exhausted, if there is no change in the present exploitation and silviculture intensity?

When using the model alternative developments can be simulated up to a 50 years time horizon. Successive runs of the model can evaluate different assumption concerning socio-economic and other type of development. By specifying more or less ambitious forest management programmes, the long-term effects of such programmes can be estimated. In the same it can be used to specify more or less ambitious agricultural programmes, expressed as increased per hectare yield. Another purpose of the model is to identify knowledge gaps. The facilitator said this helps to initiate collection of certain data, essential for long term planning, which may not be available at present.

He said that indicative APM runs might be of great help when planning national and sub-national forest inventories. The main purpose of an inventory is to provide data to aid decisions, which a traditional forest survey may not provide decision-makers with all the data needed for long term planning of forestry.

The Facilitator explained that, when running the APM, a level should be chosen which is relevant for calculating biomass energy balances (supply/demand). Using the model at country level may give misleading information. On the other hand, too small a unit is sensitive to import and export activities not covered by the model.

The administrative level chosen for the actual planning may be different from the level chosen for running the APM. He said this tied to the general rules for decision-making in the country at hand. Some countries favour centralized decision-making, while other countries employ more distributed responsibilities for the planning of land use and

forestry. There may also be a mixed approach: Some general goals may be formulated at country level, whereas lower administrative levels are responsible for the achievement of the goals.

The simulation model approach is generally speaking a (mathematical) model, which is:

- A representation of a process or problem in mathematical form
- Usually enables a range of alternative actions to be simulated
- Should include only those features of the problem which are important
- A simplification of reality
- A tool for making a complicated problem manageable

He said that the possibility to make repeated simulations is very important characteristic of a simulation model, because this enables a large number of assumptions and scenarios to be evaluated within a short time. Typically, some of the input data are fixed, whereas others are subject to controlled variation.

Main components

He explained that the complex interactions of different land-uses will require a great deal of simplification to be manageable as earlier stated. The model is divided into the following parts. Below are different such components listed, together with required data

- Part 1 land-use changes due to development of agriculture
- Part 2 Bio mass energy balances
- Part 3 Utilization of existing forests

When applying the APM, the different parts can be used separately

The facilitator explained that there are certain requirements for using the model

- Input data
- Expertise
- Computer hardware and software

APM installation

The Facilitator then finally went through the APM process trying several data input simulations to show how the APM works and the kind of outputs that are obtained.

- Running the program
- Entering basic data
- Entering plantation data
- Deleting data sets and plantations
- Copy data sets and plantations
 - Printing data-sets
 - Running the model
 - Exporting results

The Facilitator highlighted some experiences using the APM in

- Tamil Nadu, India
- East Java, Indonesia
- Ratchaburi, Thailand

The Facilitator went further to explain the Technical descriptions of the kind of data dealt with in the APM software

- Input data description
- Internal data representation
- Algorithms

14.2 User Guide to the Area Production Model, APM Version 2.0 for WINDOWS 95 AND Windows NT

This field document is one of the series of reports prepared during the course of the Project “Country capacity Building” GCP/INT/621/SWE, within the frame of the Forest Resource assessment Programme.

The Facilitator explained that the conclusions and recommendations given in this report are those considered appropriate at the time of its preparation. These can be modified in the light of further knowledge, gained at subsequent stages of the project.

14.3 Scenarios, Computer exercise with the Area Production Model – (YM)

The Facilitator then gave pictorial illustration of how humans and different land uses affect each other. Thereafter several computers were set up and participants were asked to conduct group computer exercises using the Area Production Model Computer software.

15.0 Presentation of APM Output Analysis using the computer APM software

This section presents the group discussion on the APM Software computer exercises for Forestry and Agricultural scenarios based on default input data as they were presented to the plenary session. The exercise questions were similar but each group was free to work on different scenarios. The objective of the exercise was to afford the participants an opportunity to work with the APM and be able to analyze and interpret results according to the way they understood the outputs. The groups did present varied interpretations of their findings/outputs of the computer exercise in the plenary session according to the way they understood the data they had generated.

The Facilitators emphasized that it was important to understand the significance of the generated information from the APM software and make correct interpretations.

16.0 TOPIC PRESENTATION

16.1 Information Management and Data Registration – (YM)

The Facilitator started by explaining what is information management (IM) was. She said Information Management is the management of organisational processes and systems that acquire, create, organise, distribute, and use information.

IM can be seen as a continuous cycle of five closely related activities:

- Identification of information needs;
- Acquisition and creation of information;
- Organization and storage of information (long term accessibility);
- Information dissemination;
- Information use.

