West African Drylands Project

An Ecosystem Approach to Restoring West African Drylands and Improving Livelihoods through Agroforestry-based Land Management Interventions.

A United Nations Environment Programme (UNEP) project conducted in partnership with the World Agroforestry Centre (ICRAF), the Centre for Environmental Policy of the University of Florida, and the Governments of Burkina Faso, Mali, Mauritania, Niger and Senegal. The project is funded by the Government of Norway.

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TRAINING MODULE

Introduction

The training module is built using DIVA-GIS, a freeware Geographical Information System (GIS), developed by CIP (International Potato Center, Peru). DIVA-GIS works very much like commercial front-end GIS packages (e.g. ArcView, ArcGIS, MapInfo), and if you learn DIVA-GIS, you will easily also learn to use another GIS. DIVA-GIS uses the same data format as most other GIS, and has in-built functions to export data also for IDRISI, ArcGIS, ArcView and other GIS software. Hence you can in principle do the lessons in this training module using ArcView, ArcGIS or IDRISI, albeit all instructions are written for DIVA-GIS. If you want to use the dataset with another software, you should start by looking at lesson 7, where you will learn how to export the data from DIVA-GIS for use in other software, and you will find information on batch converting the whole dataset to Idrisi or ArcView format with windows bat files supplied on the project CD.

The data for the training module is under the folder \data_spatial on the project CD. To see the data available in the dataset you can use the html-based web-catalogue that is on the Project CD, by clicking these links in the electronic version of this document:

Sahel

Parklands

By following this training module you will learn a lot about GIS and also how the regional baseline land degradation assessment was done for West Africa.

Lesson overviews

Lesson 0 - Install DIVA-GIS

In this lesson you will install and prepare DIVA-GIS.

Lesson 1 - DIVA-GIS basics

In this lesson you will learn about GIS data layers, and how to add and remove them from a DIVA-GIS project, how to turn layers on and off, and change the display order. You will also learn how to retrieve information about geographic features, and see the difference between vector and image

data. The lesson introduces the concept of land degradation by using GIS data with maps from the Global Assessment of Land Degradation (GLASOD).

Lesson 2 – Symbolizing

In this lesson you will learn about different types of attribute data; nominal data like names, ordinal data that gives an order without numbers, interval data where a number denotes a difference but the difference is not absolute, and ratio data which is data with absolute numerical values. The symbolization of attributes vary dependent on which type of data the attribute represents, and the lesson introduces symbolization of GIS data in DIVA-GIS. The lesson uses national GLASOD data as example.

Lesson 3 – Selecting features, labeling and designing maps

In this lesson you will learn how to select features in a layer and create a new vector layer from the selection; and how to label and design maps using DIVA-GIS.

Lesson 4 – Grid/raster data

In this lesson you will learn about the difference between vector and grid; to symbolize grid data, to work with stacks of multiple grid layers in DIVA-GIS, and the use map algebra to produce new grid layers. The lesson also introduces interpretation of data from multiple layers using both visualization and some built-in analysis tools in DIVA-GIS. The lesson introduces several global datasets on vegetation useful for interpreting land degradation.

Lesson 5 – Vegetation and time series data

In this lesson you will learn about satellite derived vegetation data, and how to use it for assessing land degradation; how to visually explore changes in both space and time using GIS; how to analyze time series data using DIVA-GIS; and more advanced methods for grid calculations. The lesson also gives an introduction to different data formats for grid data.

Lesson 6 – Rain Normalized NDVI and land degradation

In this lesson you will learn about how to disentangle rainfall driven vegetation changes from other factors affecting vegetation changes using the concept of Rain Normalized NDVI (RNNDVI); you will use the RNNDVI data to evaluate land degradation using trend analysis; more advanced grid calculation are introduced; you will also learn about multiple criteria for evaluating land degradation using a combination of maps.

Lesson 7 – Exporting, importing and projecting data layers

In this lesson you will learn how to import and export data from DIVA-GIS to other GIS software and applications; including a short introduction to ArcView and using the dataset in ArcView; you will also learn how DIVA-GIS can project data from Geographic coordinates to other projections.