



المندوبية السامية للتخطيط
High Commission for Planning

GIS tool for the collection and dissemination of results of General Census of Population and Housing

The Moroccan Experience

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Introduction

Aware of its contribution to enriching the analysis, the dissemination of statistical data and the publication of thematic maps, and having all necessary elements for its development (maps, databases and qualified human resources), the High Commission for Planning (HCP) undertook, since 1997, the process of setting up the Geographical Information System.

Objectives

The objectives of the HCP GIS are mainly:

- **to produce, for the census and the surveys, the maps and updated geographical data of good quality and precision;**
- **to integrate the spatialized data of the different statistical databases, thereby facilitating the follow-up of the demographic, socioeconomic and environmental evolution of the different territorial entities;**
- **to provide a modern analysis tool for the presentation and dissemination of the statistical information;**
- **to provide new solutions for the development and management of the areal sampling bases.**

Historical

Setting up (in 1997)

- **The Scanning of cartographic support of 1994 Census:**
 - maps of cities;
 - the plans of restitution;
 - topographic sheets.
- **The georeferencing of scanned maps.**

Tasks performed by a private company

Historical

Setting up

- **The digitalization of the cartographic mediums was the third work undertook in the process of setting up the GIS, and consisted in digitalizing of different layers:**
 - layers of the administrative divisions (regions, provinces and municipalities);
 - layers of the statistical divisions (census districts, sectors of control and supervision areas);
 - geographical positions and forms of islets;
 - positions of douars (villages); ;
 - street names;
 - geographical Landmarks and facilities.
 - the creation of the fields relating to geographical codes in attribute tables.

Tasks performed by the staff of the HCP

Historical

before the execution of the General Census of Population and Housing 2004, an update of the digital maps is conducted between 2001 and 2003 in the urban and rural areas:

- **16** regions;
- **62** provinces;
- **1 532** urban and rural communes;
- **37 000** census districts;
- **12 000** sectors of control ;
- **1 000** supervision areas .

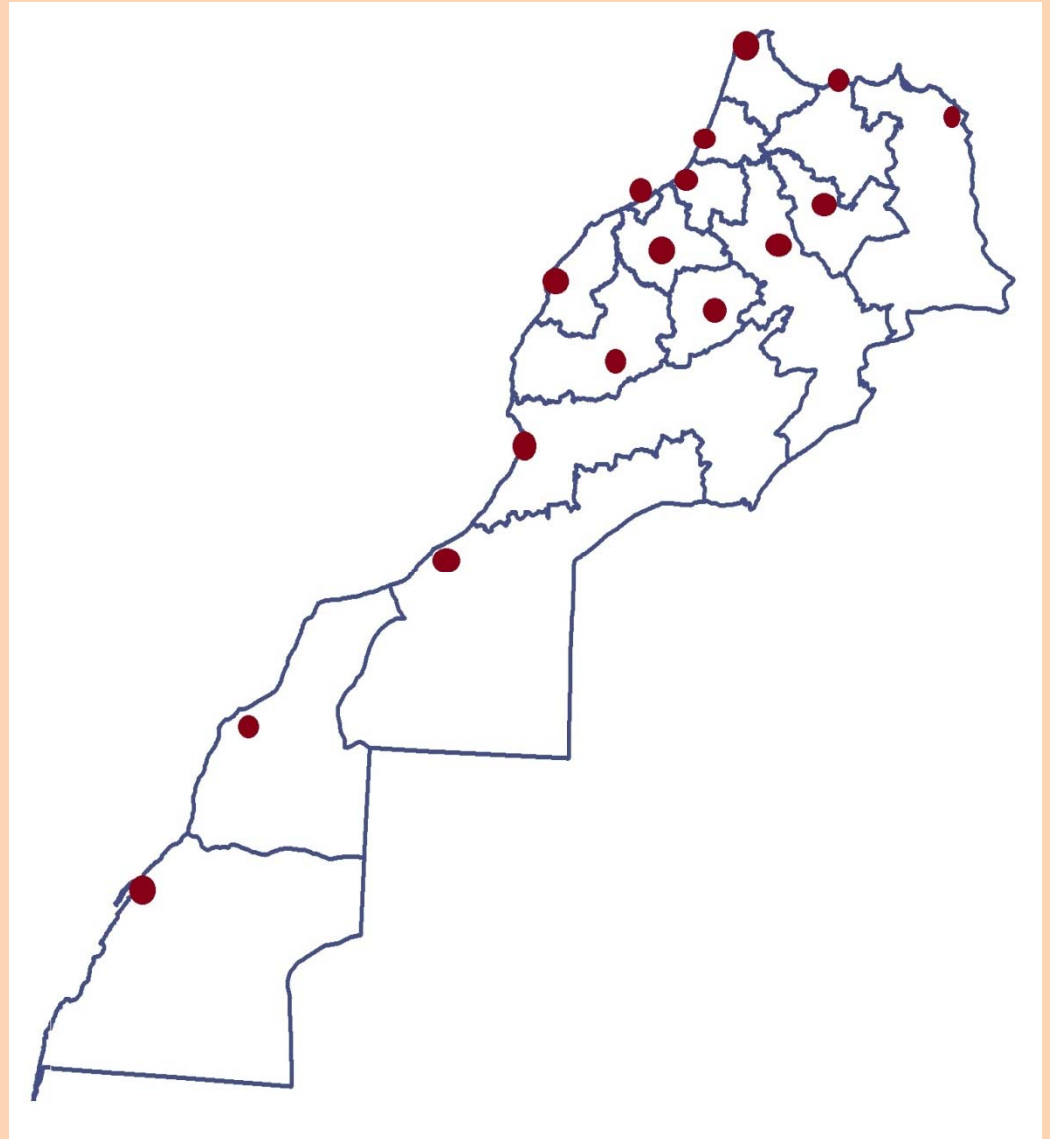
Historical

The passage from **Microstation** DGN file to **ArcGis** shape file format in 2005 :

it was a very heavy operation which required a lot of resources and time and it led to the decentralization of GIS in the 16 regions by the creation of 16 regional GIS services to help in geographical data conversion.

Historical

Regional GIS services

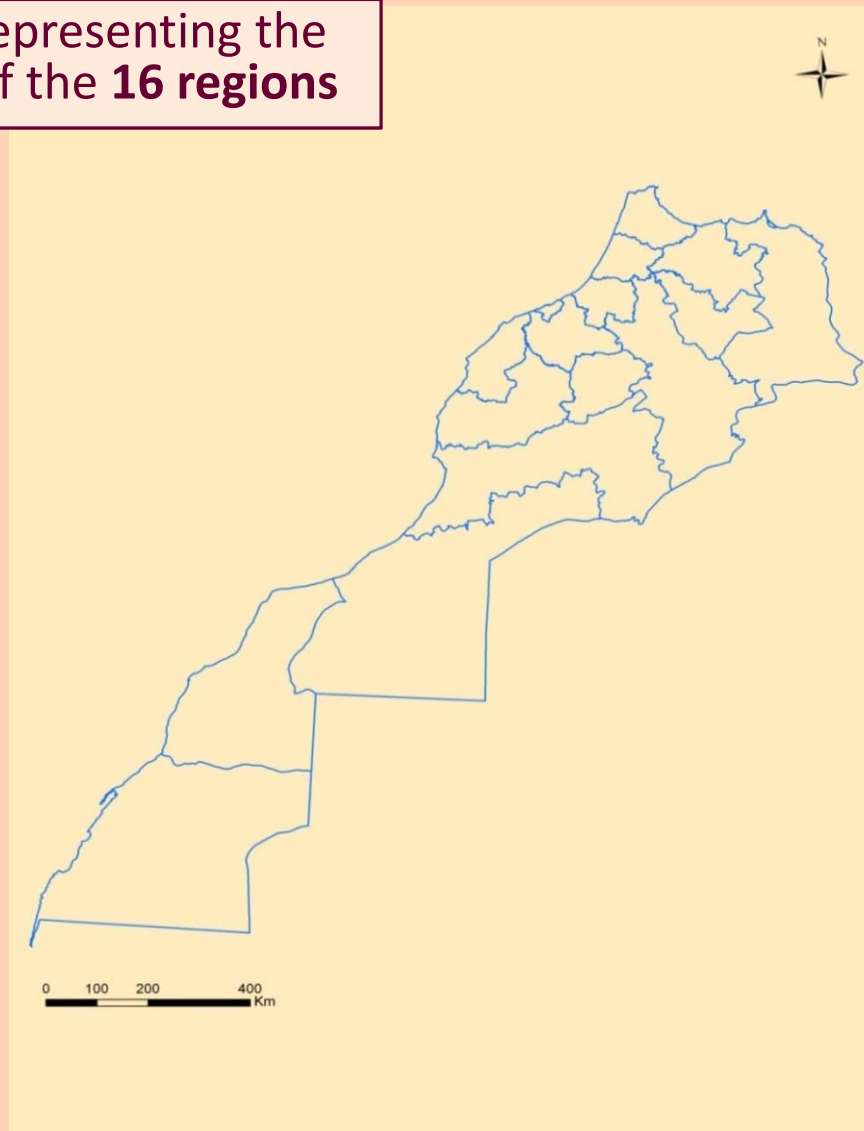


Components

After the conversion of the different layers, the structure of the geographic database contains the following layers:

