Zambia's historical forest change assessment and future plans

Sensor

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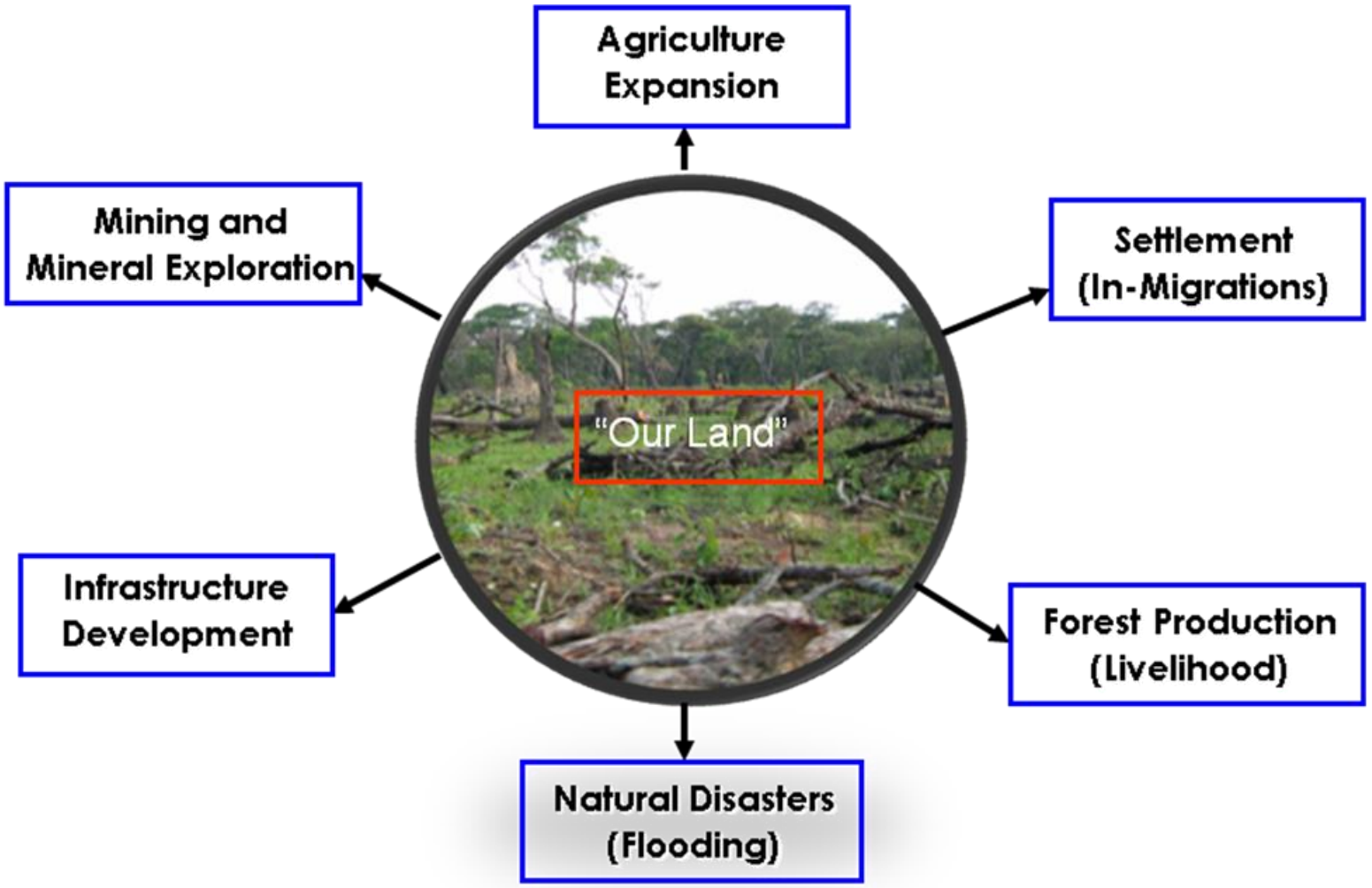
PRESENTATION

HIGH LIGHTS

- Drivers of forest cover change
- Applied Land Use forest type classification (Vegetation Map of Zambia / Agro-Ecological map)
- Landsat Satellite Index for Zambia
- National Mosaic for Zambia – Landsat, 2005
- On screen digitizing (Ground truthing/ or training sites (supervised classification)
- Annual forest change in hectares
- Comparison of estimates of major classes and corresponding SE%
- Current/Future Plans

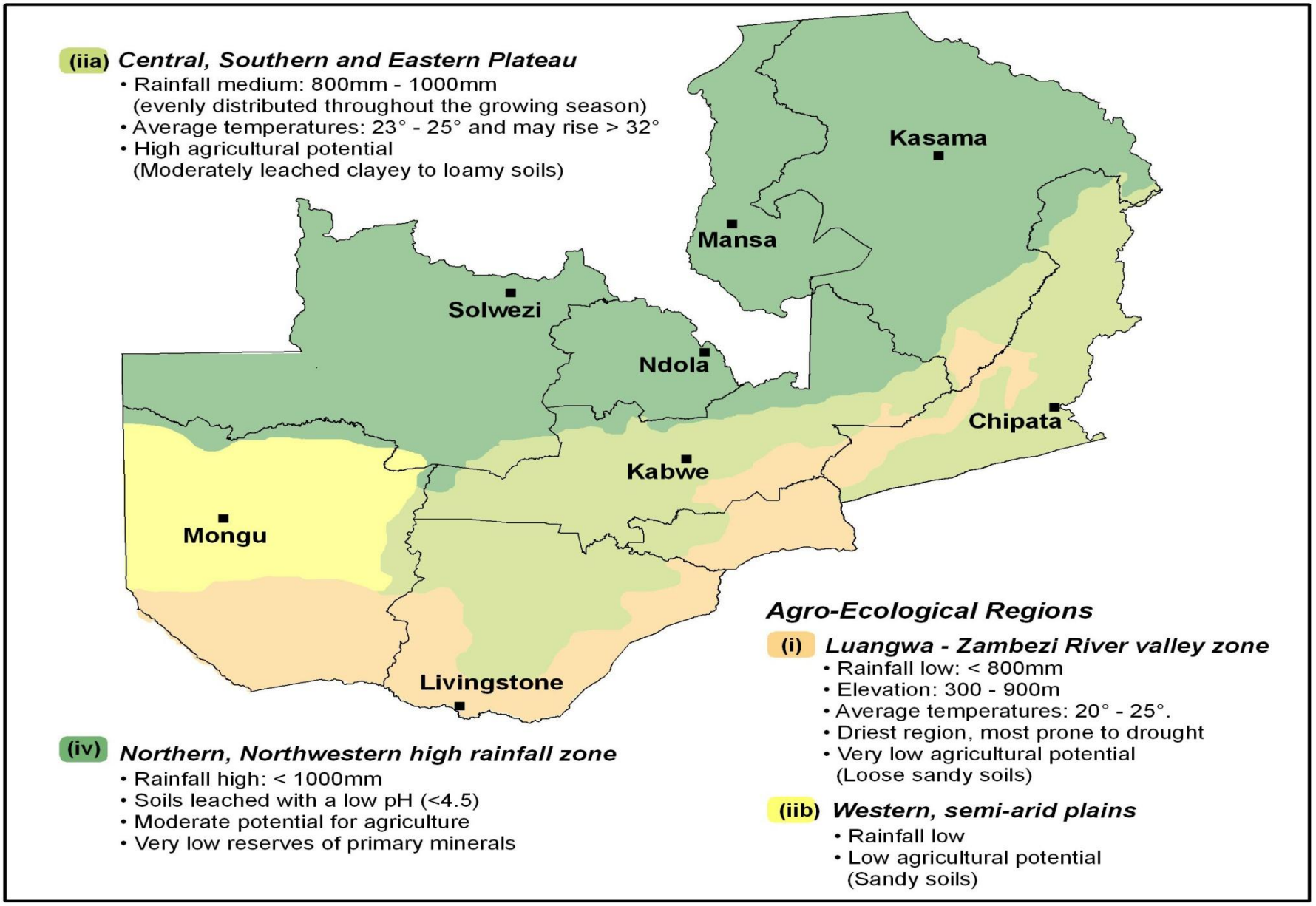
Main causes of forest cover change/drivers of deforestation



