TRAINING REPORT
GIS AND REMOTE SENSING

WESTERN KENYA INTEGRATED ECOSYSTEM MANAGEMENT PROJECT

Meshack Nyabenge
Louis Verchot

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

International Centre for Research in Agroforestry
P.O. Box 30677
Nairobi, Kenya

Table of Contents

1. Introduction

Training of KARI staff in GIS and remote sensing is the first step in preparing the team to understand the carbon measurement and monitoring system. This knowledge will also empower the team to undertake their own analyses of their project areas and improve their activity planning and monitoring processes. Training was organized in a modular fashion with three training workshops over the course of the third year of the Project. Each course was for one week in length.

Training format consisted of formal lectures followed by practical exercises. The practical exercises were organized to consolidate the concepts taught in the lecture and help the trainees apply their knowledge. To the extend feasible, practical exercises were organized around specific tasks germane to WKIEMP. As such the project blocks were generally used to illustrate the concepts in these exercises.

2. Training module descriptions

Module 1 - Introduction to GIS and GPS

Dates: 25-29th June 2007

This module will provide an introduction to GIS data capture and GPS data capture and downloading (using Ozi-explorer). Participants will be introduced to the use of ArcView in Data display (Vector, Rater, and GPS data). The course will conclude with data downloading and uploading and exchange in GIS and GPS receivers.

The key areas for knowledge development are:

➢ Basic concepts and principles of GIS and GPS, historical and current development trends, diversity in uses and cost impacts.

➢ Understanding and participate in GPS and Ozi –explorer settings, data capture and download.

➢ Understand and operate ArcView software in displaying different data formats, out put products via layout items.

➢ Master and operate GPS-GIS links downloading-uploading procedures via Ozi-explorer and ArcView and out GPS with existing maps.

<u>Module 2 - Spatial Analysis</u>

Dates: 27-31st August 2007

This module will review GIS data capture in ArcView, including items associated with Project, View, Theme, Table, and Layout. The concepts of data geo-referenceing and map projections will be covered. Participants will be introduced to geo-processing and spatial analysis tools which can be used in spatial modeling and data characterization

The key areas for knowledge development are:

➢ Review key GIS items from training module 1 and operate ArcView in data display and outputs.

➢ Understand and perform map projections and data geo-referencing within ArcView tools and modules.

➢ Learn and use different spatial analysis tools for different GIS related activities.

➢ Learn and use spatial modeling concepts for different applications areas.

➢

<u>Module 3 - GIS and Remote Sensing</u>

Dates: 14 – 18 April 2008

This module will review items associated with Project, View, Theme, Table, and Layout. Participants will be introduced to remote sensing and data analysis methods for remotely sensed data. These analysis tools will then be used to link remotely sensed data to ground data in a GIS environment. Strong emphasis will be places on data interpretation in the GIS environment.

The key areas for knowledge development are:

- ➢ Basic concepts and principles of remote sensing, historical and current development trends, diversity in uses and cost impacts.

- ➢ Satellite sensors and their properties in terms of spatial, temporal and spectral resolutions.

- ➢ Visual image interpretation procedures for different landscapes applications using different satellite image products.

- ➢ Digital image interpretation using ArcView and other s remote sensing package.

- ➢ Integration of remote sensing products with GIS data for better landscape application and output.

3. Instructor evaluation of the training course

The response in module 1(GIS-GPS links) was enormous with every participant purposefully involved in GPS settings and data capture, Ozi-Explorer installation, configuration, data download and upload. This was followed by successful data export to ArcView and basic mapping practice with GEF sampling and survey data. The initial challenges encountered in this module were due to less powerful computers (particularly from ICRAF lots), which could not process spatial data as fast as required and lack of Vista Window operating systems supported versions of Ozi-explorer (GPS data downloading software). This resulted in made some KARI computers not being used effectively during practical sessions.

For the presentation of Module 2 (spatial analysis), 6 attendants were missing from the previous module. This module also received enormous response accompanied with intensive practical use of variety of spatial tools. The major limiting factor was time for participants to practice and master all the tools and their applications areas. However, three-quarters of the participants continued practicing with these spatial tools beyond the training week and were actively engaged with the trainers through e-mail based questions related to minor difficulties encountered.

Module 3, with only 8 participants from module 2, targeted remote sensing both as data input to GIS and as an independent discipline. The session started by reviewing the previous modules to ascertain the level GIS practice and overall engagement of participants within spatial analysis and ended with extensive practical sessions on digital image interpretation and analysis. The response was positive with all participants absolutely and individually

practiced image geo-referencing, visual and digital image interpretation. However, time and lack of powerful computers remained key challenges in this module.

Overall, the response from the training was positive and two participants from ICRAF and KARI apiece requesting to come to ICRAF GIS unit (2nd week June 2008) for at least two weeks for attachment, because they would like to take charge of GIS activities in GEF project as well as other activities in their workstations. The remaining participants promised to continue practice and use GIS, GPS and remote sensing to compliment and enhance their current activities within GEF and other programs.

4. Trainee evaluation of the training course

The responses in the questionnaires were all very positive on the training modules offered. The participants appreciated the practical, hands-on focus of the training course. The trainees who followed the whole series of courses were satisfied with the technical level of the course. Those who joined in the middle of the course struggled, particularly with the last module. Trainees appreciated the technical content of the course and indicated that additional time to master some of the techniques would be helpful. To that end, several trainees will work in the GIS unit at ICRAF for two weeks to hone their skills.

When asked how the course could be improved, trainees indicated that higher power computers were required for better operation fo the software. Additionally, several participants thought that a different, non-office setting might be better for course delivery. Trainees were almost unanimous on the need for continuous and on-going training, but most acknowledged that the level offered in these introductory courses would contribute to their professional performance.