

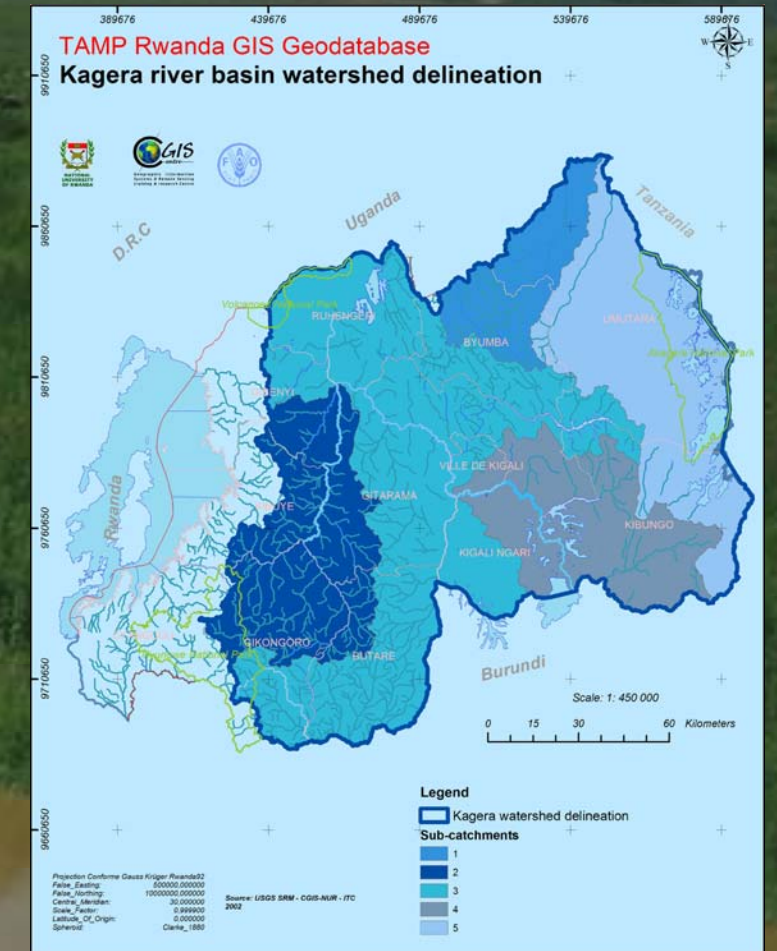
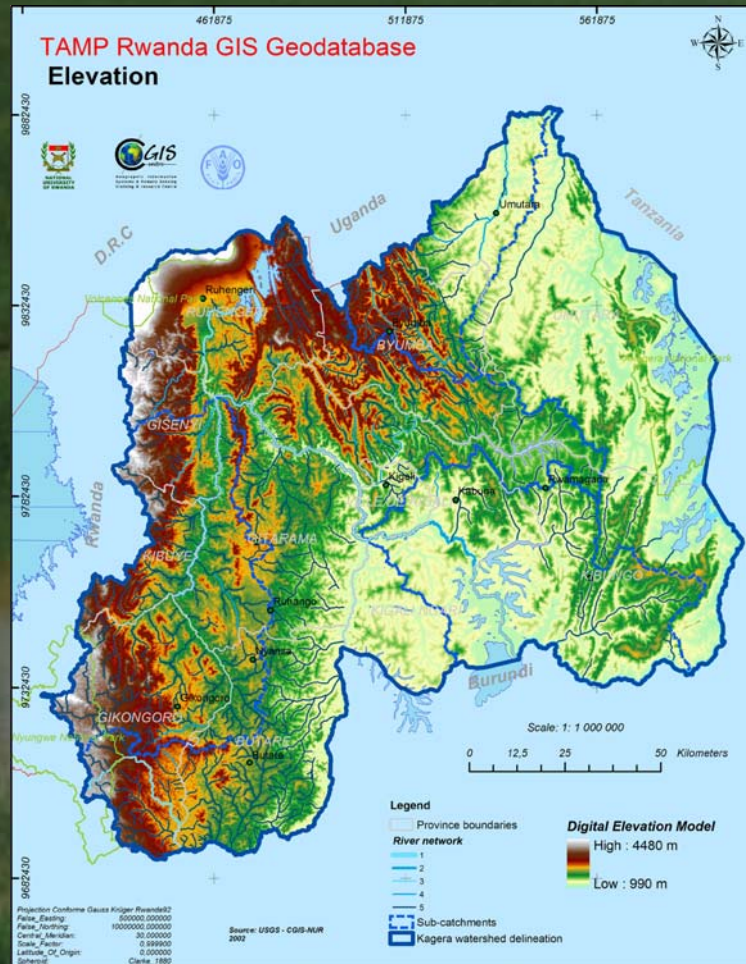
Kagera TAMP Project - FAO

Rwandan GIS database

Baseline maps and spatial trends

Centre for Geographic Information Systems
and Remote Sensing
National University of Rwanda

www.cgisnur.org

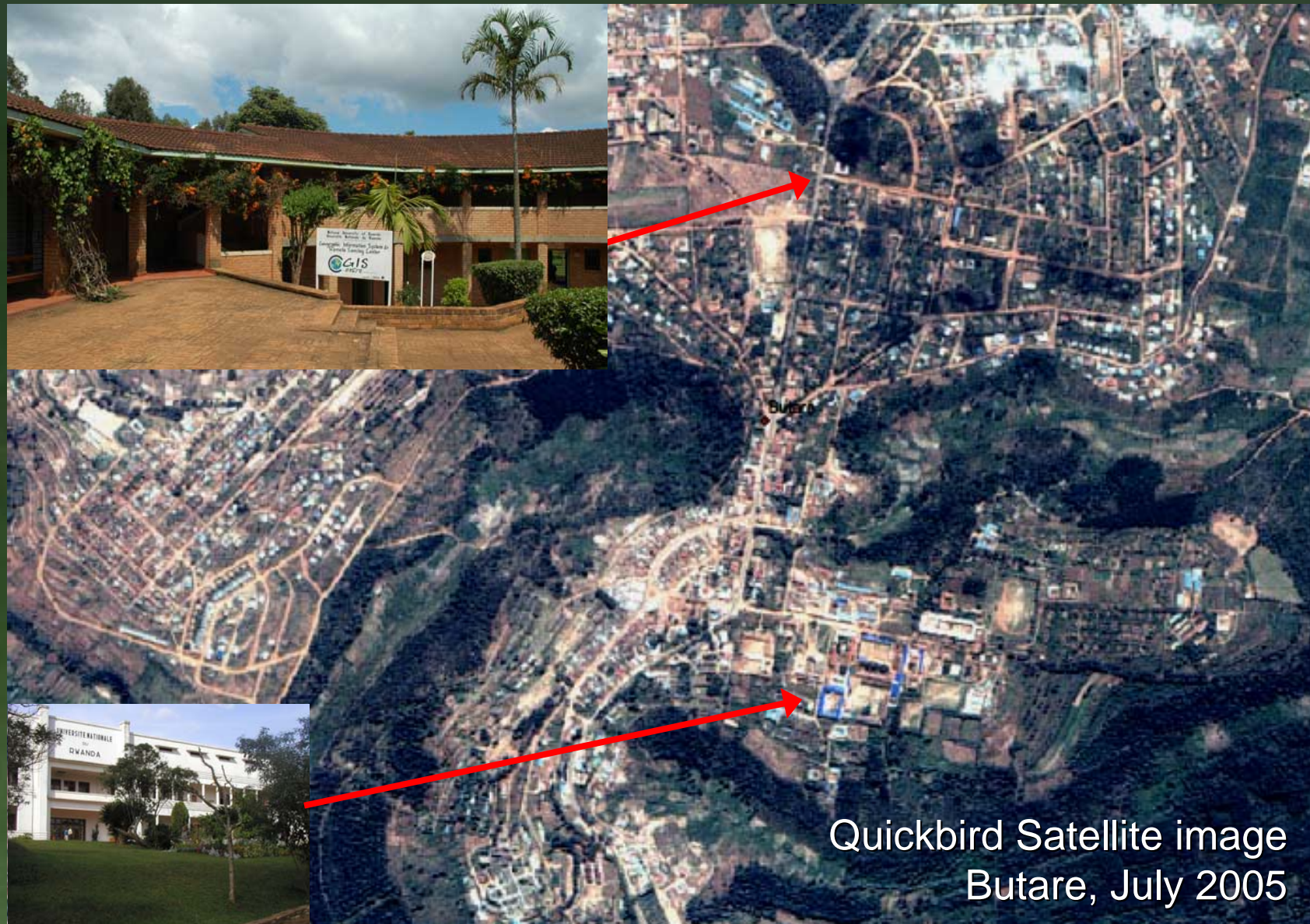


Outline

- Background and objectives of the GIS-RS component
- Datasets used : TAMP GIS database
- Results
 - Baseline thematic maps
 - Trends (spatial)
- Future administrative boundaries
- Data sharing and access

The CGIS-NUR

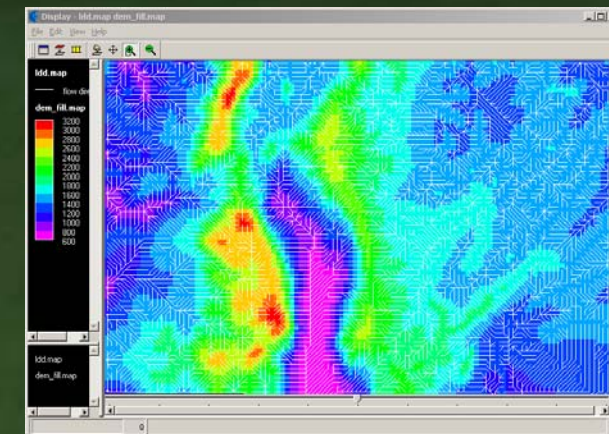
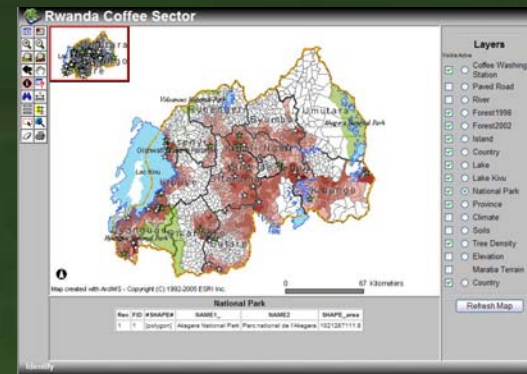
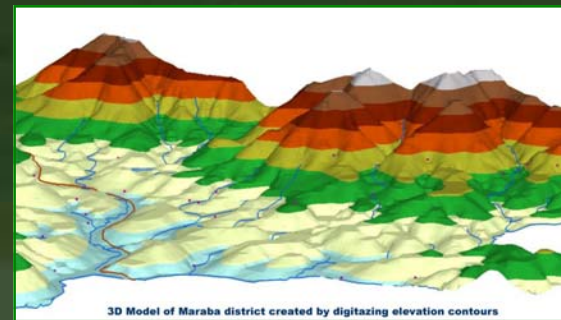
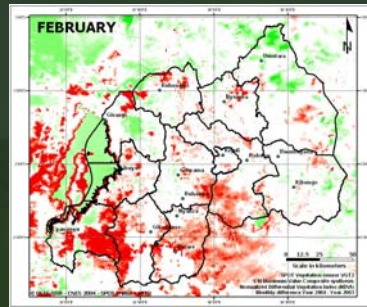
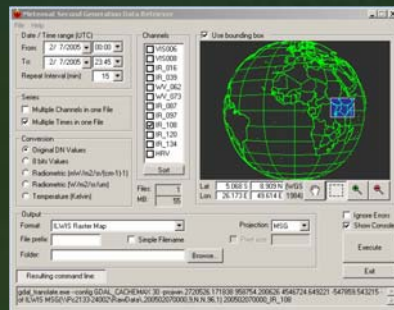
An Interfaculty Centre of the National University of Rwanda



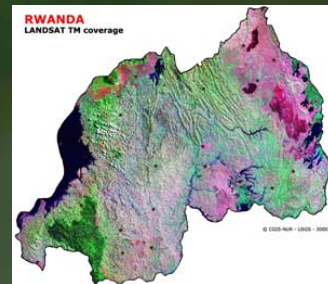
- Training and Research Centre in the fields of Geographic Information Systems and Remote Sensing, created in 1999;
- Supported by the Government Of Rwanda (GoR) through the Rwanda Development Gateway Group;
- Towards a National Geographic Institute

We are Moving to a Geodata Rich Society

More "Geospatial" Information

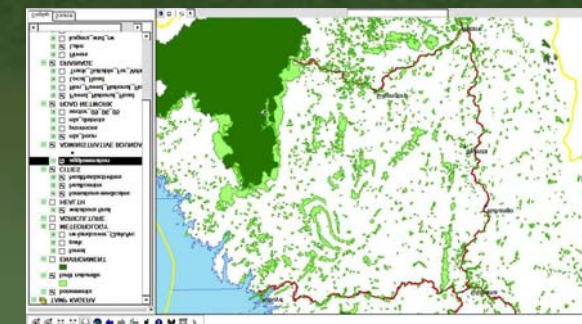
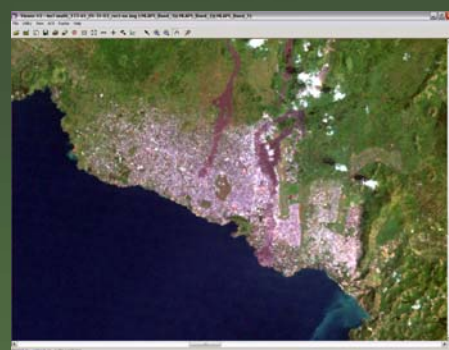
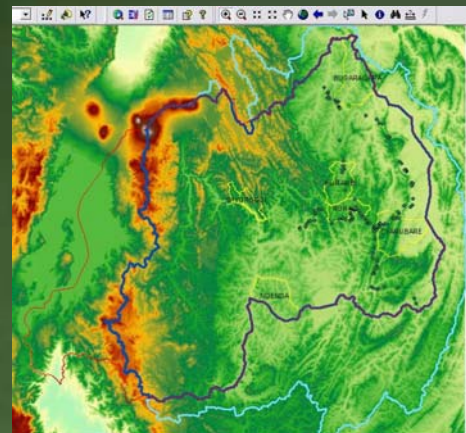


Remote Sensed Databases



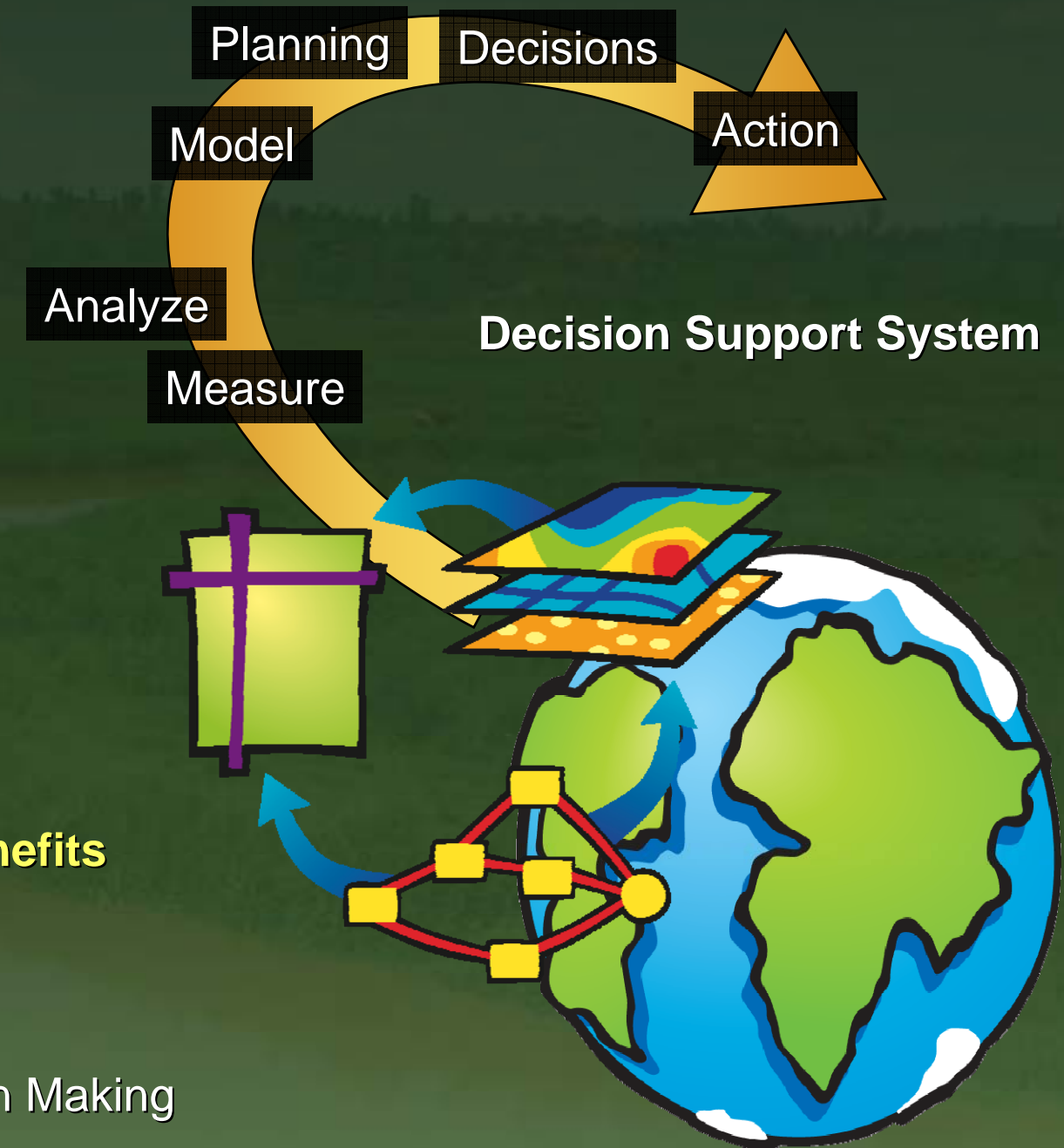
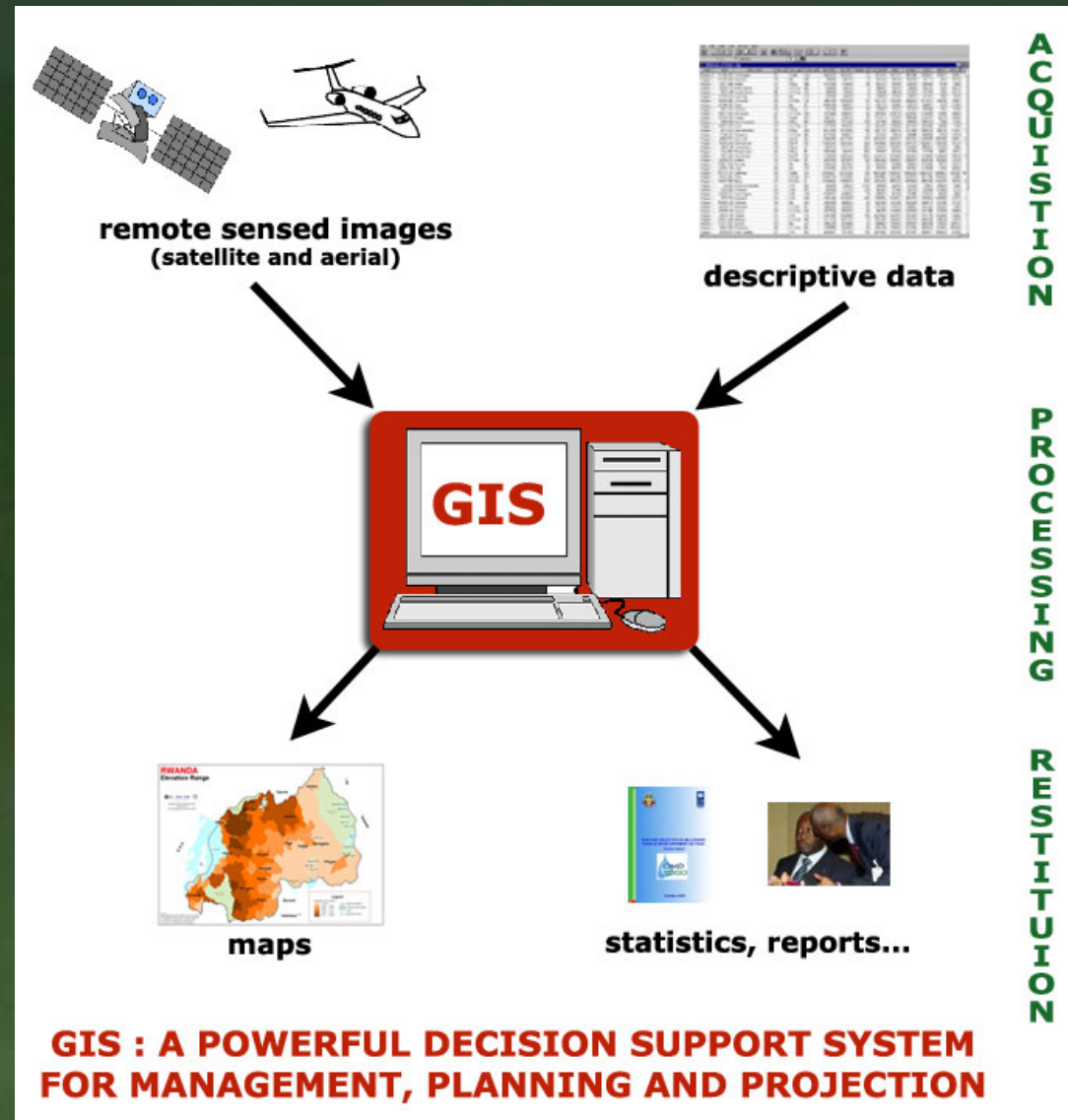
- GPS / Location Data
- Satellite Imagery (100x)
- Geo-Demographic Data
- Real Time Monitoring

