



Food and Agriculture Organization
of the United Nations

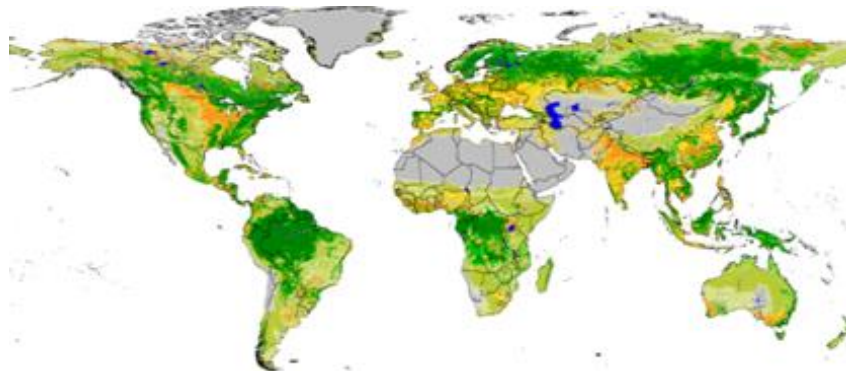
UN FAO Tools

Douglas Muchoney, FAO
Forum of Experts in SEEA Experimental
Accounting 2018
Glen Cove, New York
18-20 June 2018



Land evaluation and planning

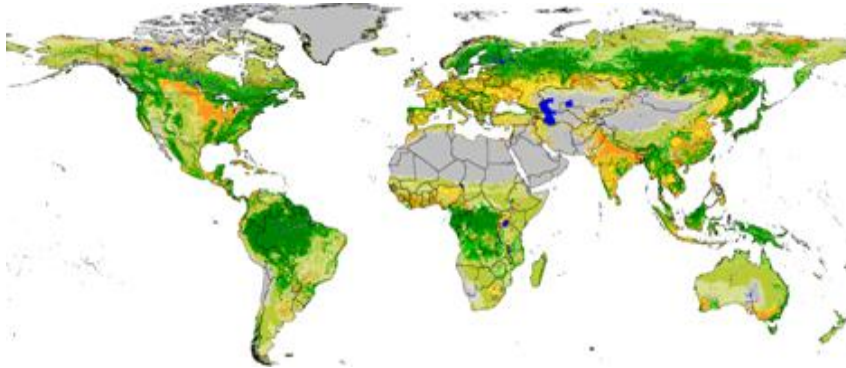
- **The Agro - Ecological Zones (AEZ) process** is the main system for assessing agricultural resources and potential
- Can be applied at global, regional and national levels for better planning, management and monitoring of land resources
- FAO involved in methodology development since 1978
- Used as SO-2 indicator (area with improved agricultural productivity and crop suitability)





GAEZ - Global Agro-Ecological Zones

- By FAO and the International Institute for Applied Systems Analysis (IIASA).
- GAEZ database is publicly available through a WEB portal.



<http://gaez.fao.org/Main.html>



GAEZ Data Portal capabilities

- Designed to facilitate access to the GAEZ database and resources
- Enables users management
- Delivers terabytes of spatial data, maps, tables, statistics, metadata, reports
- Fully documented (Data model, User's Manual, GAEZ definitions, FAQ, limitations, and hints available)
- Compliant with FAO definitions, classifications and standards, ISO metadata standards to feed FAO GeoNetwork

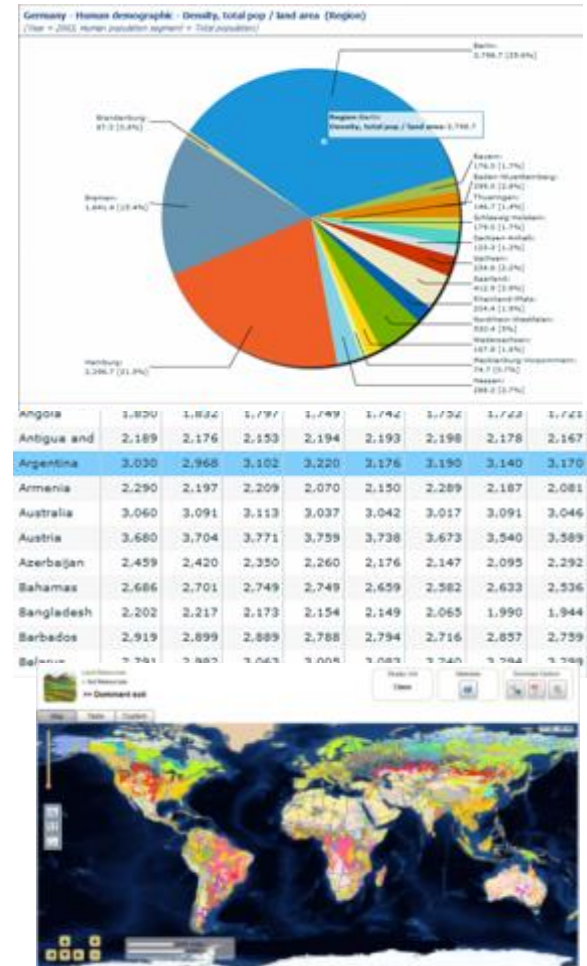


<http://gaez.fao.org/Main.html>

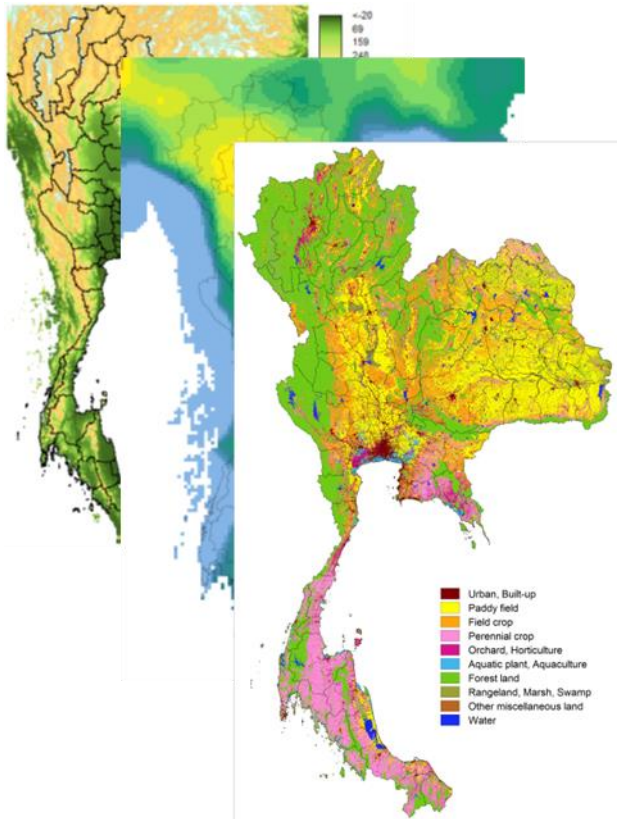
GAEZ Data Portal

www.fao.org/nr/gaez

- Brief summary of content:
 - 5 thematic areas (*Land and water resources; Agro-climatic resources; Suitability and potential yields; Actual yields and production; Yield and production gaps*)
 - > 300,000 global datasets at mainly 5 arc-minutes, also core layers at 30 arc-seconds
 - 11 crop groups, 49 crops, 92 crop types and 280 Crop/LUTs
 - yield and production gap analysis for 17 crops/commodities
 - 5 water supply types
 - 4 Input levels (*High, Intermediate, Low, Mixed*)
 - Historical 1961-2000, 30 year average (1961-1990) and Future, 2020s, 2050s, 2080s)