Goal of Information management

”The goals of information management are getting the right information to the right person, at the right time, from the right source, in the right amount, in the right order, in the right form, in the right medium, with optimal accuracy, as quickly as possible – and, at the lowest reasonable cost”

Rough chronology

- 1960s – business applications for computers
- 1970s – databases
- 1980s – PC
- 1980s-90s – merging of information and communication technologies
- 1990s www and e-commerce

Data, information and knowledge

- Data
 - Unprocessed facts or observations, which may or may not be meaningful in themselves
- Information
 - Result from processing data,
 - Provides the recipient with some understanding, insight conclusion, decision, confirmation or recommendation
 - May take a variety of forms such as a report, an analysis, meaningfully organized data output, graphs, picture, video
- Knowledge
 - Product of information and human interpretation

- Information should be organized and processed to convey understanding, experience, accumulated learning and expertise

ILUA/FRA in an information management context

An ILUA/FRA can be defined as a national process that:

- collects, manages, makes available and analyses information on land resources, their management and use;
- analyses, evaluations and scenario development for use in policy processes

Current status of information management in ILUA/FRAs

- Countries vary widely in the availability of information and in their IM capabilities
- Problems:
 - Accessibility
 - Reliability questionable
 - Different institutions are not aware of each others activities
 - Outdated data
 - Precision and accuracy of data unknown

A basic ILUA/FRA scenario

- Tools for data input
- Standards, metadata and data quality
- Verification and validation
- Reporting and dissemination
- Backups and archiving

Tools for data input

- Data loggers
 - Enhance the input and quality control of measurements, especially if linked to a central database via mobile communication and internet access
 - Database can be permanently updated and check procedures adjusted immediately for all field crew – improved data quality
- Field forms
 - Filled in directly in the field to be digitalized in the office
 - Increased risk of errors, but simple and straightforward

Appropriate standards

- Structure, transmission and meaning of information define how to share and store information
 - Important not only to data input, also to data sources
 - NFAs today – characterized by tradition and national needs
- Different standard in different countries

Metadata

- Provides a way for data users to know:
 - what data are available;
 - whether the data meet their specific needs;
 - where to find the data and;
 - how to access the data
- Includes
 - E.g. details about data's ownership, quality, time of collection and update or transformation

Issues affecting the quality of data

- Human elements
 - Error at entry
 - Error in reporting as a result of overwork
 - Biases or misinterpretation of questions
- Computational elements
 - Appropriate standards
 - Metadata
 - Verification and validation
 - Backups
 - Archiving

Verification and validation

- Information should be verified
- All data items should have a source reference
- Data processing should be transparent

Reporting and dissemination

- Meeting national and international reporting requirements
- Overflow of information – important to present in an interesting, easily available and digestible form
- Information should be neutral, objective and widely disseminated in a timely manner
- International reporting
 - Reporting obligation can be duplicative and overlapping
 - Coordination is needed

Backups

- **Making a backup of data:**
 - Making a backup of valuable data is an obvious way of reducing the damage caused when the original data is lost or damaged.

-Making a backup should be a regular occurrence and ideally the backup data should be securely stored, well away from the original data.

Archiving

- Digitally
 - Digital information is fragile, it is more easily corrupted or altered without recognition than on traditional technologies such as paper and microfilm
 - Requires access technologies that are changing at an ever increasing pace

What is the hardest part in IM?

- The largest challenges to implementing an IM plan are:
 - People, culture and political factors
 - Information behaviours and preferences are hard to change
 - Variation in attitudes towards and familiarity with IT
 - Groups and individuals may hide information for political or other reasons
 - Sharing information takes time and effort, and requires trust and mutual respect – major weakness in many countries
 - Coordinating, processing, harmonizing and managing related databases – little comparability between surveys performed in different years
 - The main weakness is failure to connect supply to demand

16.2 Information Management and Data Registration – Swedish Case (US) ULF SÖDERBERG

The Facilitator explained the process that was used in Information Management and Data Registration in Sweden. He said that the issues that were addressed were:

- Data quality
- Field system
- Data handling
 - Field data stored in a field data base consecutively
 - Further testing
 - Calculation of derived variables
 - Final data base
 - Analyses, reporting

He said the Users of results were known and that the results were packaged that it catered for a cross section of users.

16.3 Information Management and Data Registration – Laos Case (S)

17.0 ISSUES, WAY FORWARD AND CONCLUSION

▪ Workshop Evaluation

17.1 Issues and Way Forward

• Field Manual to Zambian situation

It was resolved that a team of four people be appointed from the represented four sectors, to work on the manual suitable for Zambia. These people must work on the manual before the next training workshop. The consultant was tasked to select and communicate with the identified persons.

• Forest Classification

It was agreed that

- There was need to have the Zambian classification of Low forest adjusted to accommodate the 10% FAO classification

• Tools and Equipment

The Consultant informed the participants that purchase of tools and equipment have been budgeted for in the project proposal submitted to FAO

• Training

A National Team was constituted comprising of 34 identified key stakeholders from the Provinces and Headquarters level. Seven (07) were at Headquarters i.e. coming from the Ministries/Departments; Forestry Department, Survey, Agriculture, CSO, ZAWA, Forest Research, Water Affairs and Learning institution. Three (03) representatives from each province. The group was to undergo the second and third trainings scheduled for March 2004.