Vector Databases



GIS Is Particularly Valuable

As a Tool to Manage and Analyse Spatial Information



Providing Many Benefits

- Understanding
- Efficiency
- Cost Savings
- Improved Decision Making

Objectives of the GIS and Remote Sensing component

Rwanda

- Contribute to collecting spatial database
- Develop a computerized GIS including:
 - Base-line data
 - Historical data
 - Analysis
- Spatial analysis of recent changes and trends

Spatial databases...

Image and vector DB

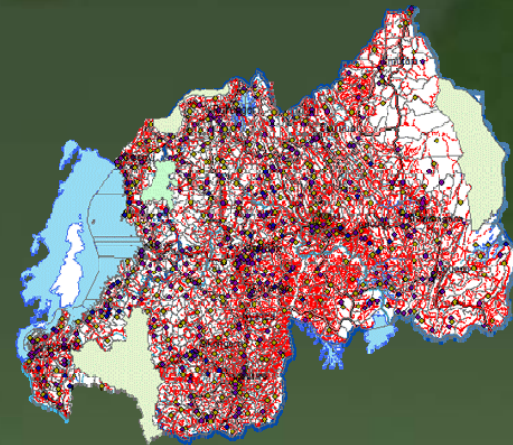
- **IMAGE DATABASE**

- satellite image
- aerial photography
- scanned maps



- **VECTOR DATABASE**

- ‘foundation’ national databases
- other spatial databases

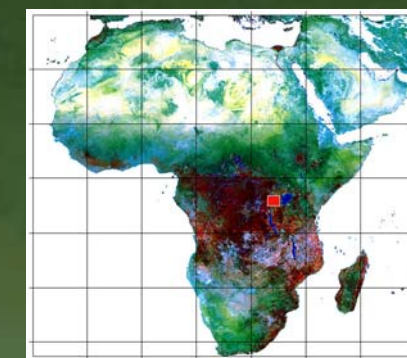
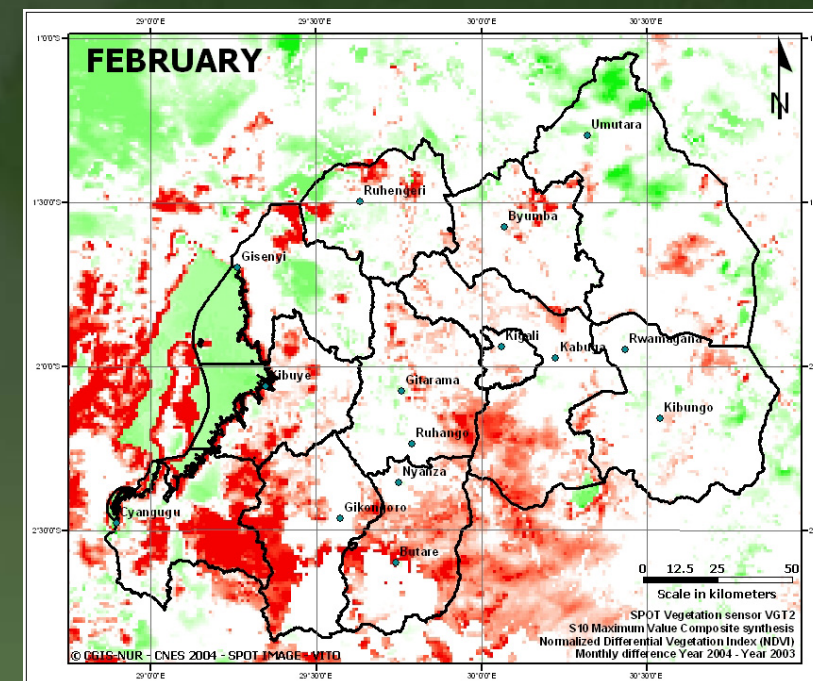
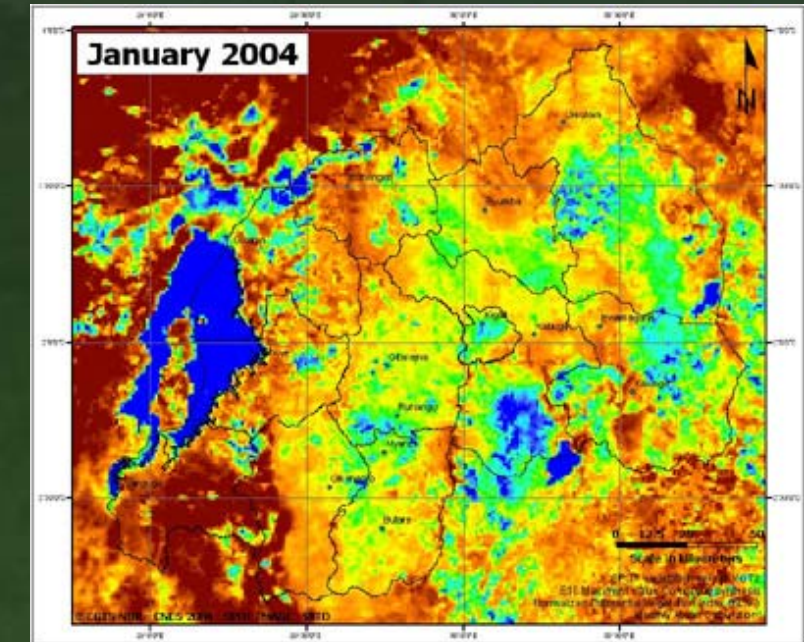
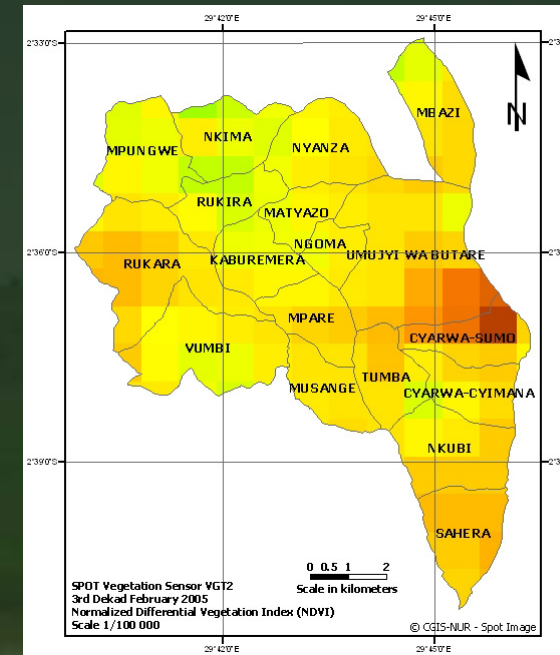


Satellite	Pixel size
SPOT VGT	1 kilometer
SPOT HRV	20 m multi. 10 to 5 m panchro.
LANDSAT	30 m multi. 15 m panchro.
ASTER	15 meters
QUICKBIRD	61 centimeters

Satellite databases...

SPOT Vegetation

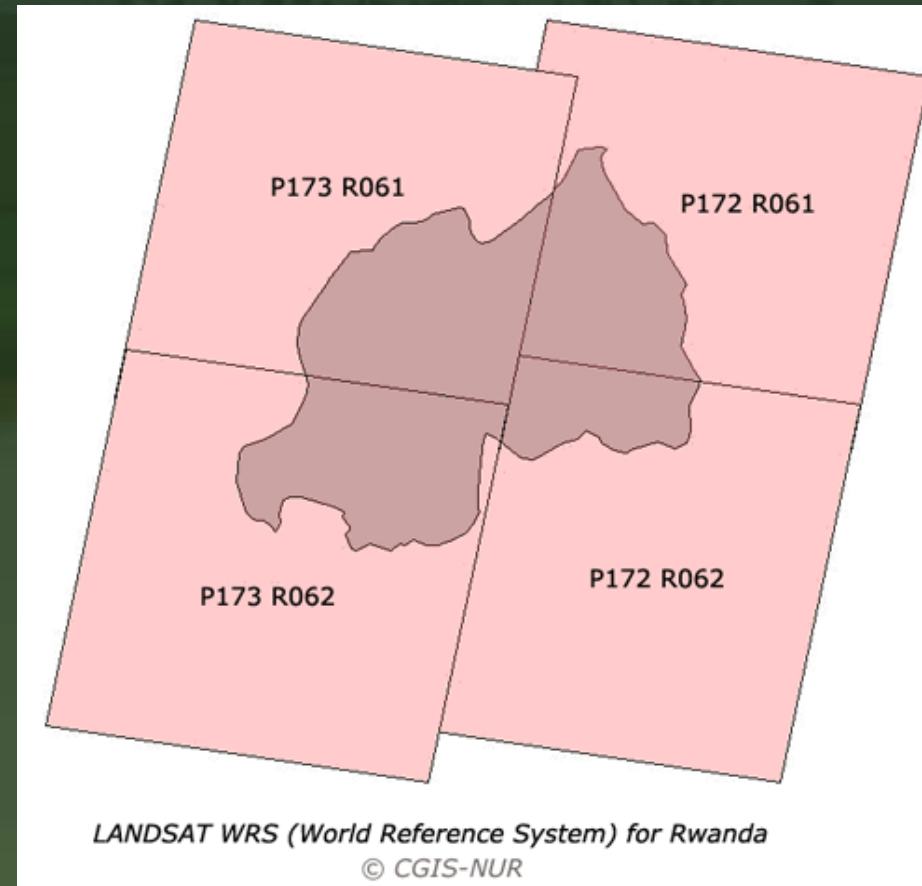
- Coverage : national (continental)
- Spatial resolution : 1 kilometer
- Dates : dekads from 1998 up to now
- Applications : vegetation monitoring, food security and early warning systems etc.



Satellite databases...

Landsat

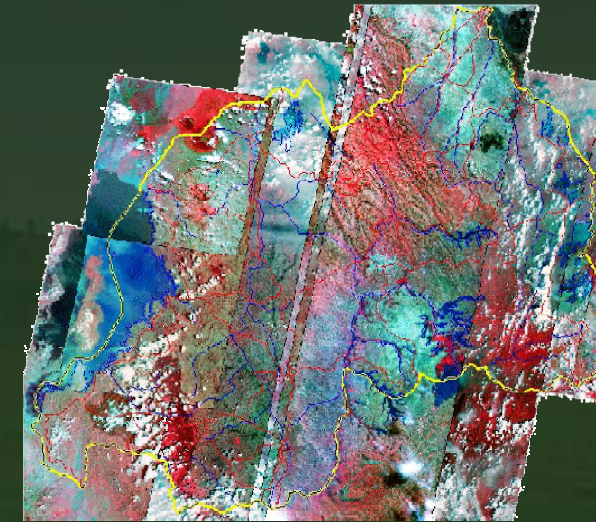
- *Spatial resolution : 15 to 30 meters*
- *Dates : from 70's up to now*
- *Applications : land use/land cover, forest, environment monitoring, change detection*



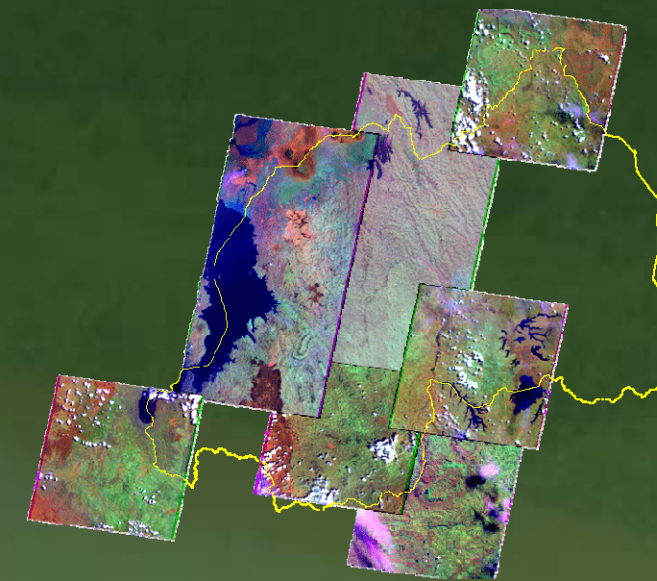
Satellite databases...

Aster

- *Spatial resolution : 15 meters*
- *Dates : from 70's up to now*
- *Applications : land use/land cover, forest, environment monitoring, change detection*



Aster coverage 2003

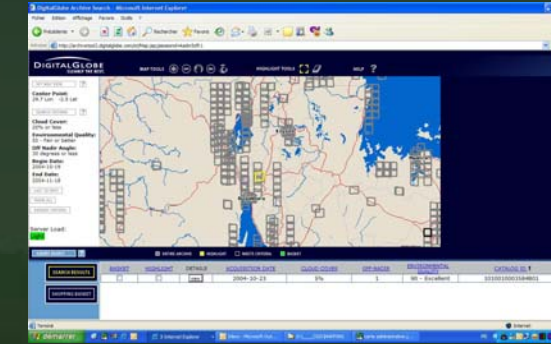


Aster coverage 2004-2005

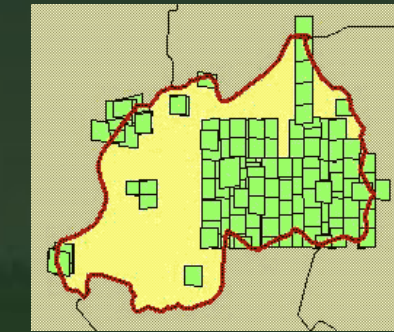
Satellite databases...