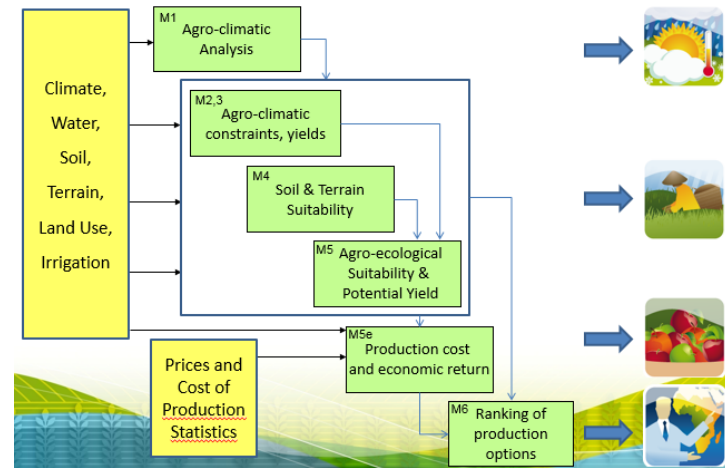


National AEZ: Thailand

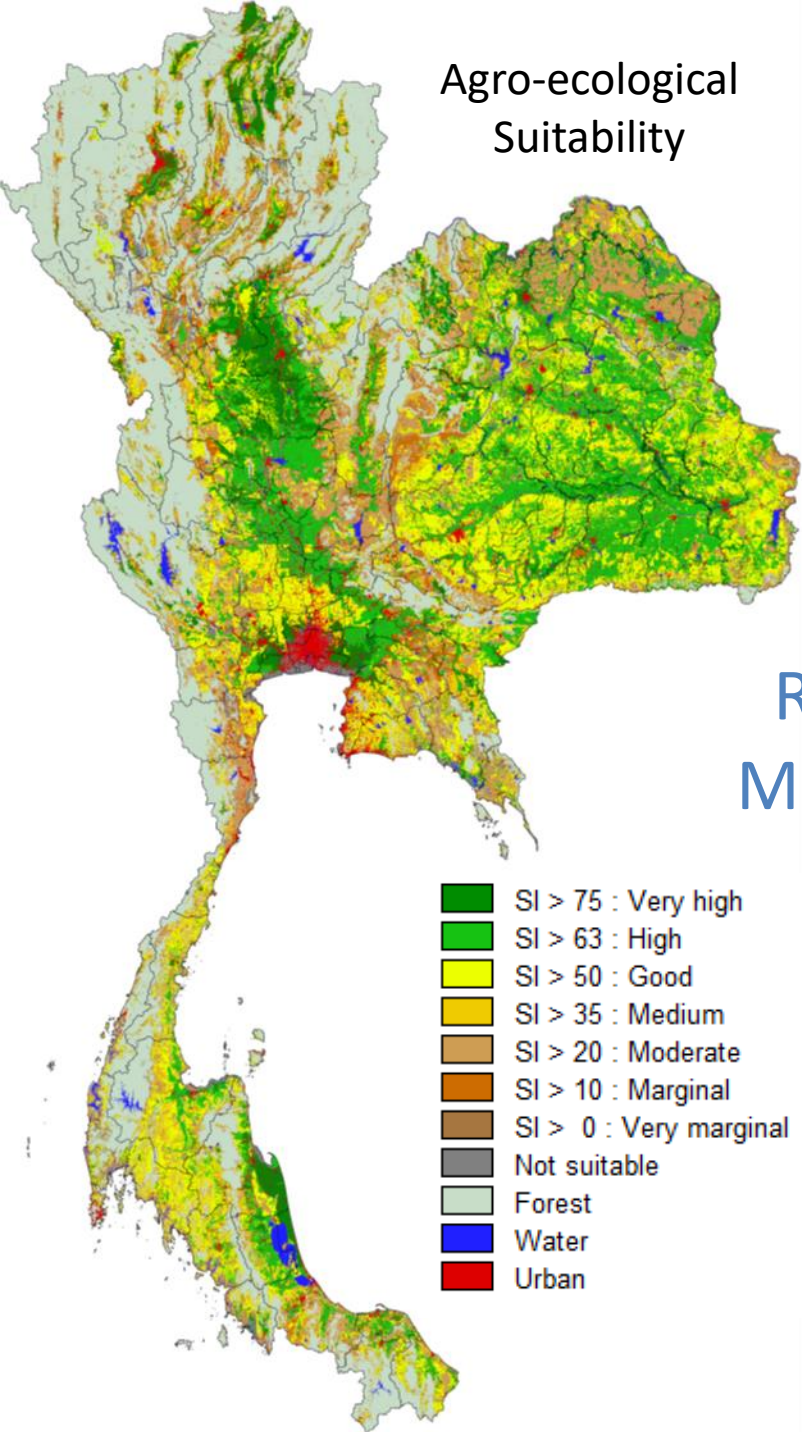


Agro-ecological assessment of crop suitability and productivity

- **Input:** resource databases; crop requirements and crop suitability criteria; crop calendars; crop statistics; industry and research data of potential attainable yields.
- **Output:** Mapped suitability and attainable yields by single crop and selected multi-cropping systems.

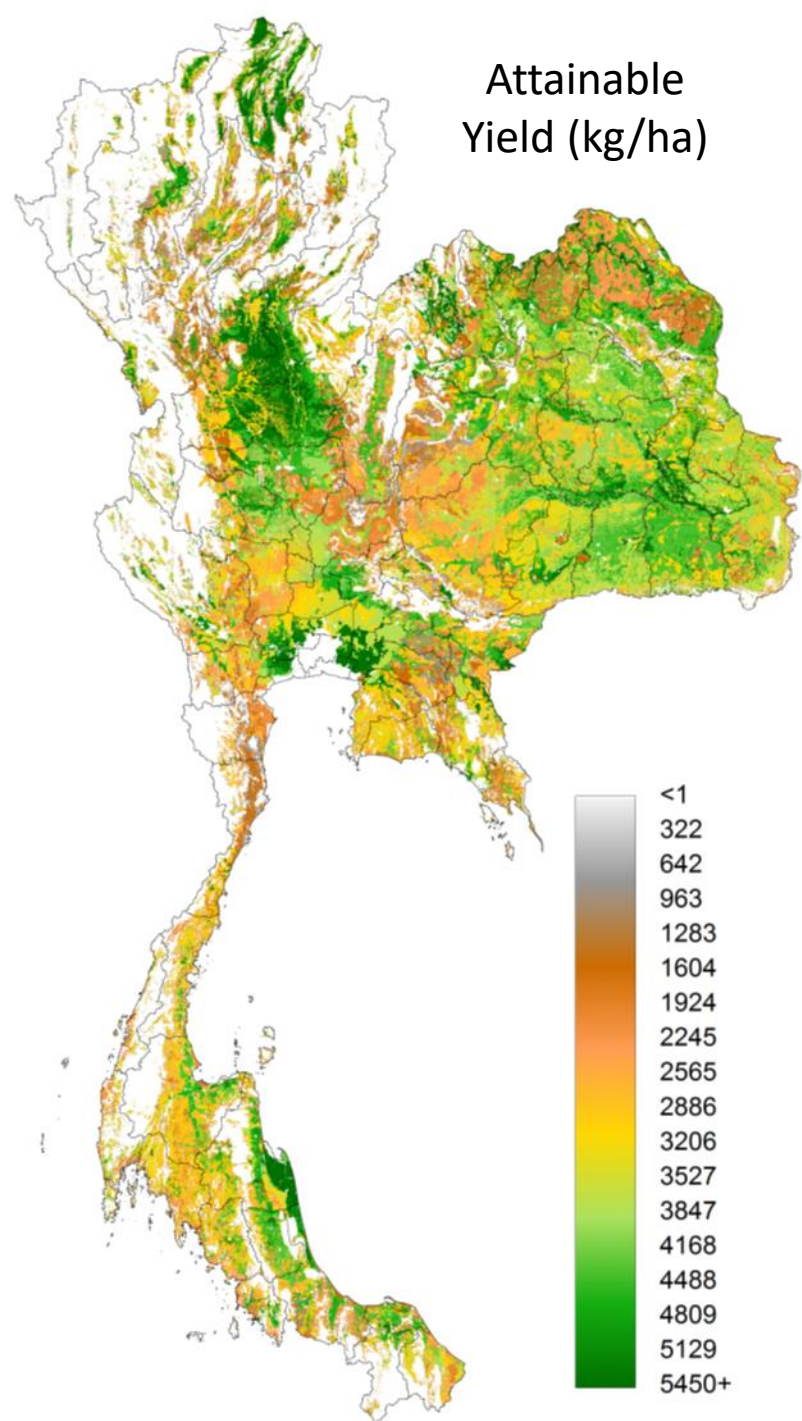


Agro-ecological
Suitability



Rain-fed
Major Rice

Attainable
Yield (kg/ha)