NB: Water Affairs did not send a representative during the first training workshop despite being invited

• Training Module

Swedish University were going to send a proposed outline of training module for input by the Zambian stakeholders.

Resource persons from some Government sectors can be incorporated to work or conduct Training in certain specialised fields. The Consultant requested to seek clarification on the matter from FAO

• Terms of Reference for Trainer of Trainers

These will be developed and given to them

18.0 CLOSSING REMARKS

One of the participants Mr P. M. Sekeli was called upon to give a vote of thanks. Mr Sekeli went on to state that it was very difficult to know whether the training workshop objective of acquiring new skills in ILUA was achieved because there was no chance to read and evaluate what individual expectations have been achieved. He said that the issue of who owns the programme should not arise because the programme was for all of us as it was being done in an integrated manner to ensure sustainability, and in an environmentally friendly manner. He wished the Facilitators and all participants well and also thanked the organisers of the workshop, noting that everyone was well fed, and the necessary literature were distributed though there were some complaints of inadequate accommodation by some participants. He urged the organisers to address the problem in future making sure that they found a place where everybody was properly accommodated. Mr Sekeli observed that Zambia should feel proud to have been the first country to undertake an ILUA and urged the fellow Zambians not to fail but succeed in this shared vision. Finally, he thanked the Motel staff for their hospitality urging them to continue aspiring to achieve even higher standards.

The meeting was finally closed at 12:45 hrs with a prayer from Mr C. Taulo – Principal Extension Officer Southern Province.

ANNEX 1

LIST OF PARTICIPANTS TO THE ILUA TRAINING

No.	Name of Officer	Organisation
1.	Mrs. Beatrice M.K. Lukama	Forestry Department
2.	Mr. Everisto Nonde	Forestry Department
3.	Mr. Abel Siampale	Forestry Department
4.	Mr. Charles M. Chewe	Forestry Department
5.	Mr. Progress Sekeli	Forestry Department
6.	Mr. Fillipo Zulu	Forestry Department
7.	Mr. Fred Siakabeya	Zambia Wildlife Authority
8.	Mr. Royd Vinya	Copperbelt University
9.	Mr. Lishomwa Mulongwe	Forestry Department
10.	Mr. Godfrey Musonda	Forestry Department
11.	Mrs. Christine J. Mwale	Ministry of Agriculture & Cooperative (MACO)
12.	Mr. Kennedy M. Kambeu	Forestry Department
13.	Mr. Bwalya Chendauka	Forestry Department
14.	Mr. Elisha Ng'onomo	Keepers (Z) Foundation
15.	Mr. Martin Njovu	Central Statistics Office (CSO)
16.	Mr. Charlton L. Phiri	Ministry of Agriculture & Cooperative (MACO)
17.	Mr. Christopher Zulu	Forestry Department
18.	Mr. Michael Njobvu	Central Statistics Office (CSO) Eastern Province
19.	Mr. Given Sicheeba	MACO Northern Province
20.	Mr. Mwanza Sumbukeni	Central Statistics Office CSO N/Western Province
21.	Mr. Elijah L. Malumo	Central Statistics Office CSO – Western
22.	Mr. Zebron Chirwa	MACO – Southern Province
23.	Mr. M. Mooka	Zambia Survey Department (ZDS)
24.	Mr. Harvey Lusambo	Ministry of Agriculture & Cooperative (MACO)
25.	Mr. Charles M. Taulo	Forestry Department
26.	Mr. Bernard M. Chomba	Forestry Department
27.	Mr. S.M. Mutemwa	Forestry Department
28.	Mr. Samuel Simute	Africare
29.	Mr. Henry A. Banda	Central Statistics Office (CSO)
30.	Mr. John Mulombwa	Forestry Department
31.	Mr. Jones Mulomba	Forestry Department
32.	Mr. Phillip K. Miti	Central Statistics Office (CSO)
33.	Mr. Aaron Mkandawire	MACO Central Province
34.	Mr. Dominic Chikopela	Central Statistics Office (CSO)
35.	Mr. Geoffrey I kuyewana	Central Statistics Office (CSO) Livingstone
36.	Mr. Mike M. Yambwa	Central Statistics Office (CSO) Central Province
37.	Mr. Valentine K. Michelo	Ministry of Agriculture & Cooperative (MACO)
38.	Mr. Christopher Chewe	Forest Resources Management Project – N/Western
39.	Mrs. Christine Sikanyika	Ministry of Agriculture & Cooperative (MACO)
40.	Mrs. Florence M. Bulukeni	Forestry Department