Quickbird

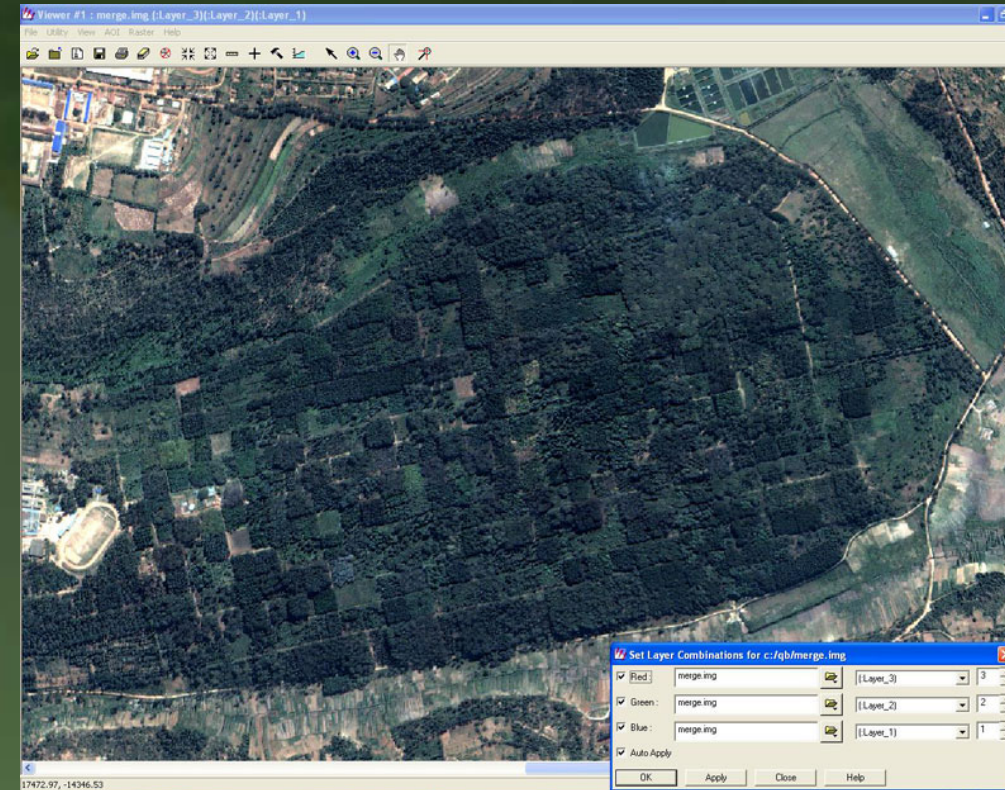
- Coverage : 100 to 200 km²
- Spatial resolution : 60 centimeters
- Dates : from 1999 up to now
- Applications : urban planning, cadastre, cartography



Quickbird archive



Ikonos archive

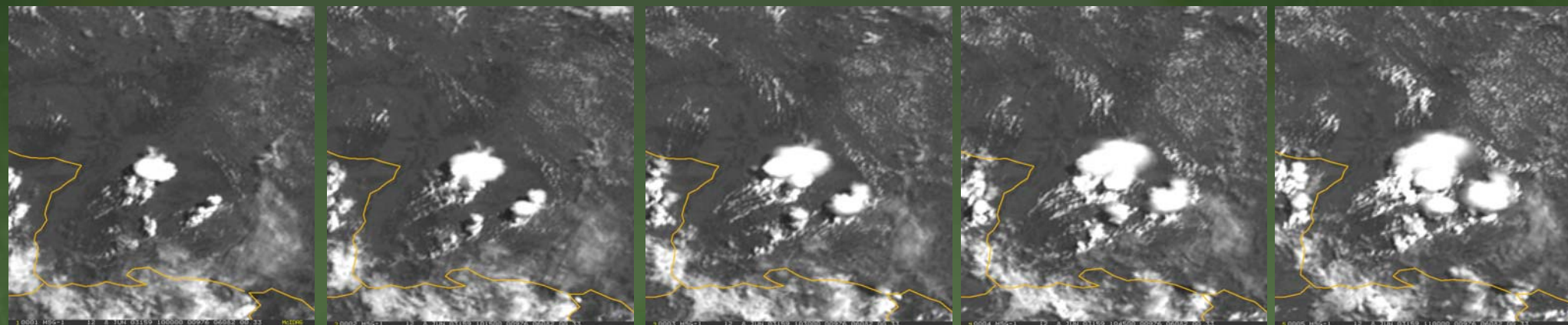
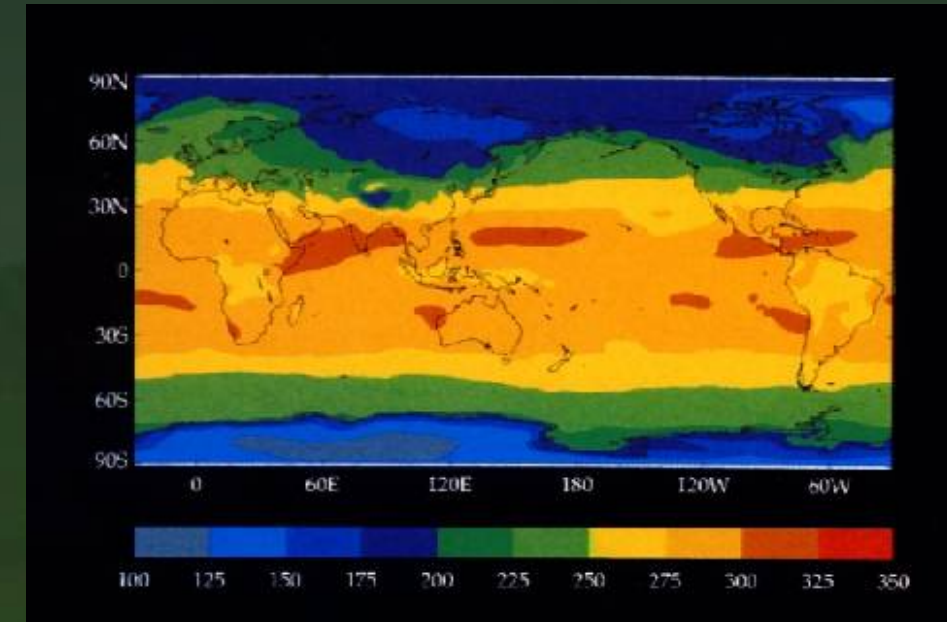
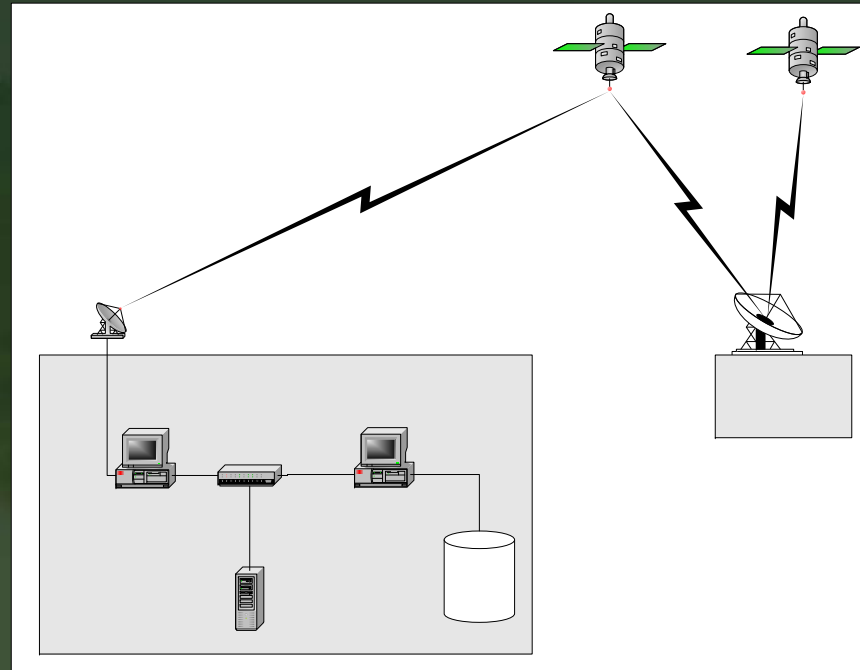


Butare July 2005

Satellite databases...

METEOSAT 2nd generation

- Coverage : national
- 1 image each 15 mns
- 12 channels
- Applications : vegetation, fires monitoring, meteorology etc.



+ meteorological station
+ gauging station

Field data collection

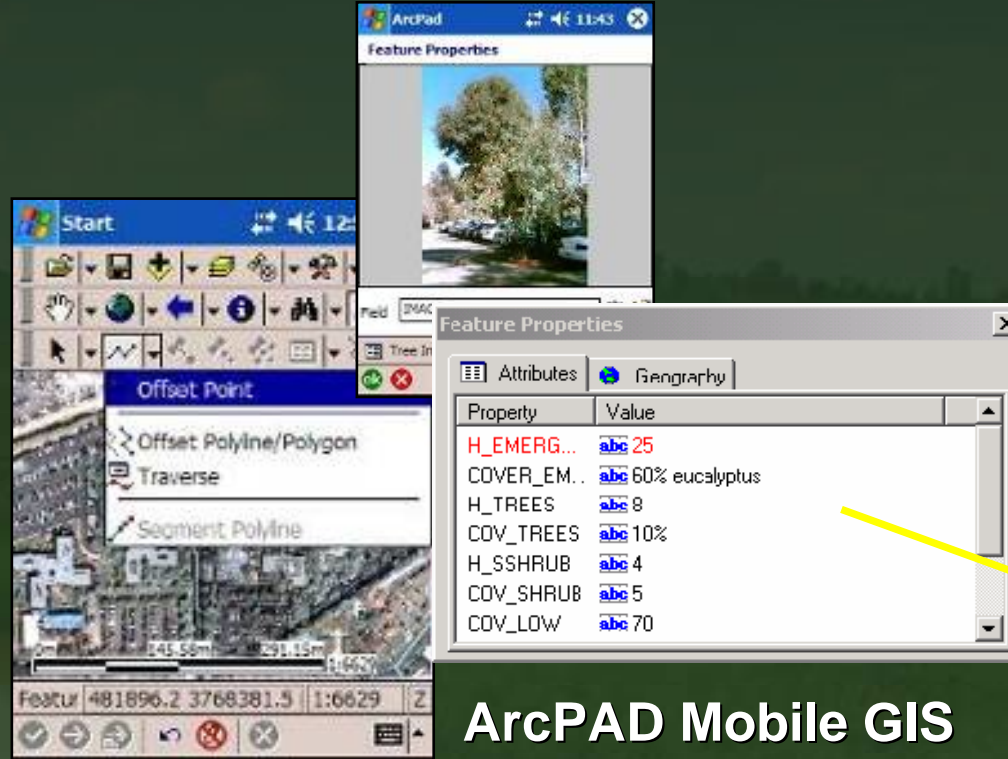
Ground data for image classification

- **Field data collection**

- Mobile GIS system
- Direct link to GIS Desktop
- Accuracy
- Reliability



Pocket PC
Coupled GPS



ArcPAD Mobile GIS

ArcGIS Desktop

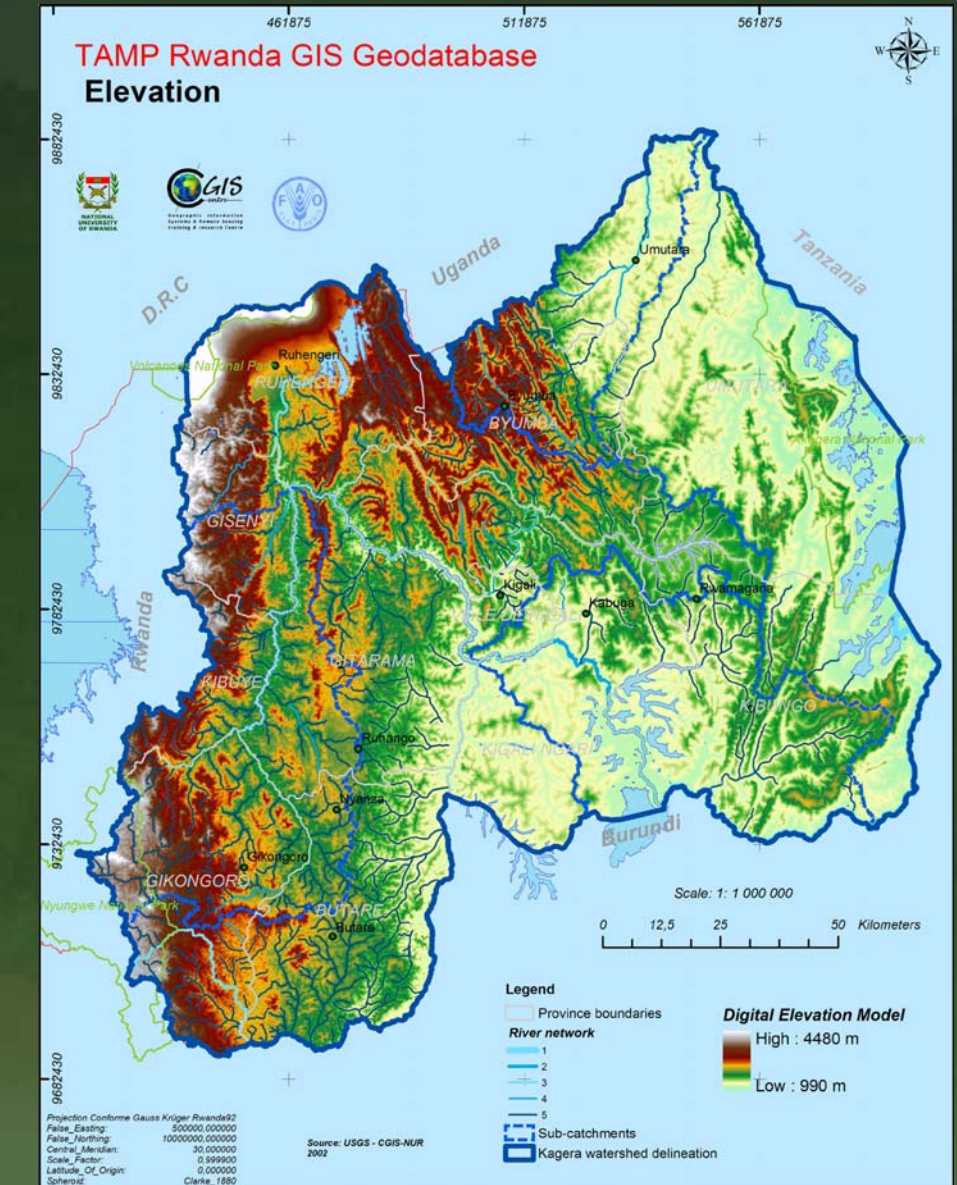
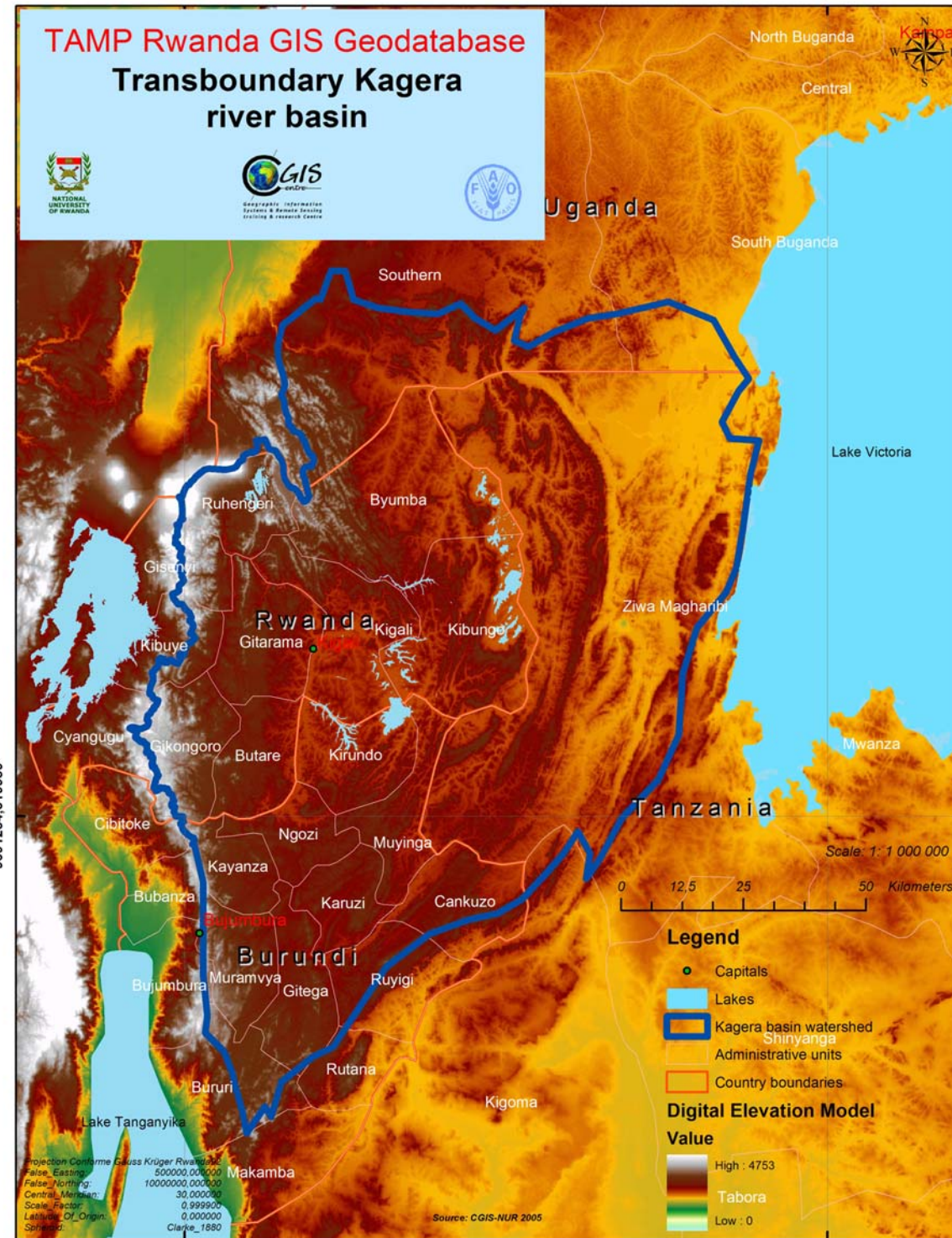