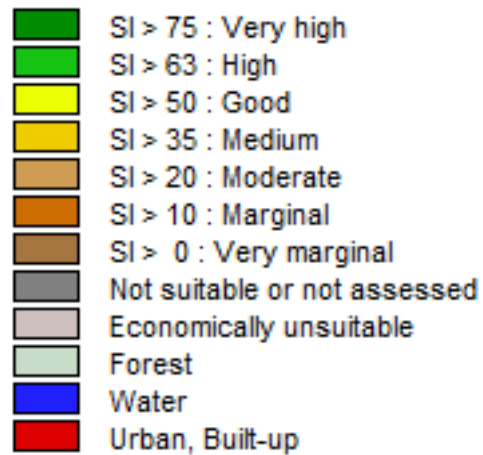


Rain-fed
Major Rice

Rain-fed
Maize

Agro-economic Suitability

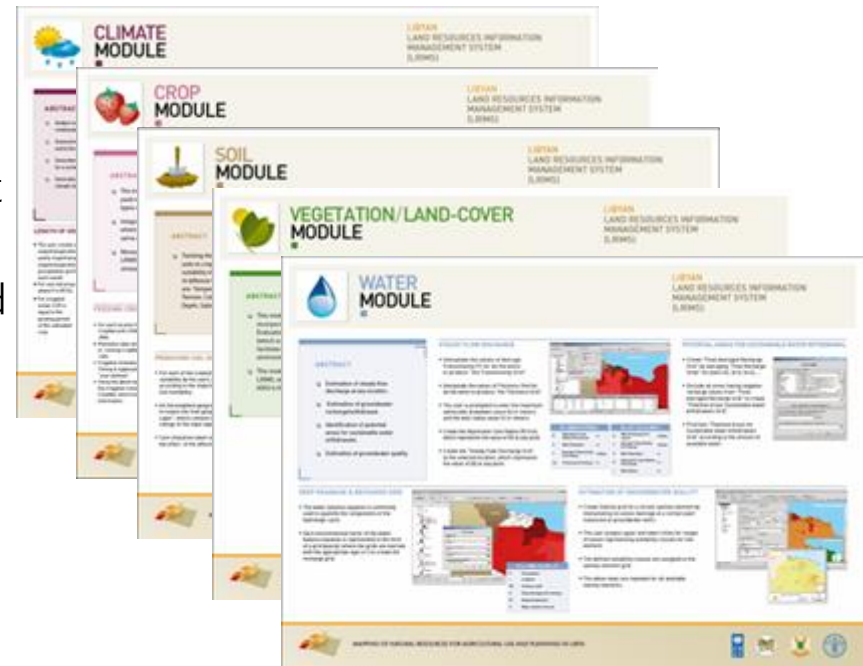
Estimation of 'optimized' spatial
production structure

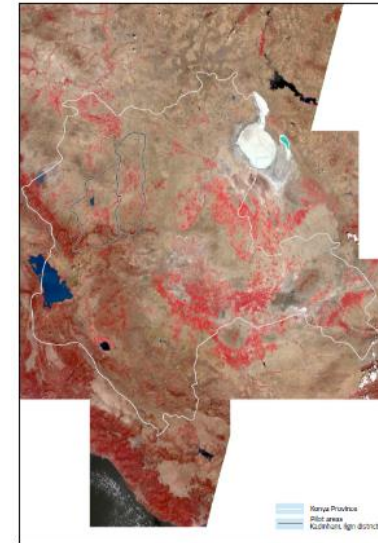
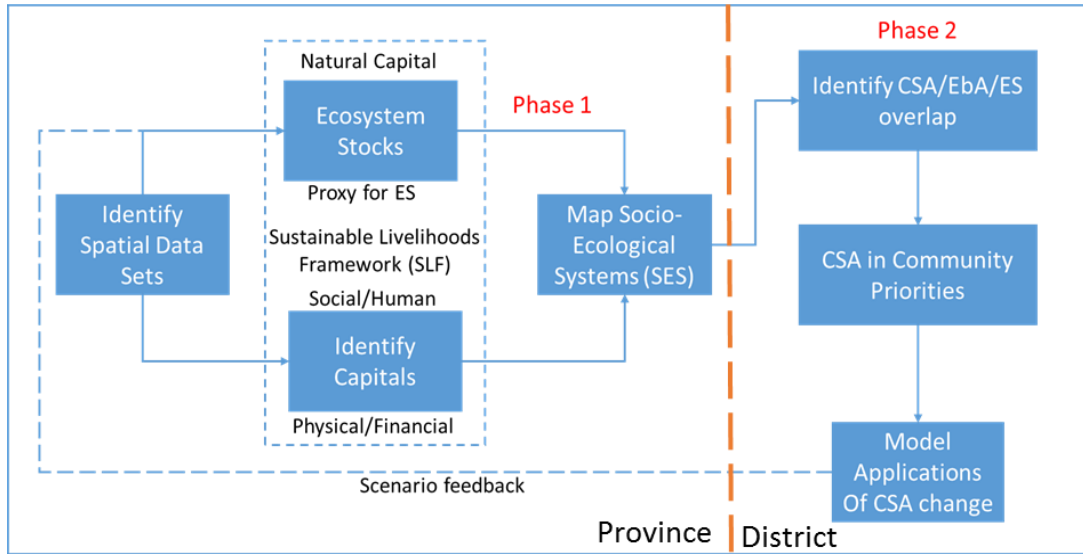




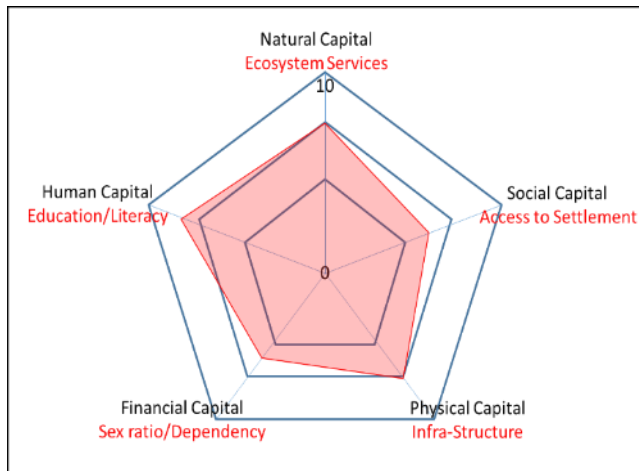
Land Resources Information Management System (LRIMS)

- Integrated processing environment where **physical and socio-economic** data are analyzed;
- Help identify sustainable land management practices;
- Allows implementation of an integrated and interactive approach to land use planning;
- Support for technicians and policy makers;
- Enables assessment and modeling of land suitability and responses to potential agricultural production;
- Developed and applied in Libya; Currently under development in Laos, Afghanistan and Macedonia