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|-----|---------------------------|--|
| 41. | Mr. Victor Chalabesa | Forestry Department |
| 42. | Mr. Duncan Musama | Environment & Natural Resources Department |
| 43. | Mr. Francis Mpampi | Planning & Information Department - MTENR |
| 44. | Ms. Bridget Chiumya | Africare |
| 45. | Mr. Jackson Mukosha | Forestry Department |
| 46. | Mrs. Catherine Z. Nguvulu | Forestry Department |
| 47. | Ylva Melin | Swedish University of Agriculture |
| 48. | Ulf Soderberg | Swedish University of Agriculture |
| 49. | Dr. Mats Sandwell | SLU, Umea |
| 50. | Davy Nkhata | ILUA - Consultant |

ANNEX 2

REMARKS BY NATIONAL CONSULTANT AT THE FIRST TRAINING WORKSHOP FOR INTEGRATED LAND USE ASSESSMENTS HELD AT BALUBA MOTEL

THE CHAIRPERSON

THE DIRECTOR OF HUMAN RESOURCES

THE ACTING DIRECTOR OF FORESTRY

FELLOW PARTICIPANTS

IT GIVES ME A GREAT PLEASURE TO BE GIVEN AN OPPORTUNITY TO GIVE YOU THE BACKGROUND OF THE INTEGRATED LAND USE ASSESSMENT PROJECT IN ZAMBIA.

THIS PROJECT WAS INITIATED BY THE FORESTRY DEPARTMENT AFTER REALISING THAT INFORMATION FOR DECISION MAKING, POLICY FORMULATION AND LOCAL AND INTERNATIONAL REPORTING WAS LACKING AND HENCE THE NEED TO HAVE THIS INFORMATION AND APPROACHED FAO FOR TECHNICAL AND FINANCIAL ASSISTANCE TO DEVELOP A PROJECT THAT WILL ADDRESS THE NEED TO HAVE UP TO DATE INFORMATION IN THE LAND USE AND AT THE SAME TIME TO BUILD CAPACITY TO ALL STAKEHOLDERS INVOLVED IN THE LAND USE IN THE COUNTRY.

THE CHAIRPERSON

THE MAIN PURPOSE OF THE INTEGRATED LAND USE ASSESSMENT PROJECT IS TO IMPROVE THE CAPACITIES OF INSTITUTIONS IN PLANNING AND IMPLEMENTING THE INTEGRATED LAND USE ASSESSMENT, GENERATING HIGH QUALITY INFORMATION AT REASONABLE COST AND CONDUCTING LONG TERM MONITORING OF THE RESOURCES.

IN ORDER TO ACHIEVE THE OBJECTIVE THE STRATEGY ADOPTED HAS BEEN TO PHASE THE PROJECT INTO THREE PHASES. THE FIRST PHASE IS A PREPARATORY PHASE THAT INCLUDES DESIGNING OF THE PLAN AND TRAINING OF THE NATIONAL TEAMS THAT WILL BE RESPONSIBLE FOR TRAINING AND SUPERVISION OF FIELD CREW TEAMS. THE SECOND PHASE IS CARRYING OUT AND ANALYSIS OF THE ASSESSMENTS IN SELECTED AREAS THROUGHOUT THE COUNTRY. THE LAST PHASE IS REPORTING OF THE RESULTS AND DECIDING THE WAY FORWARD.

THE CHAIRPERSON

I AM HAPPY TO REPORT THAT SINCE THE INCEPTION OF THE PROJECT IN AUGUST A LOT OF PROGRESS HAVE BEEN MADE. THE PLAN FOR IMPLEMENTING THE INTEGRATED LAND USE ASSESSMENT HAS BEEN PREPARED AND SUBMITTED TO FAO FOR FUNDING, ALL STAKEHOLDERS HAVE BEEN INFORMED ABOUT THE PROJECT, A TECHNICAL STEERING COMMITTEE HAS BEEN FORMED AND HAD ITS FIRST MEETING, TRAINING NEEDS ASSESSMENTS HAVE BEEN CARRIED OUT AND FIRST TRAINING IS BEING HELD TODAY WHICH WILL LAST FOR FIVE DAYS.

THEREFORE, THIS TRAINING WHICH WILL SOON BE OPENED BY THE GUEST OF HONOUR HAS DRAWN 43 PARTICIPANTS FROM GOVERNMENT MINISTRIES INVOLVED IN LAND USE, THE PRIVATE SECTOR, AND NGOS. THE TRAINING IS BEING FACILITATED BY THE SWEDISH UNIVERSITY, DEPARTMENT OF FOREST RESOURCE MANAGEMENT AND GEOMATICS. THE TRAINING HAS BEEN ORGANISED IN THREE PHASES, FIRST IS THE INTRODUCTORY LASTING FIVE DAYS, THE SECOND WILL BE DETAILED LASTING ABOUT THREE WEEKS AND HAS BEEN PLANNED TO TAKE PLACE NEXT YEAR IN MARCH. IT IS HOPED THAT THOSE WHO WILL BE TRAINED WILL TRAIN OTHERS IN THE THIRD TRAINING.(THE FIELD CREW TEAMS). THIS TRAINING IS THUS MEANT TO COME UP WITH A NATIONAL TEAM