- **Field visits**



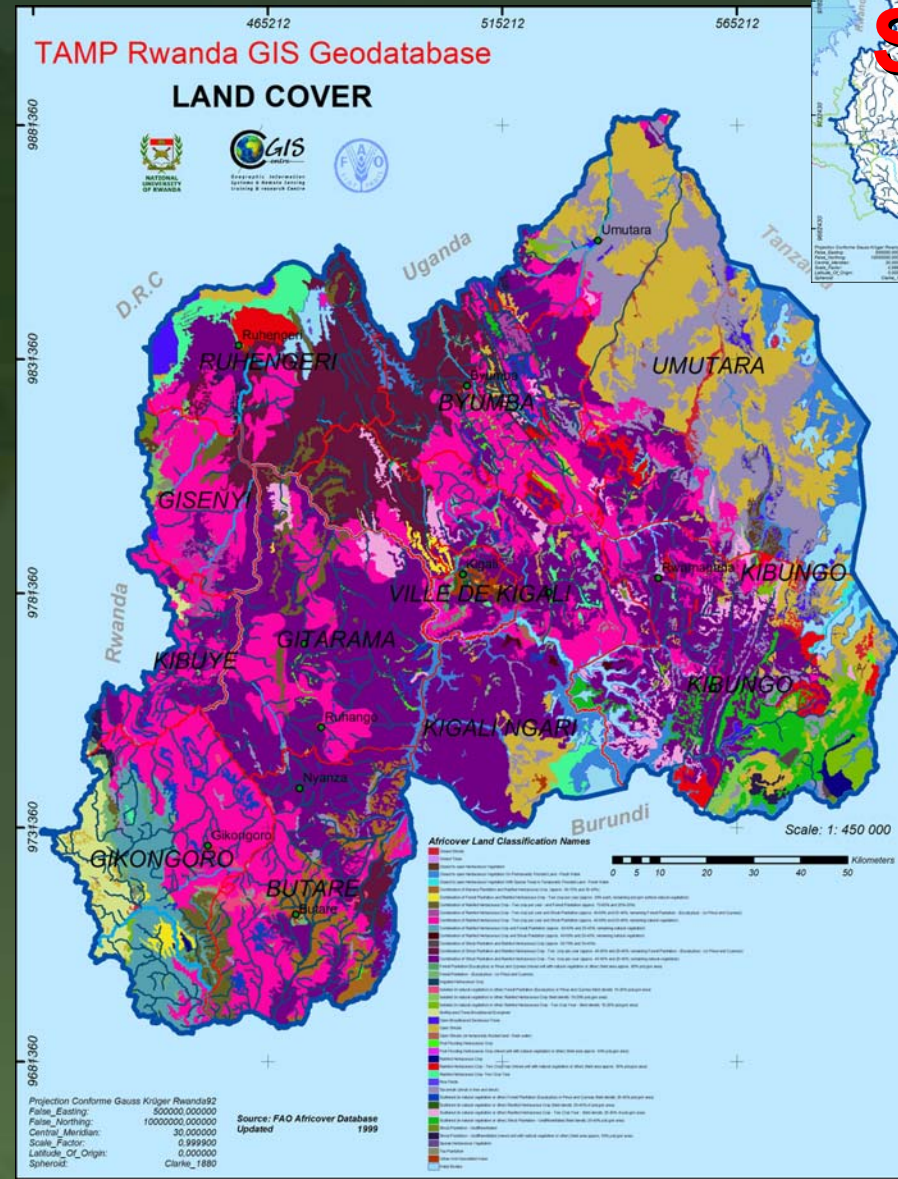
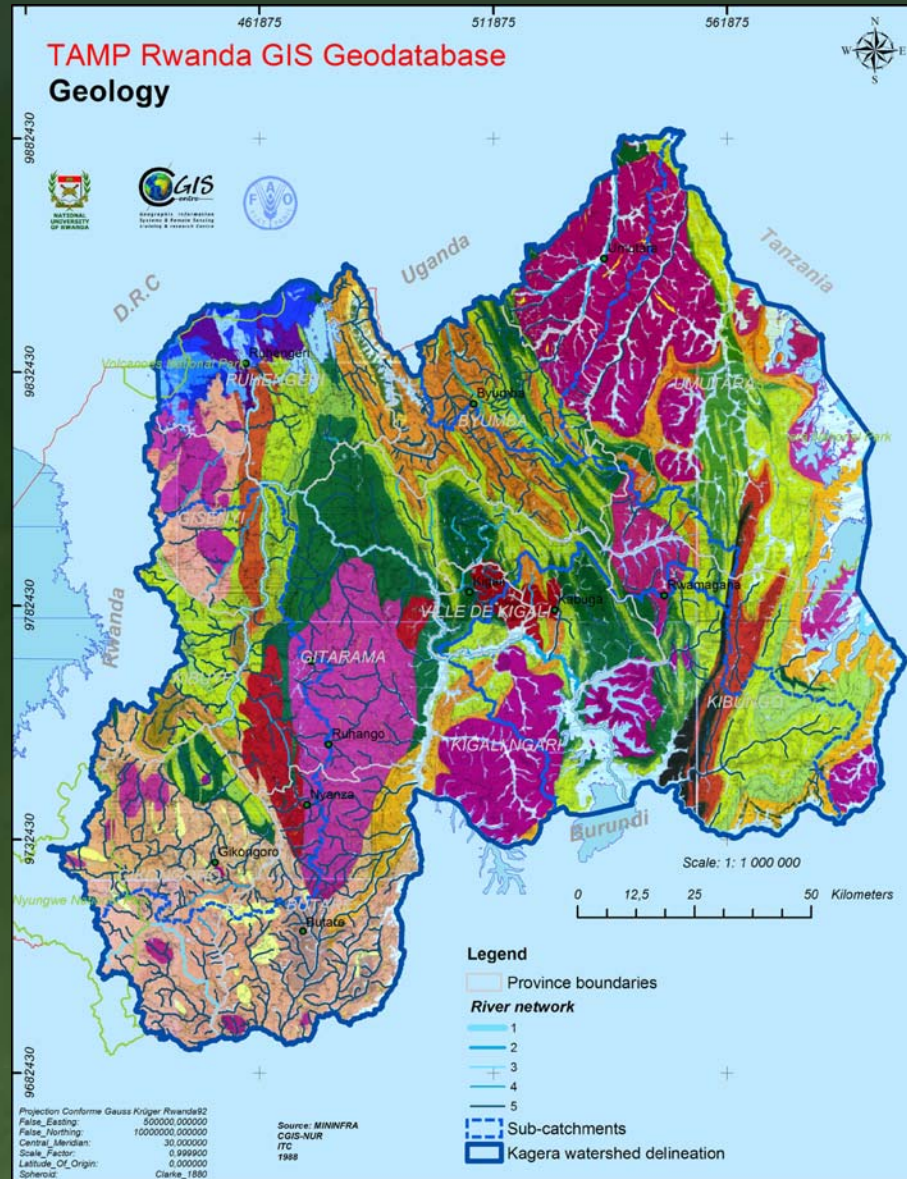
TAMP baseline maps

Kagera river basin

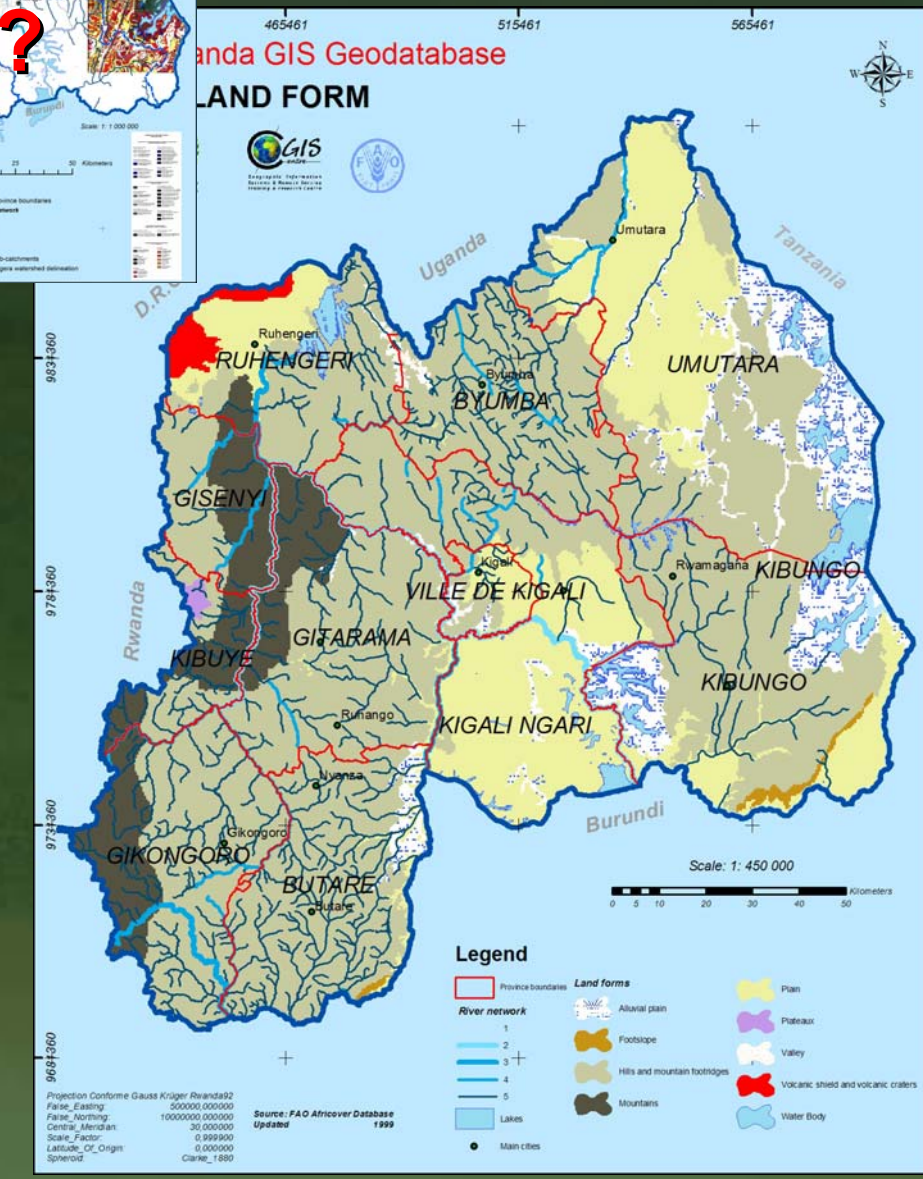


TAMP baseline maps

Physical maps



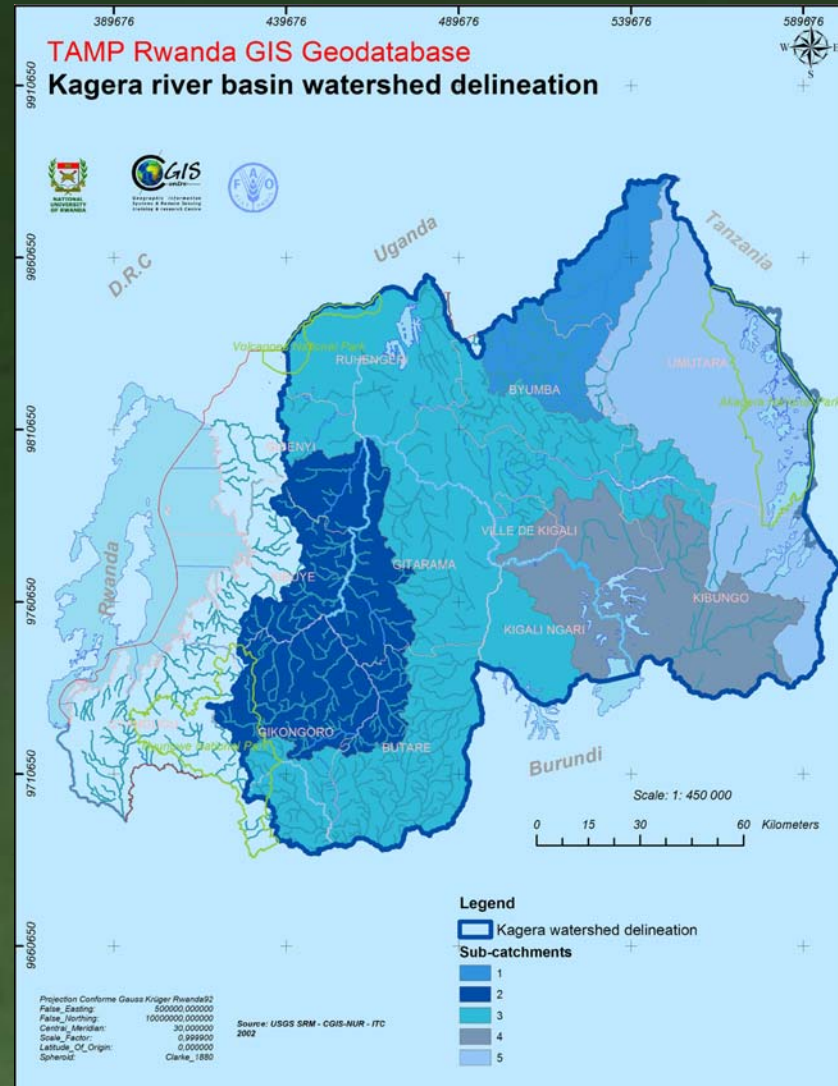
Soil ?



TAMP baseline maps

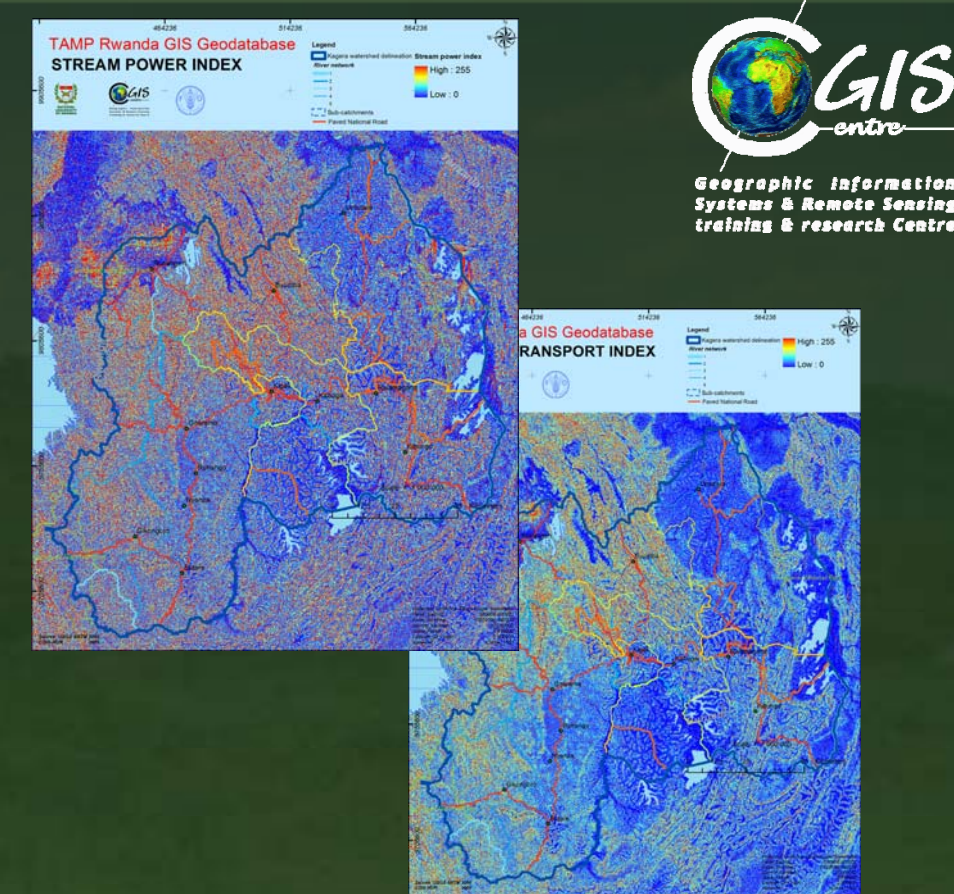
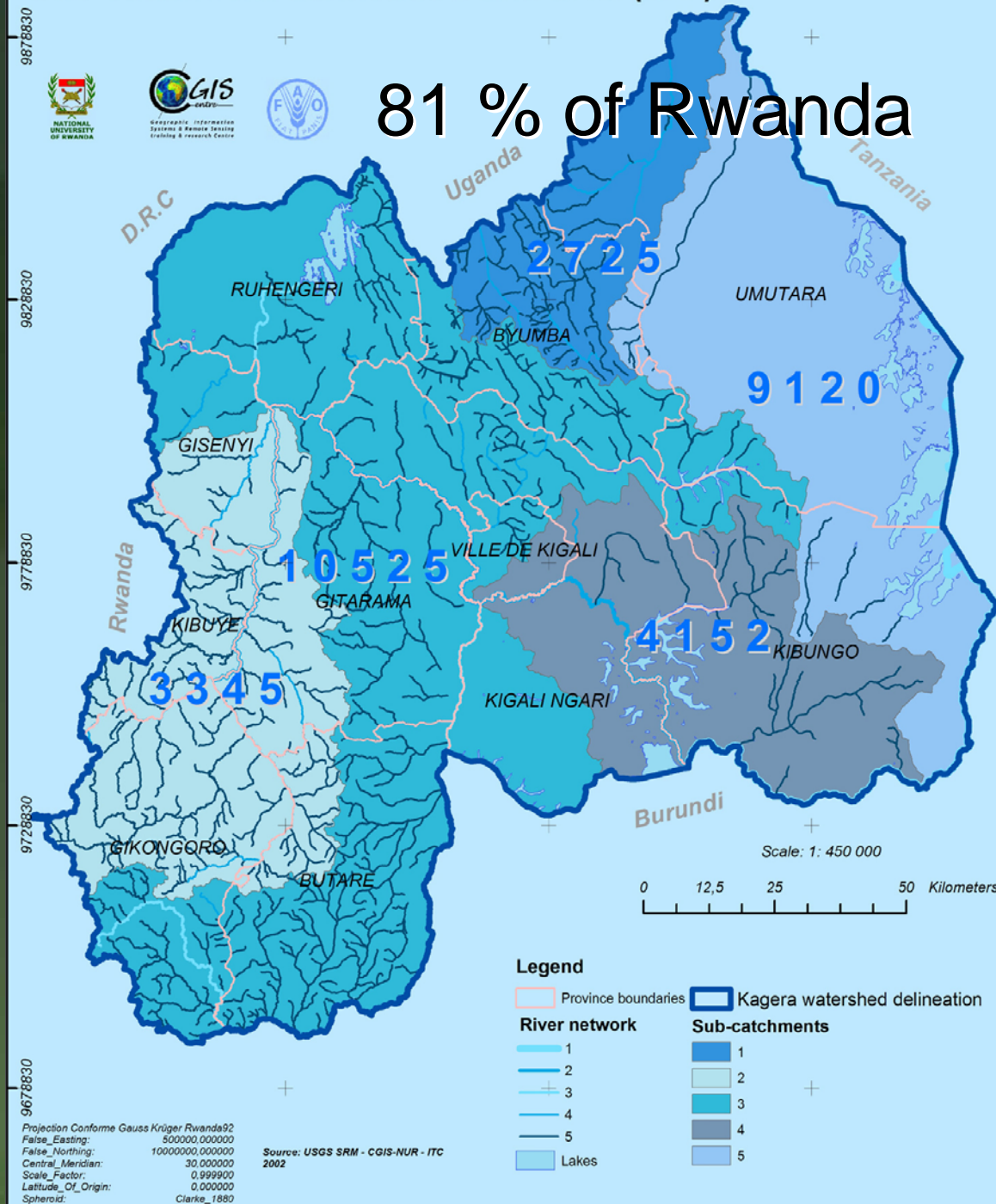
Hydrology