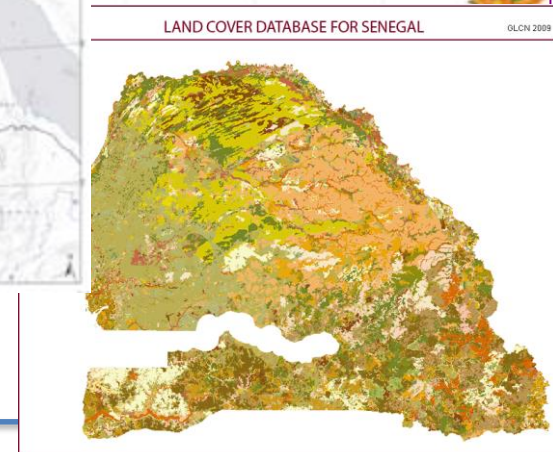
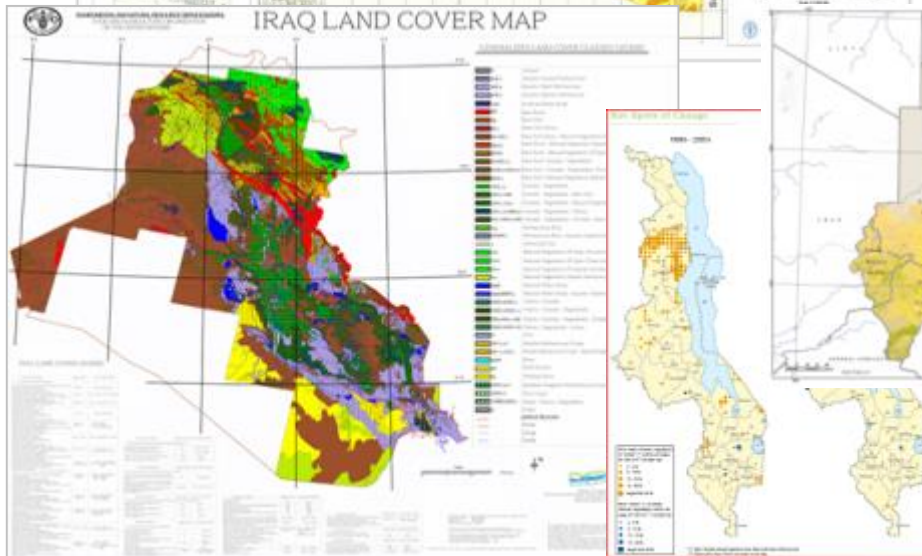
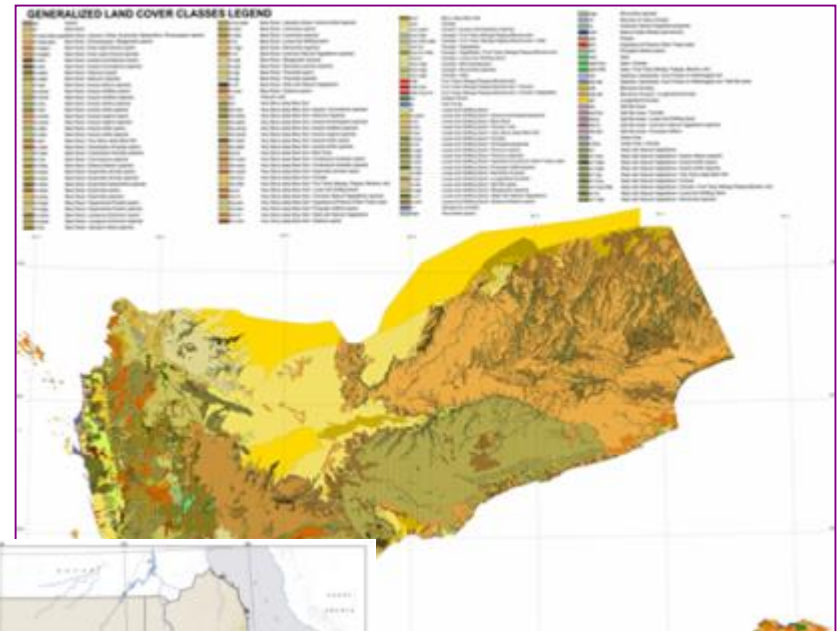
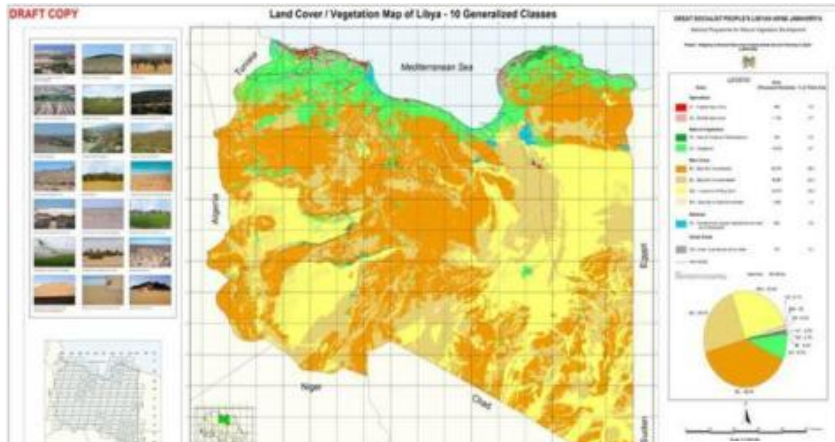


False Color Sentinel-2 Mosaic **AUG 2016**



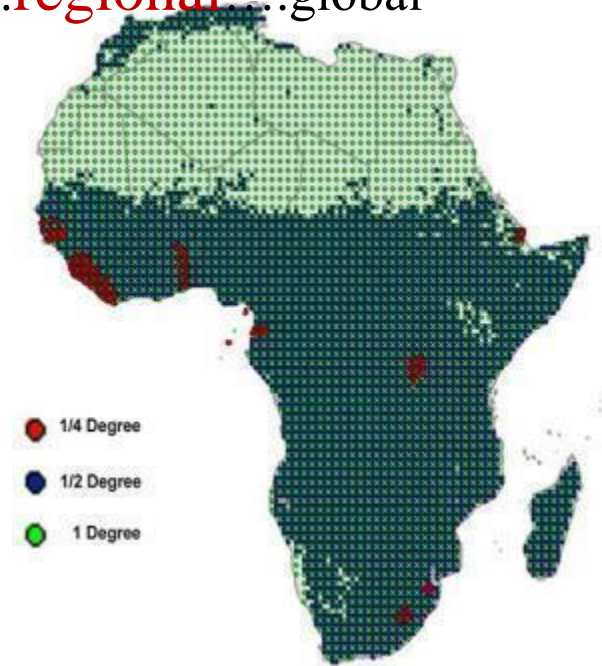
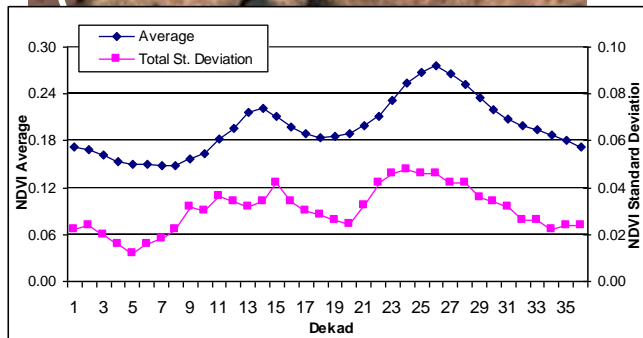
- i) map the ecosystems
- ii) determine the ecosystem condition
- iii) determine relevant ecosystem services for provisioning and regulating services
- iv) select indicators or modelled outputs of the ecosystem services for which viable data are available
- v) map the ecosystem services and service potential

National mapping



ECO-NET Africa

Land Cover Mapping: national....**regional**...global



- ECO-NET : mapping based on a statistical method approach
- GOAL: ensure reliable information at country levels
- MAPPING METHOD based on samples chosen on a fixed grid with appropriate density interval.
- OUTPUT: successfully validated in several demonstration countries in Africa

GLC-SHARE initiative

- New global land cover database created by FAO in partnership and with contributions from various partners and institutions;
- First global product created using the ISO standard for land cover classification ISO TC 211 – 19144-2 LMCL (Land Cover Meta Language);
- It provides a set of eleven major thematic land cover layers (FAO SEEA LCML legend);
- Resulted by a combination of “best available” high resolution national, regional and/or sub-national land cover databases;
- The database is produced with a resolution of 30 arc-second (~1sqkm) .



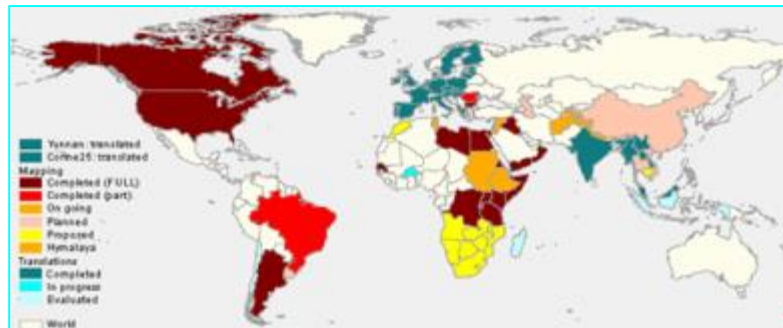
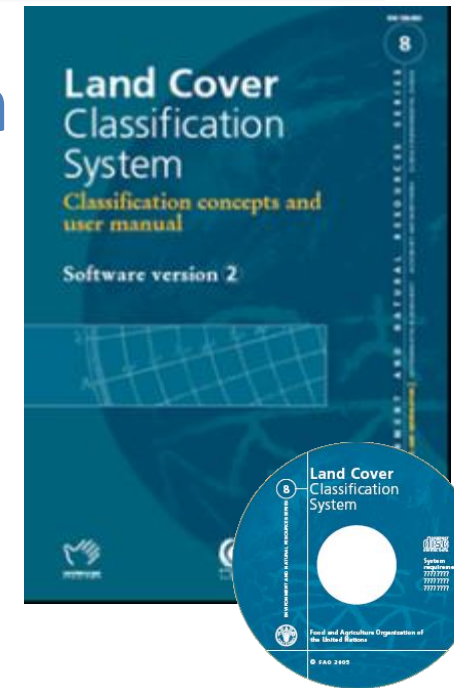
Figure 3 – Distribution of the GLC-SHARE Land Cover Database