THE CHAIRPERSON

THIS TRAINING HAS FOUR OBJECTIVES

- GIVE AN OVERVIEW AND UNDERSTANDING FOR THE METHODOLOGY AND PROCESSES INVOLVED IN THE INTEGRATED LAND USE
- ACQUIRE SKILLS IN INTEGRATED LAND USE ASSESSMENTS WHICH WILL LEAD TO ABILITY TO PLAN AND SURPERVISE THE INTEGRATED LAND USE ASSESSMENT PROJECT
- ENABLE PARTICIPANTS IN LONG RUN TO BE ABLE MANAGE AND CONDUCT A PROJECT OF THIS KIND IN THE COUNTRY
- GET VALUABLE OPINIONS FROM THE PARTICIPANTS ON HOW THE INTEGRATED LAND USE CAN BE PLANNED, ORGANISED AND IMPLEMENTED IN ZAMBIA IN THE COST EFFECTIVE WAY

IT IS MY HOPE THAT BY THE END OF THIS TRAINING PARTICIPANTS WOULD HAVE ACHIEVED THE STATED OBJECTIVES AND A TEAM OF TRAINERS FORMED

THANK YOU VERY MUCH

ANNEX 3

1.1 Remarks by the Acting Director of Forestry

**THE GUEST OF HONOUR, DIRECTOR HUMAN RESOURCE AND ADMINISTRATION,
THE CHAIRPERSON,
THE CONSULTANT,
INVITED PARTICIPANTS**

IN THE FIRST PLACE I WOULD LIKE TO WELCOME THE PARTICIPANTS TO THE WORKSHOP AND THANK THEM FOR RESPONDING FAVOURABLY TO THE INVITATION. I ALSO WOULD LIKE TO GIVE SPECIAL THANKS TO THE TRAINING WORKSHOP FACILITATORS FROM SWEDISH UNIVERSITY. IN MY VIEW THE WORKSHOP HAS COME AT A TIME WHEN MOST OF THE GOVERNMENT OFFICERS ARE VERY BUSY WITH THEIR WORK. HOWEVER, I AM VERY ENCOURAGED BY THE RESPONSE AND ATTENDANCE FROM THE INVITED STAKEHOLDERS, WHICH IS A TESTIMONY OF THE IMPORTANCE THAT THEY ATTACHED TO THE TRAINING WORKSHOP.

THE CHAIRPERSON

FOREST POLICES HAVE A DIRECT IMPACT ON ALL SECTORS. IT HAS DIRECT IMPACTS FOR EXAMPLE ON SOIL, FOOD PRODUCTION, ENERGY WHICH ALSO DIRECTLY IMPACTS ON POVERTY AND THE SOCIAL ECONOMIC WELL BEING OF THE NATION. THEREFORE, TO SOLVE THESE PROBLEMS IT REQUIRES A COORDINATED EFFORT BY ALL STAKEHOLDERS. TO THIS EFFECT I AM AWARE THAT THE GOVERNMENT OF THE REPUBLIC OF ZAMBIA THROUGH VARIOUS GOVERNMENT AGENCIES, HAS EMBARKED UPON A NUMBER OF INITIATIVES THAT ARE AIMED AT BRINGING ABOUT EFFECTIVE COLLABORATION FOR ECONOMIC DEVELOPMENT, FOR EXAMPLE ZAMSIF, CBNRM JUST TO MENTION A FEW. I THEREFORE STRONGLY BELIEVE THAT FORESTRY CAN PROVIDE SUCH AN ENTRY POINT AND HENCE, THE LAUNCHING OF AN INITIATIVE LIKE THE INTEGRATED LAND USE ASSESSMENT (ILUA) CAN HELP IN ALLEVIATING POVERTY BECAUSE IT IMPACTS ON ALL SECTORS. THEREFORE, A WORKSHOP LIKE THE ONE WHICH THEY WERE ATTENDING WAS A DEMONSTRATION OF THE KIND OF SPIRIT THAT THE FORESTRY DEPARTMENT WANTS TO PROMOTE IN ORDER TO FOSTER DEVELOPMENT IN THE NATION.

I THEREFORE URGE ALL PARTICIPANTS TO SERIOUSLY ADDRESS THEMSELVES TO THE TRAINING WORKSHOP AND LEARN NEW SKILLS AND ALSO SHARE THEIR EXPERIENCES SO THAT THE NATION CAN

MOVE FORWARD IN ITS QUEST TO ACHIEVE SUSTAINABLE
MANAGEMENT OF OUR NATURAL RESOURCES.

LASTLY WITH THESE FEW WORDS I WISH ALL THE PARTICIPANTS A
SUCCESSFUL TRAINING WORKSHOP.