86 on 106 districts



TAMP Rwanda GIS Geodatabase

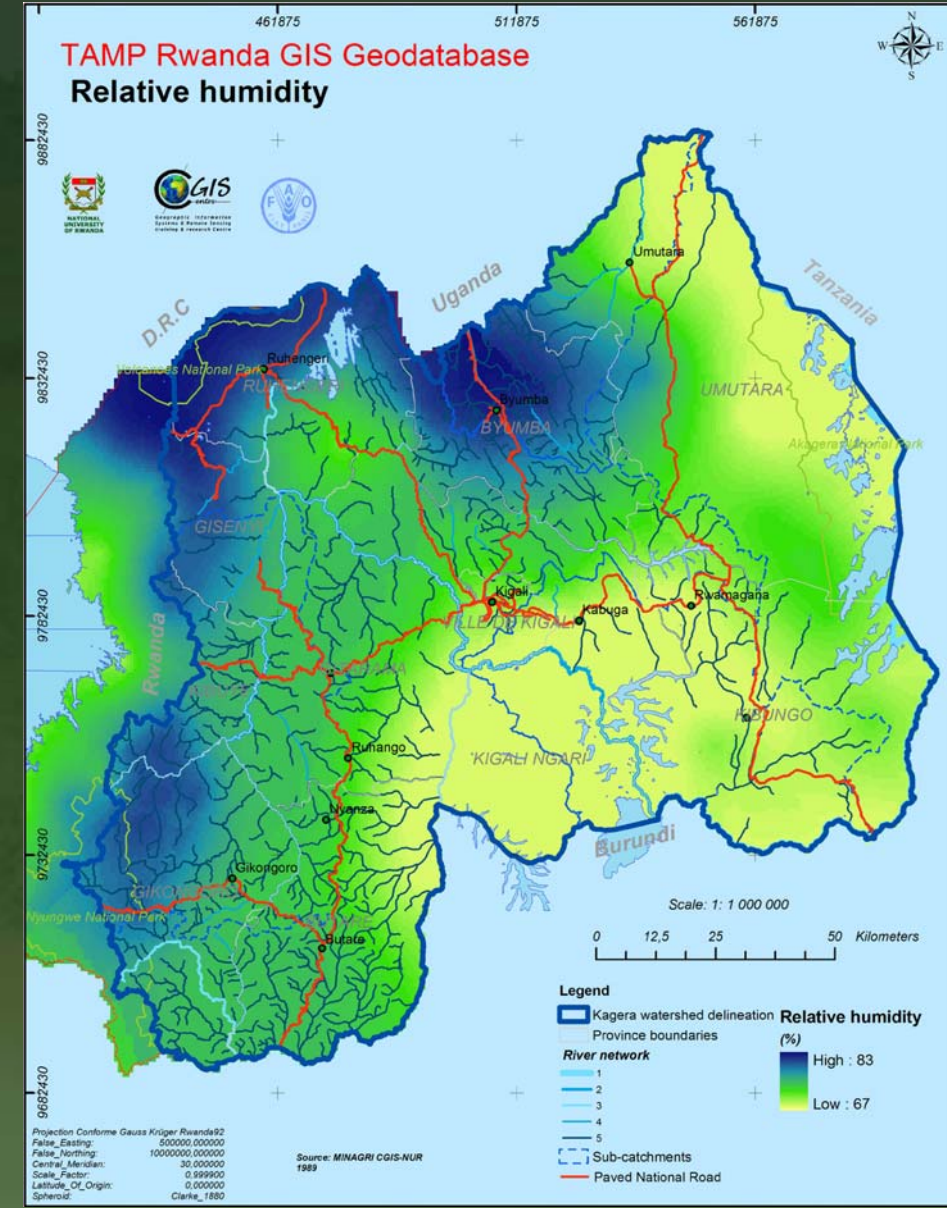
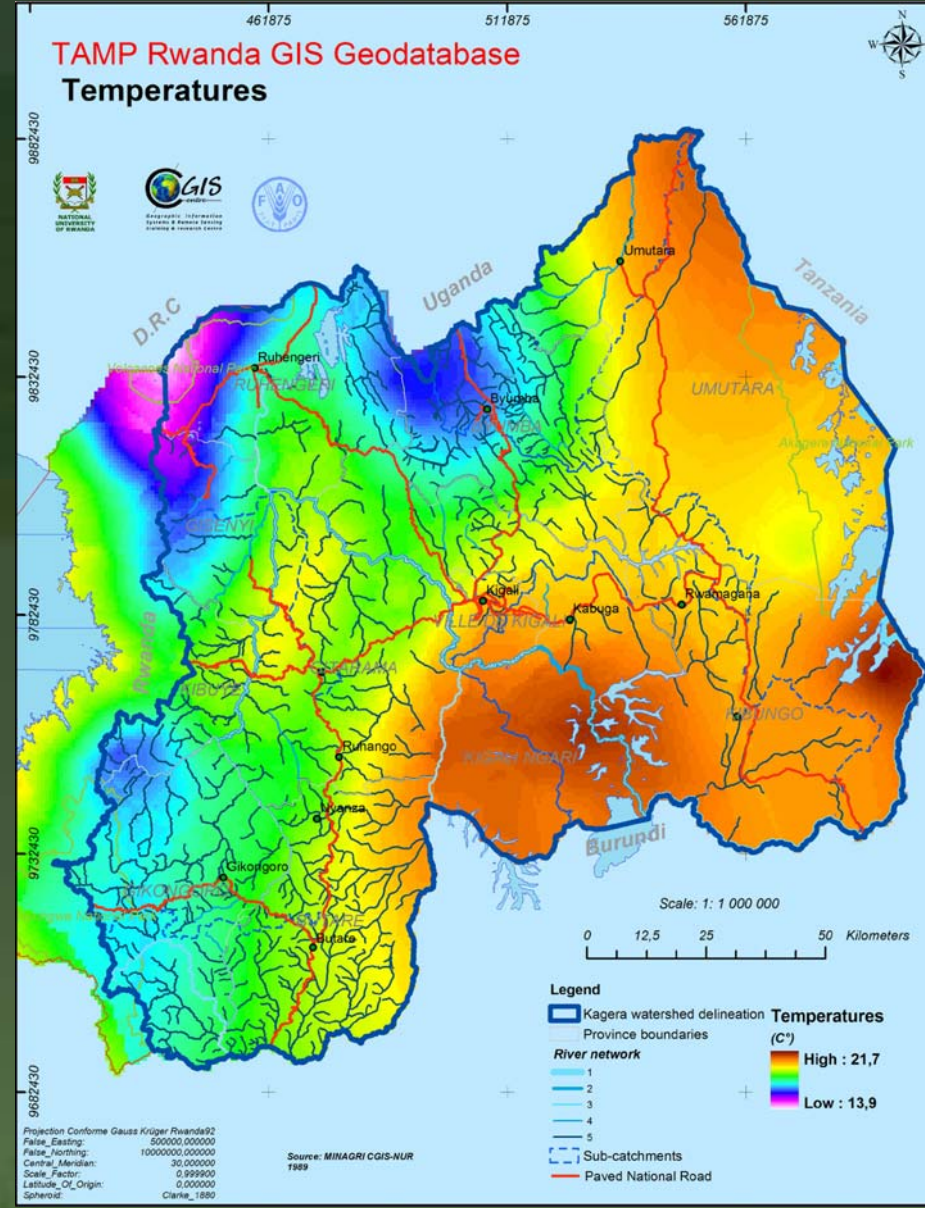
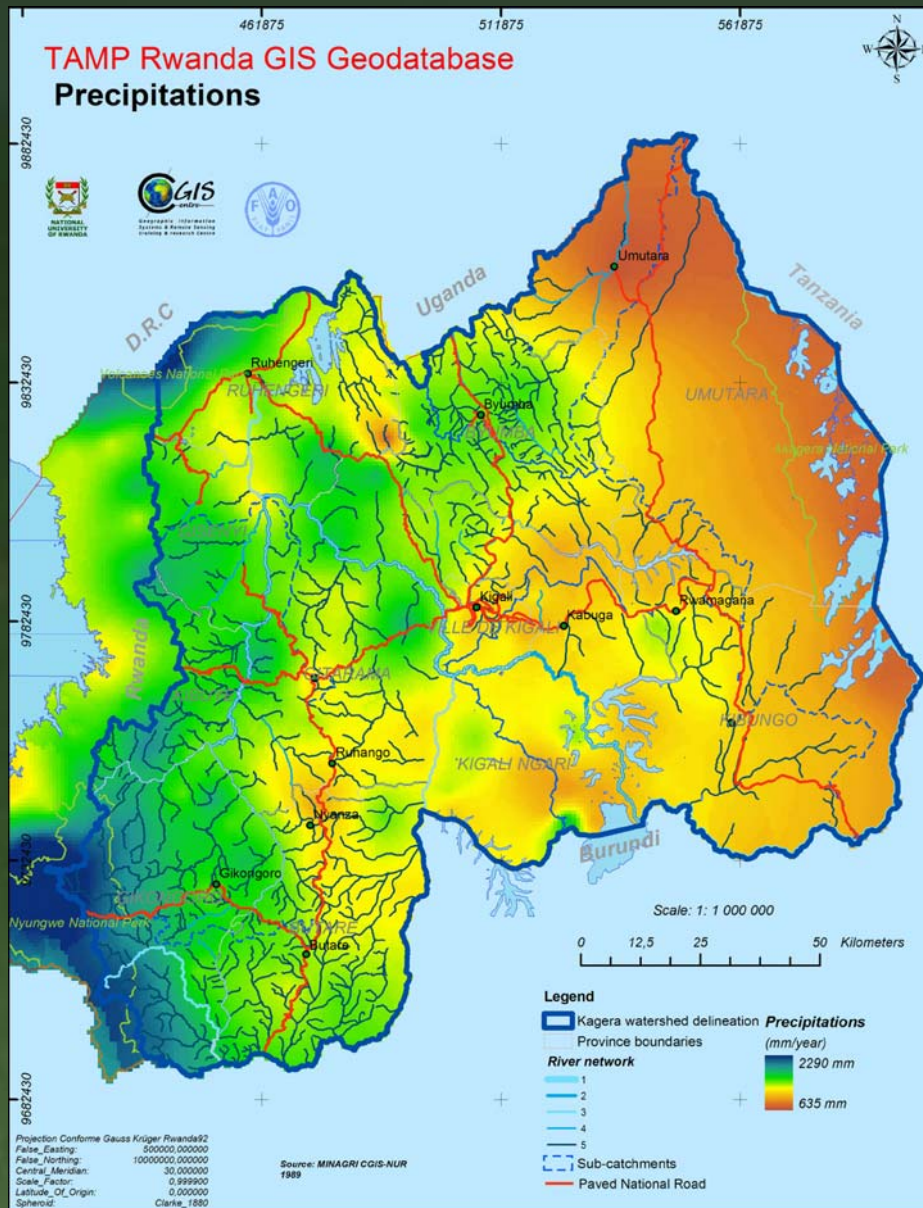
Sub-catchment delineation and area (km²)



Kagera Basin	Land area sq km	% Land Area
Uganda	5 980	10
Tanzania	20 210	34
Rwanda	20 800	34
Burundi	13 060	22
Total	59 800	100

TAMP baseline maps

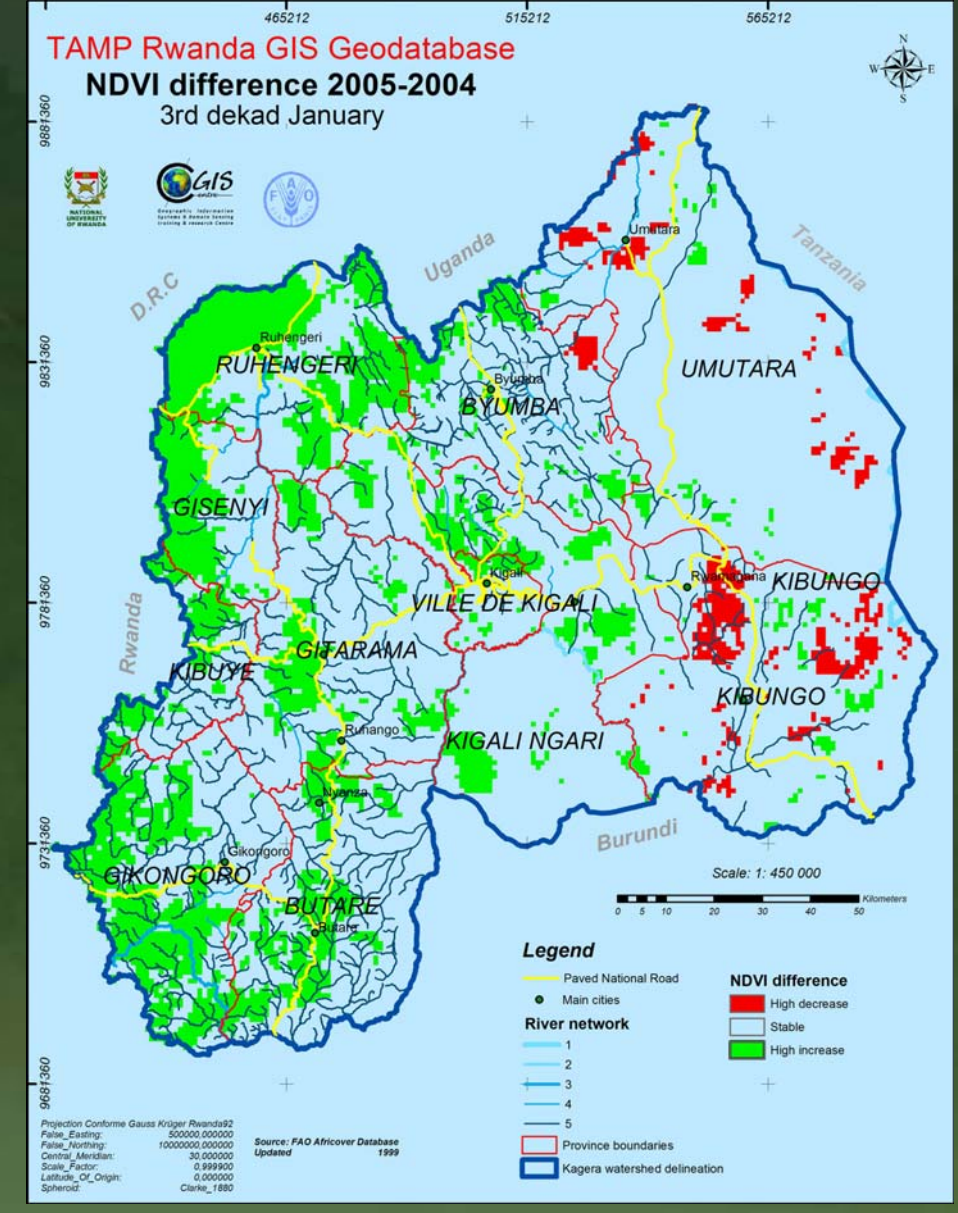
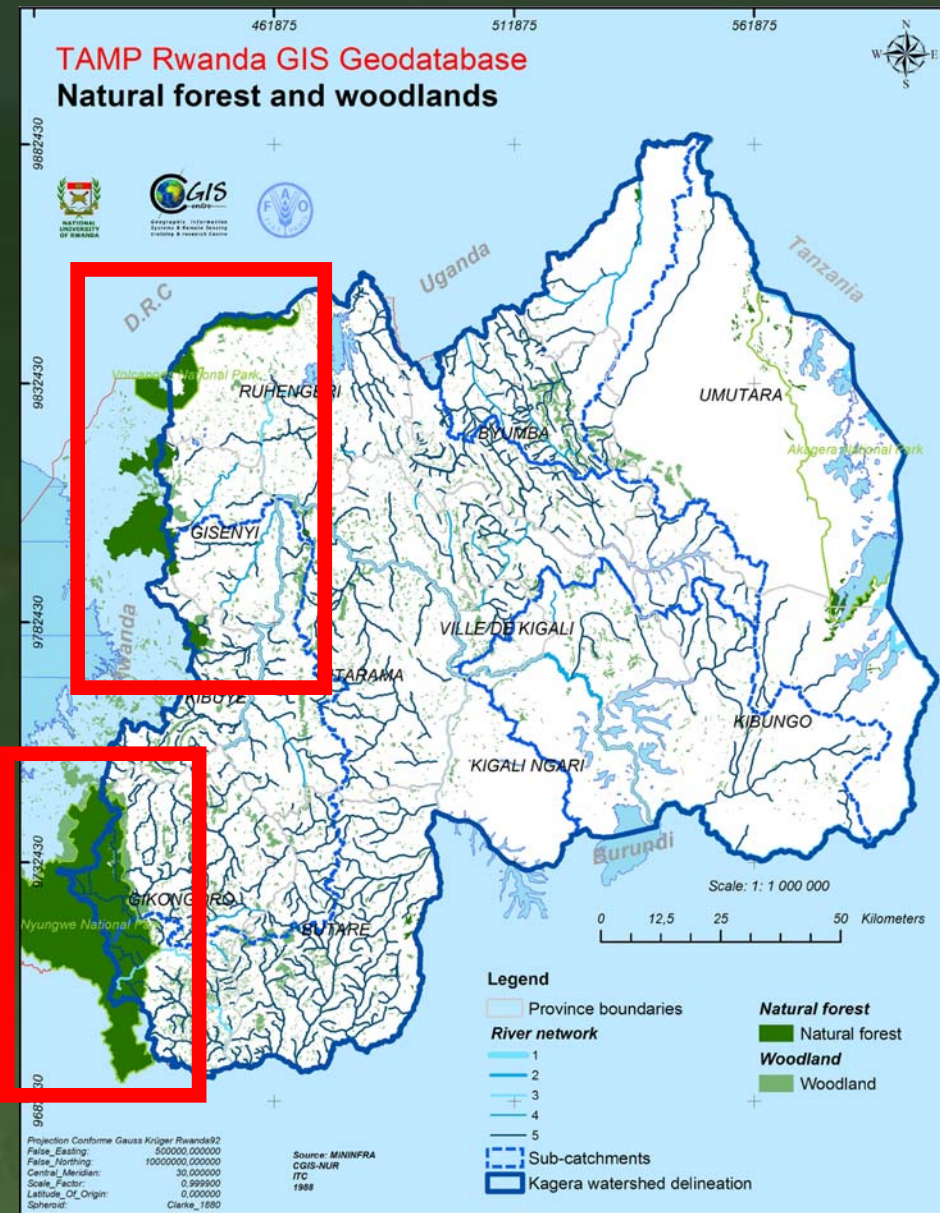
Climate / Meteorology



