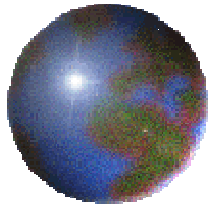


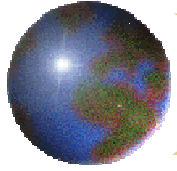
Fourth United Nations International  
UN-SPIDER Bonn Workshop on  
Disaster Management and Space Technology  
Bonn, Germany, 12 – 14 October 2010



**CAPACITY BUILDING IN EARTH  
OBSERVATION AND GEO-INFORMATION  
SCIENCE – A BRIDGE TO KNOWLEDGE FOR  
DISASTER MANAGEMENT**

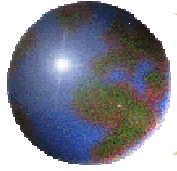
**Mahamadou KEITA**

**REGIONAL CENTRE FOR TRAINING IN  
AEROSPACE SURVEYS (RECTAS)**



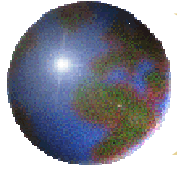
## **CONTENT**

- ✚ Introduction
- ✚ RECTAS Profile
- ✚ Capacity Building and Disaster Management
- ✚ RECTAS' contributions
- ✚ Conclusion
- ✚ Recommendations



## **INTRODUCTION**

In Africa, majority of the professionals and technicians in different organisations involved in geospatial information activities have not been making a full use of data and tools to manage and alleviate the consequences of natural disasters due to low proficiency in the space technologies.



## **INTRODUCTION (cont'd)**

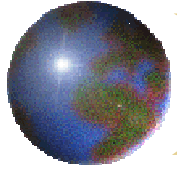
Today, there is increasing demands of well-trained staff at all levels, to face the main challenges of disaster management and emergency response.

RECTAS, through its training and capacity building activities is trying to face the challenges.

# **REGIONAL CENTRE FOR TRAINING IN AEROSPACE SURVEYS (RECTAS)**

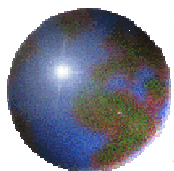
**(Under the auspices of the United Nations Economic  
Commission for Africa – UNECA)**





# RECTAS

RECTAS was established in **1972** under the auspices of the United Nations Economic Commission for Africa (UNECA) to undertake training and research in Geoinformation Science for the manpower needs of African nations.



# MEMBER COUNTRIES OF RECTAS

*PAYS MEMBRES DU RECTAS*

NIGER

MALI

SENEGAL

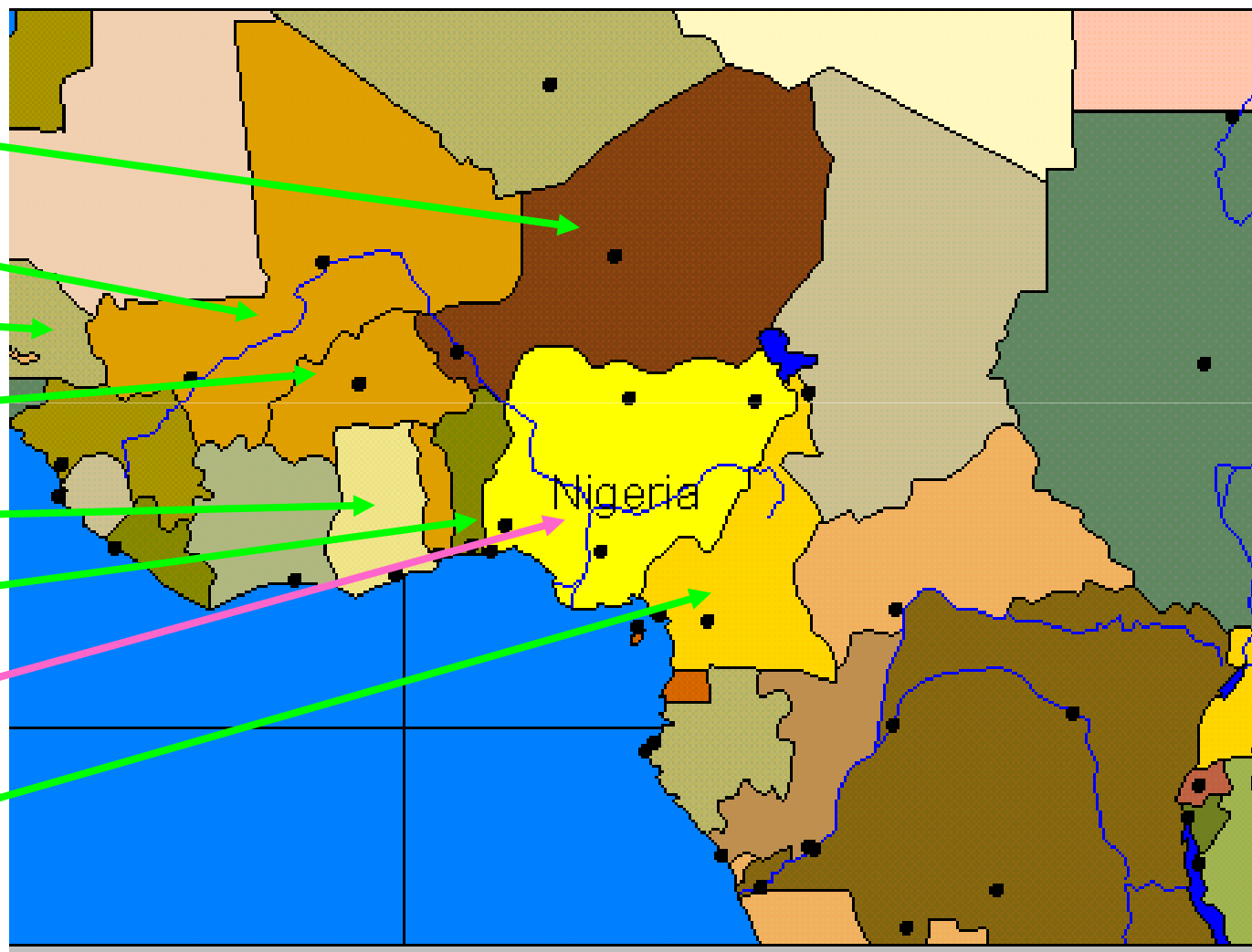
BURKINA

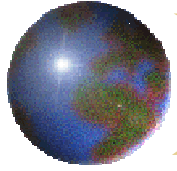
GHANA

BENIN

**NIGERIA**

CAMEROUN

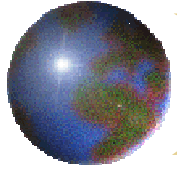




## **VISION OF RECTAS**

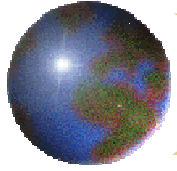
To be a leading **Centre of Excellence** providing one-stop solution for quality geospatial science training, education and research and critical capacity for sustainable development in Africa.





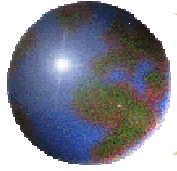
## **MISSION OF RECTAS**

To contribute to rapid development of member states in particular and Africa in general, through capacity building for timely delivery and responsible use of appropriate geospatial information.