THANK YOU

ANNEX 4

KEY NOTE ADDRESS BY THE DIRECTOR OF HUMAN RESOURCES AND ADMINISTRATION IN THE MINISTRY OF TOURISM, ENVIRONMENT AND NATURAL RESOURCES TO BE DELIVERED AT THE OFFICIAL OPENING OF THE FIRST TRAINING WORKSHOP FOR THE INTEGRATED LAND USE ASSESSMENT PROJECT TO BE HELD AT BALUBA MOTEL, LUANSHYA, FROM 30TH NOVEMBER, 2003 TO 5TH DECEMBER, 2003.

**CHAIRPERSON,
ACTING DIRECTOR OF THE FORESTRY DEPARTMENT,
REPRESENTATIVE(S) FROM THE FOOD AND AGRICULTURAL
ORGANISATION
OFFICIALS FROM SWEDEN,
DEAR PARTICIPANTS,
LADIES AND GENTLEMEN.**

IT GIVES ME GREAT PLEASURE TO WELCOME YOU ALL THIS MORNING TO THE FIRST TRAINING WORKSHOP FOR THE INTEGRATED LAND USE ASSESSMENT PROJECT. ALLOW ME TO EXTEND A SPECIAL WARM WELCOME TO OUR VISITORS FROM UMEA, SWEDEN, WHO HAVE COME TO ASSIST US WITH THIS PHASE OF THE FIRST TRAINING WORKSHOP FOR INTEGRATED LAND USE ASSESSMENT PROJECT.

CHAIRPERSON

ZAMBIA IS WELL ENDOWED IN NATURAL RESOURCES, WITH A FOREST COVER OF APPROXIMATELY 60% OF THE TOTAL LAND AREA. AS YOU ARE AWARE, NATURAL RESOURCES ARE VITAL FOR THE ECONOMIC AND SOCIAL DEVELOPMENT OF THE LOCAL POPULATION AND THE COUNTRY IN GENERAL. IT IS AS A RESULT OF THIS THAT THE GOVERNMENT HAS GIVEN THIS SECTOR PRIORITY IN THE POVERTY REDUCTION STRATEGY PAPER.

DEAR PARTICIPANTS

DESPITE THIS GREAT POTENTIAL, ZAMBIA'S NATURAL RESOURCES, ESPECIALLY IN FOREST COVER, HAVE CONTINUED TO BE ON THE DECLINE BOTH IN QUALITY AND IN QUANTITY. THIS IS DUE TO A COMBINATION OF FACTORS SUCH AS EXTENSIVE PRACTICES OF SHIFTING CULTIVATION AND THE SLASH AND BURN METHOD USED BY MANY FARMERS.

IN ADDITION, THE EVER INCREASING DEMAND FOR WOOD BASED ENERGY SUCH AS FIREWOOD AND CHARCOAL, THE CONTINUED

UTILISATION OF THE (NON?)KNOWN COMMERCIAL INDIGENOUS TREE SPECIES ON UNSUSTAINABLE BASIS, COUPLED WITH OVER-GRAZING AND FOREST FIRES HAVE WORSENERED THE SITUATION FURTHER.

CHAIRPERSON

I WISH TO EMPHASISE THAT THE SCALE AND INTENSITY OF DEFORESTATION, THE LOSS OF BIOLOGICAL DIVERSITY, OVERGRAZING, OVER-EXPLOITATION OF THE NATURAL RESOURCES AND SOIL EROSION, ASSOCIATED WITH THE DECLINE IN OVERALL SOIL FERTILITY AND NATURAL RESOURCES PRODUCTIVITY HAVE REACHED ALARMING PROPORTIONS.

WHILST RECOGNISING THAT NATURAL RESOURCES ARE ON THE DECLINE, IT IS, HOWEVER, SAD TO NOTE THAT WE, AS A COUNTRY, LACK BOTH THE TECHNICAL AND FINANCIAL CAPACITY TO DETERMINE THE EXTENT OF DECLINE. THIS IS BECAUSE WE DO NOT HAVE AN UP-TO-DATE INFORMATION BASE ON LAND USE AS WELL AS ON THE ENVIRONMENT, CONSIDERING THAT THE LAST NATIONAL INVENTORY WAS CARRIED OUT 39 YEARS AGO.

DEAR PARTICIPANTS

THIS KIND OF SITUATION MAKES PLANNING, DECISION -MAKING, POLICY FORMULATION AND MONITORING OF NATURAL RESOURCES VERY DIFFICULT. IT IS THUS THE DESIRE OF MY MINISTRY TO DEVELOP A SYSTEM THAT WILL PROVIDE INFORMATION TO NATIONAL AND INTERNATIONAL USERS OF NATURAL AND OTHER RELATED RESOURCES, THROUGH THE DESIGN, PLANNING AND IMPLEMENTATION OF POLICIES WHICH WILL IMPROVE THE ADMINISTRATION SYSTEM AND SUPPORT INVESTMENT IN DIFFERENT SECTORS IN THE COUNTRY.