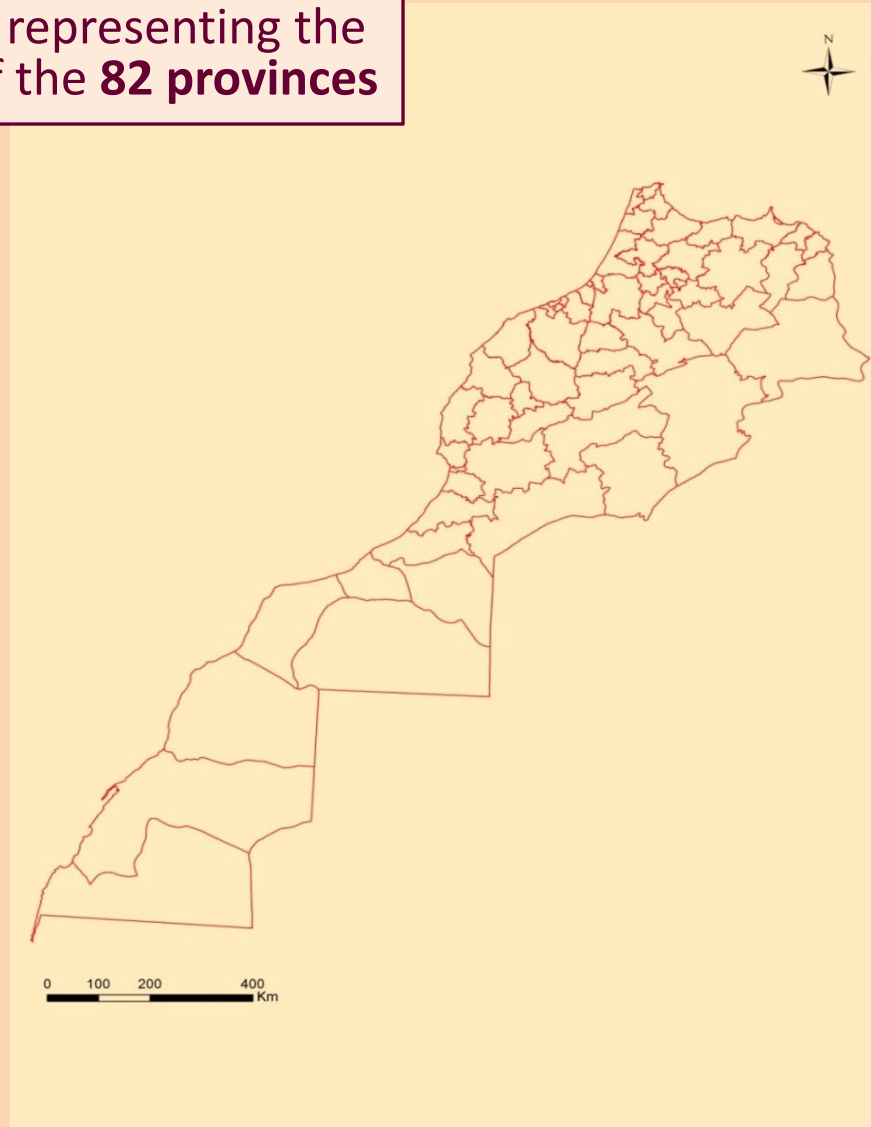
Components

Layer of the regions representing the administrative limits of the **16 regions**



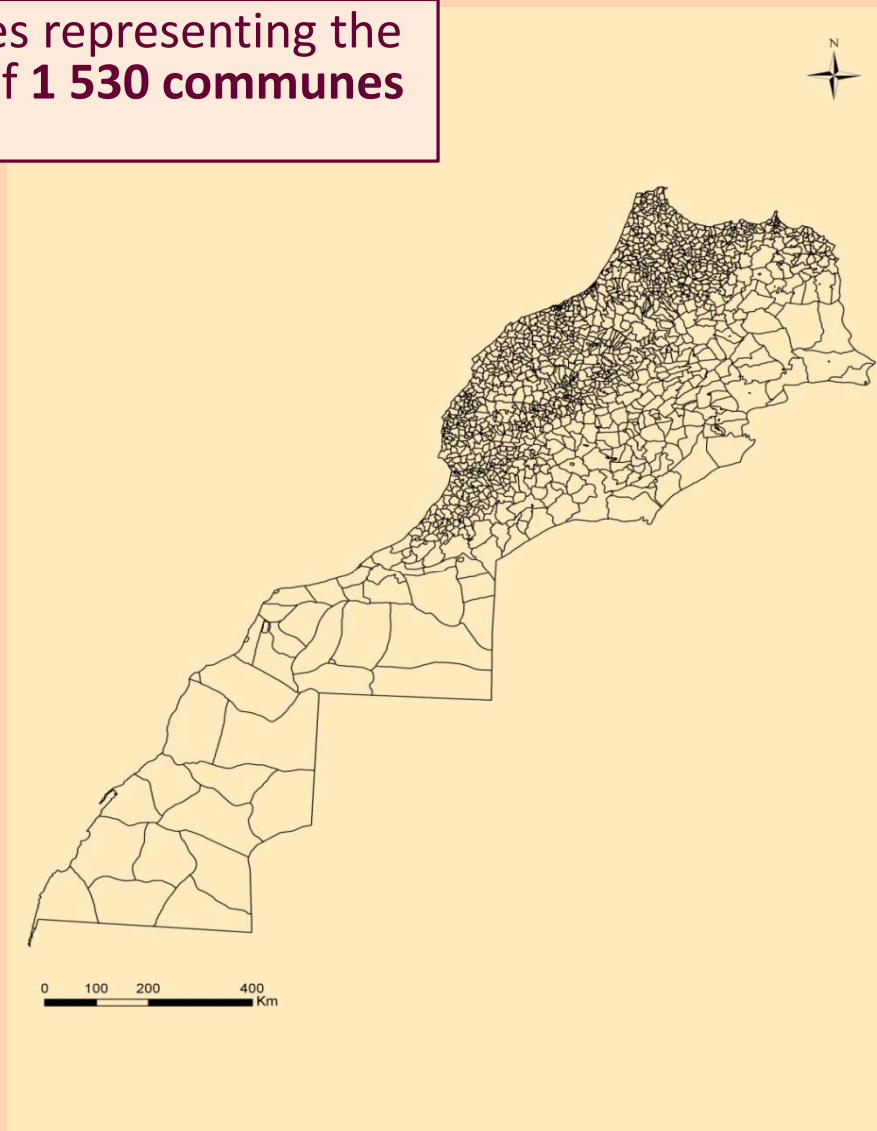
Components

Layer of the provinces representing the administrative limits of the **82 provinces**