## **OBJECTIVES OF THE CENTRE**

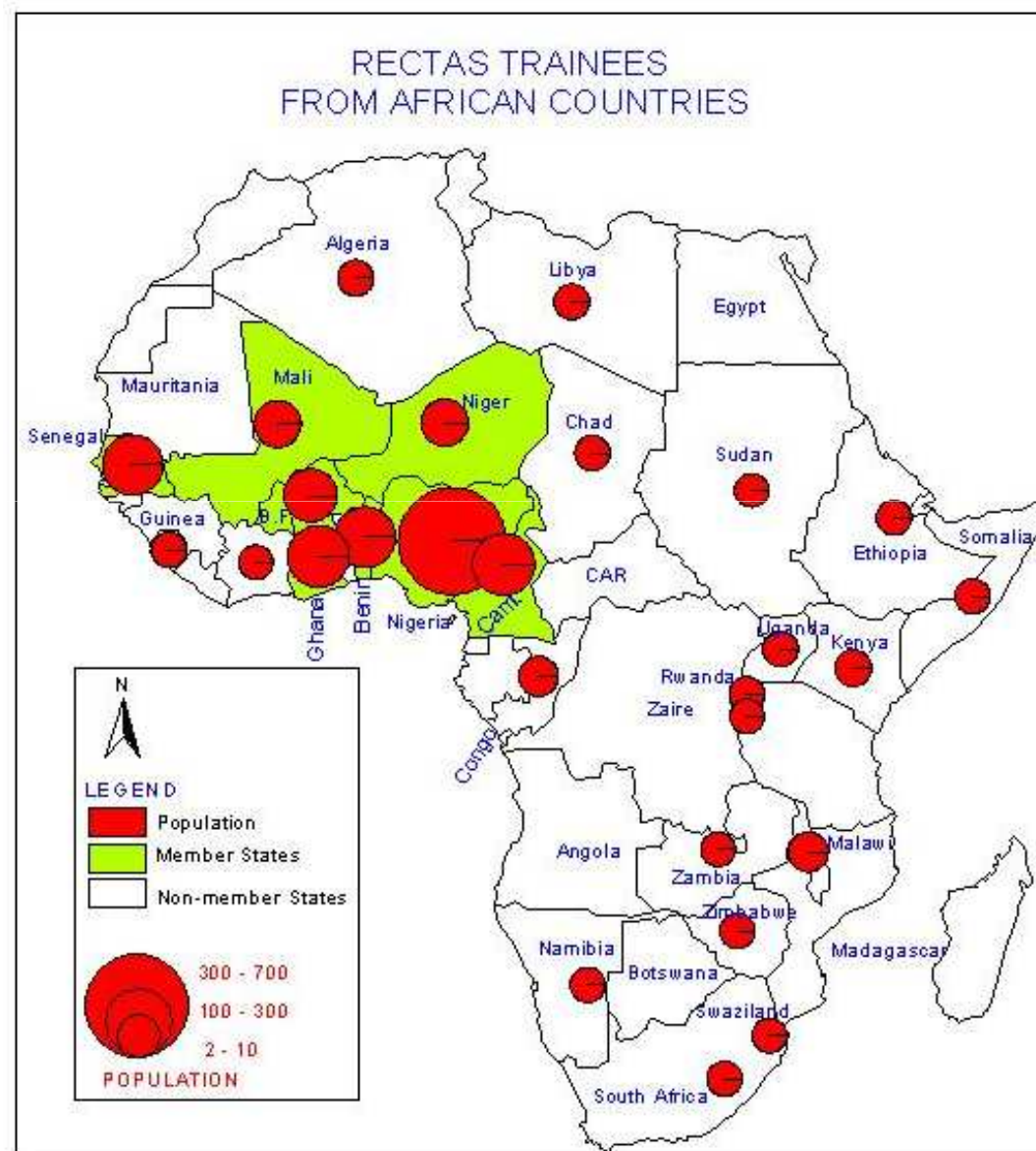
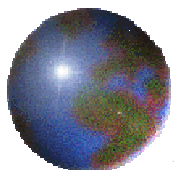
- To provide theoretical and practical training in Geoinformatics (Photogrammetry, Remote Sensing, GIS and their applications);
- To conduct seminars, workshops and short term courses
- To carry out studies and research
- To provide advisory and consultancy services

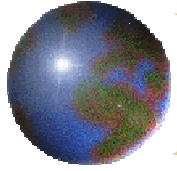


## ACTIVITIES OF THE CENTRE

From inception in 1972 to date, a total of **1,522** trainees from **28 countries** have been trained in Geoinformation Production and management at RECTAS at the following levels:

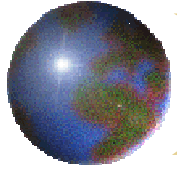
- Technician (18 months)
- Technologist (18 months)
- Post Graduate (12 months)





RECTAS' training programmes equip the graduates with adequate technical capability in GIS, Remote Sensing and usage of geospatial data for environmental/disaster management



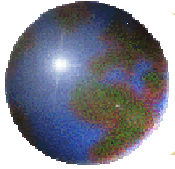


## **RECTAS' ACTIVITIES (cont'd)**

The Centre has also organised for professionals from different organisations and different backgrounds, **Short Term Courses** (2 - 4 weeks), **Seminars** and **Workshops** in different applications of geoinformatics.

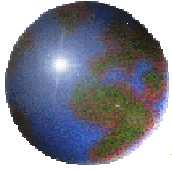
In addition to the regular training programme, the Centre has run a special Postgraduate Programme in Geoinformation and Environmental Management for 11 nominees of Sokoto State Government in Nigeria.





## **Short course participants at RECTAS during a 4-week training course in GIS**

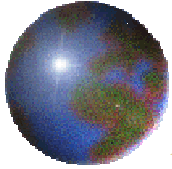




**Refresher course in Disaster Management , organised at RECTAS, Ile-Ife, Nigeria, in collaboration with ITC/Netherlands.**