01 Artificial Surface	04 Tree Covered Area	07 Mangrove
02 Cropland	05 Shrub Covered Area	08 Sparse Vegetation
03 Grassland	06 Herbaceous Vegetation	09 Desert
		10 Snow and Glaciers + Arctic/Antarctic
		11 Water Bodies

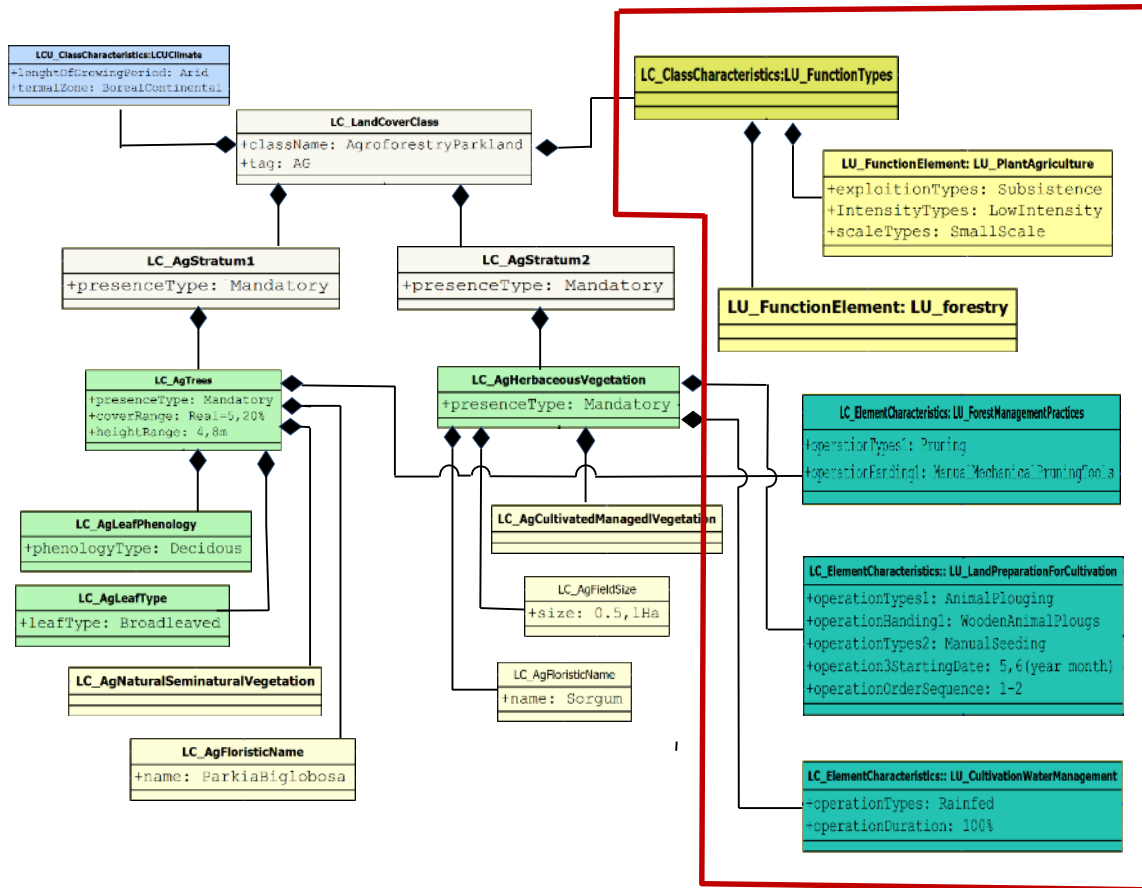


Land Cover Classification System

- LCCS / LCML : Comprehensive methodology for description, characterization, classification and comparison of most land cover features identified anywhere in the world, at any scale or level of detail: basis for comparative classification. (6 UN official languages)
- Created in response to a need for a harmonized and standardized collection and reporting on the status and trends of land cover

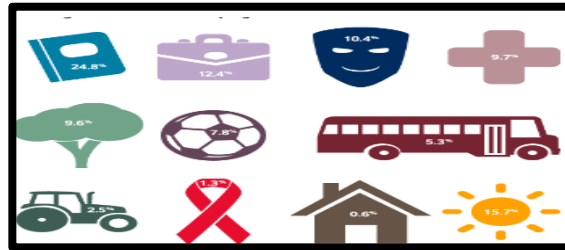


From land cover to land use (LCML to LCHML)





BEHAVIORAL INTERACTION OF INDIVIDUALS
AND GROUPS THROUGH CULTURAL, SOCIAL
ECONOMIC RELATIONSHIPS



REAL WORLD FEATURES

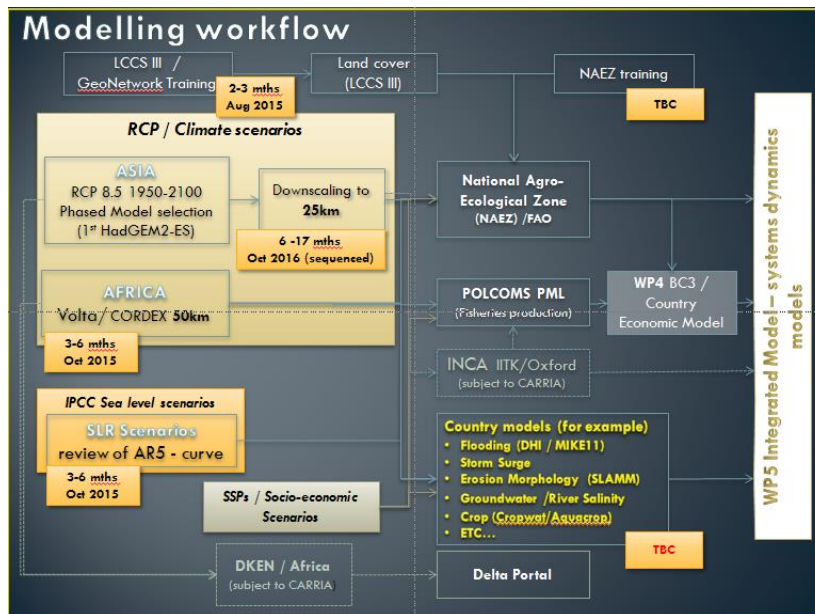


LAND RECURRENT/PERMANENT
MODIFICATIONS

The functional relationship between physical objects, land events and related socio economic functions key parameters to built up a "Land Representation" system

Vulnerable Ecosystems: DECCMA project

DECCMA: Deltas Vulnerability and Climate Change: Migration and Adaptation” examines the vulnerability, environmental stressors and hazards of a range of climate change and biophysically driven scenarios across the study deltas.



THREATENED DELTAS

(Ericson et al (2006); IPCC AR4, 2007)



Population potentially displaced by current sea-level trends to 2050
(Extreme >1 million; high = 1 million-50,000; medium 50,000-5,000 people)
Global population in deltas is about 500 million people

GeoNetwork – FAO metadata catalogue

- Internet access to interactive maps, satellite imagery and related spatial databases maintained by FAO and its partners;
- Powered by GeoNetwork opensource, which was developed by FAO and other UN agencies based on Free and Open Source Software (FOSS) principles and international standards;
- Almost 7000 records are stored;
- Ongoing upgrade to latest opensource version.