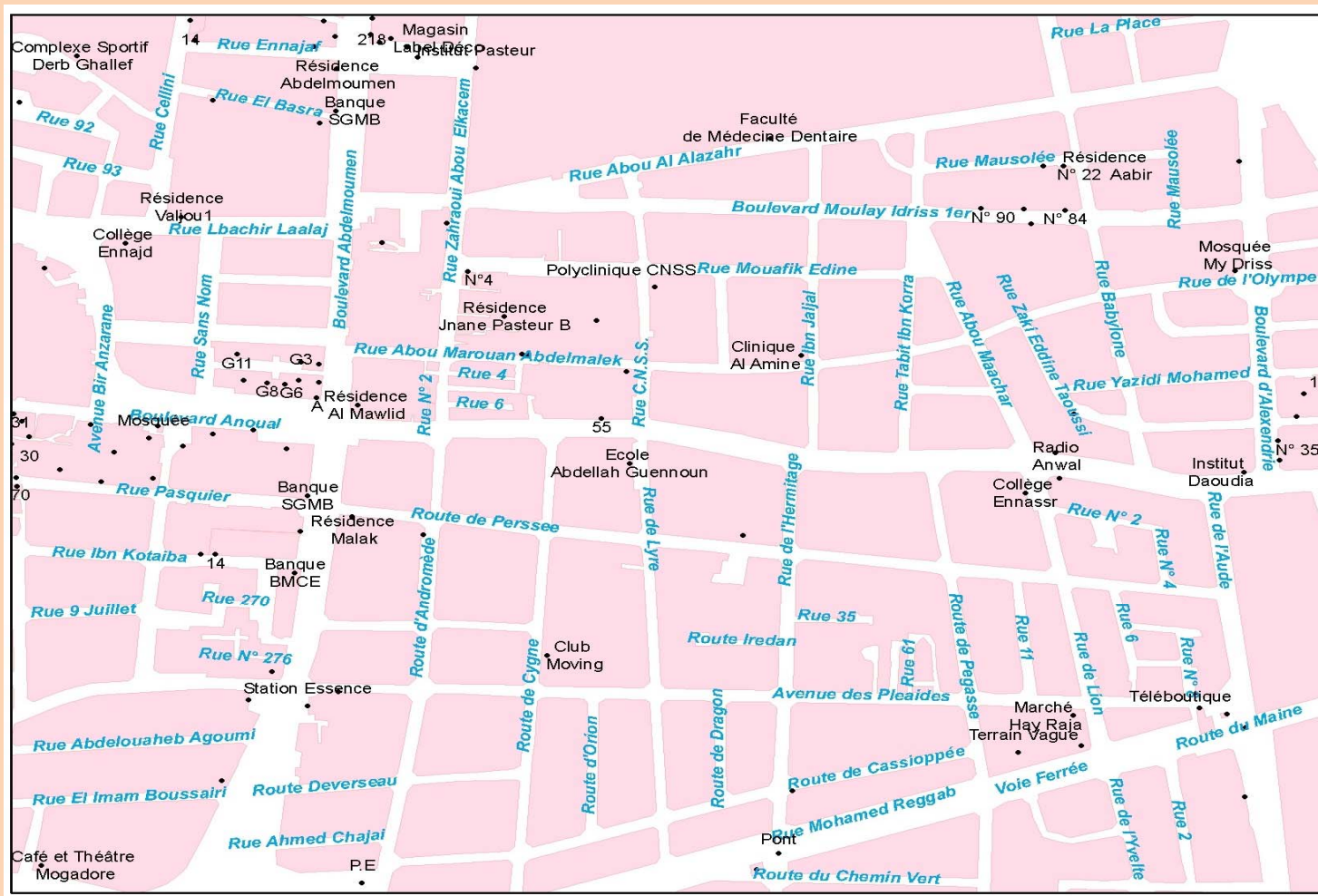
Components

Layer of the communes representing the administrative limits of **1 530 communes**