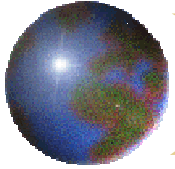




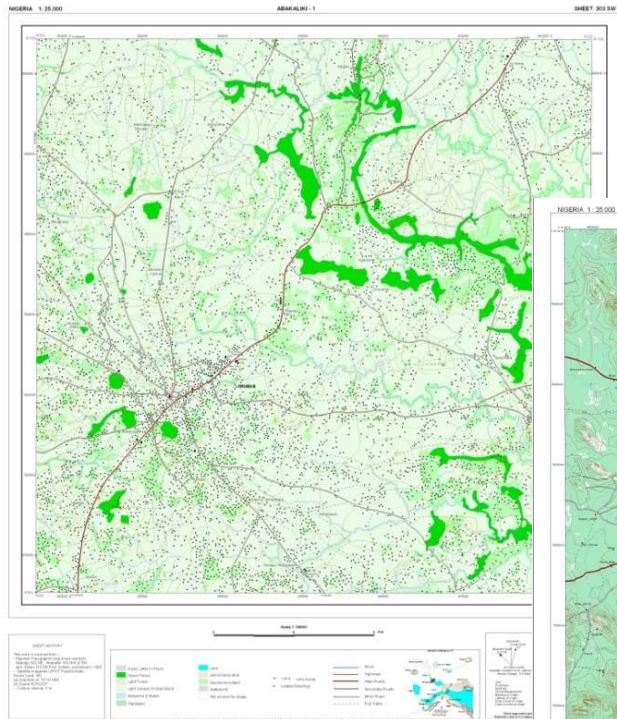


## AFREF Experts' Meeting at RECTAS

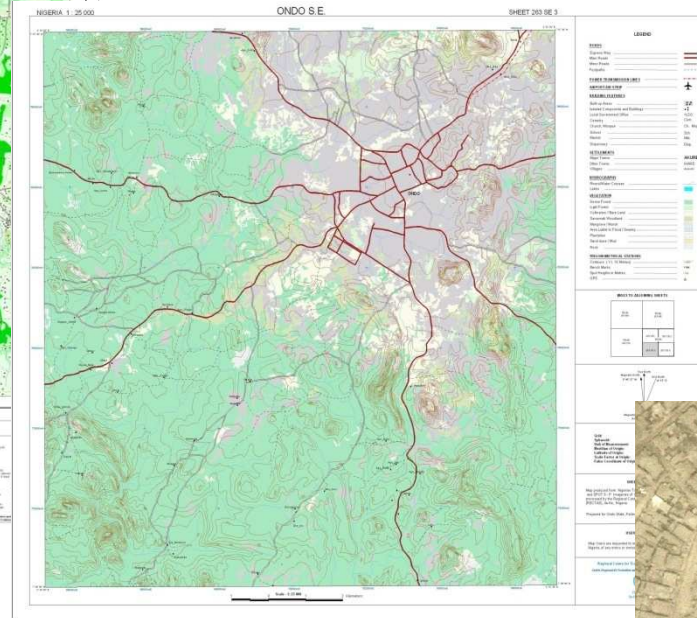




# RECTAS' CONSULTANCY & ADVISORY SERVICES



Topographic Map  
of ONUEKE at  
1:25,000

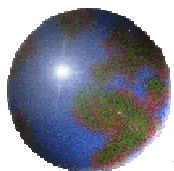


ONDO Township  
map

Quick Bird Image  
of AKURE Town



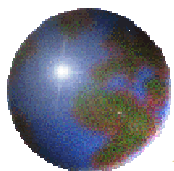




# AFRICAN GEODETIC REFERENCE FRAME (AFREF)

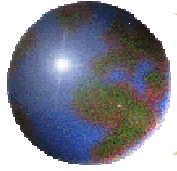


Antenna of the first  
AFREF Permanent  
Station installed at  
RECTAS in 2007



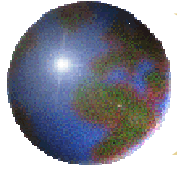
# **CAPACITY BUILDING IN SPACE SPACE AND GEOINFORMATION TECHNOLOGIES**





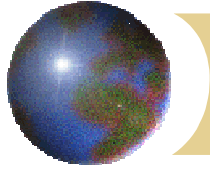
## OBJECTIVE OF CAPACITY BUILDING

The fundamental goal of Capacity Building is to enhance the ability to evaluate and address the crucial questions related to the strategy for Disaster Management/Disaster Risk Reduction using space-based technologies. This involve **human resource** development, **organisational** development, **Institutional** and **legal framework** development.

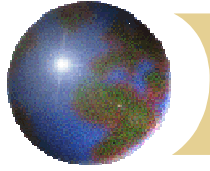


## **ROLE OF CAPACITY BUILDING IN D.M.**

- Understand the hazard (where , and when and why it is likely to occur);
- Know which areas and communities are most vulnerable to hazards;
- Develop knowledge and information resources to enable the risks to be identified and potential impacts to be adequately assessed;

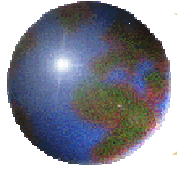


- Ensure political commitment to disaster risk reduction at various levels
- Increase education and raise awareness of the risks and motivate for changes in collective behavior to reduce risks;
- Understand and take action to mitigate or relieve the socio-economic conditions that create or increase the vulnerability of a community;



- Implement environmental management, physical and technical measures to reduce risks to communities;
- Increase the coping capacity of communities through better communication, improved resources, etc;
- Have a disaster preparedness plan in place. This plan should cover both emergency management and recovery from the disaster;
- Develop hazard monitoring systems and early warning indicators.

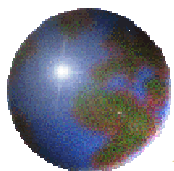




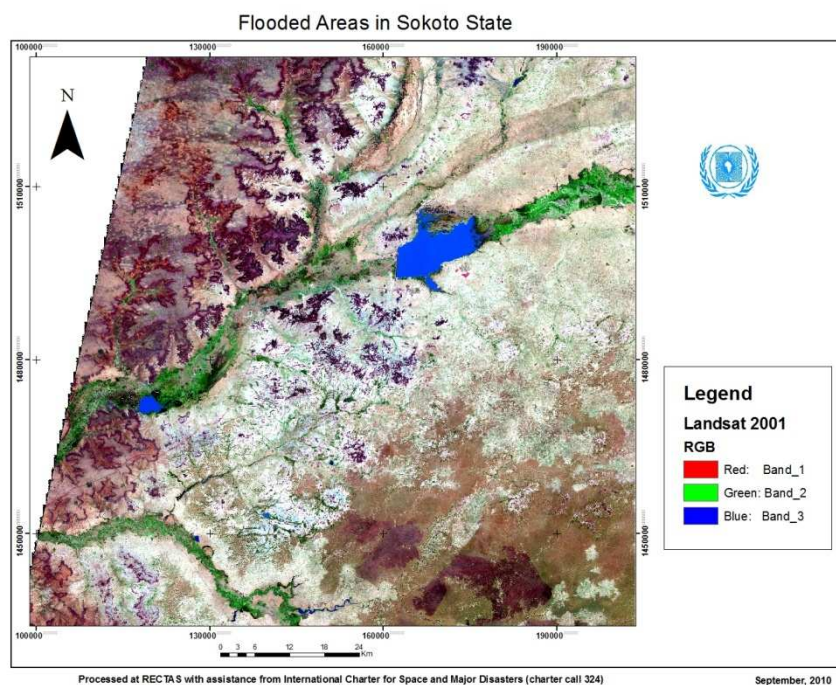
## **RECTAS' CONTRIBUTIONS**

RECTAS conducted many studies and researches, capacity building and projects execution in different areas of specialisation including disaster management in the participating countries as well as in other countries in Africa.

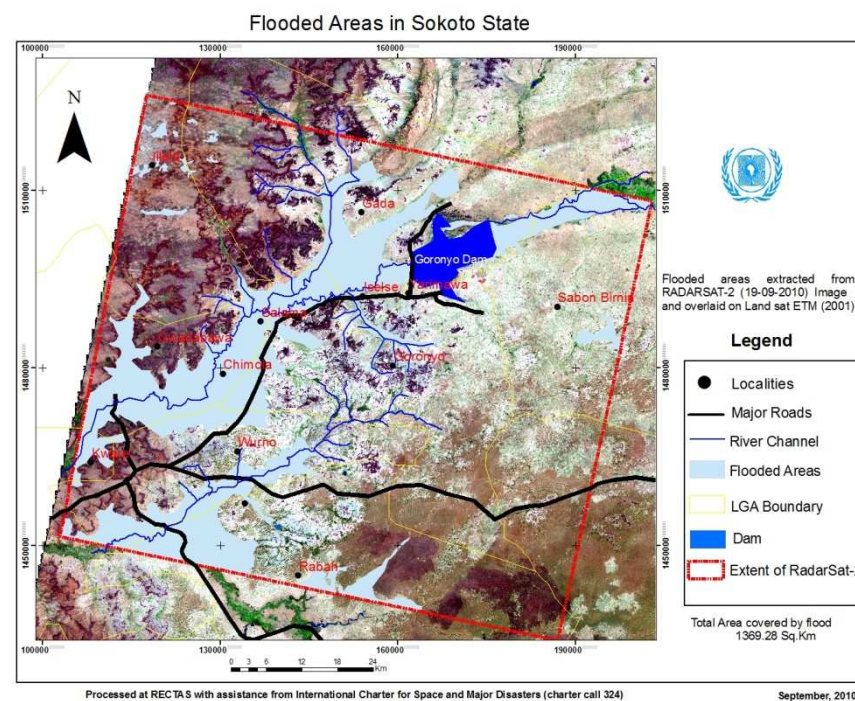
The following case-studies were undertaken by students and staff members of RECTAS.