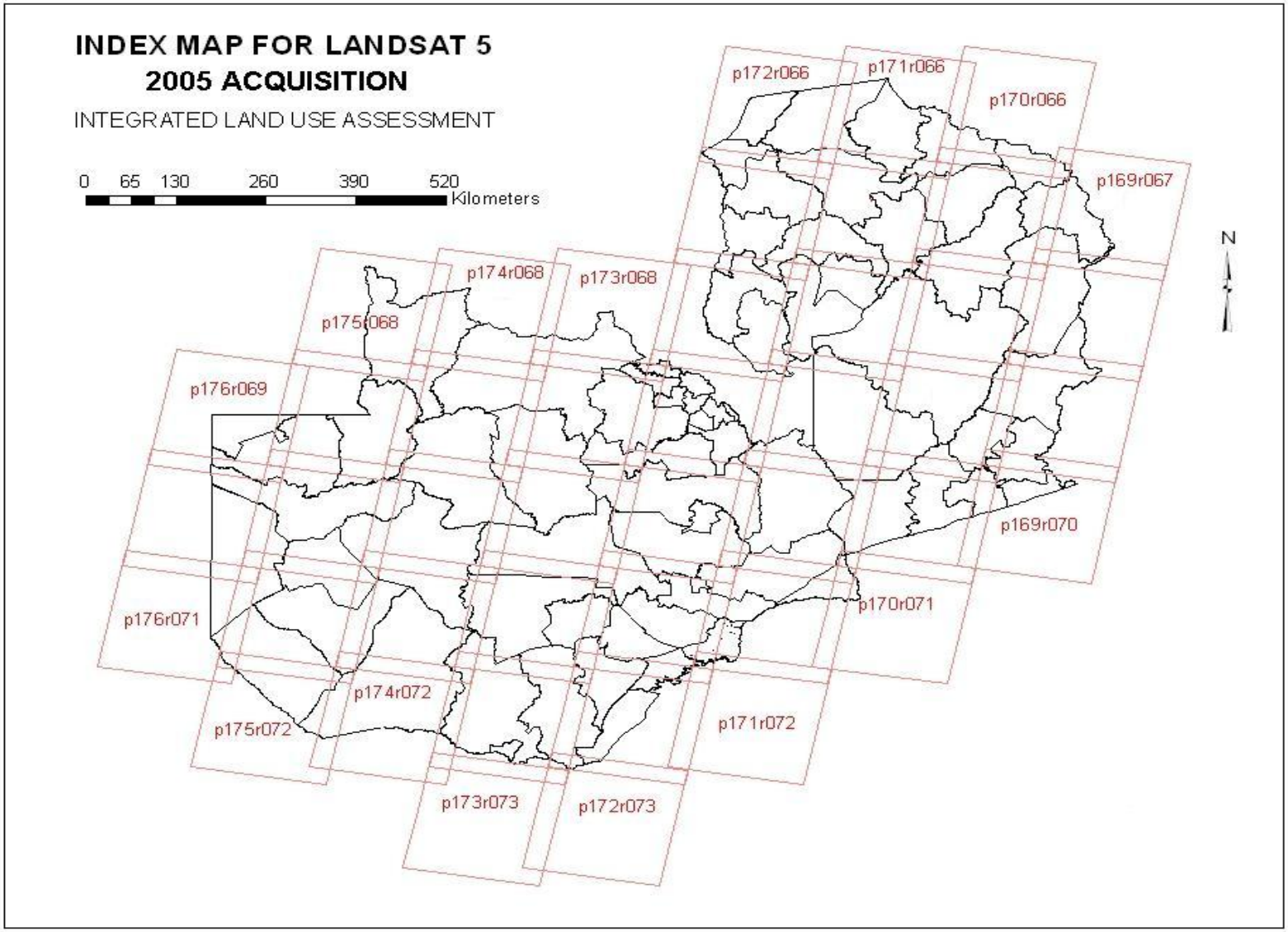
Applied land use and forest type classification (Vegetation Map of Zambia

Country Area (75,261,400 hectares)	**Forests**	Natural Forests (1. semi-evergreen, 2. evergreen and 3. deciduous forests)
		plantations (4. broad leaved and 5. coniferous)
	Other wooded land	Shrub thickets (6. shrubs)
		Wooded grassland (7. all grasslands)
	Other land	Managed (8. perennial and 9. annual crop)
		Built-up areas (10. urban)
		Barren land (11. outcrop/rocky faces)
	Inland water	