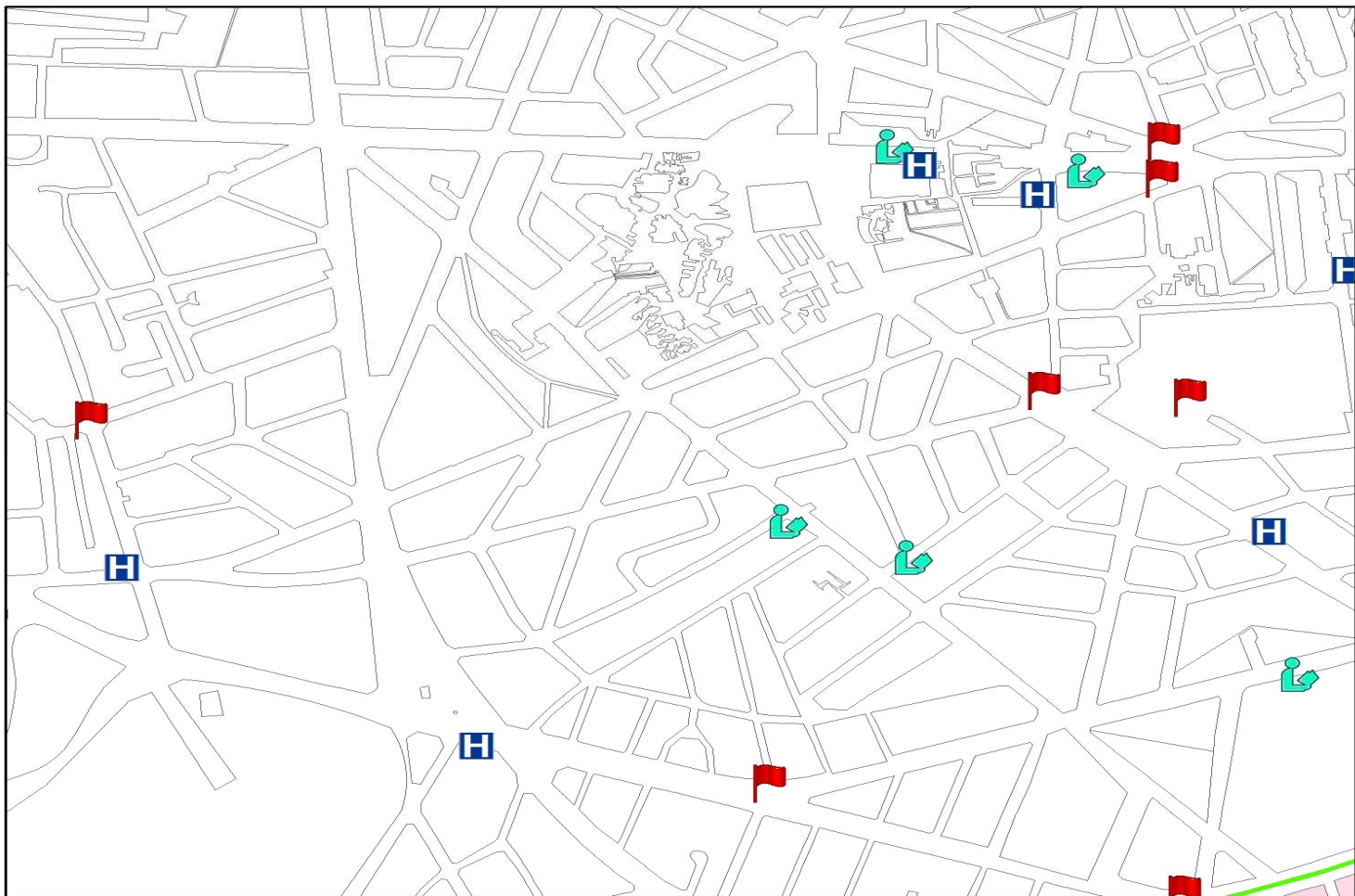


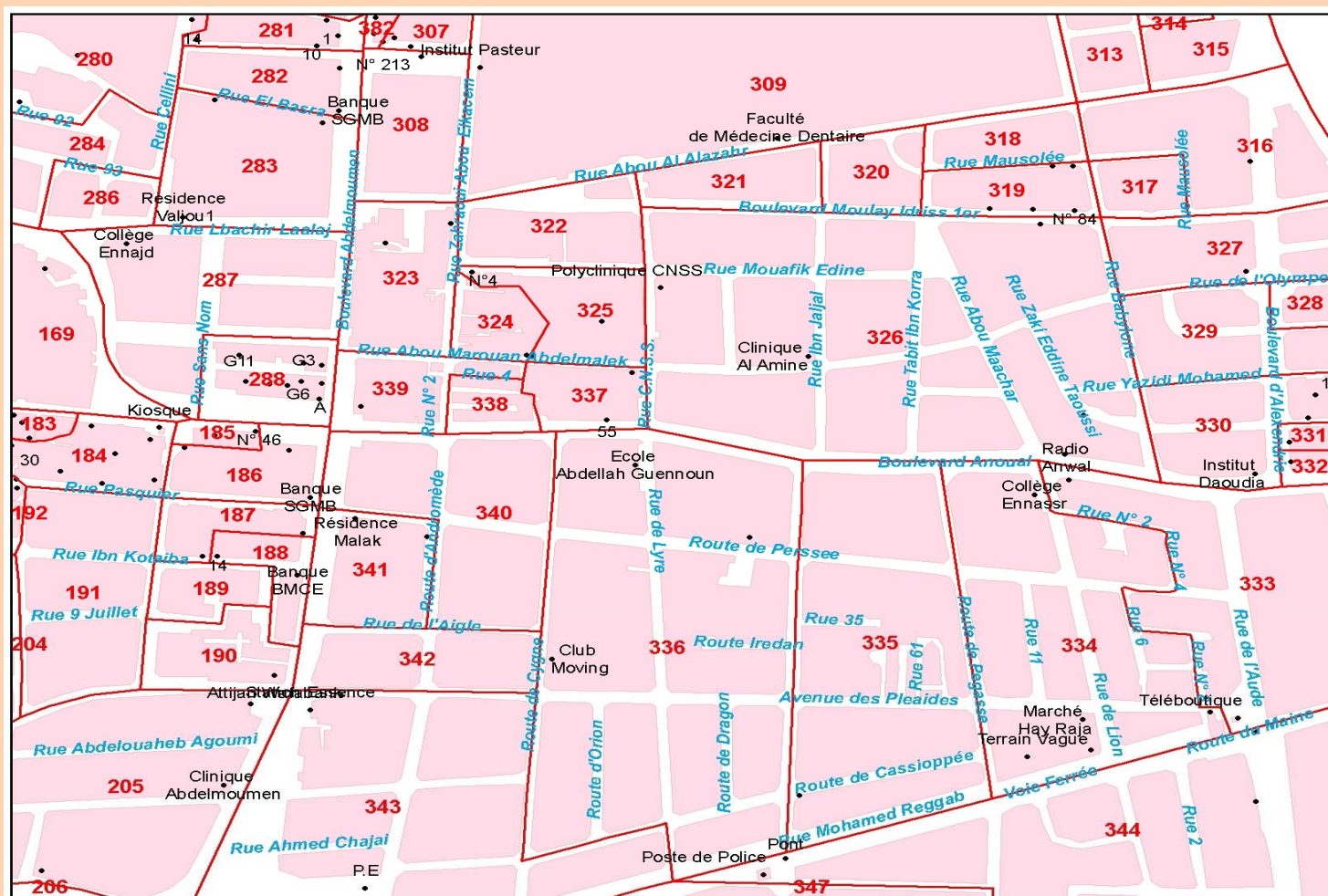
layers of islets, streets and geographical landmarks