TAMP baseline maps

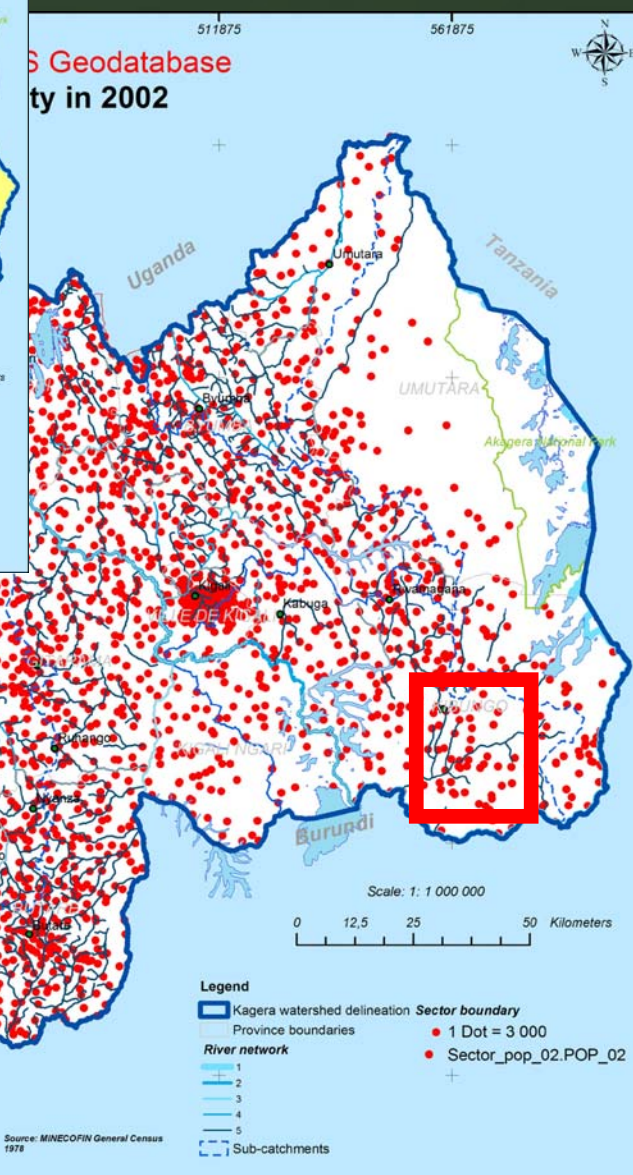
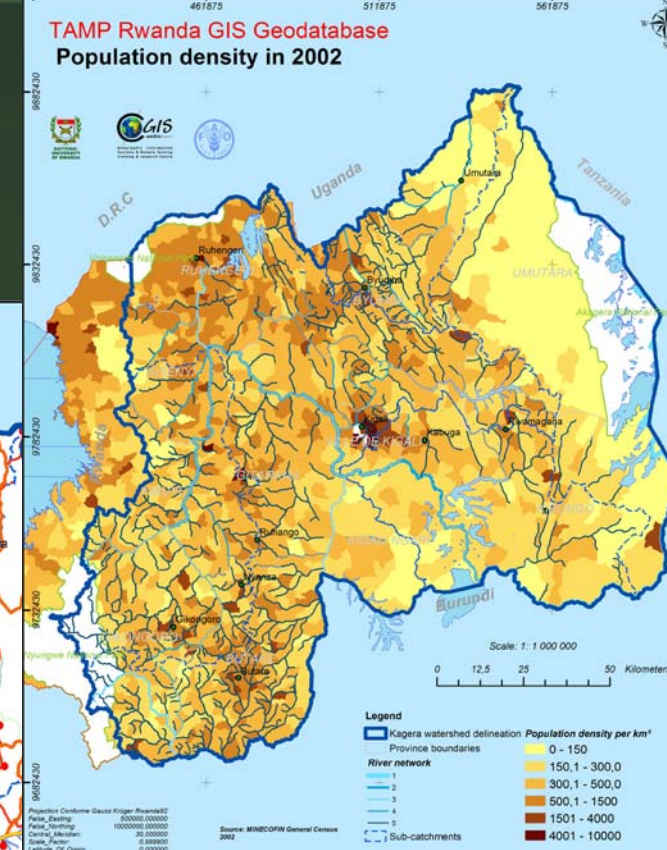
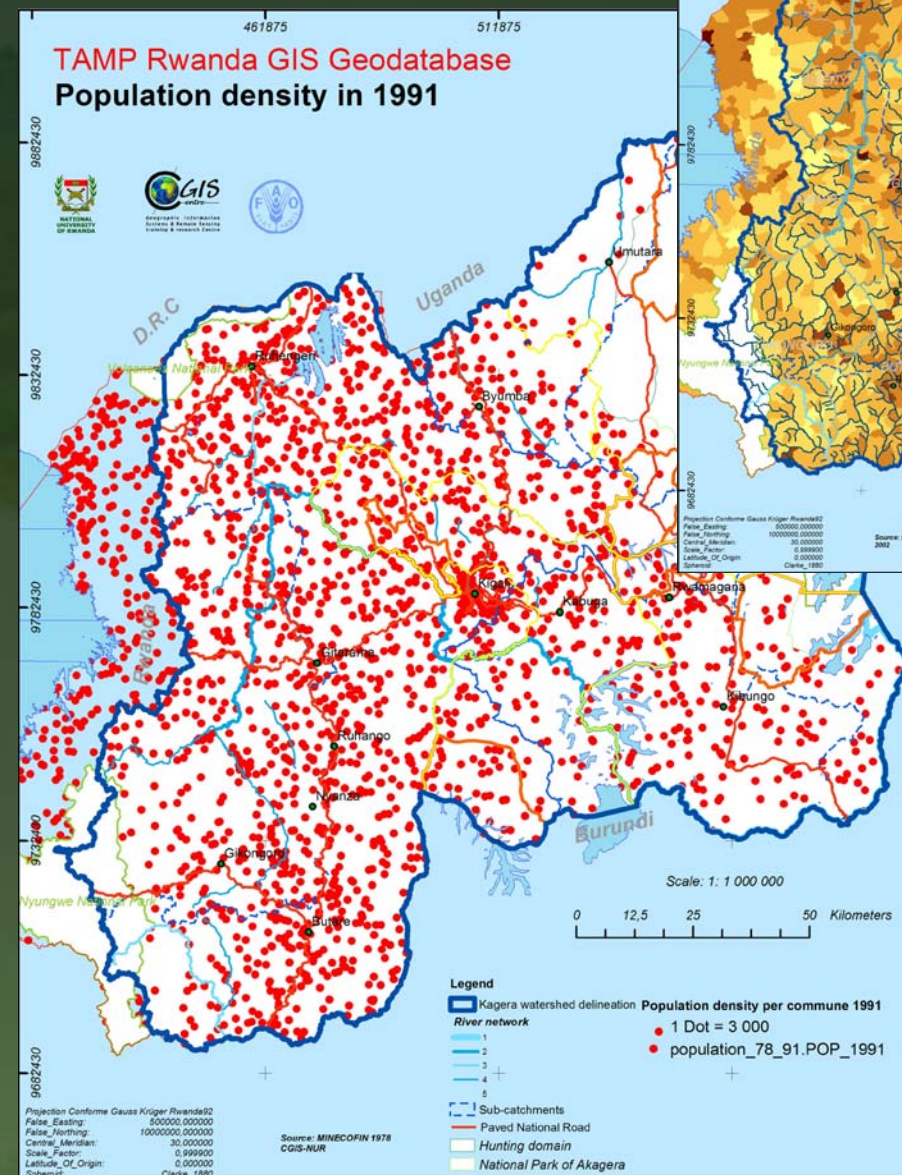
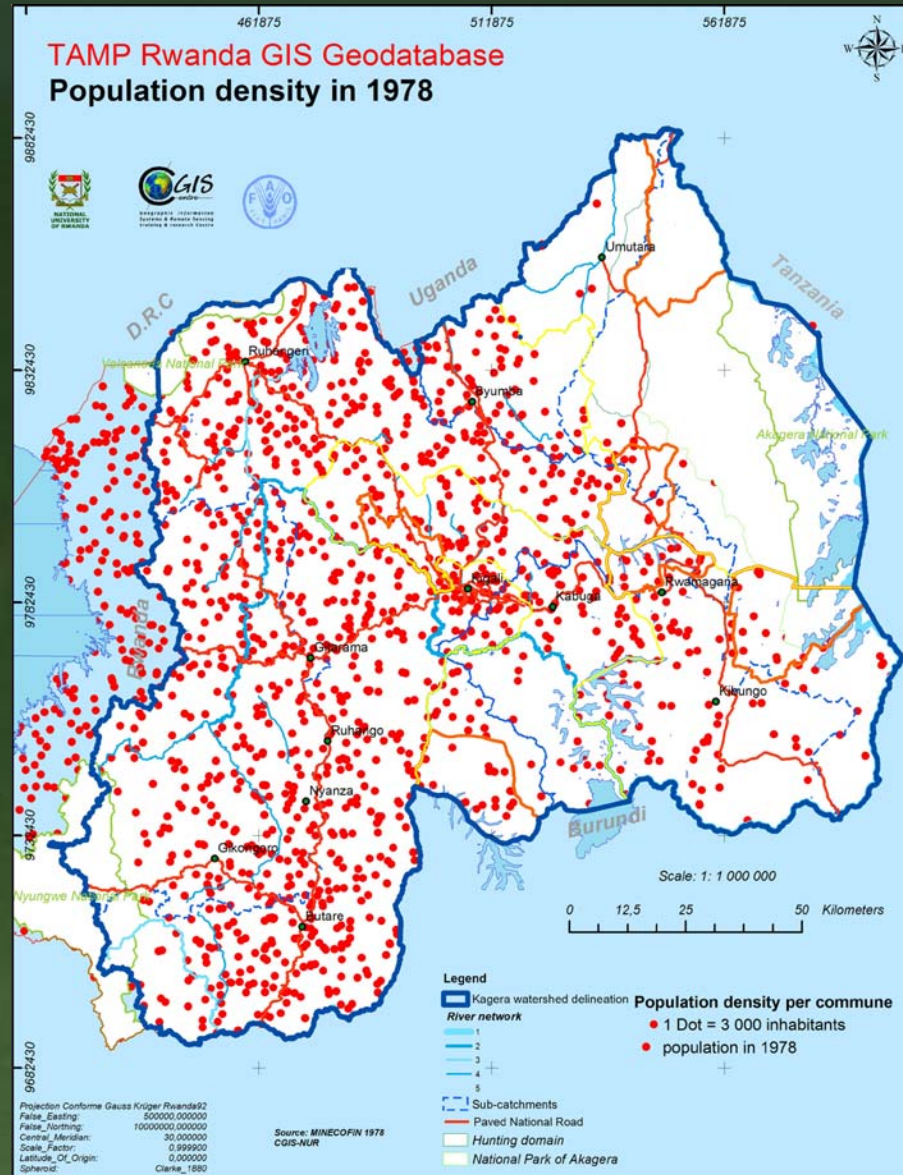
Natural resources: vegetation

Vegetation stress:
Food security



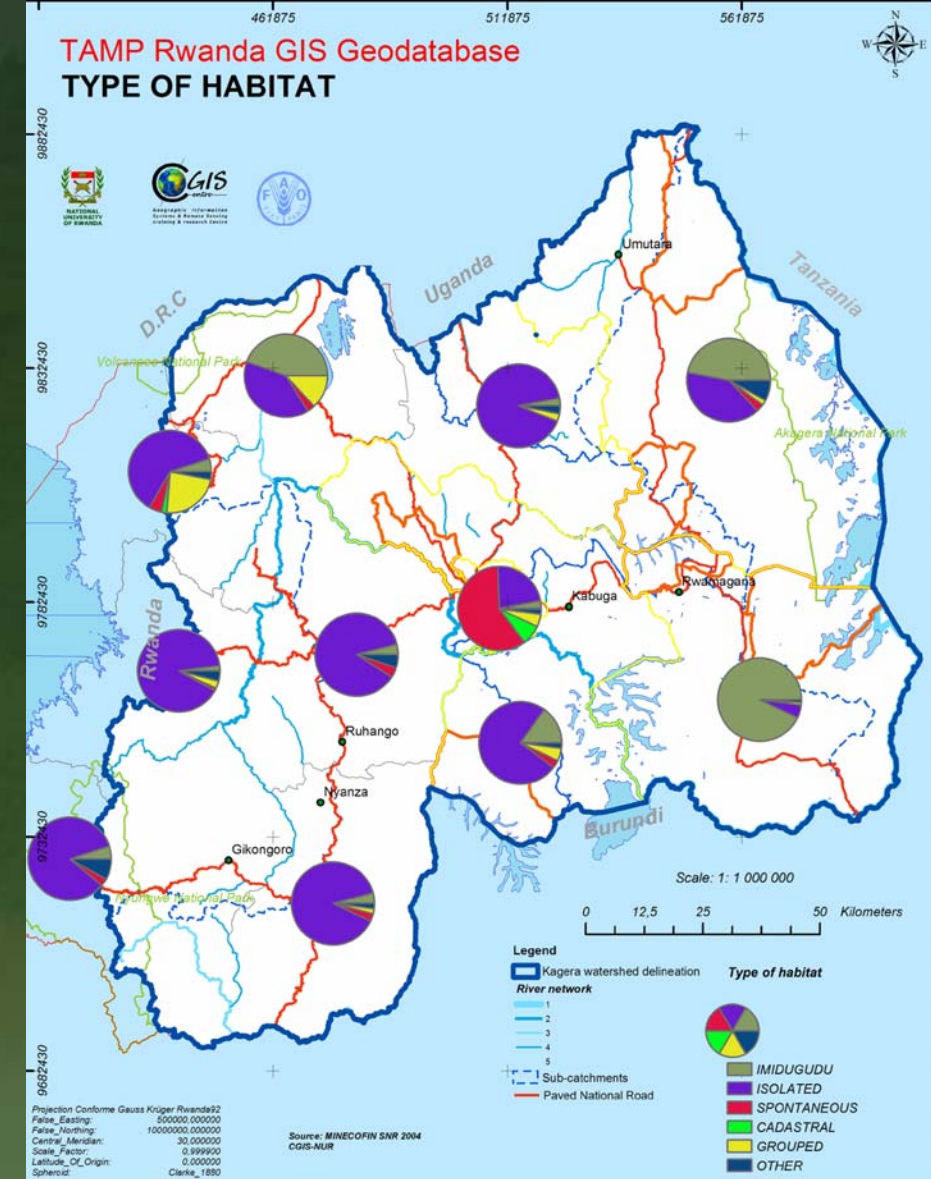
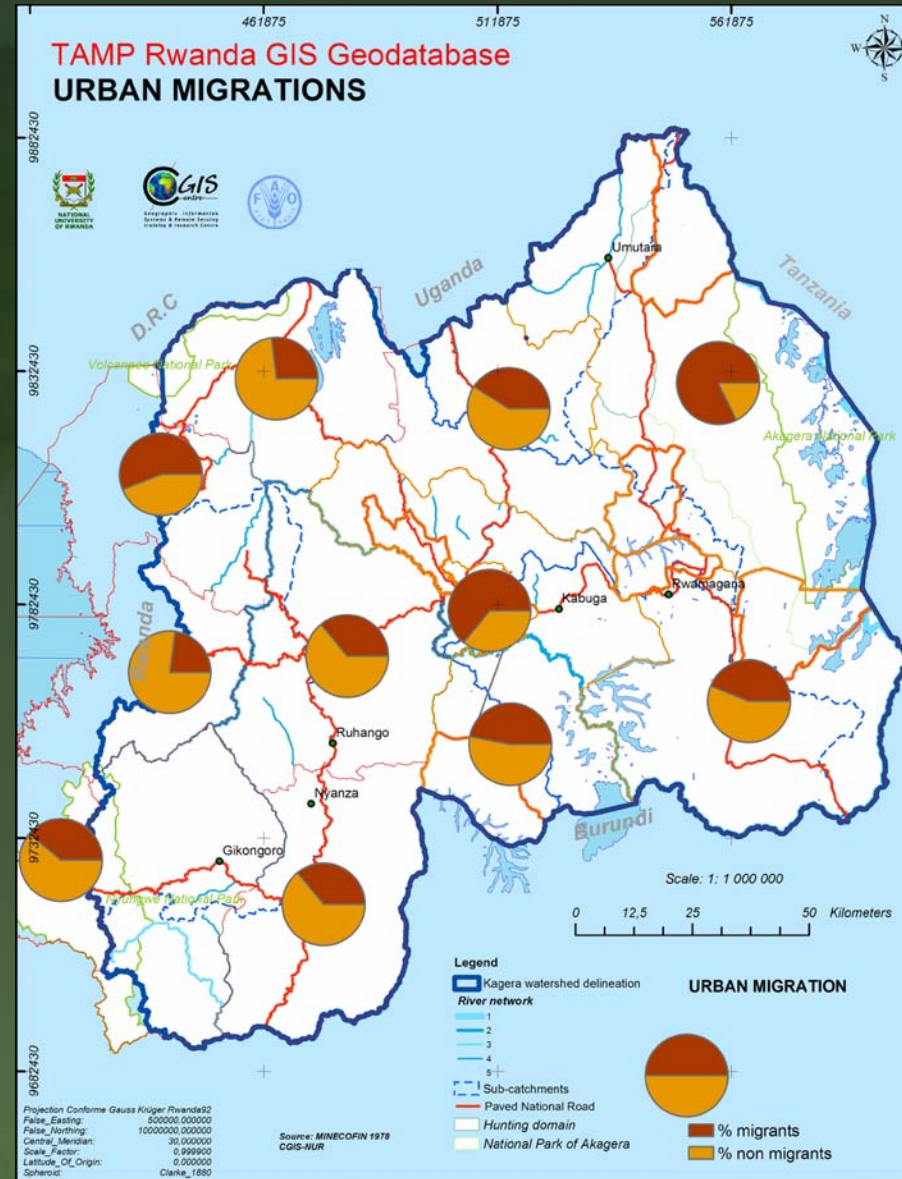
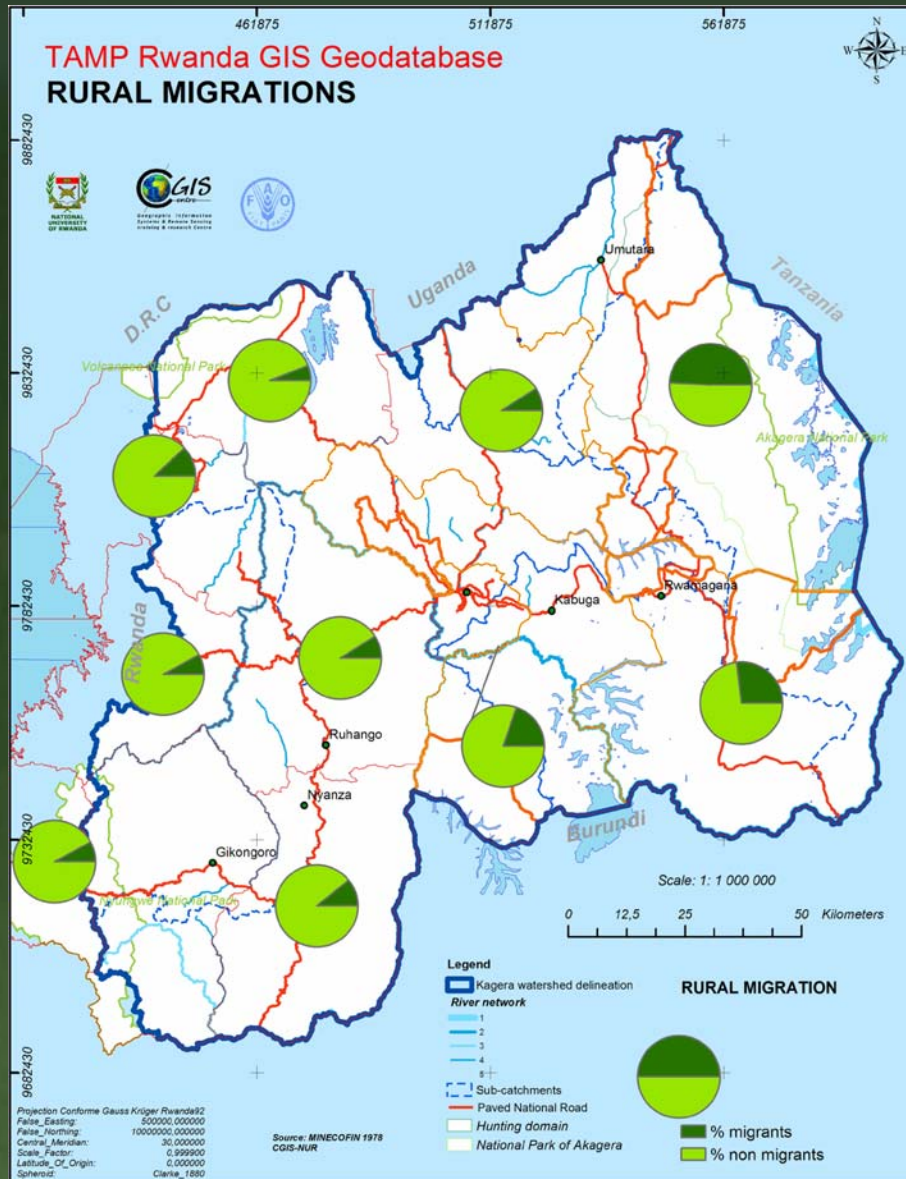
TAMP baseline maps