Agro-Ecological Regions

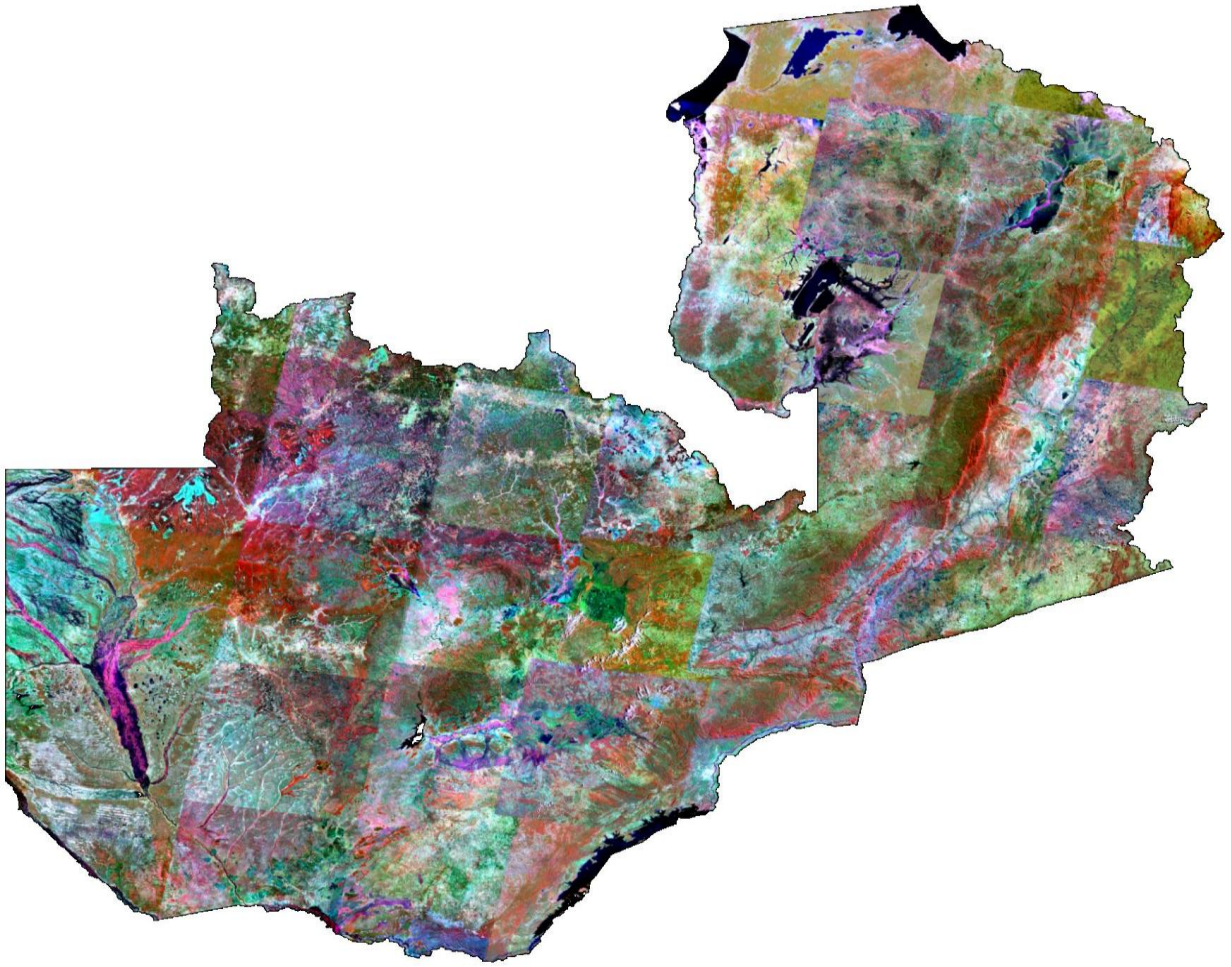


Landsat TM Images for Zambia - 2005



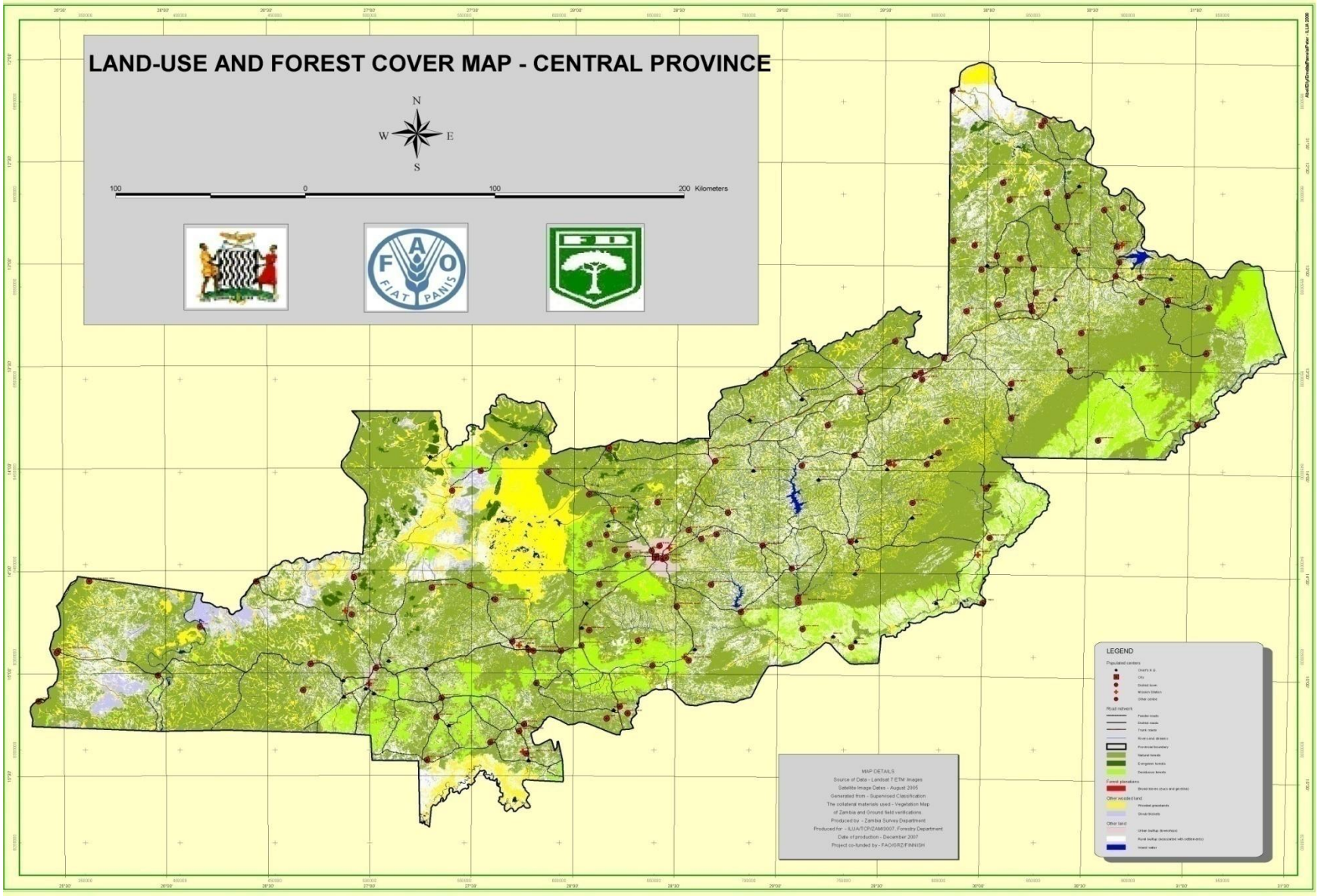
Landsat Satellite Imagery