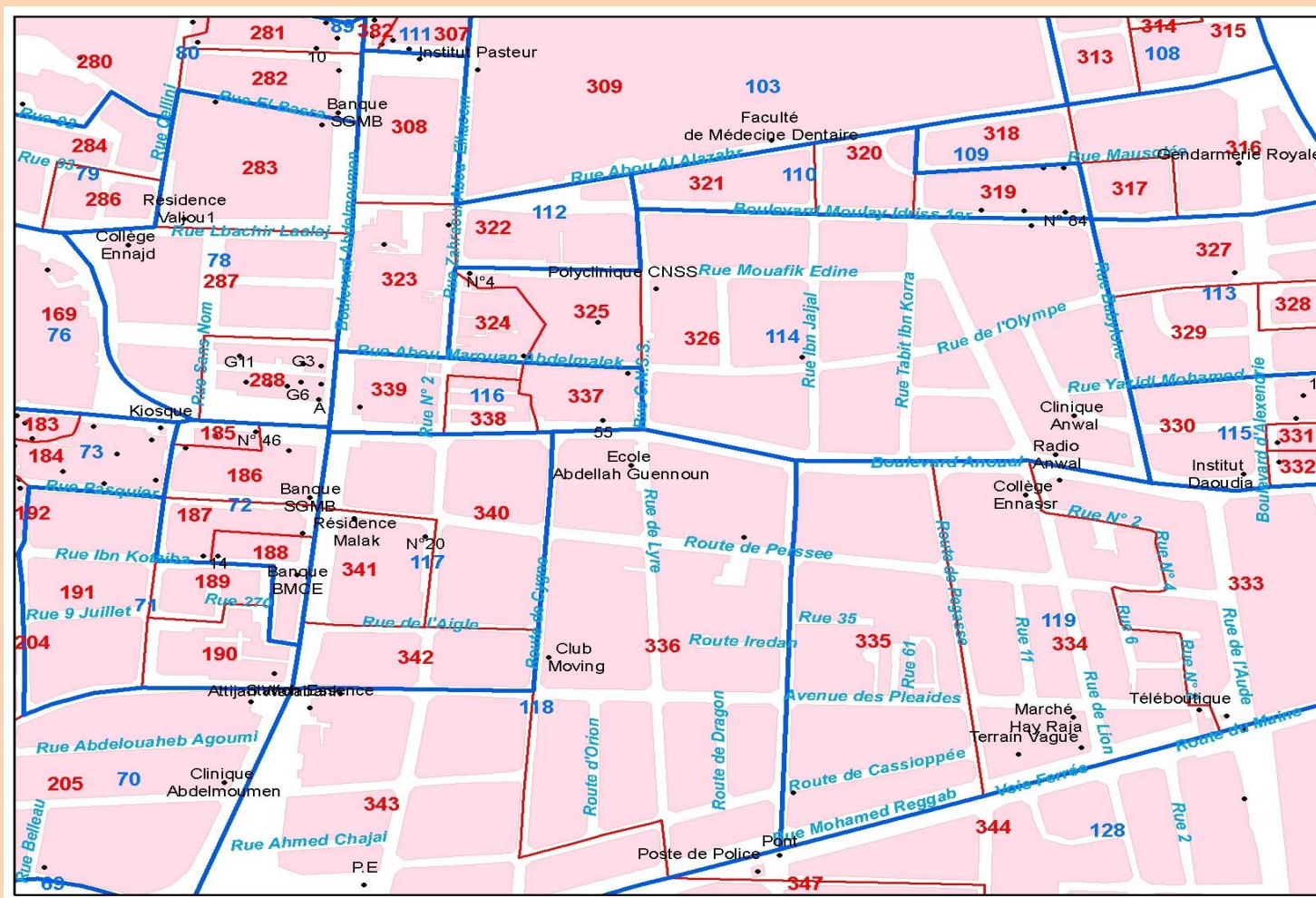


Components

layer of facilities

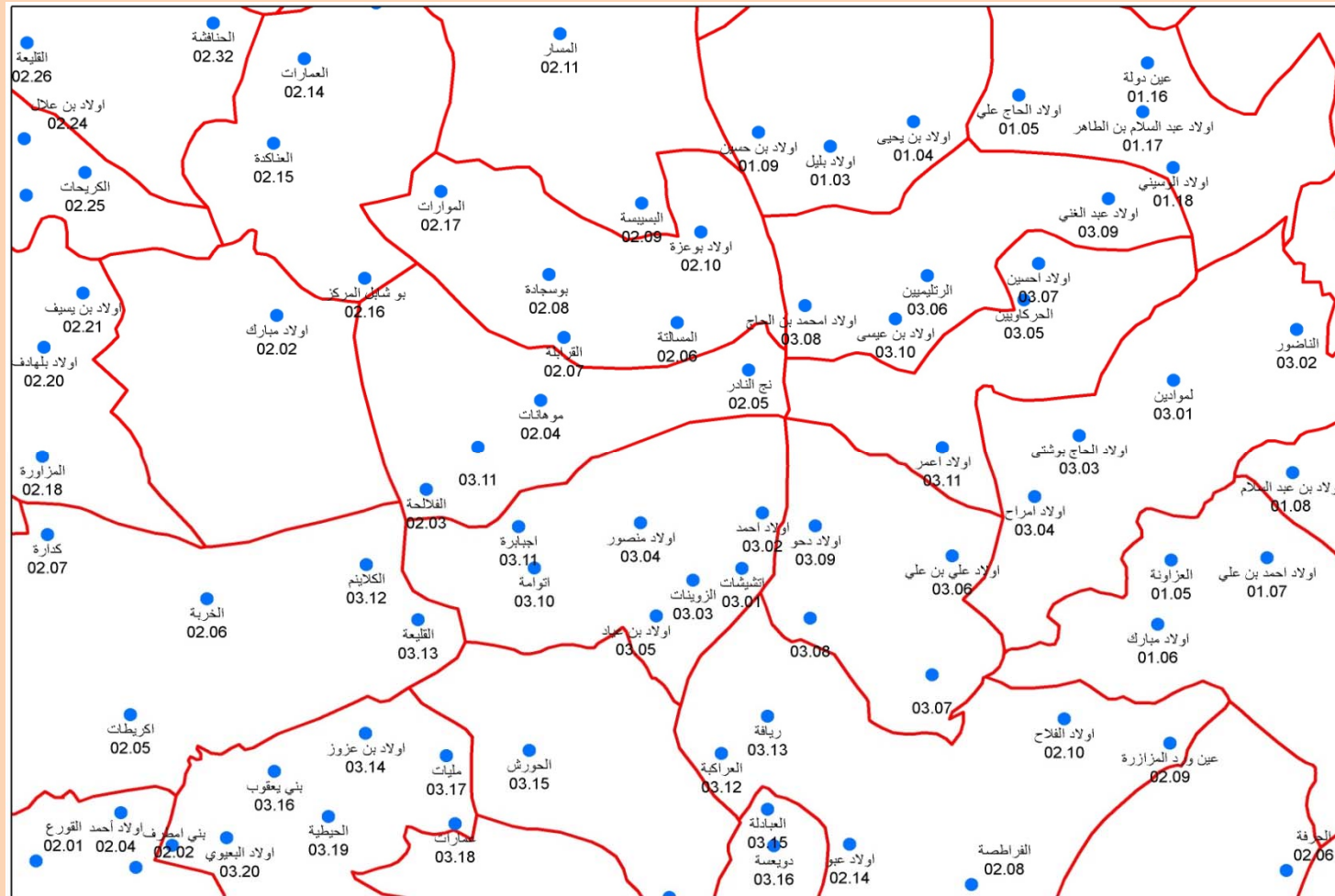


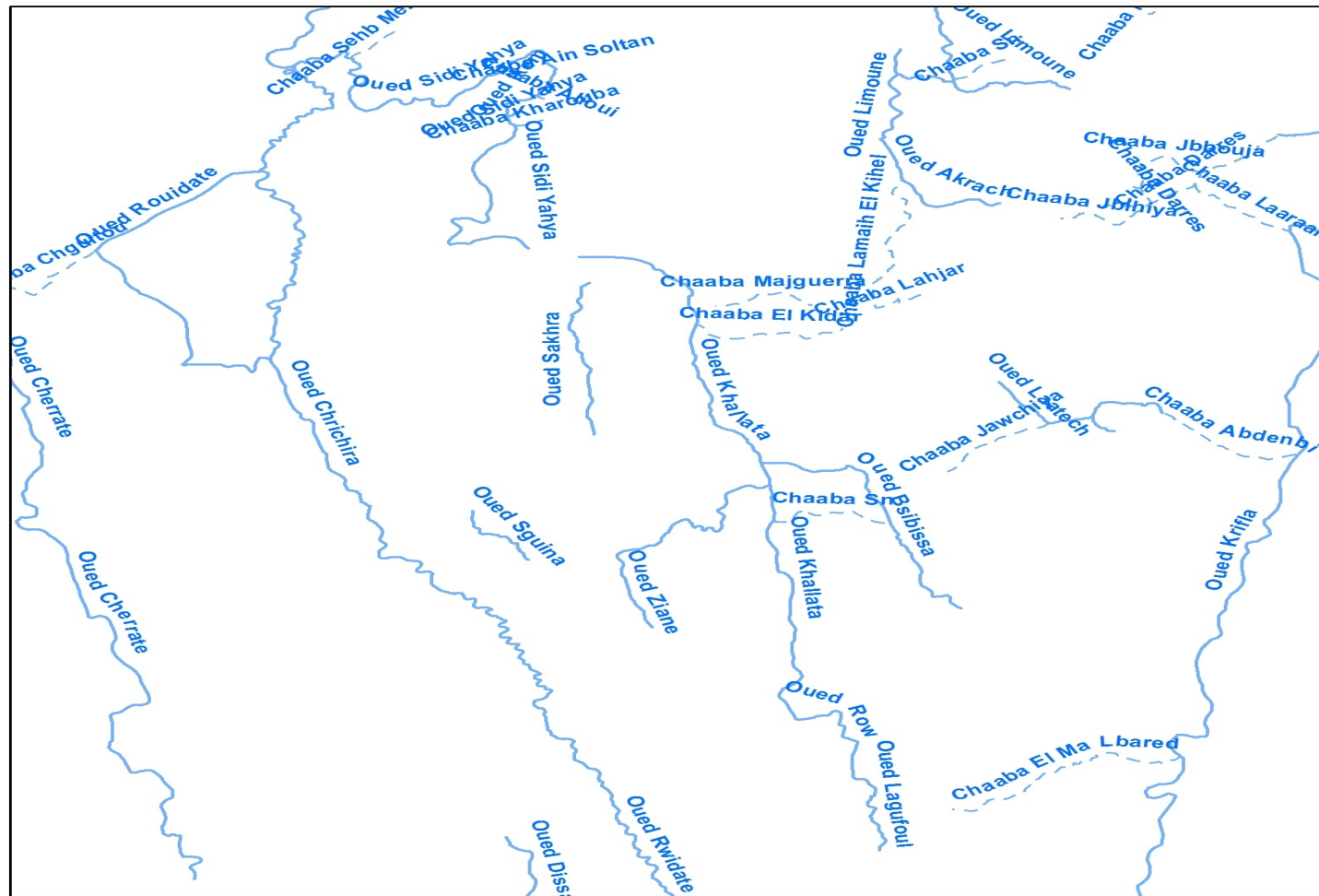




Components

layer of Douars





Use of satellite imagery to improve the quality of geographic information

Digitizing geographical data from cartographic census of 1994 and 2004, collected by imprecise techniques, led to a decrease in the quality of spatial data:

- Incorrect forms and positions of islets, positioning of Douars ... Etc;
- Problem of continuity of space (overlap and omission) between urban and rural areas.

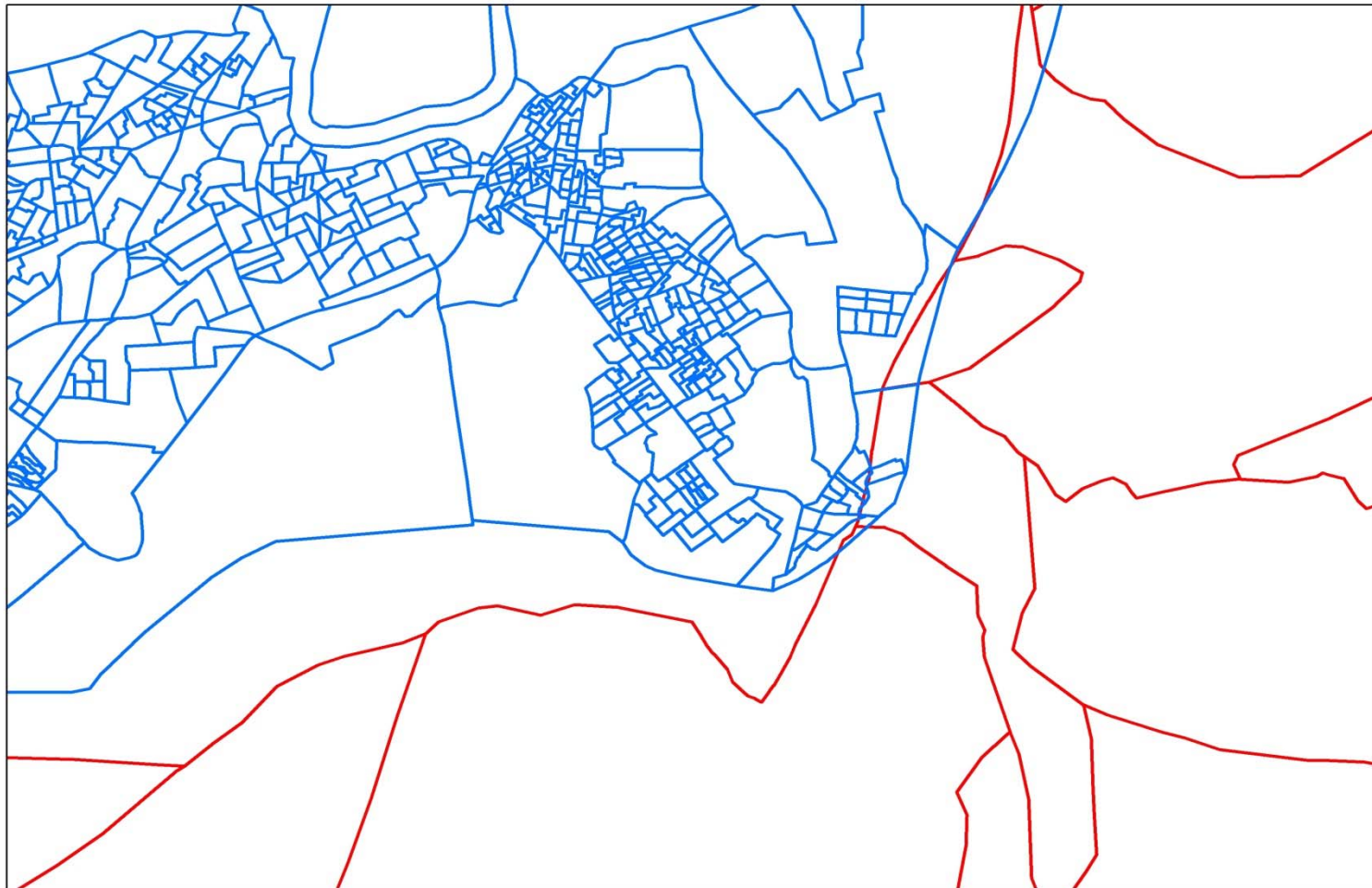
Use of satellite imagery to improve the quality of geographic information