## Case-study: Flood in Sokoto state

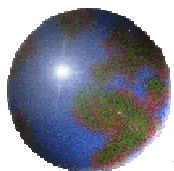


Landsat view of the area under investigation

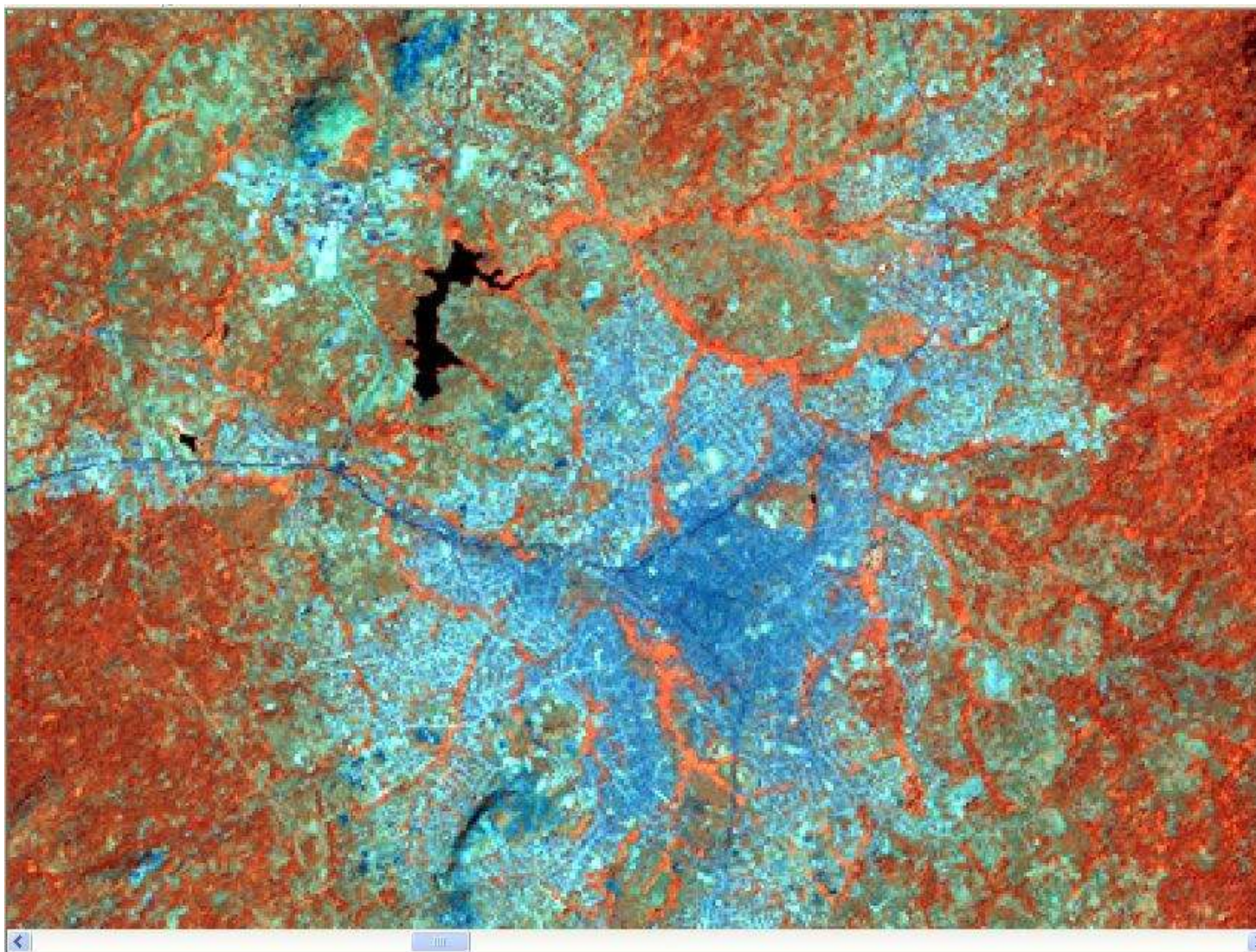


Flooded area detected from Radarsat-2 image of Sept.2010

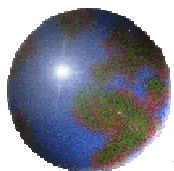