CAPACITY BUILDING IS, THEREFORE, NEEDED IN FORM OF TRAINING OF STAFF INVOLVED IN INTEGRATED LAND USE. IN ADDITION, WE NEED INFORMATION THAT IS RELATED TO THE STATE AND QUALITY OF NATURAL AND OTHER RESOURCES IN THE COUNTRY AND THE EXISTING PRODUCTS DESTINED FOR NATIONAL AND INTERNATIONAL MARKETS. WE NEED TO DESIGN NATIONAL POLICIES AND STRATEGIES FOR SUSTAINABLE USE AND CONSERVATION OF NATURAL ECOSYSTEMS AND UNDERSTAND THE RELATIONSHIP BETWEEN RESOURCES AND USERS OF THE RESOURCES.

IT IS IN THIS REGARD THAT MY MINISTRY REQUESTED THE FOOD AND AGRICULTURAL ORGANISATION (FAO) WHICH HAS VAST EXPERIENCE IN CARRYING OUT SUCH ASSESSMENTS TO ASSIST THE ZAMBIAN GOVERNMENT, BOTH FINANCIALLY AND TECHNICALLY, TO CARRY OUT

INTEGRATED LAND USE AND THROUGH AN AGREEMENT WITH THE SWEDISH UNIVERSITY BUILD CAPACITY OF NATIONAL STAFF INVOLVED IN INTEGRATED LAND USE ASSESSMENT.

THIS TECHNICAL ASSISTANCE COMPRISES MAINLY THE FOLLOWING:

- BUILDING CAPACITY IN THE FORESTRY DEPARTMENT AND OTHER RELATED LAND USE SECTORS SUCH AS AGRICULTURE, WILDLIFE AND WATER;
- DEVELOPING METHODOLOGY TO CARRY OUT INTEGRATED LAND USE ASSESSMENT THROUGH-OUT THE COUNTRY; AND
- ESTABLISHING AN INFORMATION DATABASE SYSTEM THAT WILL BE USED FOR PLANNING, DECISION -MAKING, POLICY FORMULATION AND REPORTING AT BOTH NATIONAL AND INTERNATIONAL LEVELS.

CHAIRPERSON

I UNDERSTAND THAT THE FIRST NATIONAL AWARENESS WORKSHOP, WHICH WAS HELD IN OCTOBER THIS YEAR IN KABWE CAME UP WITH THE METHODOLOGY OF CARRYING OUT THE INTEGRATED LAND USE ASSESSMENT AND ALSO AGREED THAT THE NEXT STAGE WOULD BE TO TRAIN STAKEHOLDERS IN HOW TO CARRY OUT THE ASSESSMENTS. I AM HAPPY, THEREFORE, TO NOTE THAT THINGS ARE MOVING AS PLANNED IN THAT WITHIN ONE MONTH OF THAT WORKSHOP, THE TRAINING OF STAKEHOLDERS HAS COMMENCED TODAY.

THIS TRAINING HAS THE FOLLOWING OBJECTIVES-:

- TO GIVE AN OVERVIEW AND UNDERSTANDING OF THE METHODOLOGY AND PROCESSES INVOLVED;
- TO ACQUIRE SKILLS IN INTEGRATED LAND USE ASSESSMENT WHICH WILL LEAD TO ABILITY TO PLAN AND SUPERVISE THE INTEGRATED LAND USE ASSESSMENT PROJECT;
- TO ENABLE PARTICIPANTS IN THE LONG RUN TO BE ABLE TO MANAGE AND CONDUCT A PROJECT OF THIS KIND IN THE COUNTRY; AND
- TO GET VALUABLE OPINIONS FROM THE PARTICIPANTS ON HOW INTEGRATED LAND USE CAN BE PLANNED, ORGANISED AND IMPLEMENTED IN ZAMBIA IN THE MOST COST EFFECTIVE WAY.

DEAR PARTICIPANTS

THIS TRAINING HAS BEEN ORGANISED IN THREE PHASES. THE ONE TAKING PLACE TODAY IS THE FIRST WHILE THE SECOND AND THIRD PHASES WILL TAKE PLACE IN MARCH AND APRIL OF NEXT YEAR. THE SAME PARTICIPANTS WHO ARE HERE TODAY WILL CONTINUE WITH THE SECOND AND THIRD PHASES OF THIS TRAINING. THE MAIN AIM OF THIS IS TO COME UP WITH A NATIONAL TEAM THAT WILL BE RESPONSIBLE FOR TRAINING AND SUPERVISING CREW TEAMS IN CARRYING OUT ASSESSMENTS THROUGHOUT THE COUNTRY.