Malposition of islets



Use of satellite imagery to improve the quality of geographic information

Overlap and omission between urban and rural areas

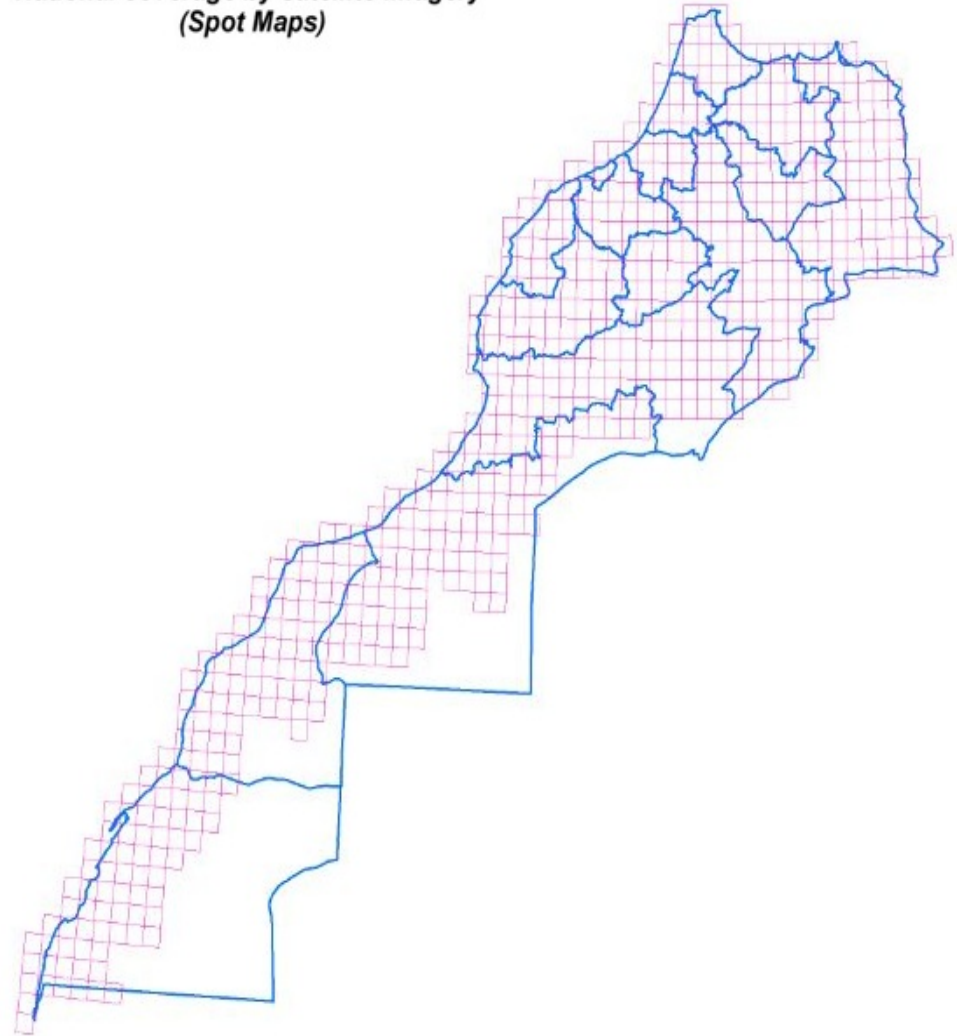


Use of satellite imagery to improve the quality of geographic information

To remedy this problem, the HCP proceed with the purchase of satellite imagery that cover most of the territory:

SpotMaps 2,5 m (500 000 Km²)

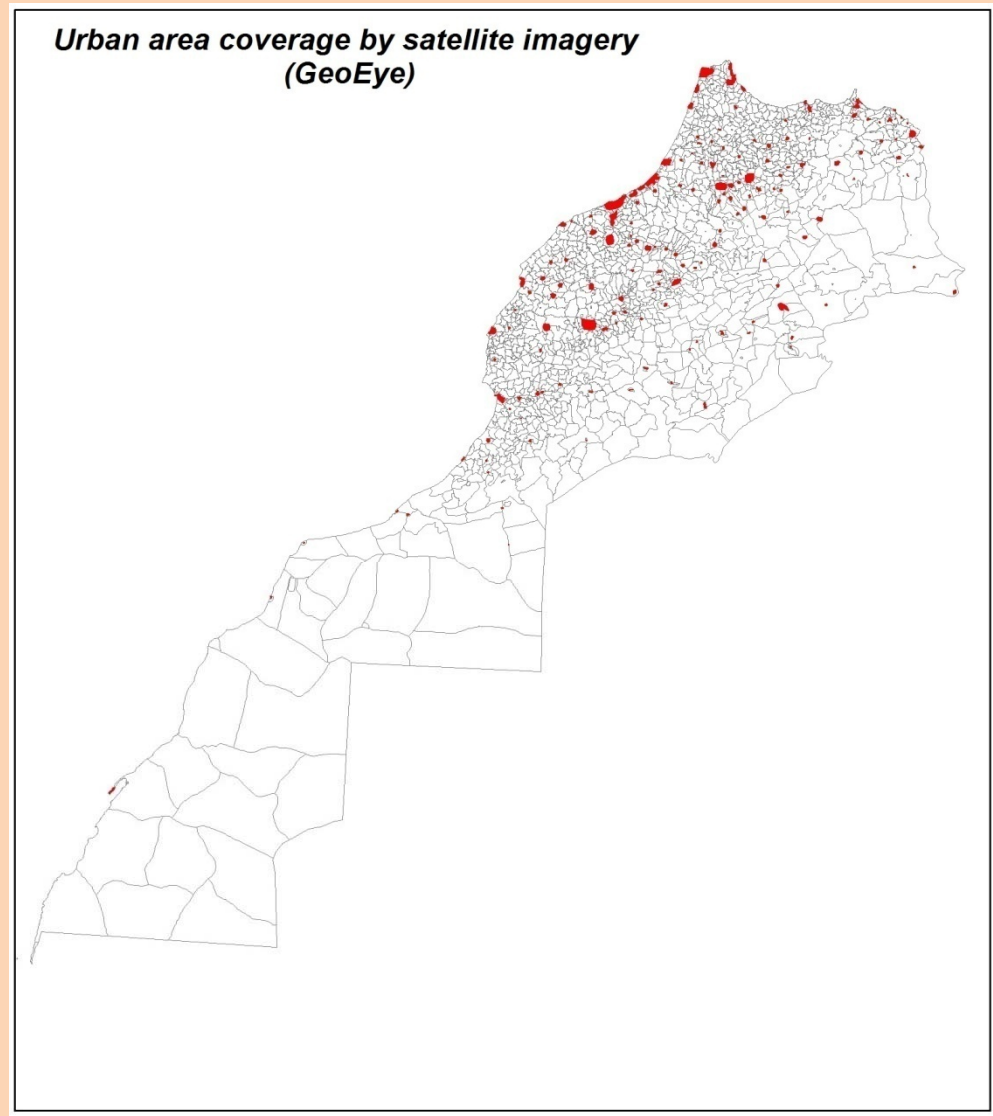
*National coverage by satellite imagery
(Spot Maps)*