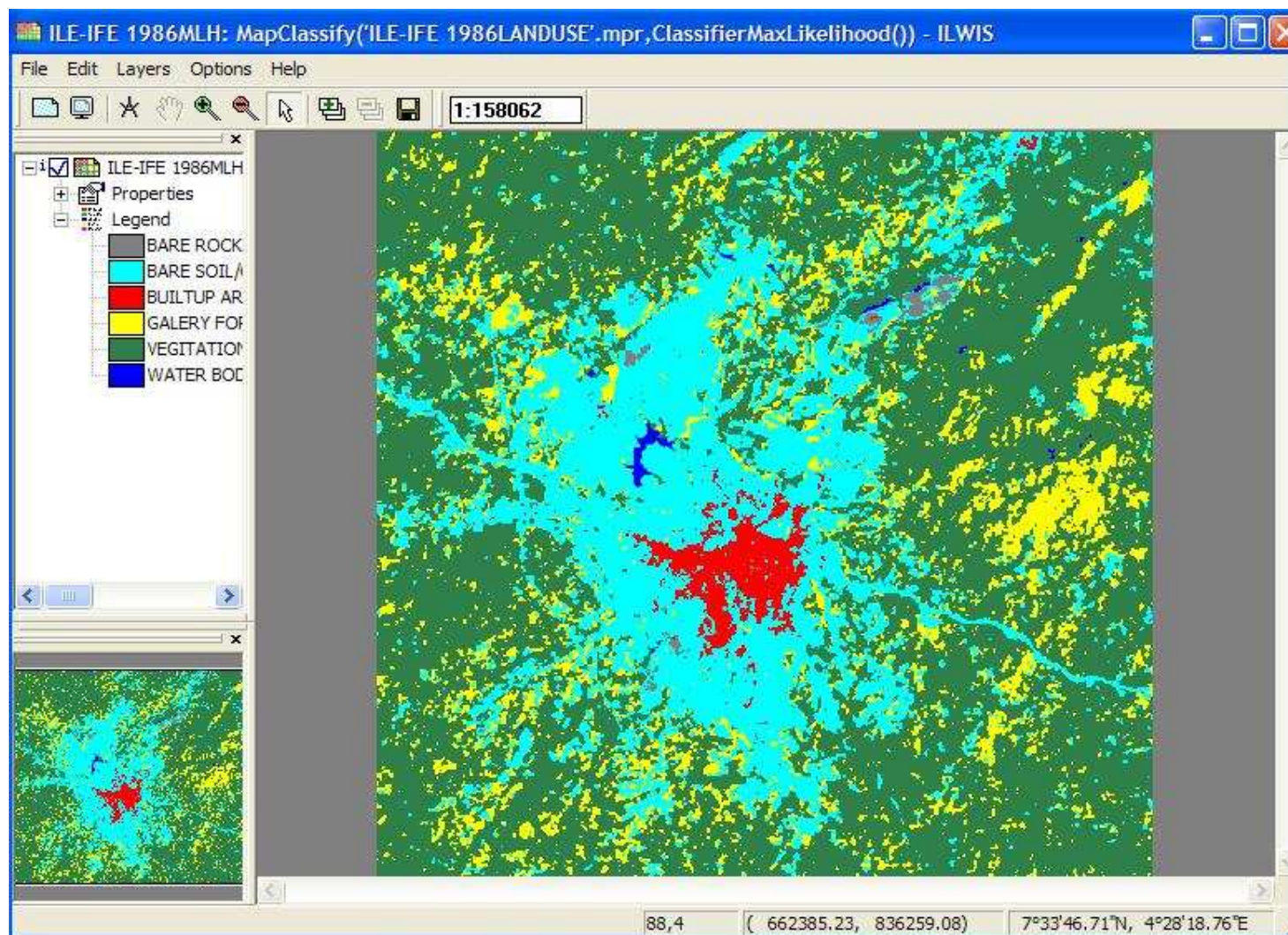
## **COLOUR COMPOSITE IMAGE (LANDSAT ETM + 2002) OF ILE-IFE**



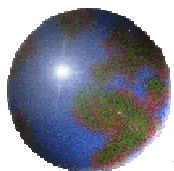




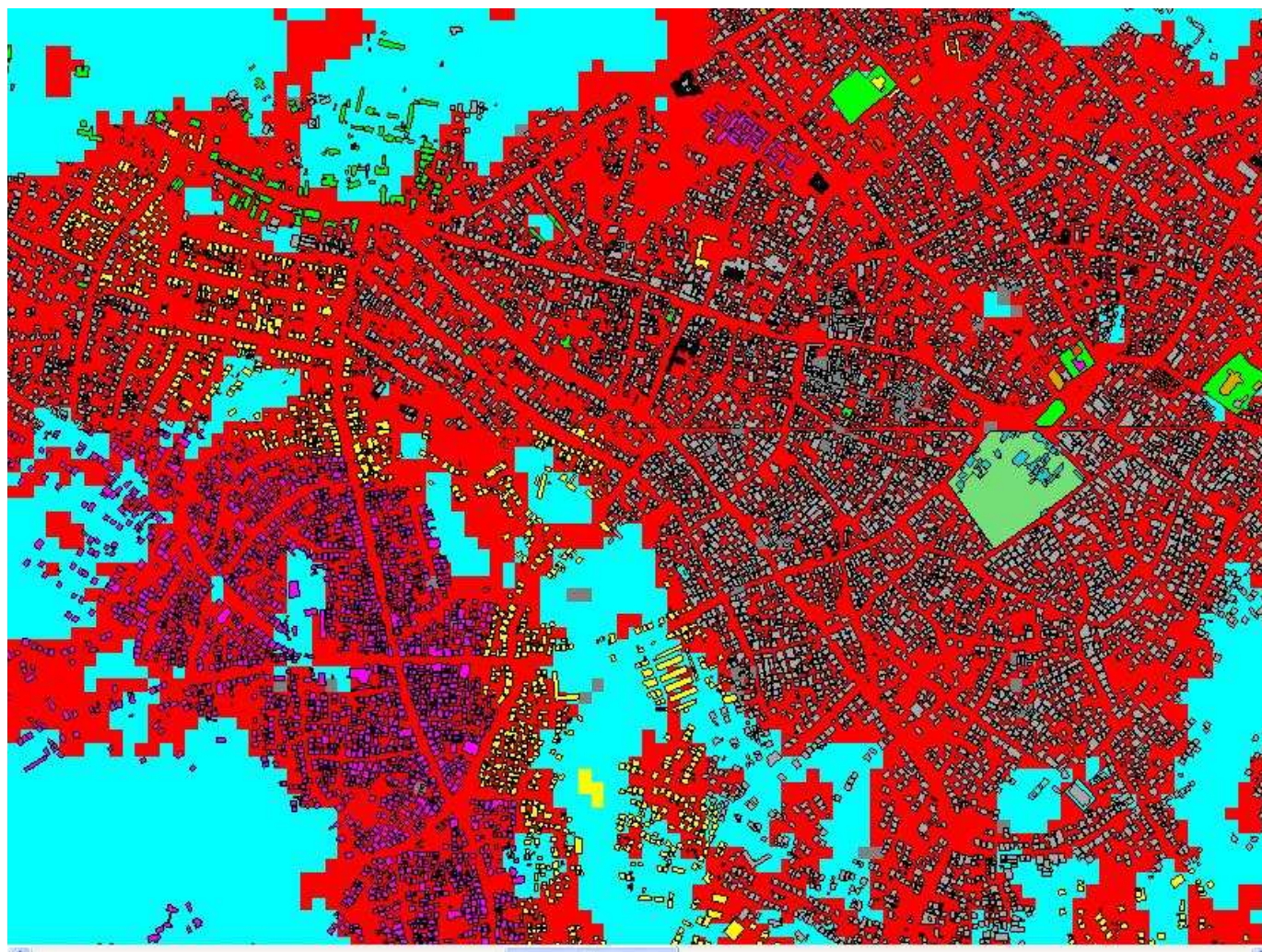
## CLASSIFIED LANDSAT TM IMAGE OF ILE-FE LANDUSE AND LAND COVER (1986)