National Mosaic for Zambia – Landsat TM of 2005
Quality images was challege

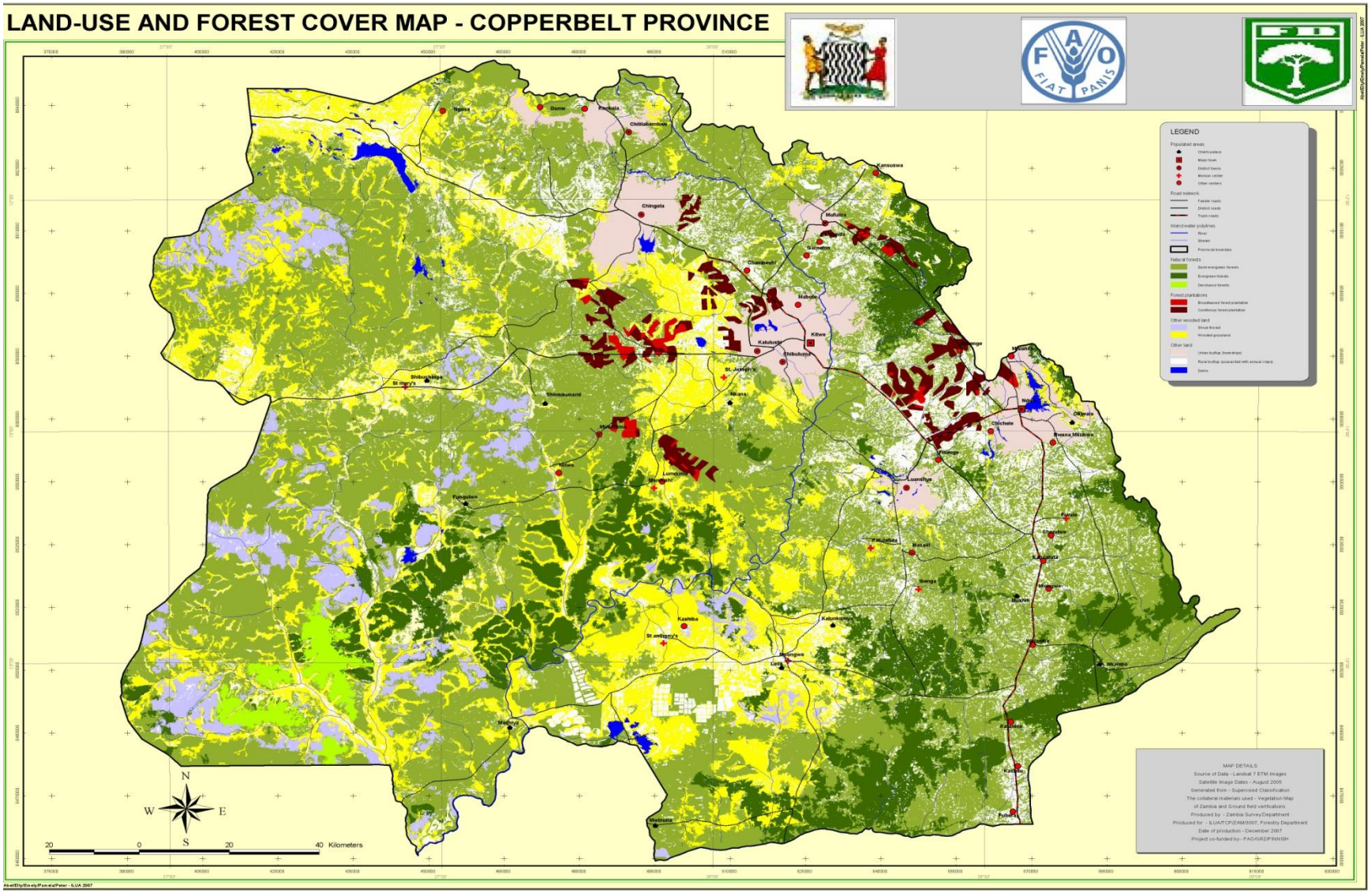


RESULTS ILUA I ON THE SCREEN INTERPRETATION BY PROVINCE

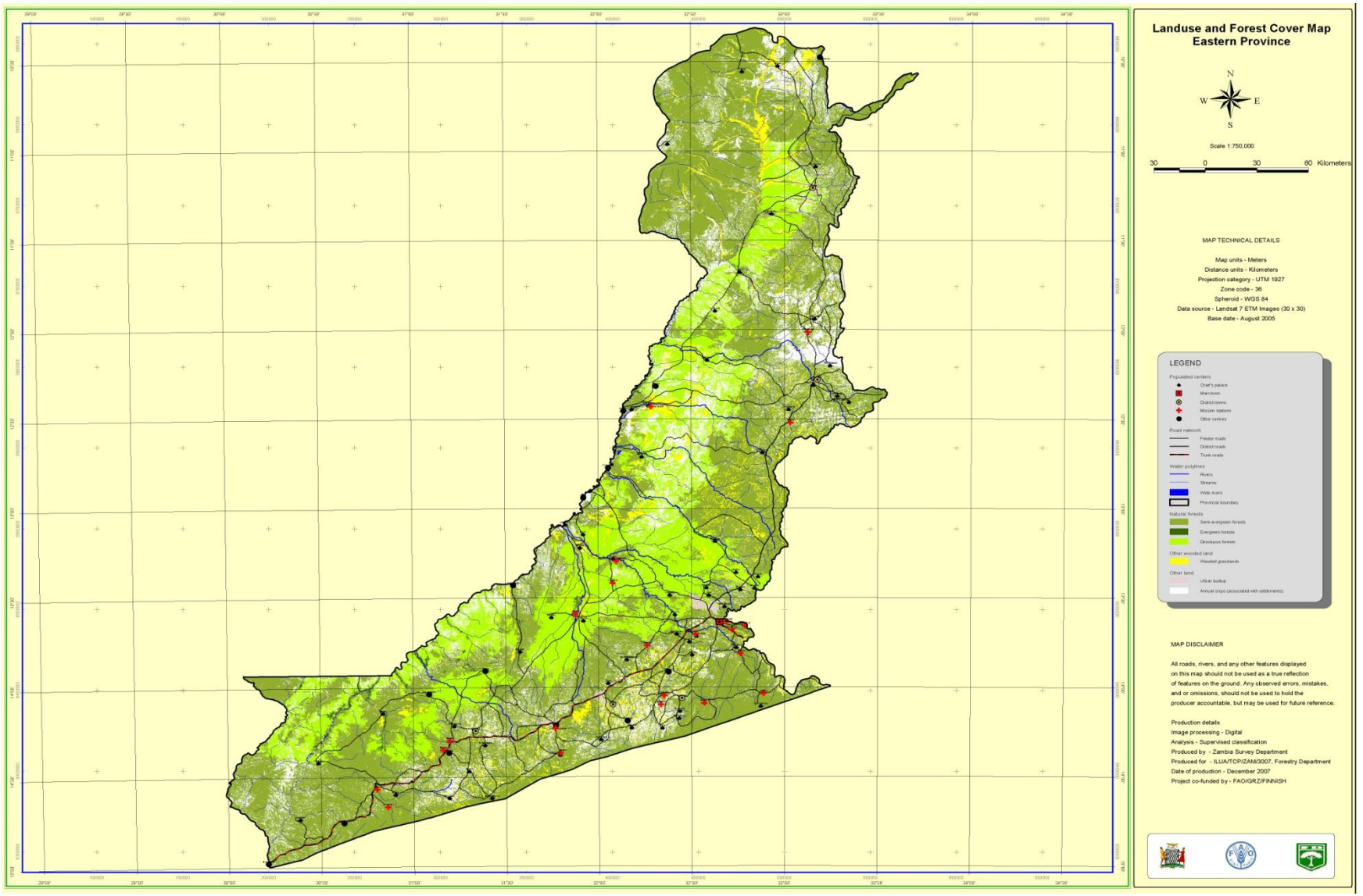