Use of satellite imagery to improve the quality of geographic information

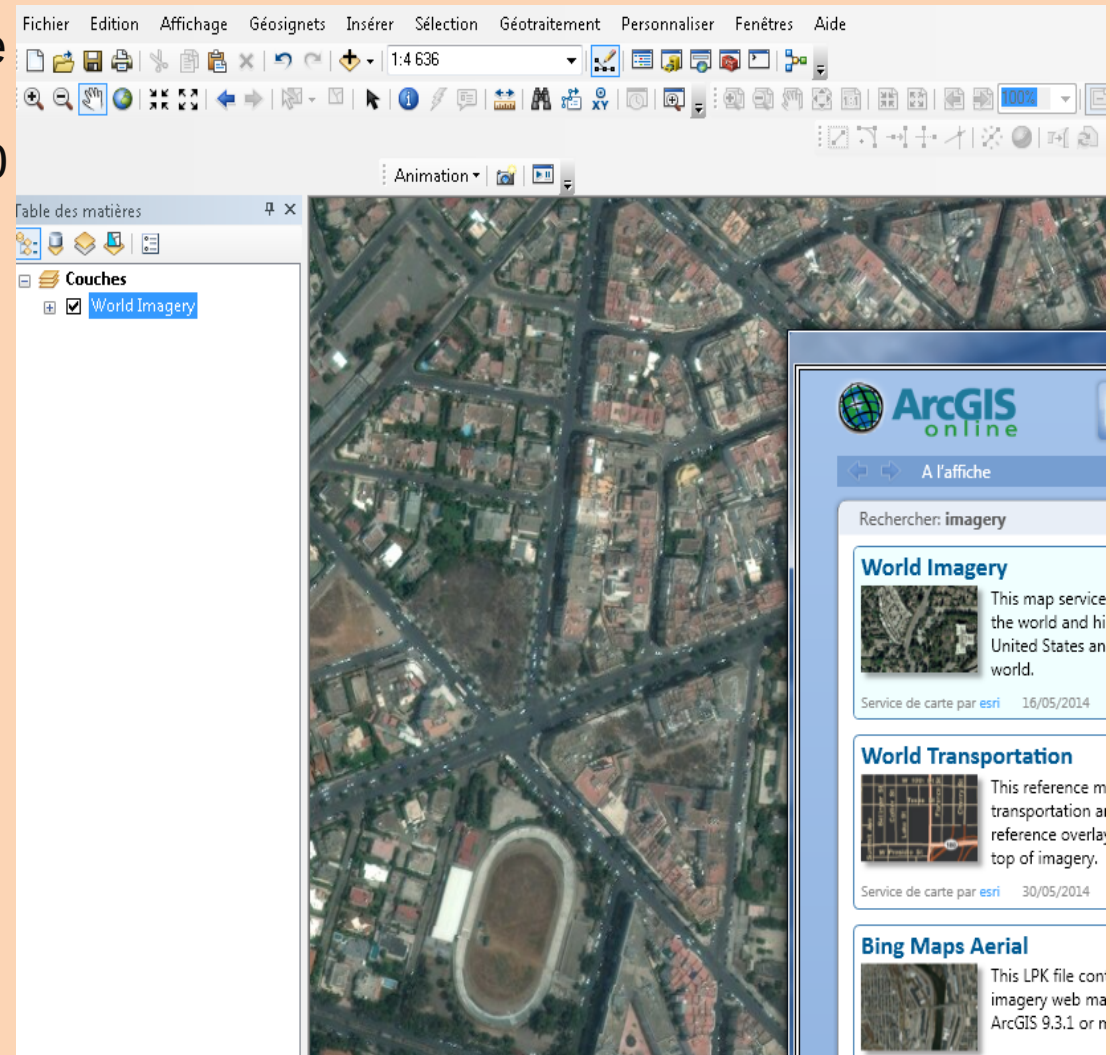
To remedy this problem, the HCP proceed with the purchase of satellite imagery that cover most of the territory:

GeoEye 50 cm (7 247 Km²)



Use of satellite imagery to improve the quality of geographic information

In addition to purchased satellite imagery, we used the free World Imagery integrated in ArcGIS 10.0 and 10.2.