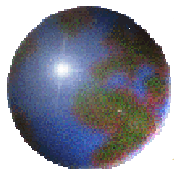


## **CLASSIFIED LANDSAT TM IMAGE OF ILE-FE OVERLAID WITH DESTROYED BUILDINGS IN 2000 CRISIS**

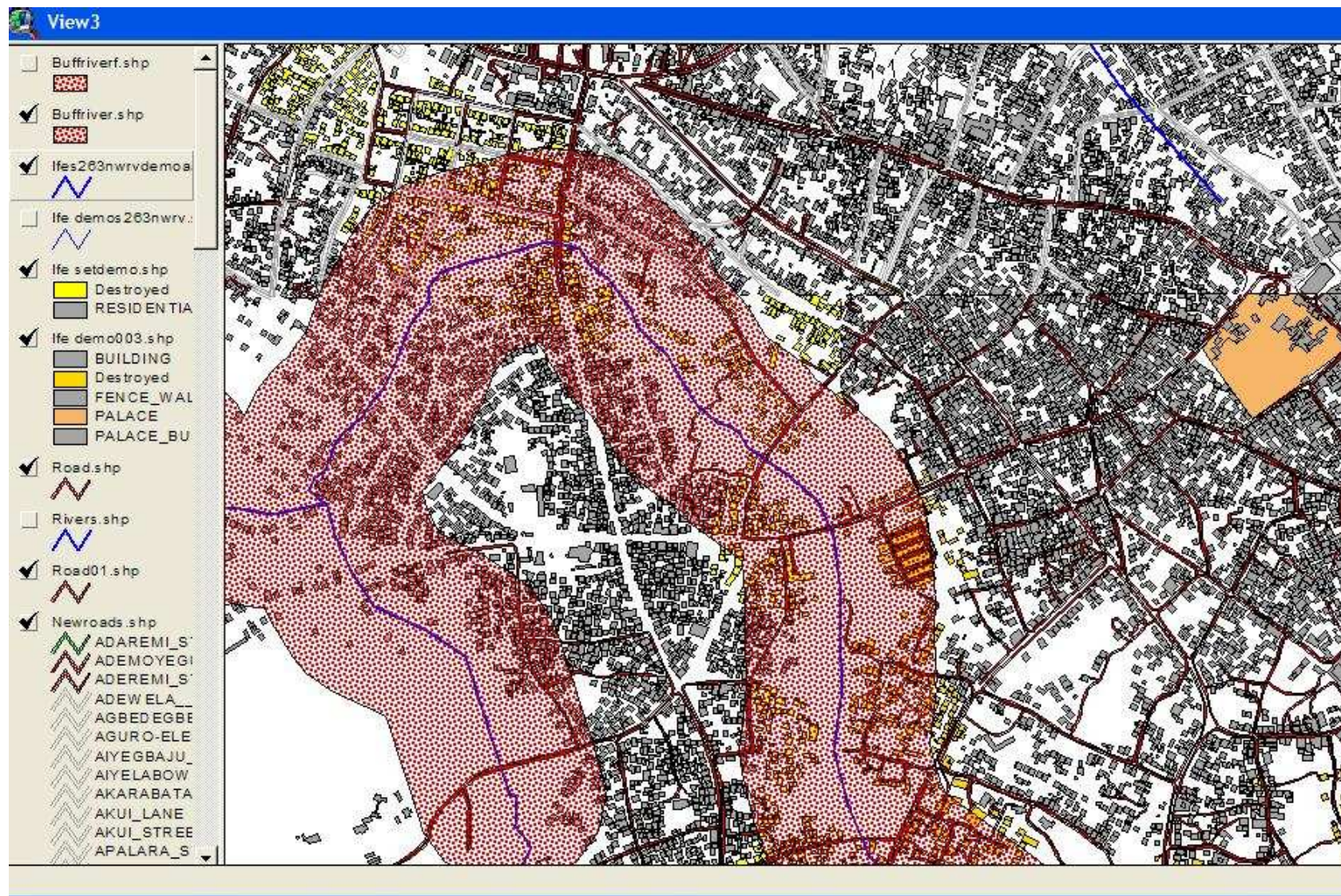


**DESTROYED BUILDINGS IN YELLOW COLOUR**

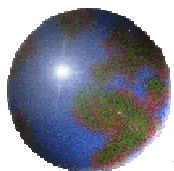




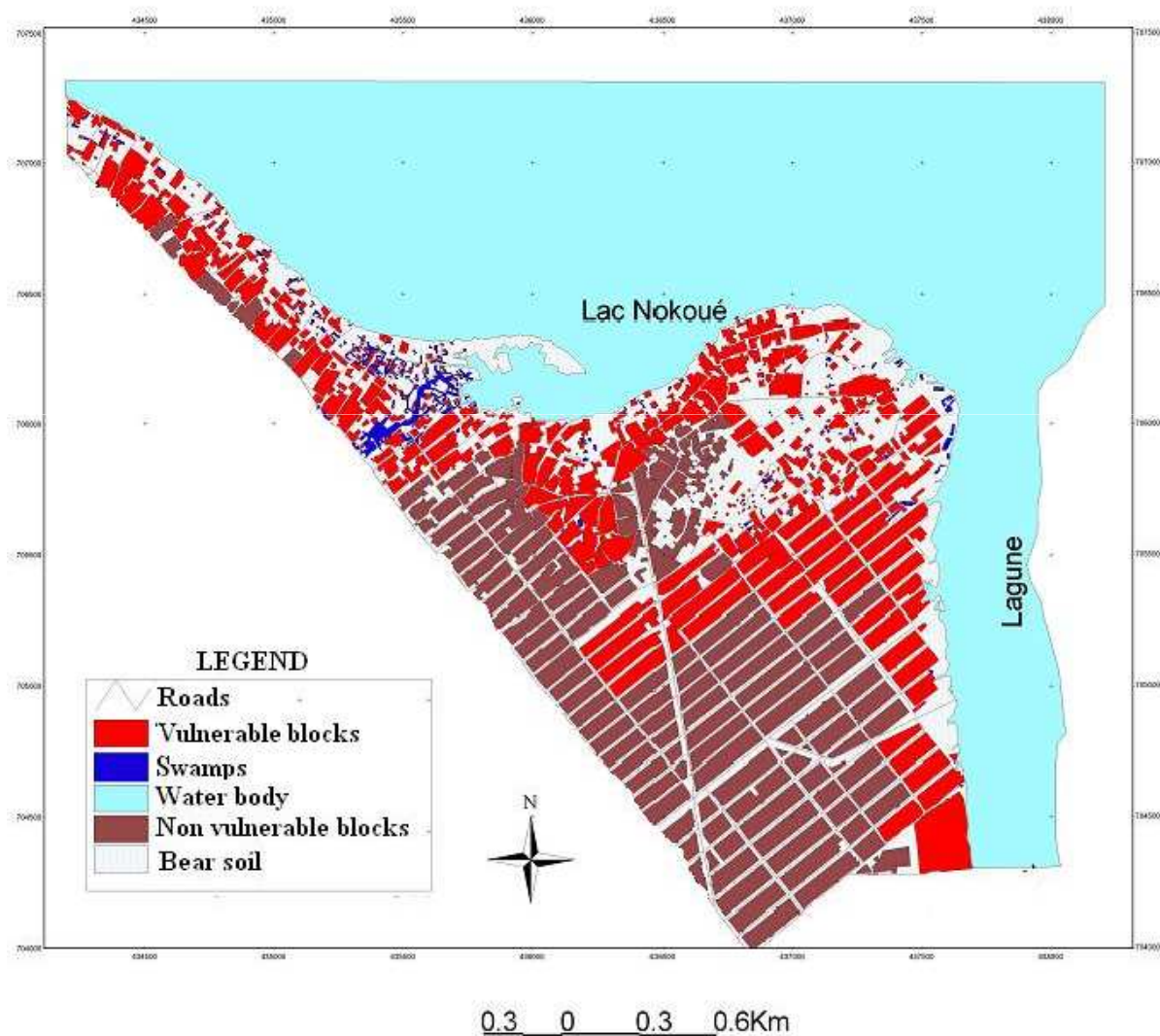
## EXAMPLE OF VULNERABILITY MAP OF ILE-IFE.

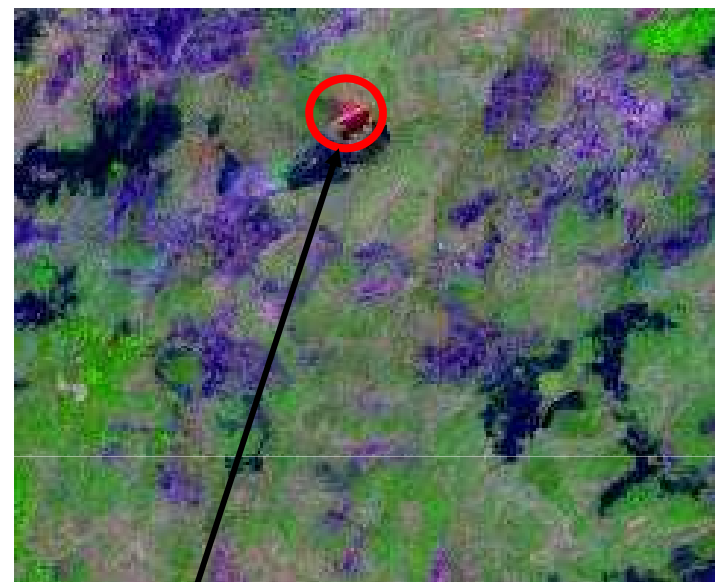
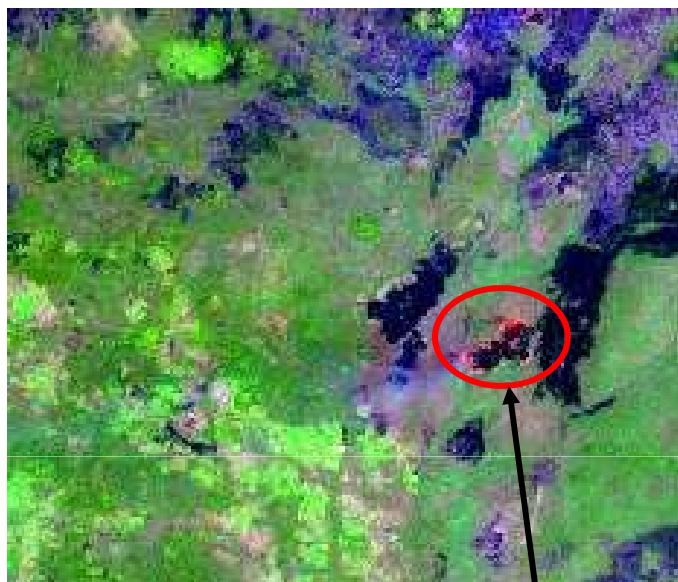
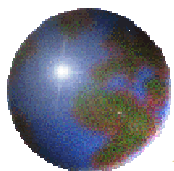