Land use map (Central Province) 2005



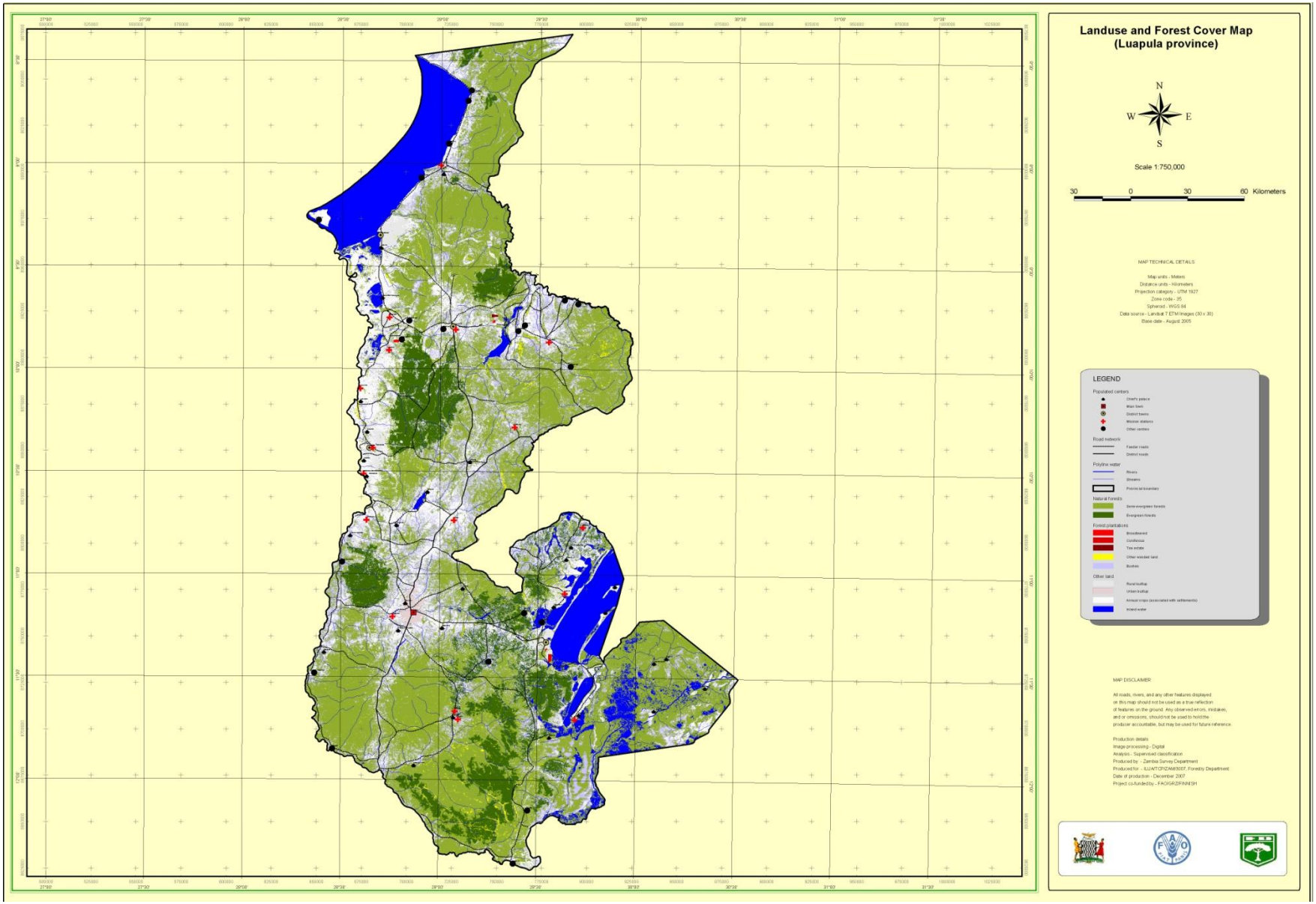
Land use map (Copperbelt Province)



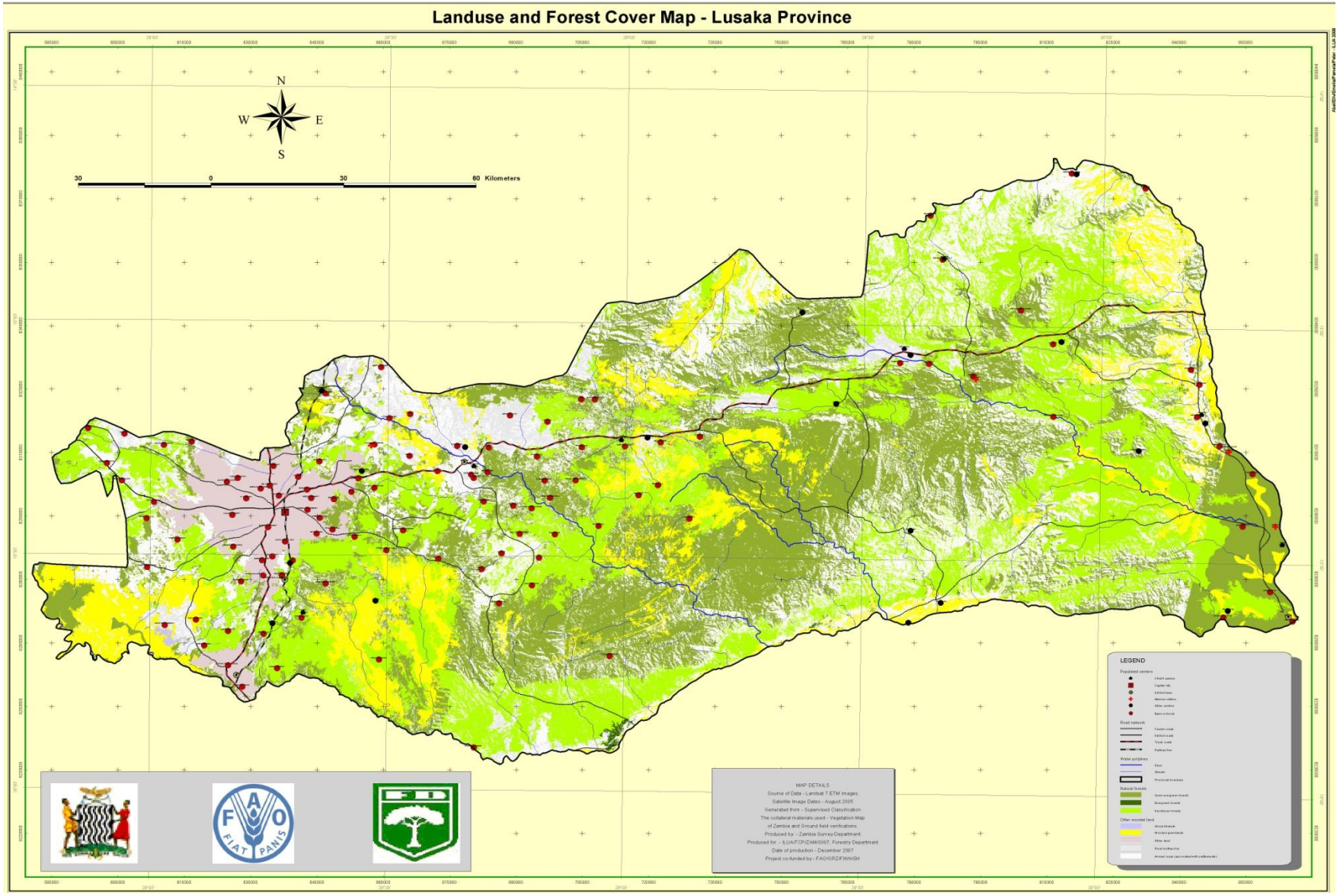
Land use map (Eastern Province)