Population growth : historical data



TAMP baseline maps

Migrations and type of habitat

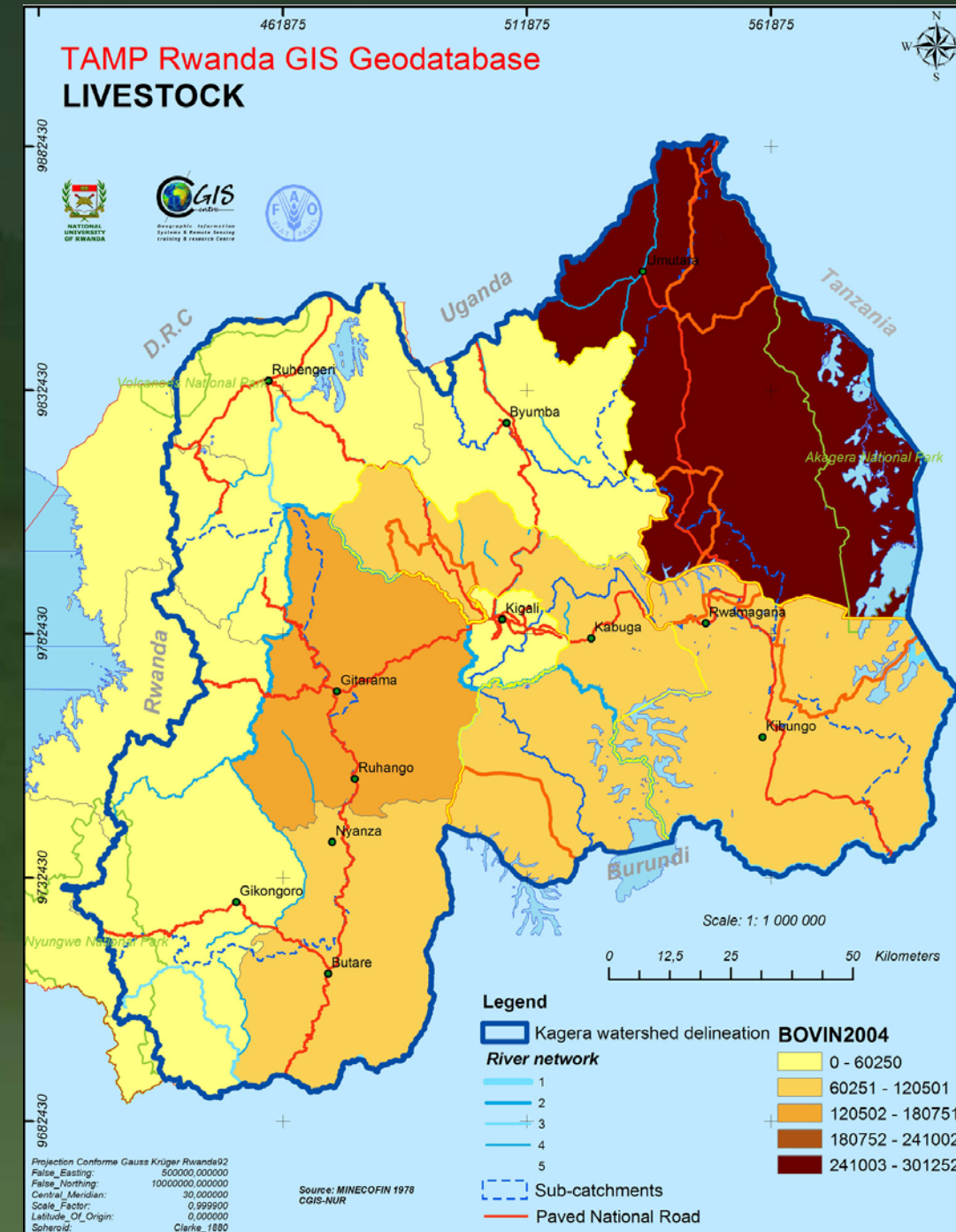


TAMP baseline maps

Livestock

BOVIN2001	BOVIN2002	BOVIN2003	BOVIN2004
10668	0	0	0
88038	89359	100980	102495
53091	62294	63331	64281
42768	38147	55730	56566
35760	42331	50838	51601
229682	226710	296800	301252
0	0	0	0
0	0	0	0
0	0	0	0
48753	50701	49168	49906
35357	48161	48893	49626
26511	23362	27883	28301
36362	36907	51989	52766
140296	142400	173400	176001
59440	55078	72688	73778

C_EPTEL_20	OVINS_03	CAPRIN_03	PORCIN_03	LAPIN_03	VOLAILLE_0
0	0	0	0	0	0
538093	32559	100980	14834	36176	252564
500005	13047	144334	34155	31968	213170
350211	61682	73985	20266	45827	92721
1008419	85066	65065	8399	43588	755463
559136	2187	86861	1246	5974	166068
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
276348	46369	71298	32418	32418	44677
409874	30035	42529	9328	40066	239023
290171	20127	73292	17041	11425	140403
428355	45666	71268	14428	150044	94960
924267	30618	138378	47936	224164	309771
375393	4410	100363	11867	12761	173304



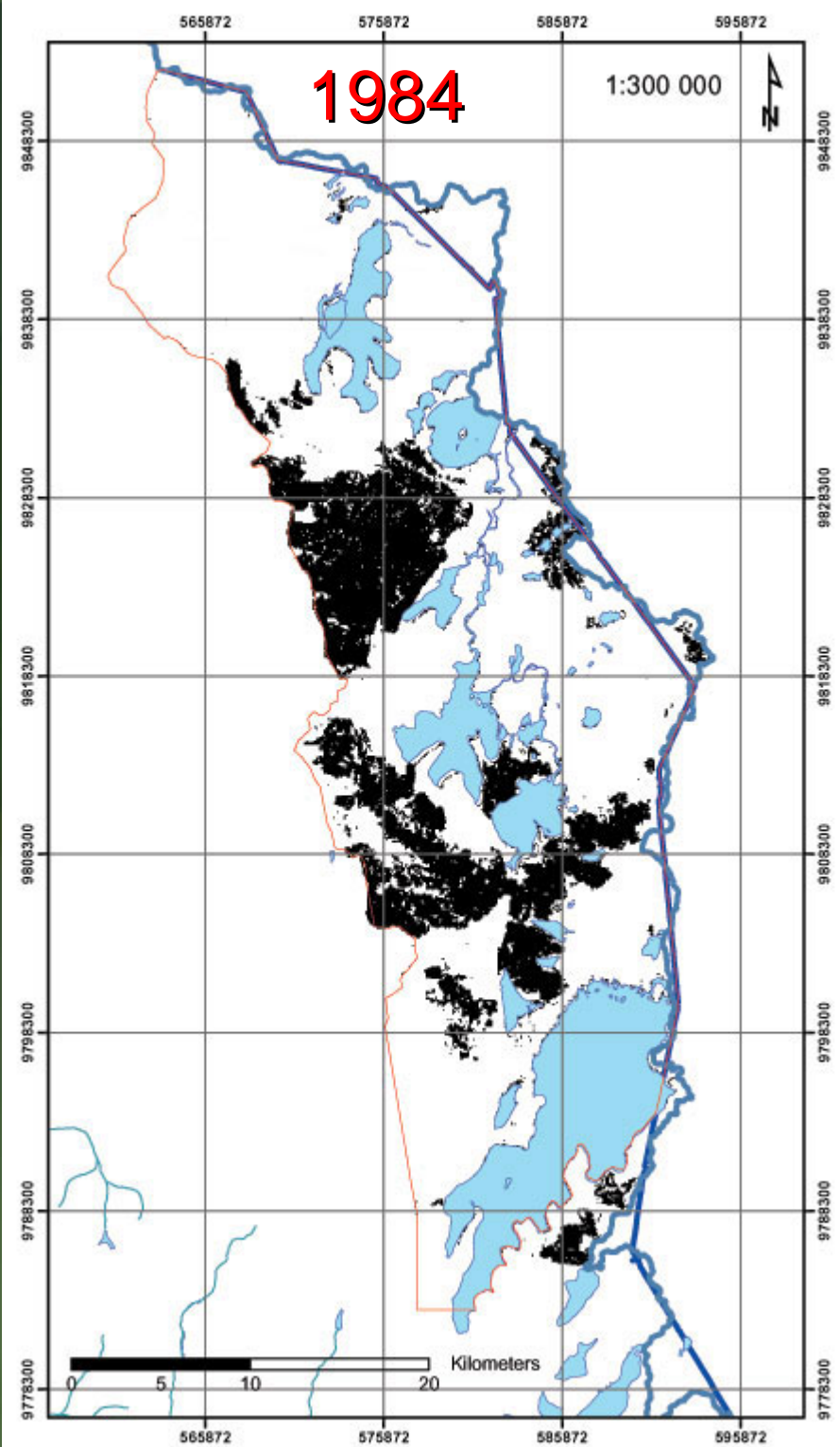
TAMP Spatial Trends

3 main threats

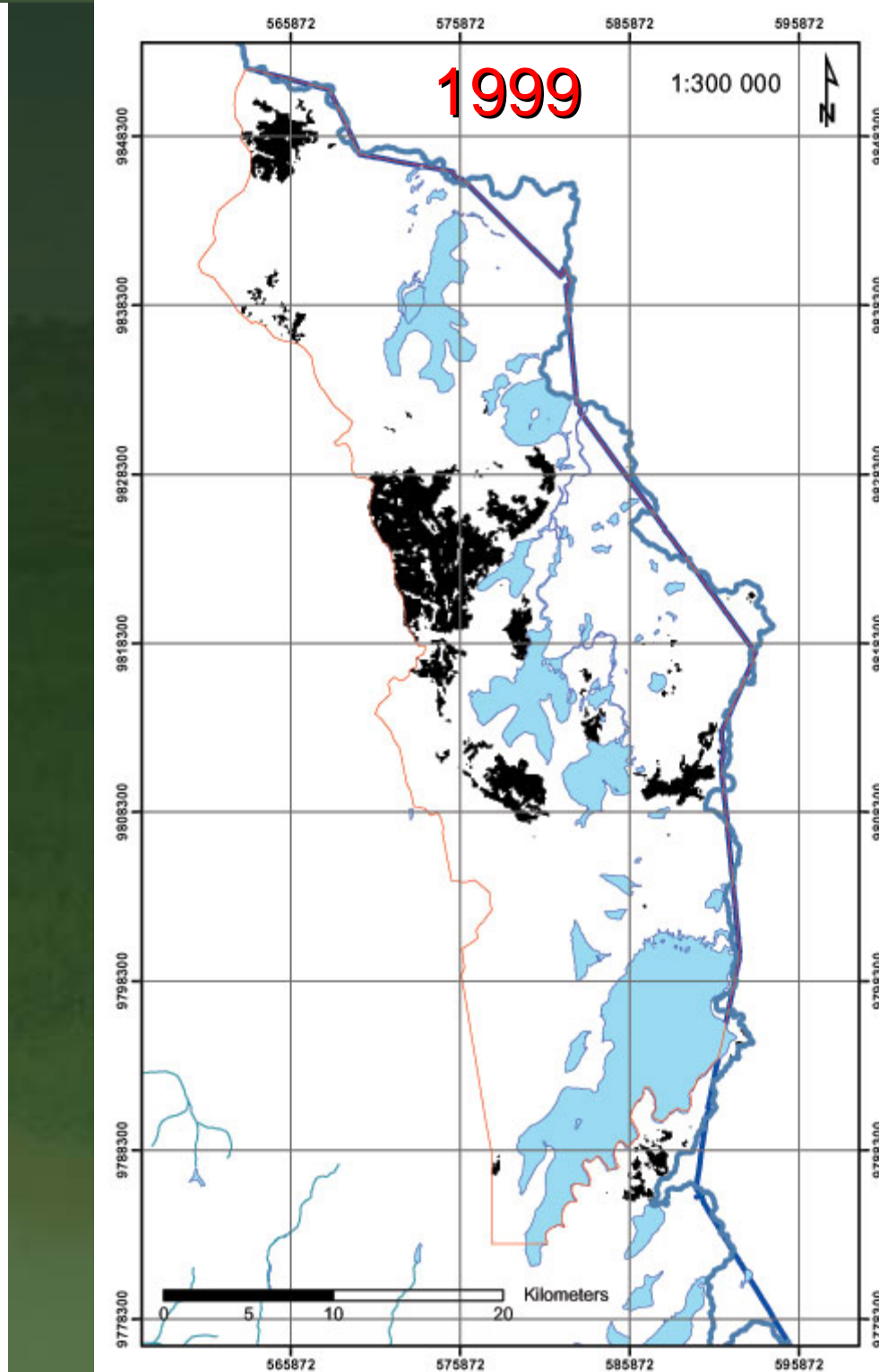
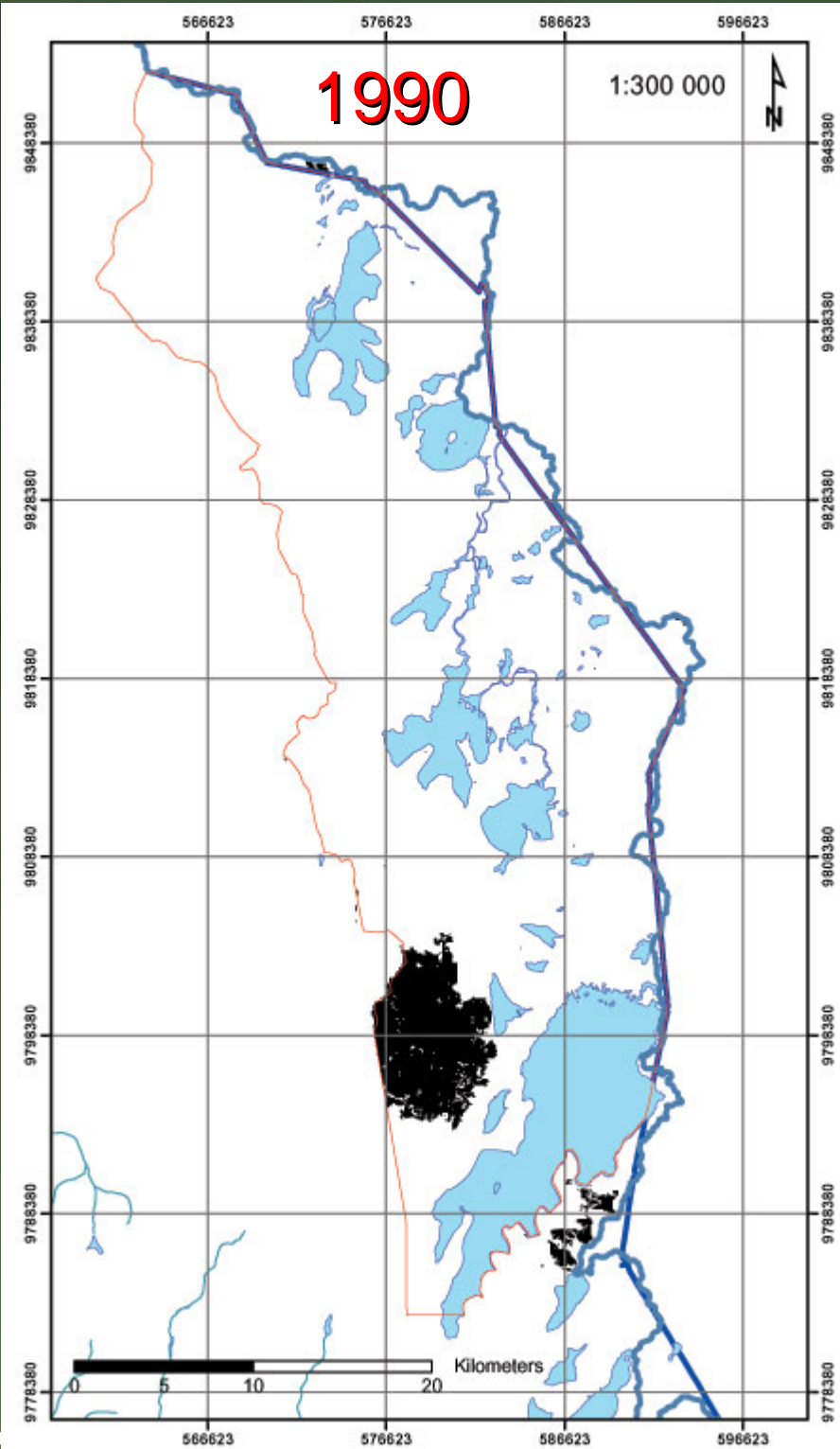
- Fires
- Deforestation
- Degradation of wetlands