IT IS MY SINCERE HOPE, THEREFORE, THAT SUSTAINABILITY WILL BE MAINTAINED SO THAT ASSESSMENTS WILL BE CARRIED OUT SUCCESSFULLY AND WILL ACHIEVE THE ASPIRATIONS OF THE ZAMBIAN GOVERNMENT. I WISH, THEREFORE, TO APPEAL TO THE PARTICIPANTS TO WORK VERY HARD IN THE NEXT FIVE DAYS TO ENSURE THAT THEY ACQUIRE THE SKILLS NEEDED IN CARRYING OUT INTEGRATED LAND USE ASSESSMENTS. THIS DOES NOT MEAN, HOWEVER, THAT YOU SHOULD NOT TAKE TIME OFF TO ACQUAINT YOURSELVES WITH THE ENVIRONMENT AND SOCIAL SURROUNDINGS OF THIS PLACE.

CHAIRPERSON

BEFORE I END MY ADDRESS, ALLOW ME TO EXPRESS SINCERE GRATITUDE TO FAO AND THE SWEDISH UNIVERSITY FOR THE FINANCIAL AND TECHNICAL ASSISTANCE RENDERED TO MY MINISTRY. I AM ALSO GRATEFUL TO THE LINE MINISTRIES INVOLVED IN LAND USE FOR THEIR CO-OPERATION IN WORKING TOGETHER AND CARRYING OUT THE ASSESSMENTS.

FINALLY, I WISH TO THANK THE MANAGEMENT OF BALUBA MOTEL FOR HOSTING US. WITH THESE REMARKS, I NOW DECLARE THIS TRAINING WORKSHOP OFFICIALLY OPEN.

GOD BLESS YOU

WORKSHOP EVALUATION FORM

1. What was good about the training workshop?

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2. What was bad about the training workshop?

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3. Have your expectations been fulfilled?

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4. What is your suggestion for the future workshop?

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ANNEX 6

INTEGRATED LAND USE ASSESSMENT PROJECT TRAINING WORKSHOP PROGRAMME

Venue: Baluba Motel, Luanshya

Dates: 1st to 5th December 2003

Programme

1 st December 2003 – Monday
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- 8:00 – 8:30 Registration of Participants
- 8:30 – 9:00 Official Opening
- National Consultant Remarks
 - Director of Forestry Remarks
 - Key Note address by Guest of Honour
- 9:00 – 10:00 Introduction to ILUA – Ylva Melin (YM)
- Introduction and Expectations – Participants
 - Background and purposes
 - Discussion
- 10:00 – 10:20 Break
- 10:20 – 12:00 Area Production Model (APM) – MS
- Illustration of how humans and different land uses affect each other
- 12:00 – 13:00 Introduction to forest/land use classification systems – MS & YM
- 13:00 – 14:00 Lunch Break
- 14:00 – 15:00 Classification of Forestry system in Zambia – Able Siampale
Classification of Agriculture systems in Zambia – Charlton Phiri
- 15:00 – 15:15 Break
- 15:15 – 16:30 Group Work
- 16:30 – 17:00 Plenary Session
- 17:00 – 17:15 End of the Day

2 nd December 2003, Tuesday
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- 08:30 – 10:00 Organization and Implementation of ILUA – YM
- 10:00 – 10:15 Break
- 10:15 - 11:30 Group Work
- 11:30 – 12:00 Plenary Session
- 12:00 – 13:00 Overview of options for resource assessments – Ulf Soderberg (US)
- 13:00 – 14:00 Lunch Break
- 14:00 - 15:00 Sampling Design – US

15:00 – 15:15 Break
15:00 – 16:00 Group Work
16:00 – 16:30 Plenary Session
16:30 – 17:15 Establishment and Use of Permanent sample plots – US
17:15 End of the Day

3rd December 2003, Wednesday

8:30 – 9:15 Data Collection through Interviews – Mats Sandewall (MS)
9:15 – 10:00 Group Work
10:00 – 10:15 Break
10:15 – 11:00 Plenary session
11:00 – 12:00 Remote Sensing YM & MS
12:00 – 13:00 Remote Sensing in ILUA in Zambia
 o Discussion
13:00 – 14:00 Lunch Break
14:00 15:00 Observation and Measurements – MS & US
15:00 – 15:15 Break
15:15 – 16:30 Group Work
16:30 – 17:15 Plenary Session
17:15 End of the Day

4th December 2003, Thursday

8:30 – 10:00 Information Management and data registration
10:00 – 10:15 Break
10:15 – 12:00 Group Work
12:00 – 13:00 Plenary Session
13:00 – 14:00 Lunch Break
14:00 – 15:15 Modelling for estimation and monitoring – US
15:15 – 15:30 Break
15:20 – 17:00 Modelling for estimation and monitoring –US
17:00 End of the Day

5th December, Friday

8:30 – 13:00 Scenarios, Computer exercises with the Area Production Model – YM
13:00 – 14:00 Lunch Break
14:00 – 15:15 Plenary Session
15:15 – 15:30 Break
15:30 – 16:00 Way Forward and Conclusions
16:00 Closing