<http://www.fao.org/geonetwork/srv/en/main.home>

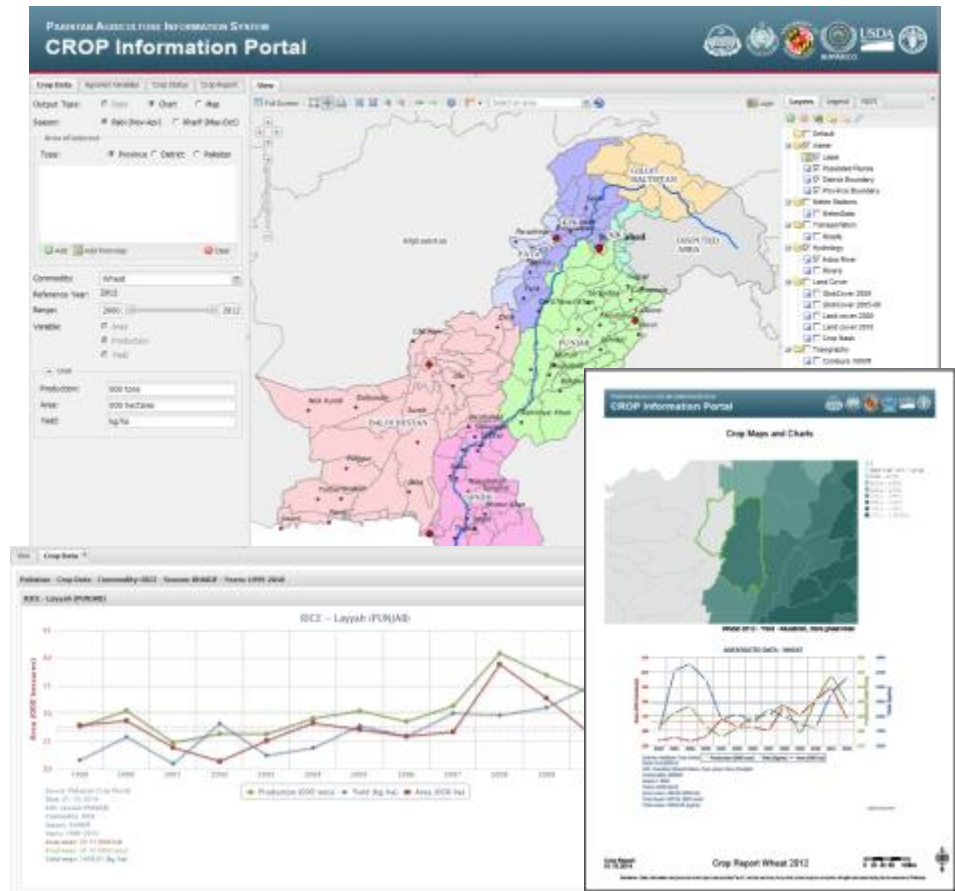


The screenshot displays the GeoNetwork web application interface. At the top, there is a navigation bar with the GeoNetwork logo and the tagline "find and analyze geo-spatial data". Below this, there is a search bar and a list of categories including Administrative and Political Boundaries, Agriculture and Livestock, Applied Ecology, Base Maps, Remote Sensing and Toponymy, Biological and Ecological Resources, Climate, Fisheries and Aquaculture, Forestry, Human Health, Hydrology and Water Resources, Infrastructures, Land Cover and Land Use, Population and Socio-Economic Indicators, Soils and Soil Resources, and Topography. The main content area is divided into two sections. The left section, titled "WHAT?" and "WHERE?", features a search bar and a "Search" button. The right section, titled "Map viewer", shows a map of North America with a layer tree on the left and a legend below it. The map viewer displays a "Hydrological basins in North America" layer. Below the map viewer, there are two metadata records. The first record is titled "HYDROLOGICAL BASINS IN NORTH AMERICA (DERIVED FROM HYDROSHEDS)" and includes an abstract, keywords, and buttons for "Metadata", "Download", and "Interactive Map". The second record is titled "WORLD MAP OF THE MAJOR HYDROLOGICAL BASINS (DERIVED FROM HYDROSHEDS)" and also includes an abstract, keywords, and buttons for "Metadata", "Download", and "Interactive Map".

Pakistan Crop Information Portal

<http://cip.sqs-suparco.gov.pk/>

- The **Pakistan's Crop Portal** is a component of the *Pakistan Agriculture Information System*;
- It is being developed to support data and information dissemination on major crops (area, yield and production) and agro-meteorological conditions affecting crop growth;
- The Crop Portal uses **District** based crop data (wheat, maize, sugarcane, rice and cotton) and agromet conditions





Afghanistan Agriculture Information Portal (AAIP)



MAIN OBJECTIVES OF THE CROP PORTAL:

Sharing historical statistics and forecasts on crop yields and area.

1

Sharing historical and near real time agronomic, meteorological and hydrological data.

2

Monitoring crop conditions during main growing stages to detect stresses affecting future crop results.

3

GIS interface for the mapping of crop production information, natural resources, infrastructure and vegetation indexes from remote sensing.

4

GEOGLAM

Monitoring Crop Production

- In this context a global system to monitor and assess production is seen as an important decision making tool to:
 - provide timely information on crop production and yield in a standardized and regular fashion at the regional to global level.
 - provide estimates as early as possible during the growing season(s) and update the estimates periodically through the season until harvest.
- Examples of current global crop estimation systems is **GEOGLAM**, which combines in-situ information, weather and satellite data in a convergence of evidence approach to estimate production and yield.





SIGMA

Stimulating innovation for Global Monitoring of Agriculture (SIGMA)

- FP7 EC Project.
- SIGMA's main challenge is to develop innovative methods and indicators to monitor and assess progress towards 'sustainable agriculture'.
- The project is a contribution to GEOGLAM initiative started by the G20.
- Reinforce awareness of the impact of agriculture on the global environment enabling the prediction of the impact of crop production on natural resources and ecosystems.

Stimulating Innovation for global Monitoring of Agriculture and its Impact on the Environment in Support of GEOGLAM (SIGMA)

Project number: 93935303

Country: Europe

Starting date: 01 Nov 2013

Completion date: 30 Apr 2017

Clients:

- European Commission

Total budget: Euro 407.818

Project Officer: Boer

Supervisor: Mannaerts

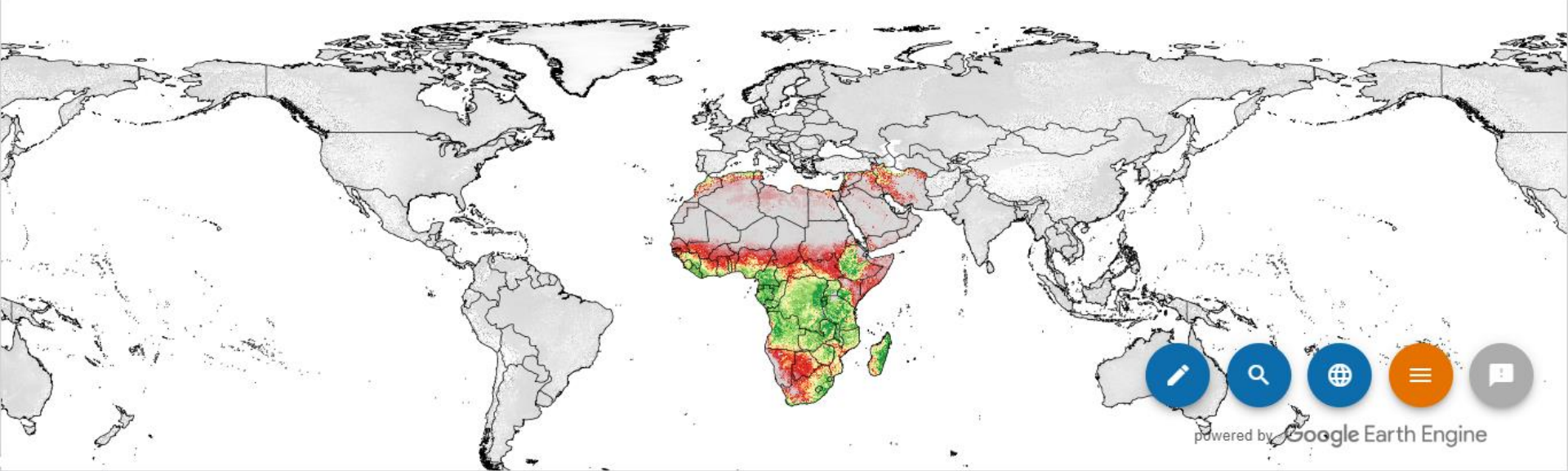
Project type: Contract Research





LEVEL 1 (250 m)