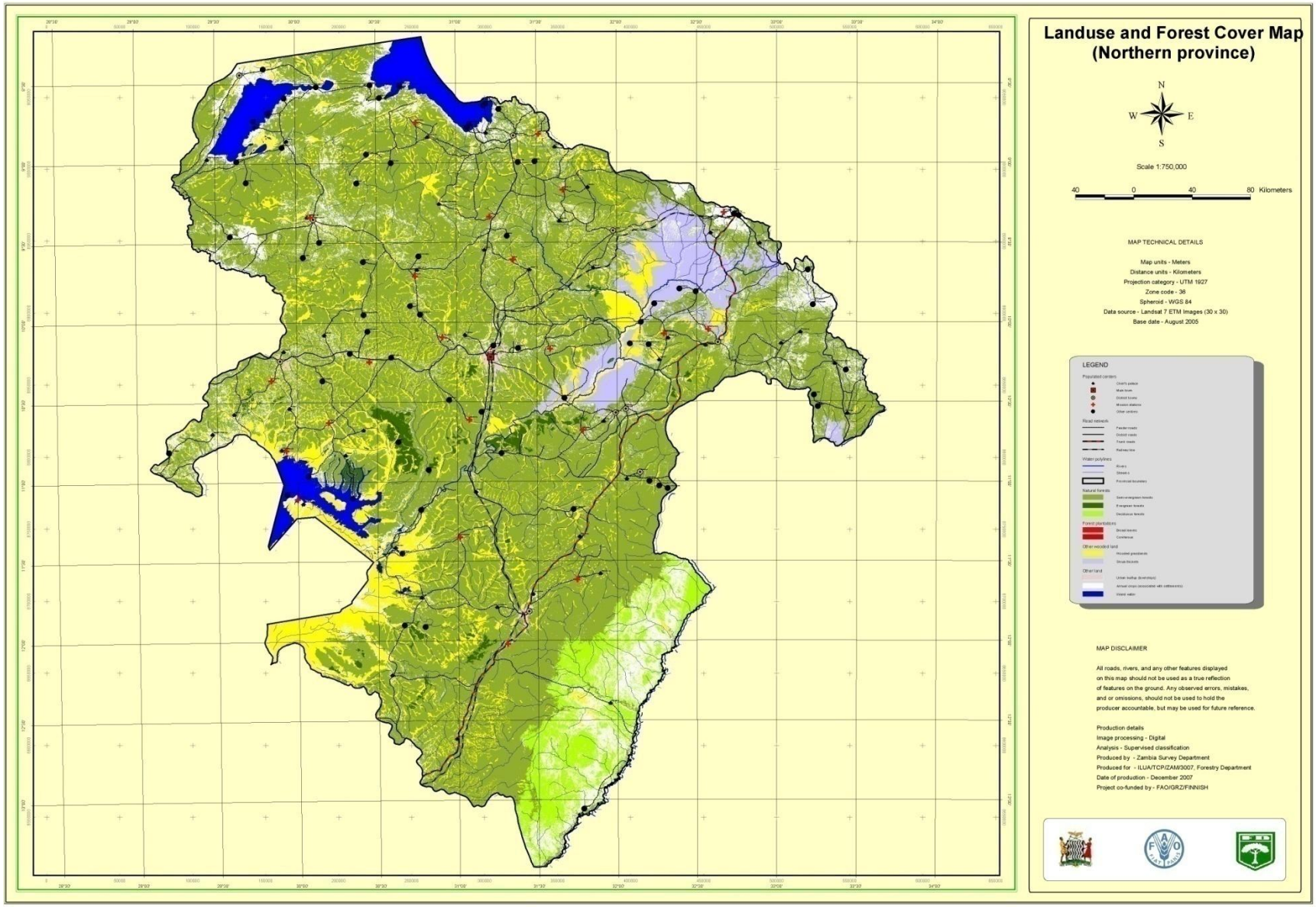
Land use map (Luapula Province)



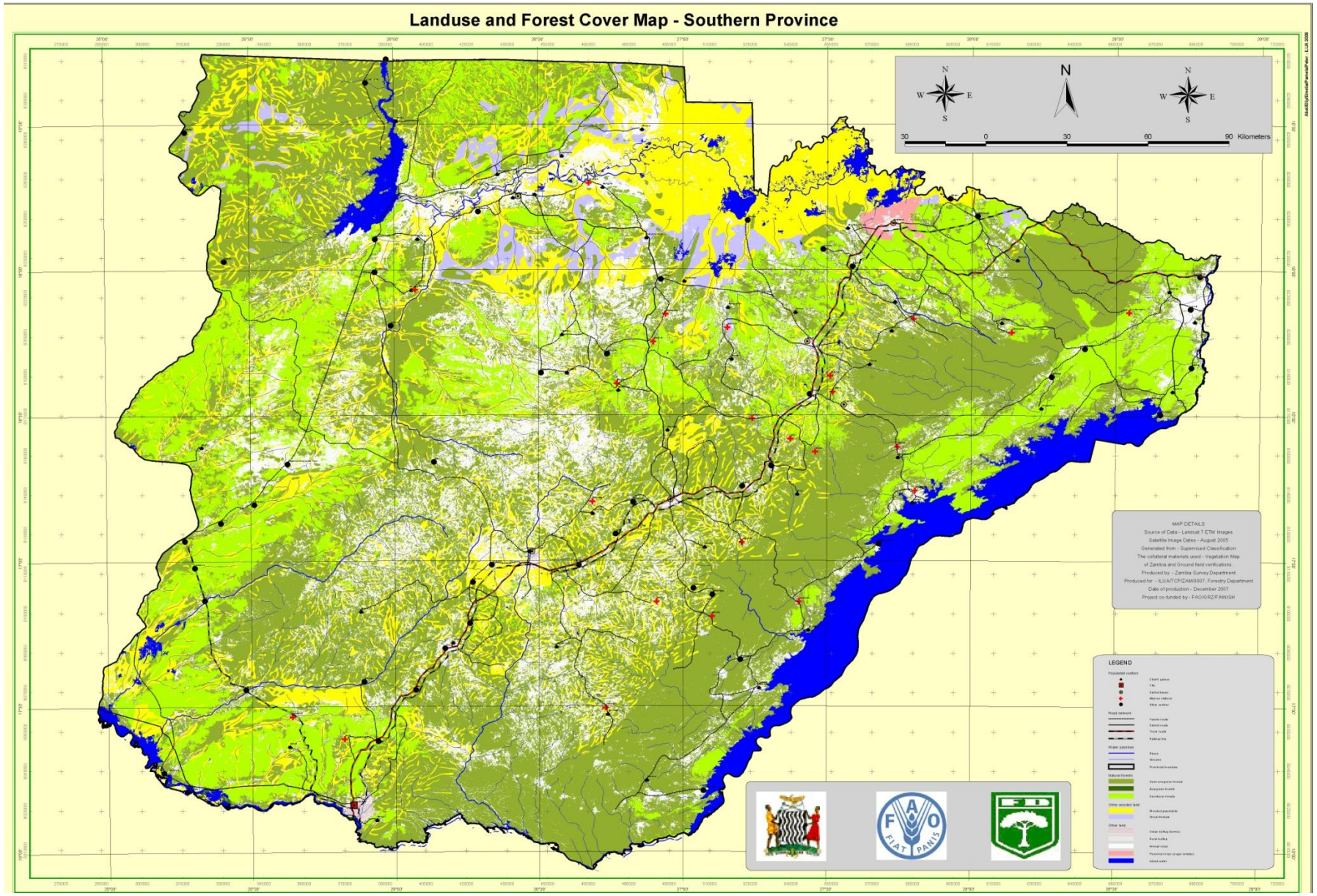
Land use map (Lusaka Province)