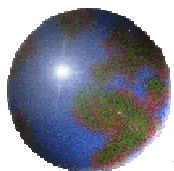
## VULNERABILITY MAP



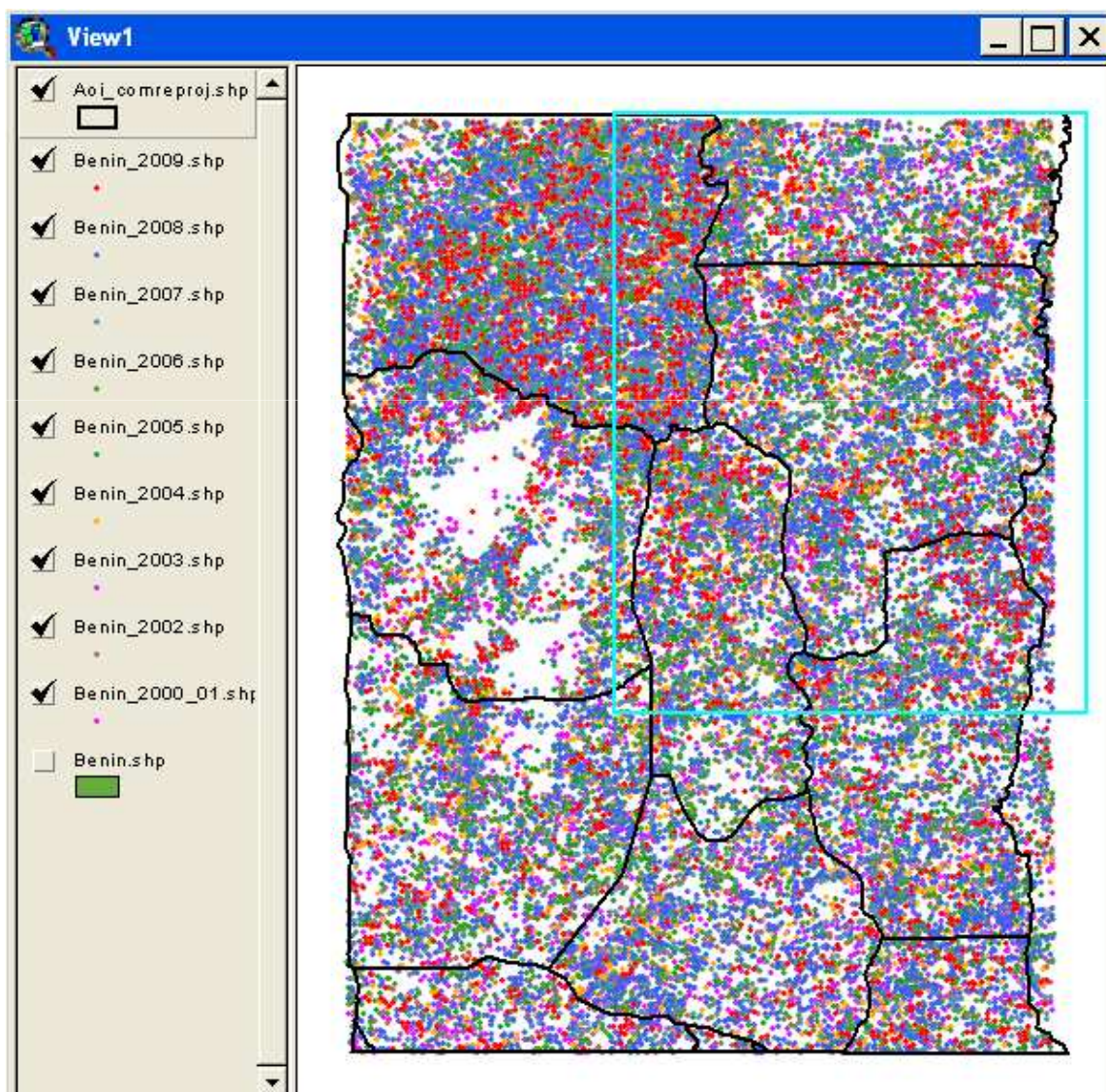


**Active fire detected on ETM+ image  
Combination of Bands 5, 4 and 3  
(Pseudo Natural Colour)**

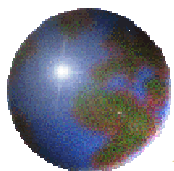




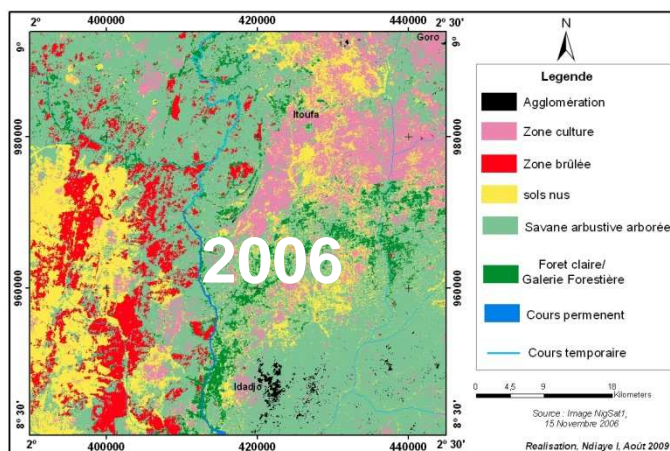
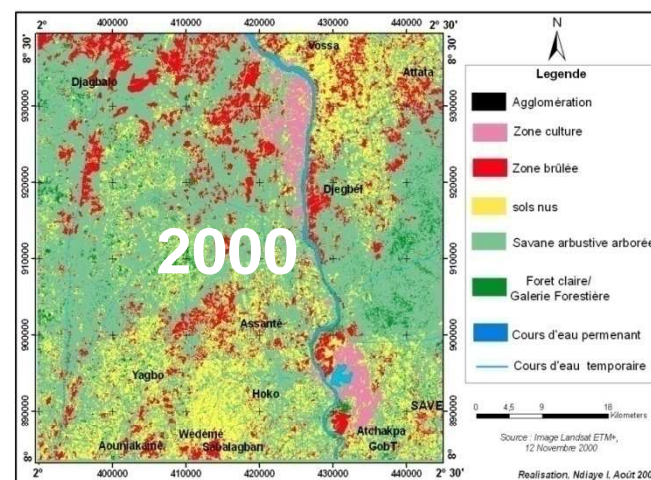
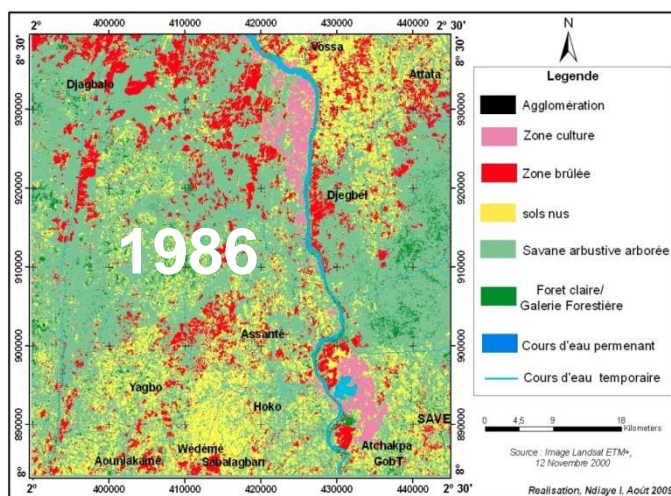
## Fire spots detected by MODIS (2000-2009)



**Each dot  
represents  
the hotspots  
fire of a  
specific year  
(Example: red  
for 2009)**

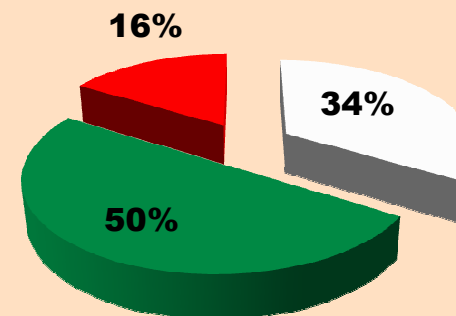


## DETECTION OF BURNT AREAS IN SAVE NORTH WEST / BENIN REPUBLIC

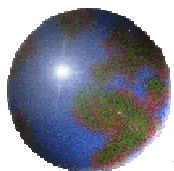


### Burnt areas

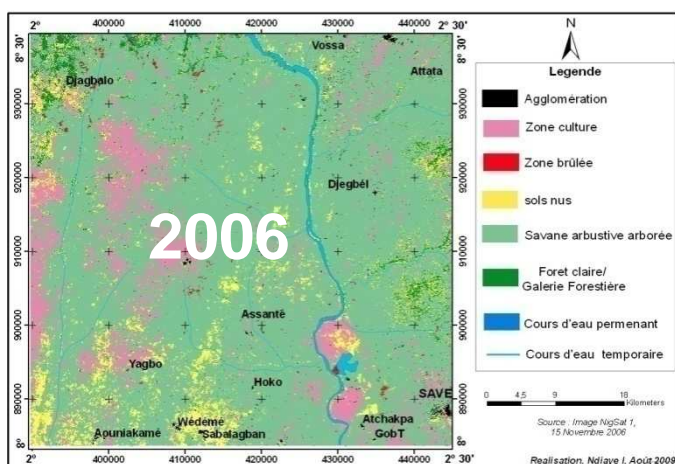
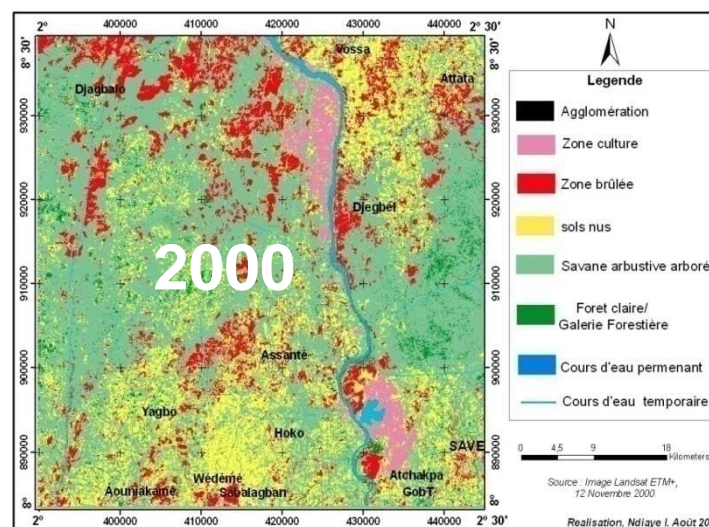
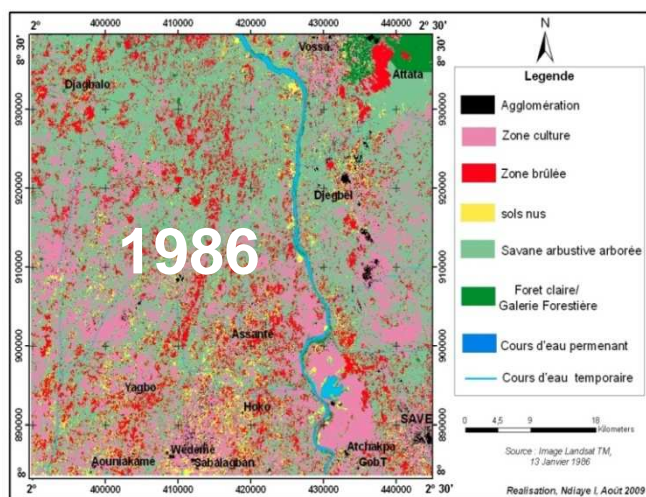
1986 2000 2006