LEVEL 2 (100 m)



powered by Google Earth Engine

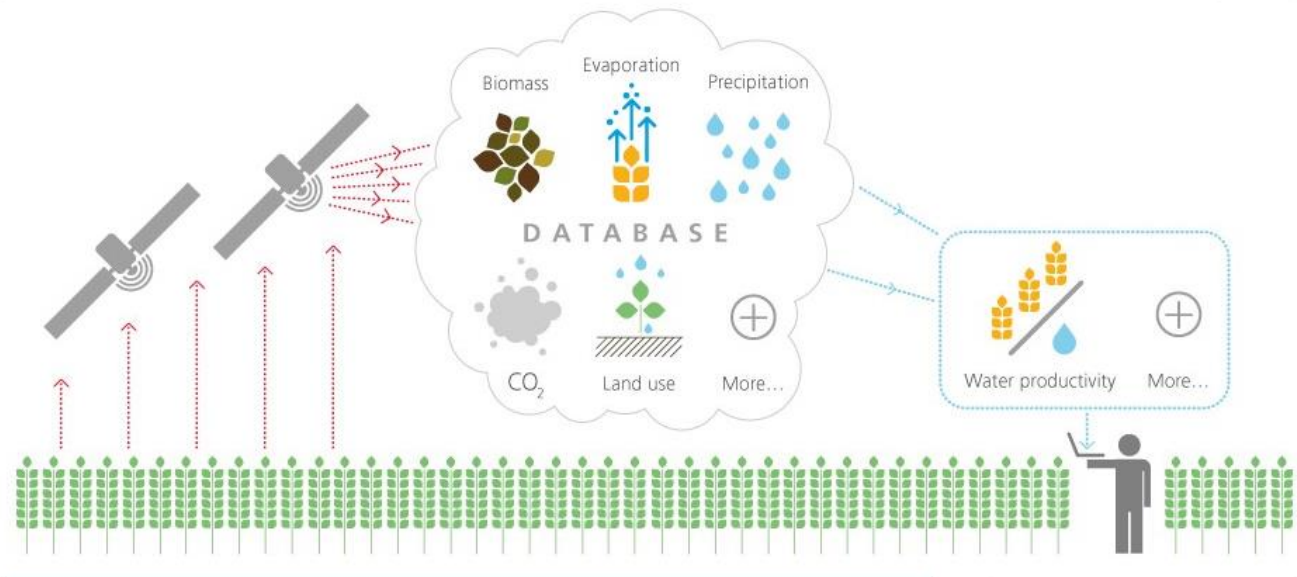




English

Remote sensing for water productivity

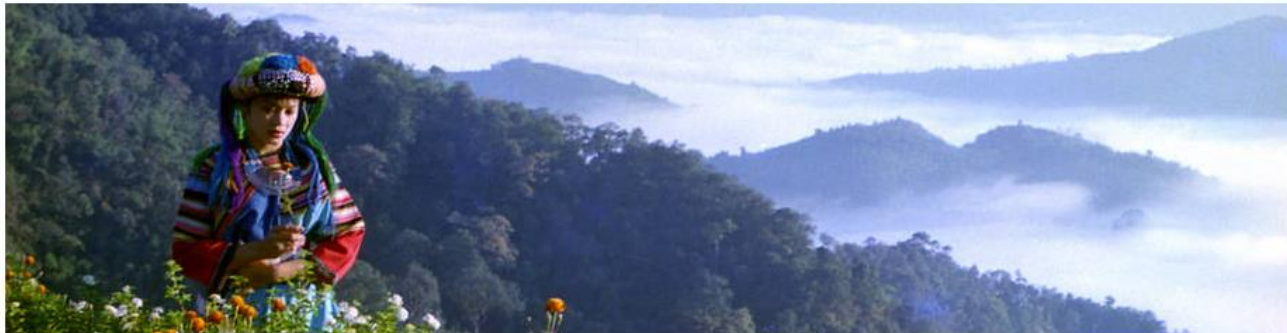
-  Overview
- Database
- Water and land productivity assessment
- Water accounting
- Capacity development
- Resources
- News



With the support of



Sustainable Forest Management (SFM) Toolbox



What is SFM

Sustainable forest management (SFM) can be viewed as the sustainable use and conservation of forests with the aim of maintaining and enhancing multiple forest values through human interventions. People are at the centre of SFM because it aims to contribute to society's diverse needs in perpetuity.

The United Nations describes SFM as:

"a dynamic and evolving concept [that] aims to maintain and enhance the economic, social and environmental values of all types of forests, for the



Sustainable Forest Management (SFM) Toolbox

[Home](#)
[Background](#)
[Modules](#)
[Tools](#)
[Cases](#)
[Partners](#)
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Technical modules



Agroforestry



Climate Change Adaptation and Mitigation



Community-based Forestry



Development of Forest Based Enterprises



Modules

The SFM Toolbox modules correspond to thematic areas relevant to the implementation of SFM. In each module you will find specific knowledge, tools and cases that will help you put SFM in practice.

You can browse the modules, conduct a free search, or use the filters to select the modules that best match your specific interests.

Filter by



Fisheries and Resources Monitoring System



Español Français

Site map Email us

Home

About FIRMS

FIRMS Data coverage

Concepts & Definitions

Search Tools
Stocks and Fisheries map viewer

Resource inventory
Marine Resource fact sheets
State & Trend Summaries
Browse Fisheries
Fishery fact sheets

Information

Contacts

Logon name

Password

Login

RES

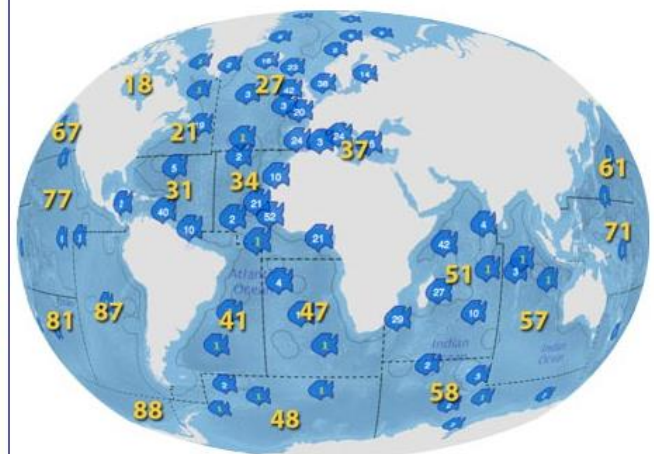
Fisheries and Resources Monitoring System (FIRMS)

Our mission...

The primary aim of the Fisheries and Resources Monitoring System (FIRMS) is to provide access to a wide range of high-quality information on the global monitoring and management of fishery marine resources.

Our data ...

Launch the Stocks and Fisheries map viewer



Get Marine Resource and Fishery fact sheets by clicking a fishing area on the map.

Latest news...

CECAF - check latest updates in the Eastern Central Atlantic

Highlights

Review of the state of world marine fisheries resources
FIRMS on deep sea (high seas) resources
FIRMS on Tuna and Tuna fisheries

Related documents

Report of the tenth Session of the FIRMS ...
Report of the FIRMS Technical Working Group ...
FIRMS Information Management Policy
...full list

Meetings & News

BlueBRIDGE Technical Working Group (TWG3) ...
TCP/RAF/3512 - Final workshop : ...
FIRMS Steering Committee Meeting - 10th ...
...full list



Collect



Collect Mobile



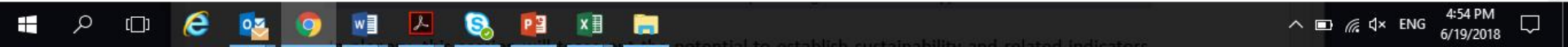
Collect Earth



Calc



Geospatial Toolkit





System for earth observations, data access, processing & analysis for land monitoring