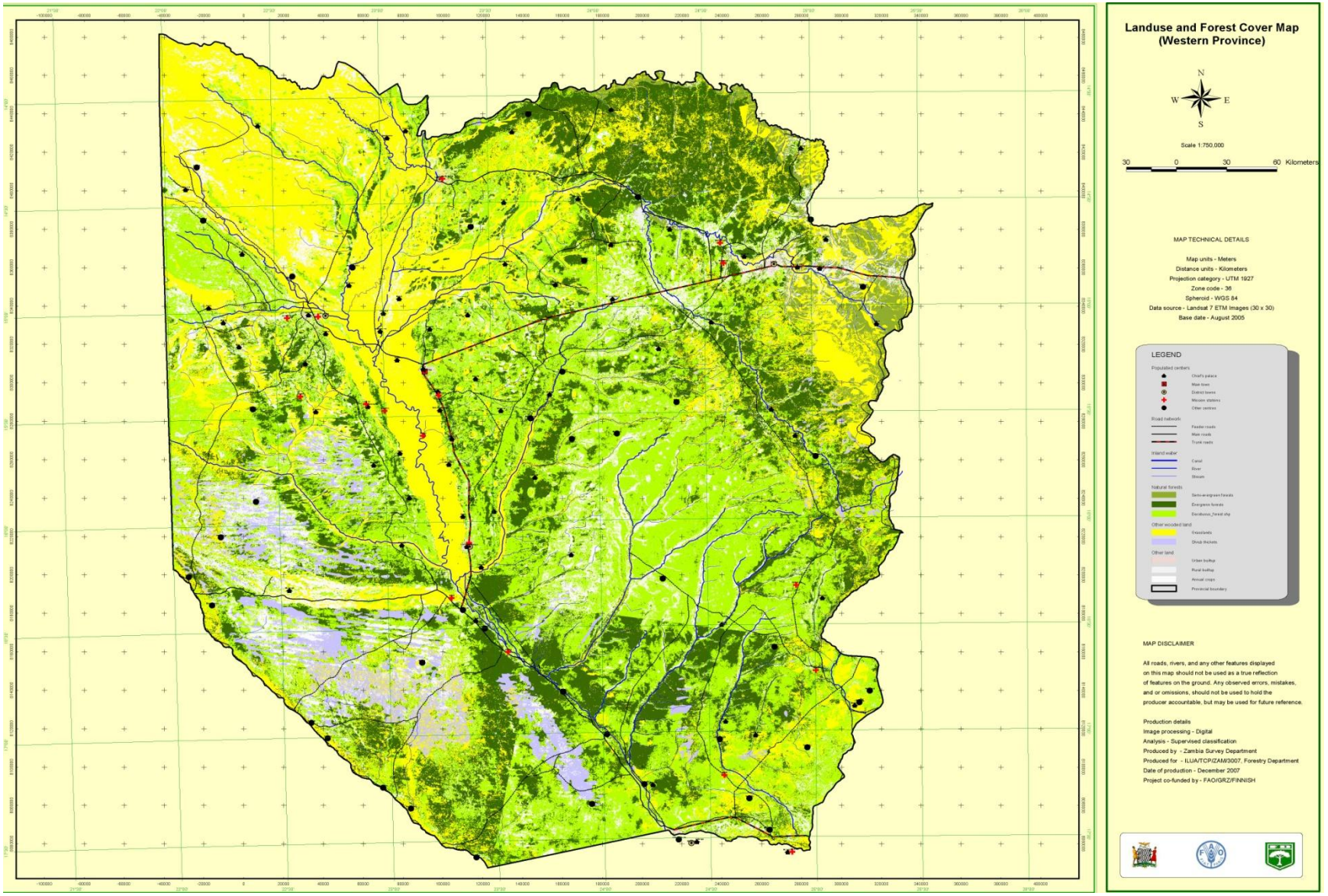
Land use map (Northern Province)



Land use map (Southern Province)



Land use map (Western Province)



Annual Forest Change in Hectares

Province	Land Area	Forests in 1990	Forests in 2000	Forests in 2005	Annual Loss%
Central	9,439,438	6,213,999	5,232,563	4,913,115	1.22
Copperbelt	3,132,839	2,118,888	2,004,202	1,893,522	1.1
Eastern	6,910,582	5,334,941	5,110,742	5,128,460	0.07
Luapula	5,056,908	3,314,598	3,286,495	3,162,225	0.78
Lusaka	2,189,568	1,405,363	1,387,786	986,260	5.79
Northern	14,782,565	7,900,920	7,692,586	8,023,022	0.86
N/Western	12,582,637	9,599,120	9,403,079	8,915,325	1.04
Southern	8,528,283	6,961,224	5,161,349	5,101,232	0.23
Western	12,638,580	8,535,384	8,403,159	8,433,420	0.07
Total	**75,261,400**	**51,384,438**	**47,681,962**	**46,556,581**	**0.62**

Comparison of estimates of *major land use* and corresponding SE% - 2005 Images

Major Land Use Classes	Total Area ('000 ha)	Proportion (%) Against Total land	Sampling error with 95% PL
Based on ILUA Field Inventory			
1. Forest	49,968	66	7.8
1. Other Wooded Land	6,055	8	36.8
1. Other land	15,771	21	20.4
1. Inland Water	3,467	5	57.2
Based on ILUA Land use mapping			
1. Forest	46,556	62	7.8
1. Other Wooded Land	7,254	10	35.7
1. Other land	18,426	24	20.1
1. Inland Water	3,024	4	57.4

Future Plans - Land Cover/Land Use Mapping

- Collaborating with Regional Center for Mapping of Resources for Development – Nairobi, Kenya – Remote Sensing Center, Zambia, Department Geography, University of Zambia