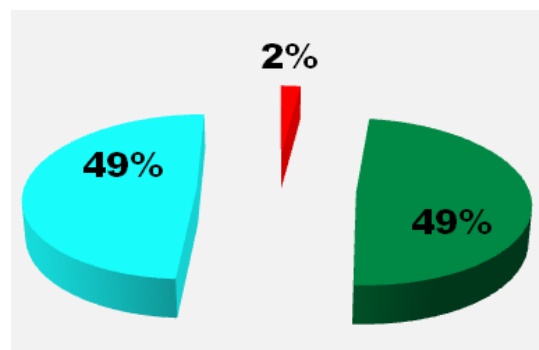


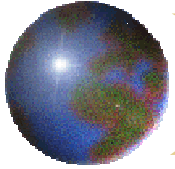
## DETECTION OF BURNT AREAS IN SAVE SOUTH WEST / BENIN REPUBLIC



### Burnt areas

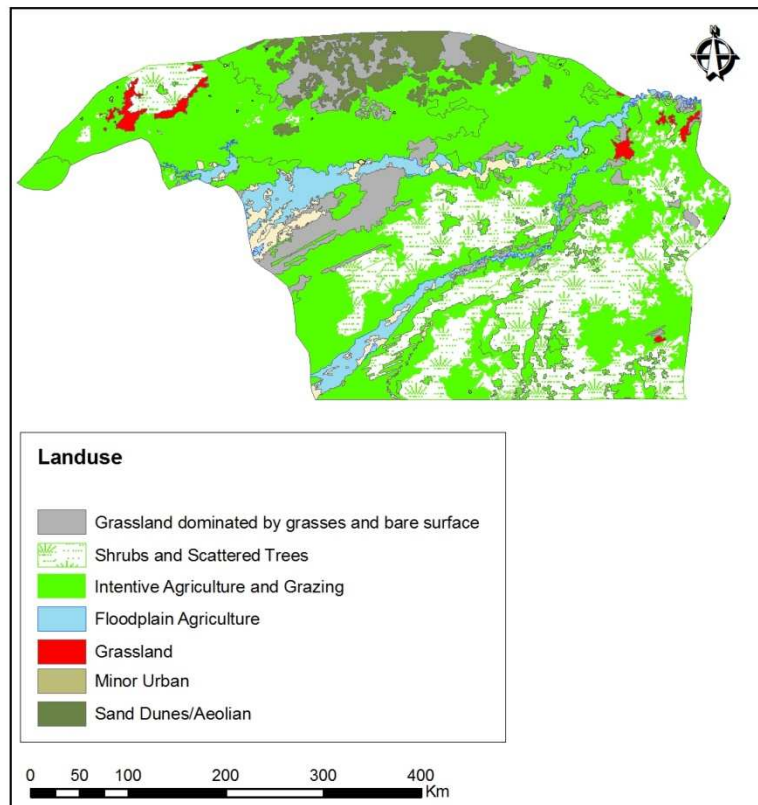
1986 2000 2006



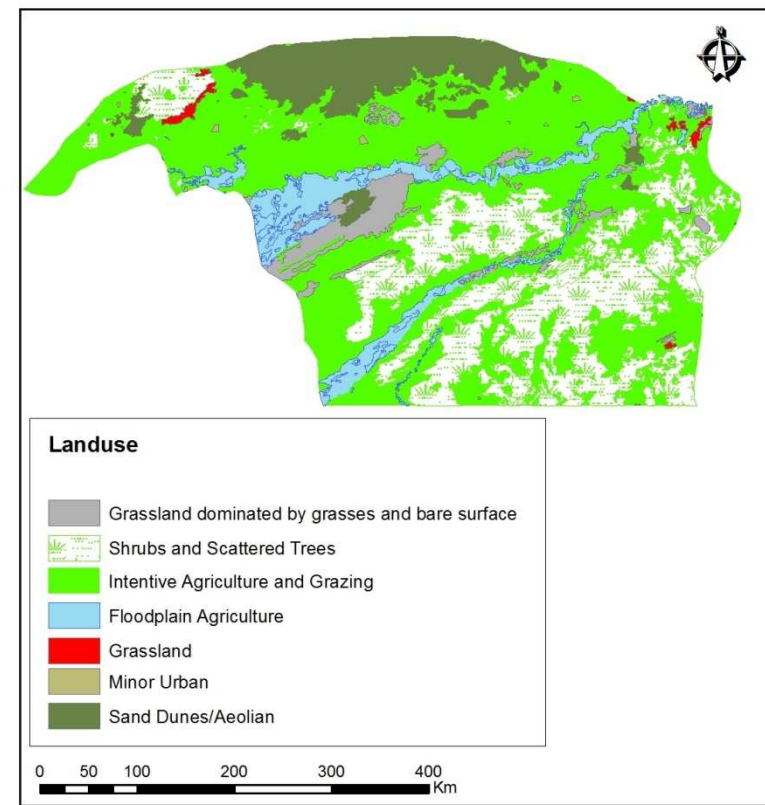


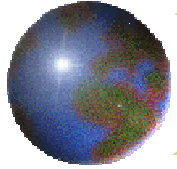
## Case-study: Land use change in Yobe state

**1975 Landuse Classification for Part of Yobe State, Nigeria**



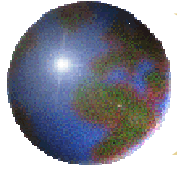
**1999 Landuse Classification for Part of Yobe State, Nigeria**





## **CONCLUSION**

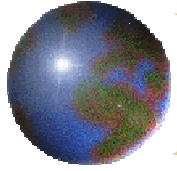
Enhancing skills in the use of remotely-sensed data, in interpreting multi-temporel, multi-date and multi-sources input data has been considered as a priority for developing countries. To tackle the other challenges, the relevant data and information should be made at the disposal of experts and communities affected by the catastrophes, for early warning and emergency response, a better disaster management.



## **RECOMMENDATIONS**

To improve the situation and save the lives of people, there is urgent need to:

- ✚ Amplify the importance of earth observation and geo-information in disaster management;
- ✚ Develop synergies between technical/financial partners, experts and local communities to improve exchanges and communication;
- ✚ Develop Disaster Risk Reduction Networks



## **RECOMMENDATIONS (cont'd)**

- ✿ Develop appropriate curriculum on the use of space technologies for disaster management for training institutions;
- ✿ Make use of free or low-cost data (ASTER, MODIS, Landsat ETM+, SRTM-DEM AVHRR, etc.) in order to increase and ease the access to disaster data
- ✿ Create legal frames to develop standards and monitoring parameters.



***THANK  
YOU FOR YOUR  
ATTENTION...***

***... AND CONCERN***