SEPAL



SEARCH GEO DATA

Fast and easy access to scenes and mosaics



BROWSE YOUR DATA

Preview and download your products



PROCESS YOUR DATA

Easy-to-use data processing Apps



TERMINAL

Powerful command-line tools for data processing

USERNAME

Enter your user name

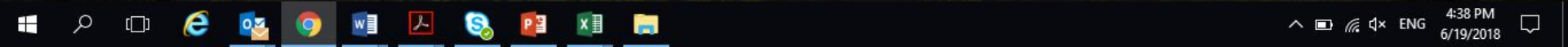
PASSWORD

Enter your password

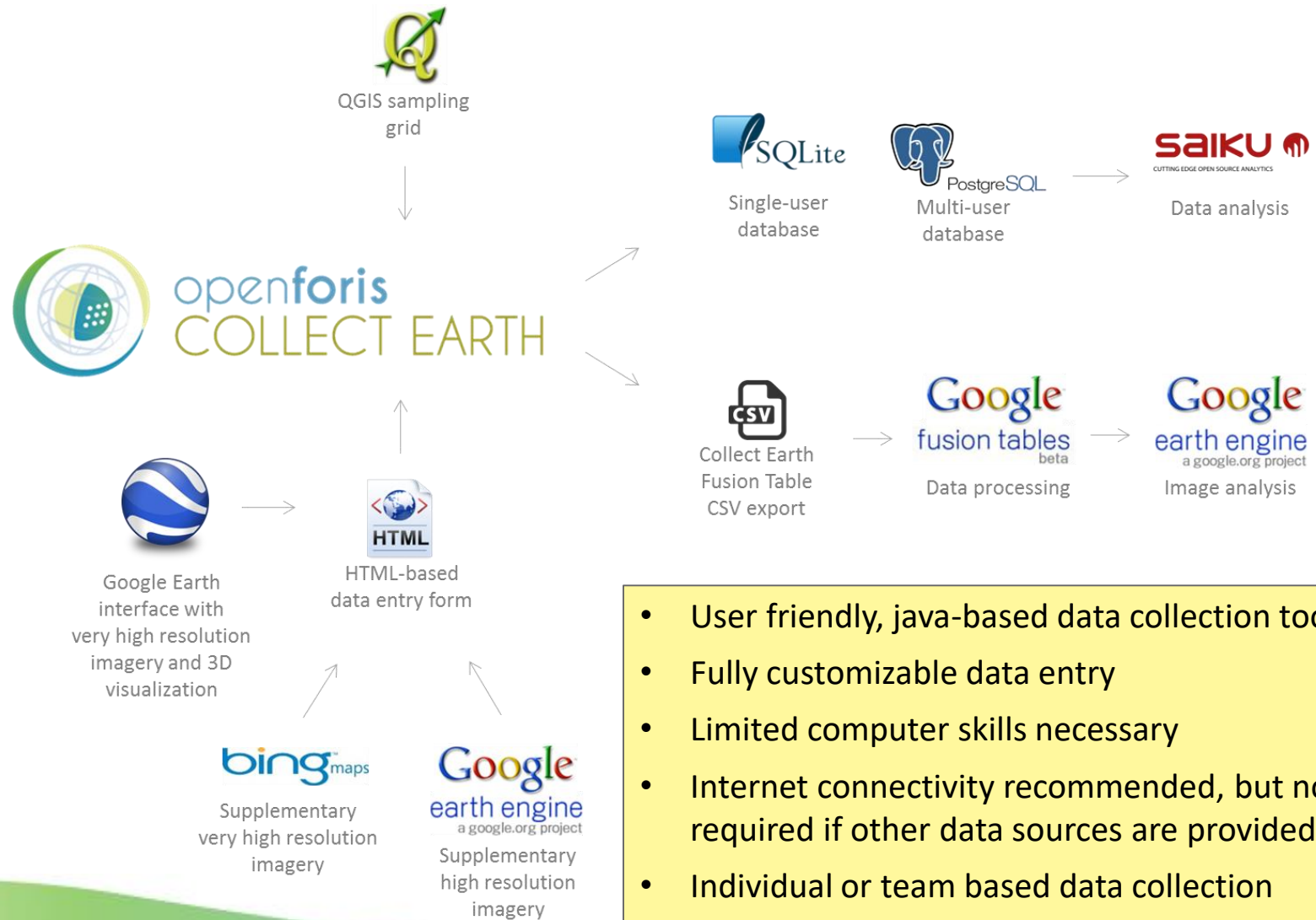
LOGIN

Forgot password

Sign up



Collect Earth System Overview



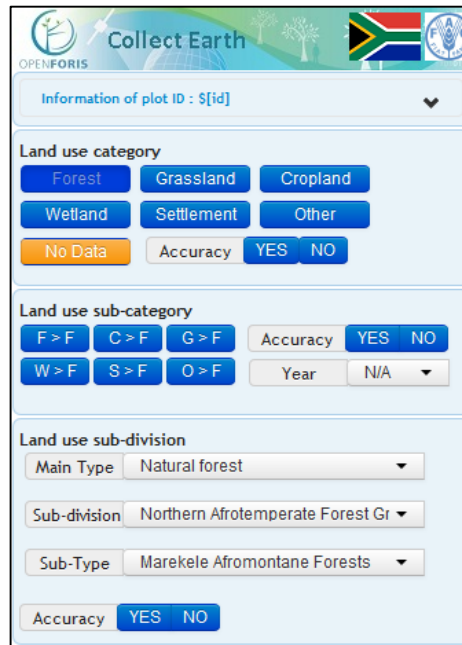
- User friendly, java-based data collection tool
- Fully customizable data entry
- Limited computer skills necessary
- Internet connectivity recommended, but not required if other data sources are provided
- Individual or team based data collection
- Open-source software with code available on Github.com



Collect Earth user cases

Collect Earth facilitates the analysis of high and very high resolution satellite imagery for a wide variety of purposes, including :

- Support **multi-phase National Forest Inventories**
- **Land Use, Land Use Change and Forestry (LULUCF) assessments (18 partnering countries)**
- **Monitoring agricultural land** and urban areas
- Accuracy assessment of existing maps **(DRC, Zambia)**
- Collection of spatially explicit socio-economic data **(Vietnam)**
- Quantifying deforestation, reforestation and desertification



Collect Earth

Information of plot ID : \$[id]

Land use category

Forest Grassland Cropland

Wetland Settlement Other

No Data Accuracy YES NO

Land use sub-category

F > F C > F G > F Accuracy YES NO

W > F S > F O > F Year N/A

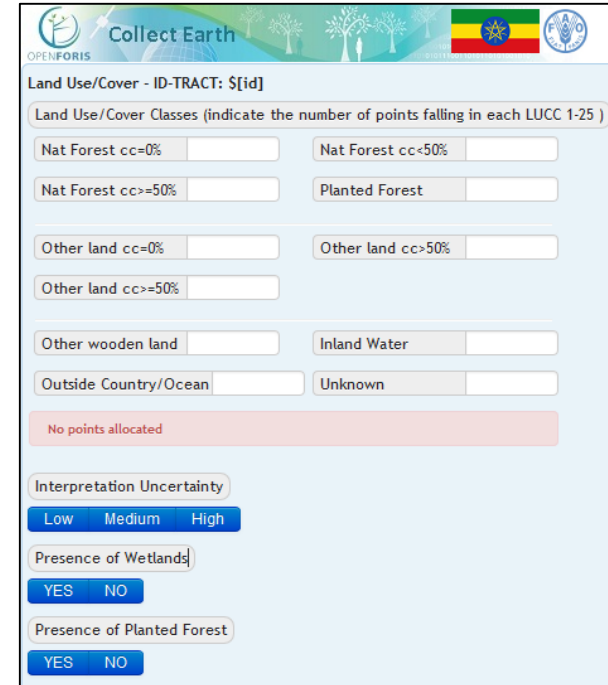
Land use sub-division

Main Type Natural forest

Sub-division Northern Afrotropical Forest Gr

Sub-Type Marekele Afromontane Forests

Accuracy YES NO



Collect Earth

Land Use/Cover - ID-TRACT: \$[id]

Land Use/Cover Classes (indicate the number of points falling in each LUCC 1-25)

Nat Forest cc=0% Nat Forest cc<50%

Nat Forest cc>=50% Planted Forest

Other land cc=0% Other land cc>=50%

Other land cc>=50%

Other wooden land Inland Water

Outside Country/Ocean Unknown

No points allocated

Interpretation Uncertainty

Low Medium High

Presence of Wetlands

YES NO

Presence of Planted Forest

YES NO





Food and Agriculture Organization
of the United Nations

Thank You!!

Douglas.Muchoney@fao.org

Geospatial: www.fao.org/geospatial

SEPAL: <https://sepal.io>

GAEZ: <http://gaez.fao.org/Main.html>