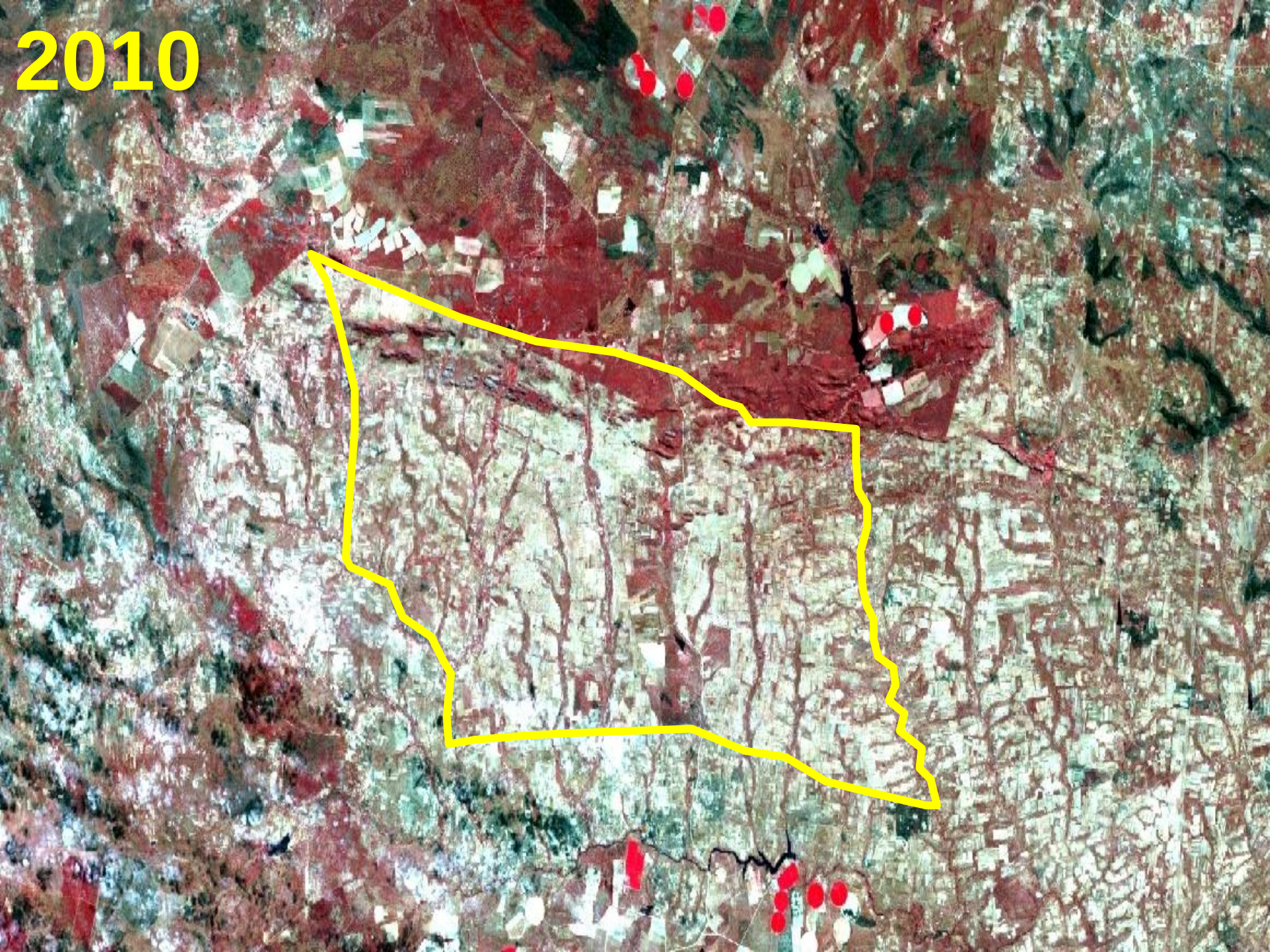
- Mapping of land cover three period:
  - 1990 done by Zambia (validation)
  - 2000 done by Regional Center (validation)
  - 2010 done by Regional Center (Validation)

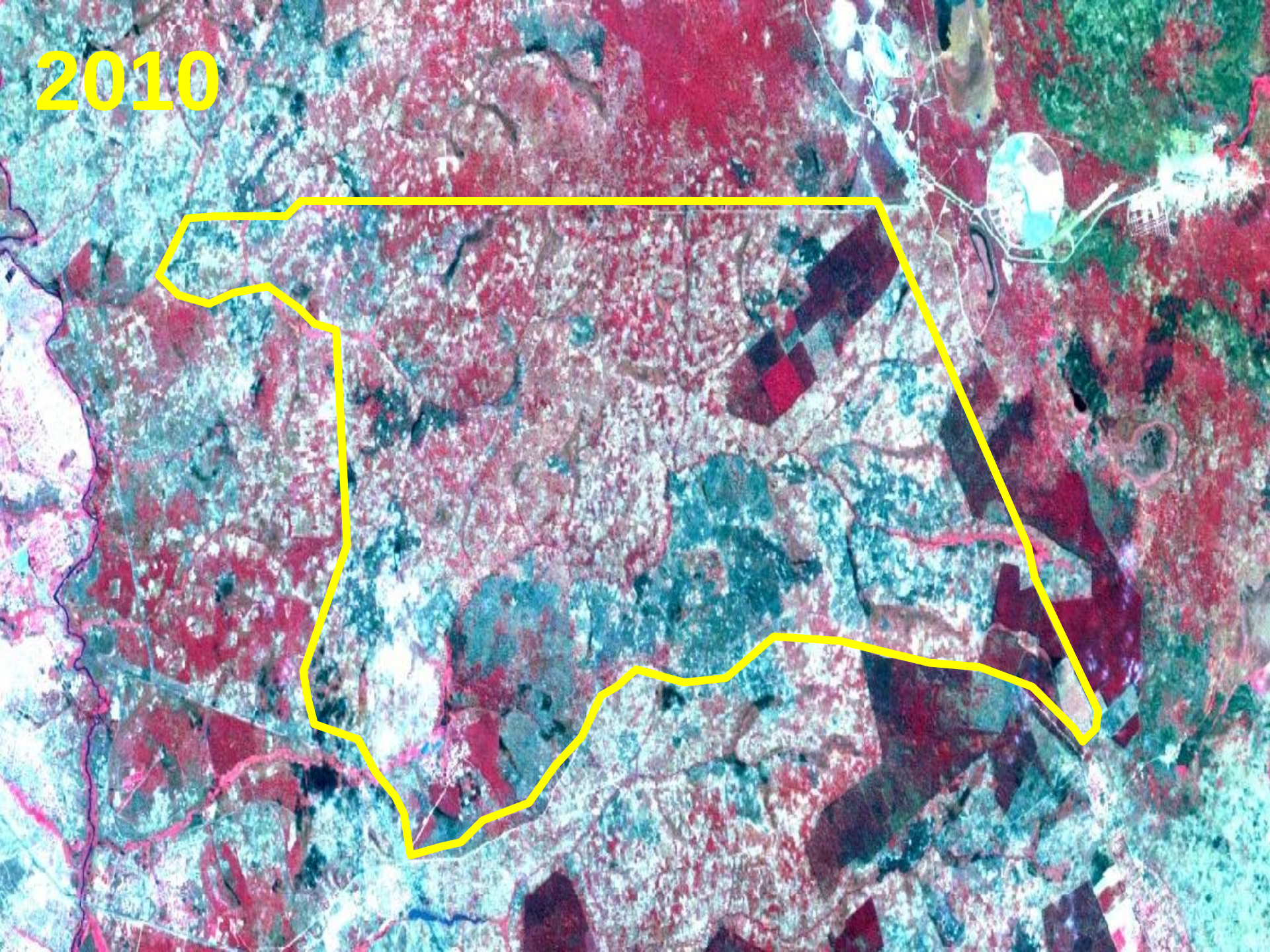
Aiming at Forest Cover change detection

Contribution to National and International Reporting


2010


2010


2010


2010

Challenges

- High resolution images
- Working station/Computer space
- Cloud free images
- Image processing software

Refer to ILUA I REPORT (2005 – 2008)

LAND USE AND LAND COVER MAPPING RESULTS

- Image processing methodology, page 82
- Land use/cover classification methodology, page 83
- Feature interpretation and extraction for land use mapping, page 84
- Provincial land use map validation, page 85
- Land cover change detection, page 98

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THANK YOU