TAMP Trends Fires *Akagera Park*



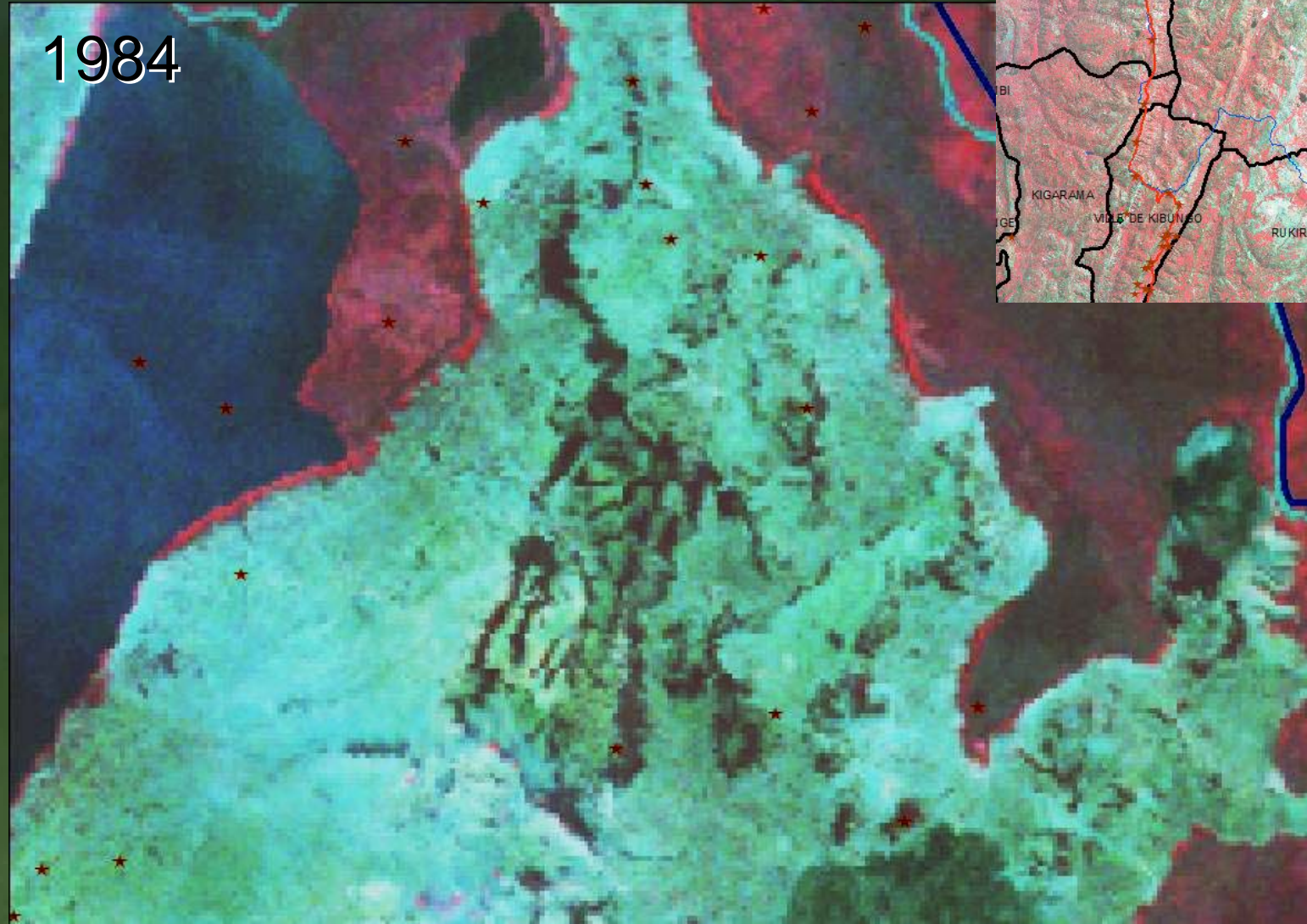
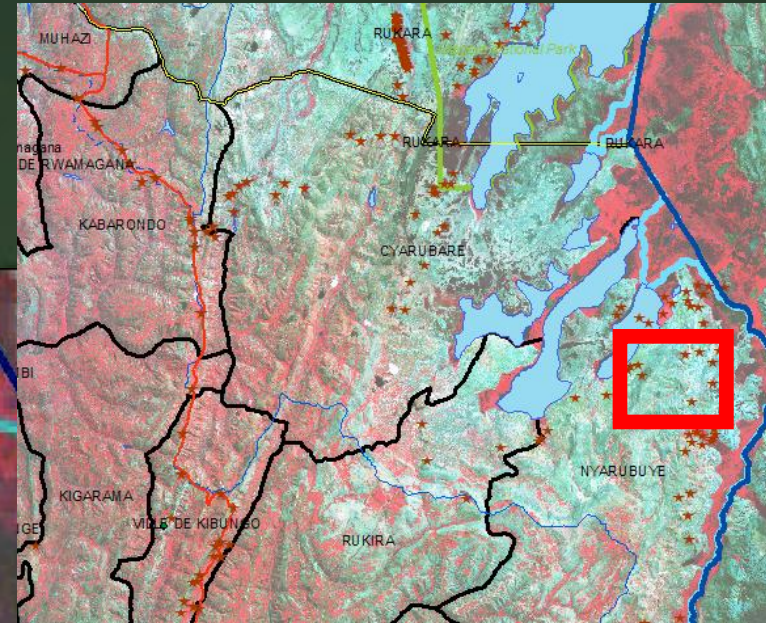
MP proj



TAMP Trends

Deforestation

District of Nyarubuye



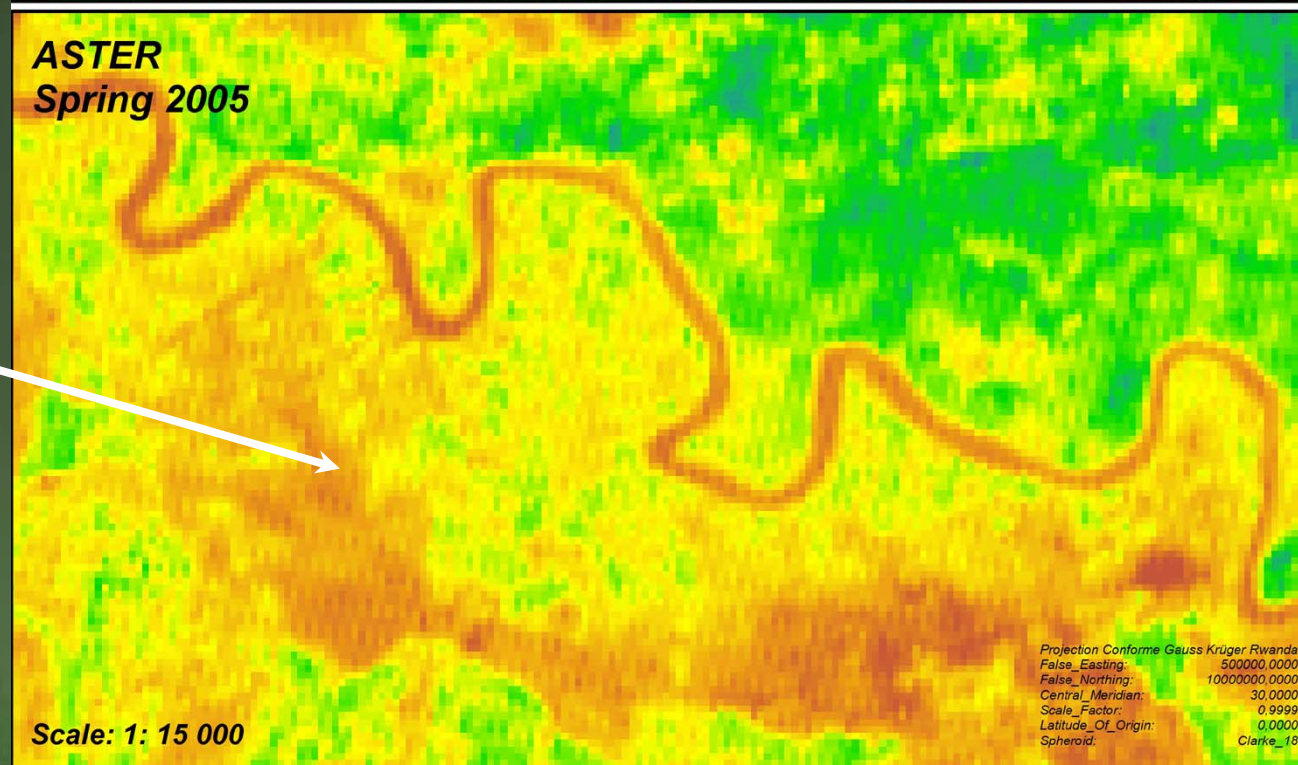
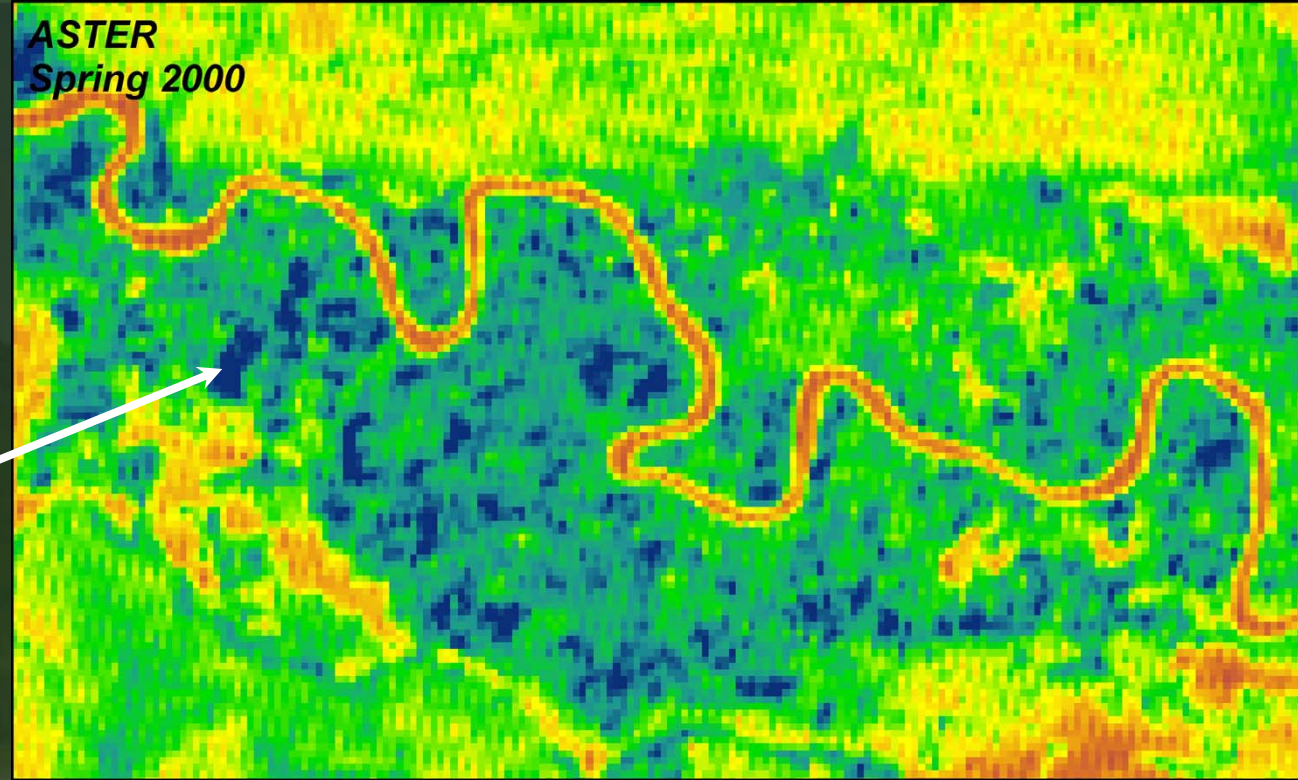
Degradation of wetlands

District of Ngenda

Papyrus



Maize



Hot spots for protection

Example of Makera forest

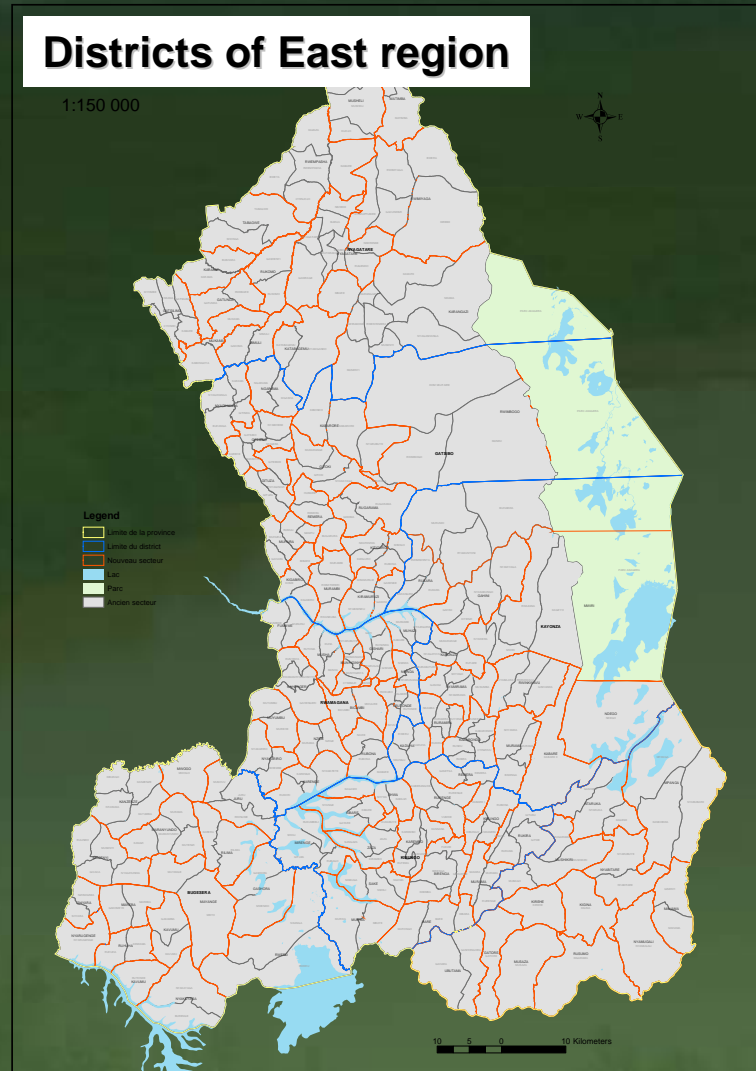


Specific species of interest



New administrative boundaries

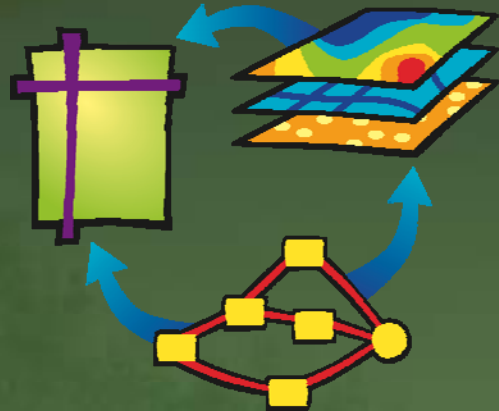
January 2006 : 5 regions



Spatial data sharing and access

Webmapping service

Acquisition



DataWarehouse
Spatial Databases
Analysis-Applications

Distribution



NUR WebMapping Server



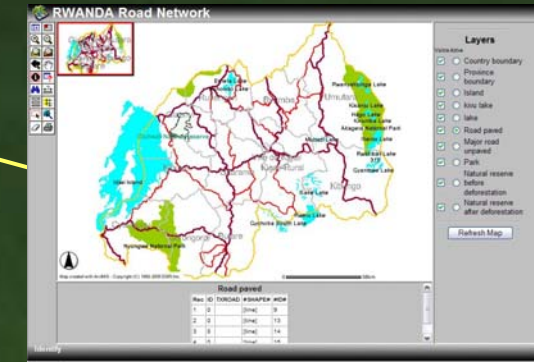
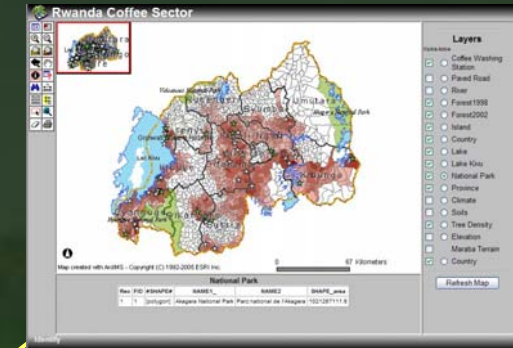
Map Catalog



Web Browser



End User



TAMP Webmapping Products

Soon available online

www.cgisnur.org



Geographic Information Systems & Remote Sensing Centre

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Focus On

REFRESHER COURSE ON GEO-INFORMATICS FOR HYDROLOGICAL MODELING

This course (3/10/2005 to 14/10/2005) aims at providing better understanding of hydrological processes and equip the participants with up-to-date knowledge and skills on the modelling and prediction of (...)

Ministries Area - Kacyiru QuickBird image 15 July 2005

Latest News

- 19th October: Closing the Refresher course on Geoinformatics for Hydrological Modeling
- 10th October: Announcement for a Training on Remote Sensing for Forestry
- 30th September: Full time Job Announcement for an ICT

Agenda

Mon	Tue	Wed	Thu	Fri	Sat	Sun
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Current Projects

- Rwandan Forest Mapping Project
- Kagera Basin GIS Database Project

Training Programs

- BsC in Urban Planning and Land Administration

Development of Geographic Information Sciences based Education and Research Program at the National University of Rwanda, funded by the NUFFIC NPT projects, hosted at NUR. Objective to build (...)

Partners

- Rwanda Gateway
- ORTPN
- Dipfory

Other Partners...

PHOTOS GALLERY

DOWNLOADS

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News Letter

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Administration

Education

Population

Environment

Agriculture

BETTER DECISIONS THROUGH MODELING AND MAPPING OUR WORLD

Web-Mapping is about publishing maps and data on the Web. The CGIS, using the ERSI ArcIMS platform, delivers maps and data on the web that allows users to visualize, create and query their own thematic maps and thus extract relevant information to help them in their decision making processes.

Contents

- Administration
- Education
- Population
- Environment
- Agriculture

Rwanda Administrative Map

Secondary schools access

Rwandan Population Density by District in 2002

Rwanda Road Network

Rwandan Coffee sector

Ministries Area - Kacyiru QuickBird image 15 July 2005

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CREATE A MAP ONLINE...

CGIS WEBMAPPING

News Letter

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