Use of satellite imagery to improve the quality of geographic information

Correction of forms and positions of islets



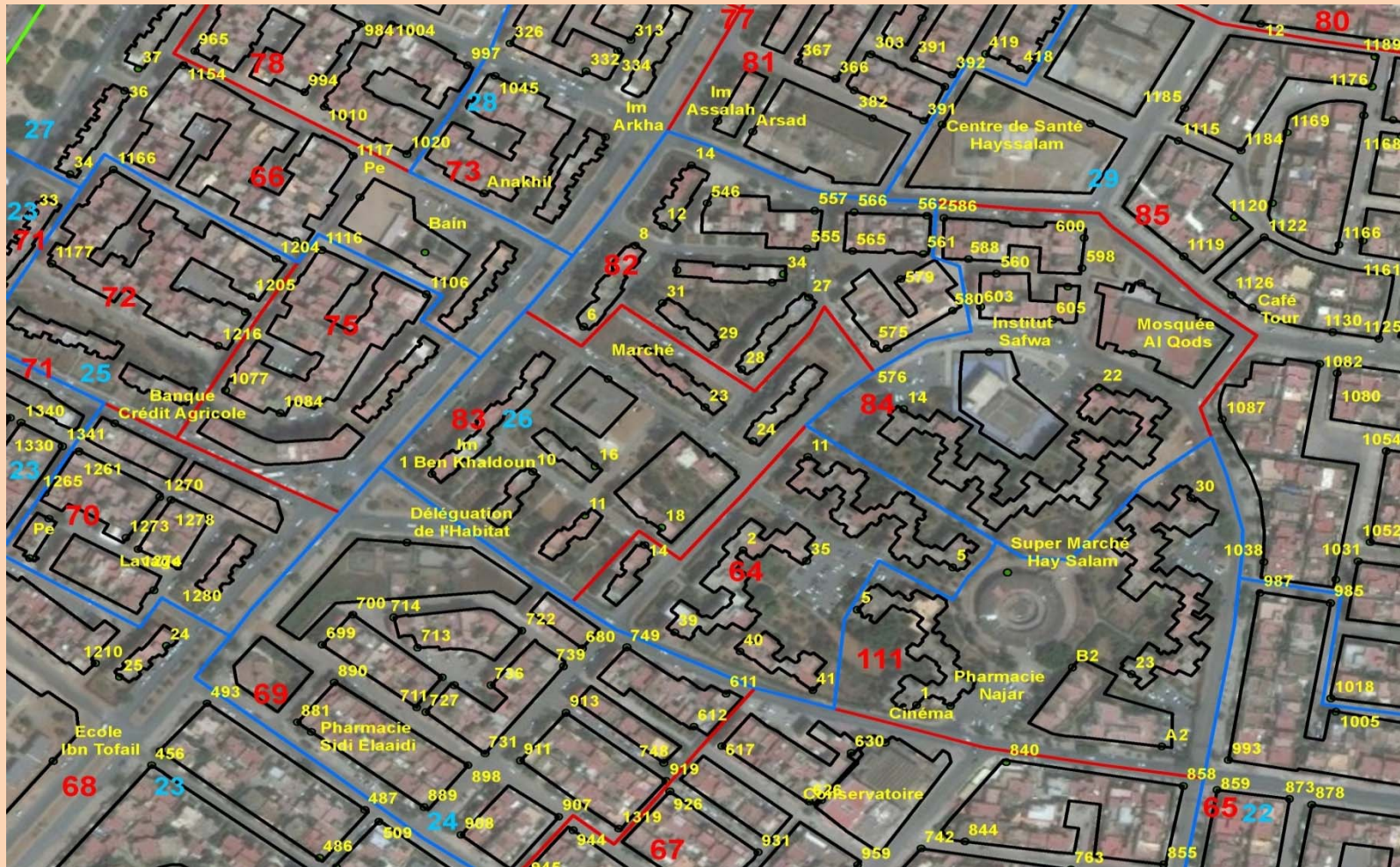
Before



after

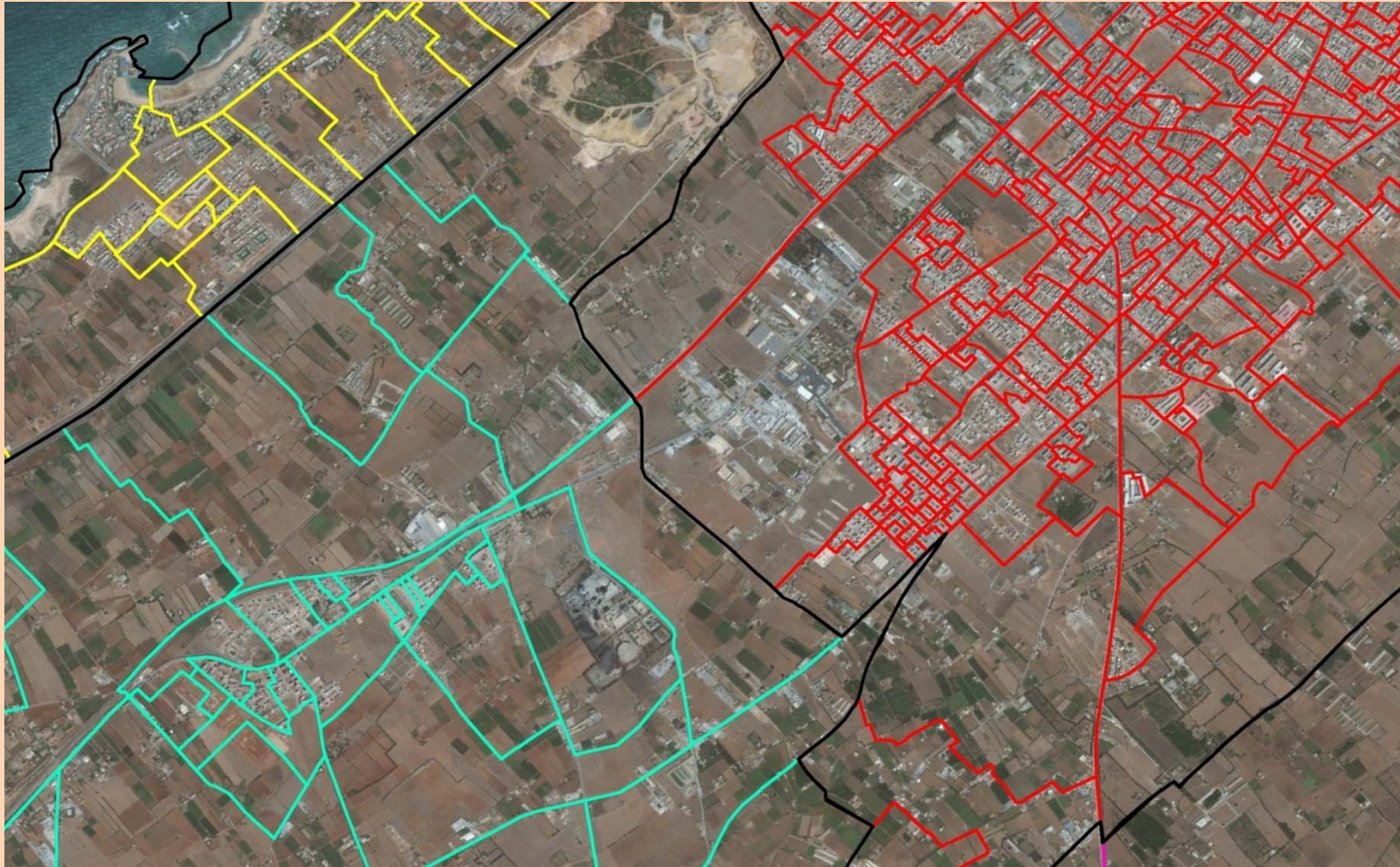
Use of satellite imagery to improve the quality of geographic information

Correction of forms and positions of islets and geographical landmarks



Use of satellite imagery to improve the quality of geographic information

Correction of the continuity of space



Achievements

GIS, tool of collection

Since its setting up, the GIS has enabled the HCP to elaborate the requested digital maps to realize:

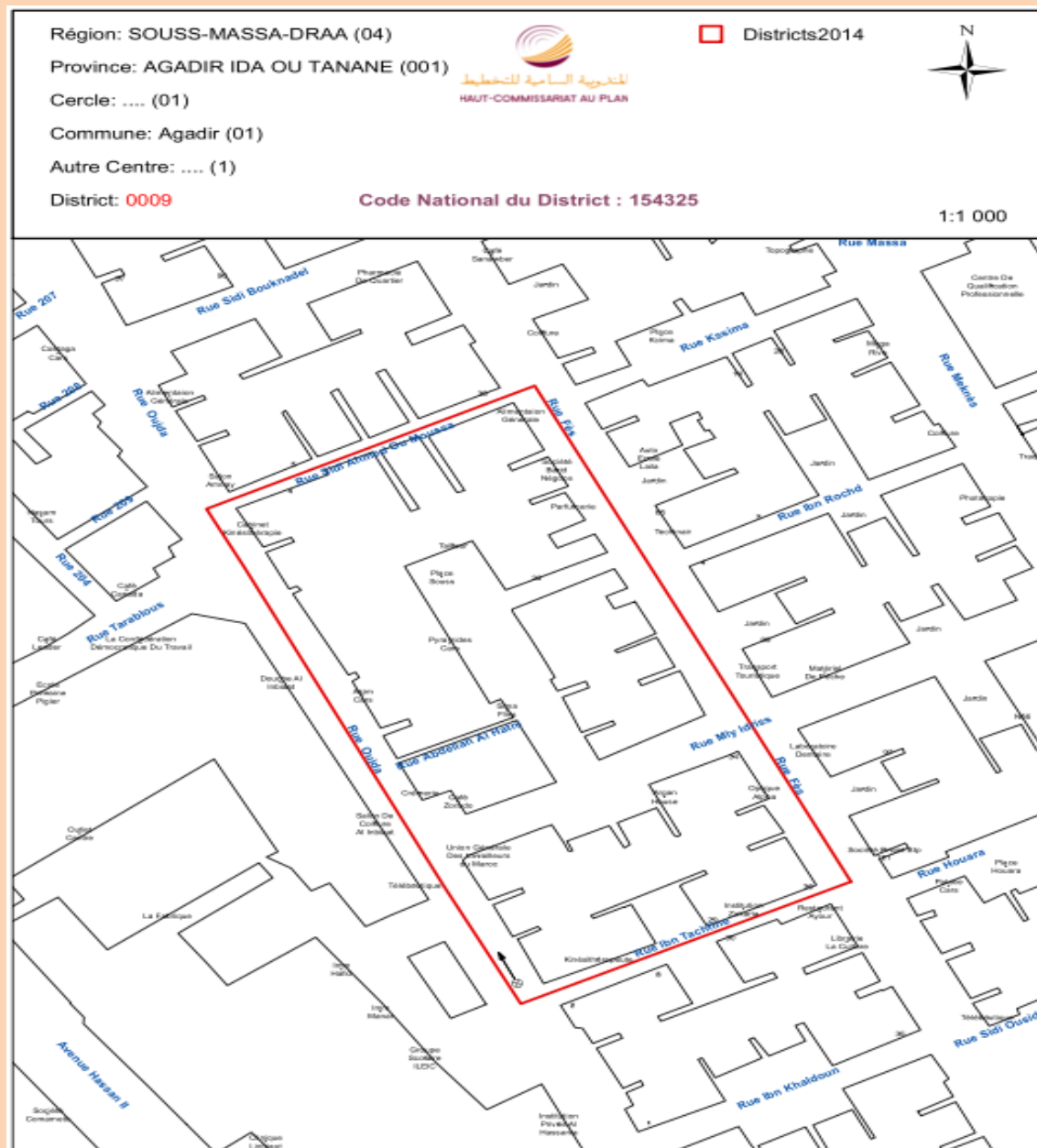
- The Economic Census of 2001;
- The cartography of the General Census of Population and Housing of 2004 and 2014;
- All post-census surveys and other household surveys;
- The General Census of Population and Housing of 2004 and the incoming census of 2014.

Achievements

GIS, tool of collection

Map of census district
(urban area)

34 142 census districts



GIS, tool of collection

Map of census district
(rural area)

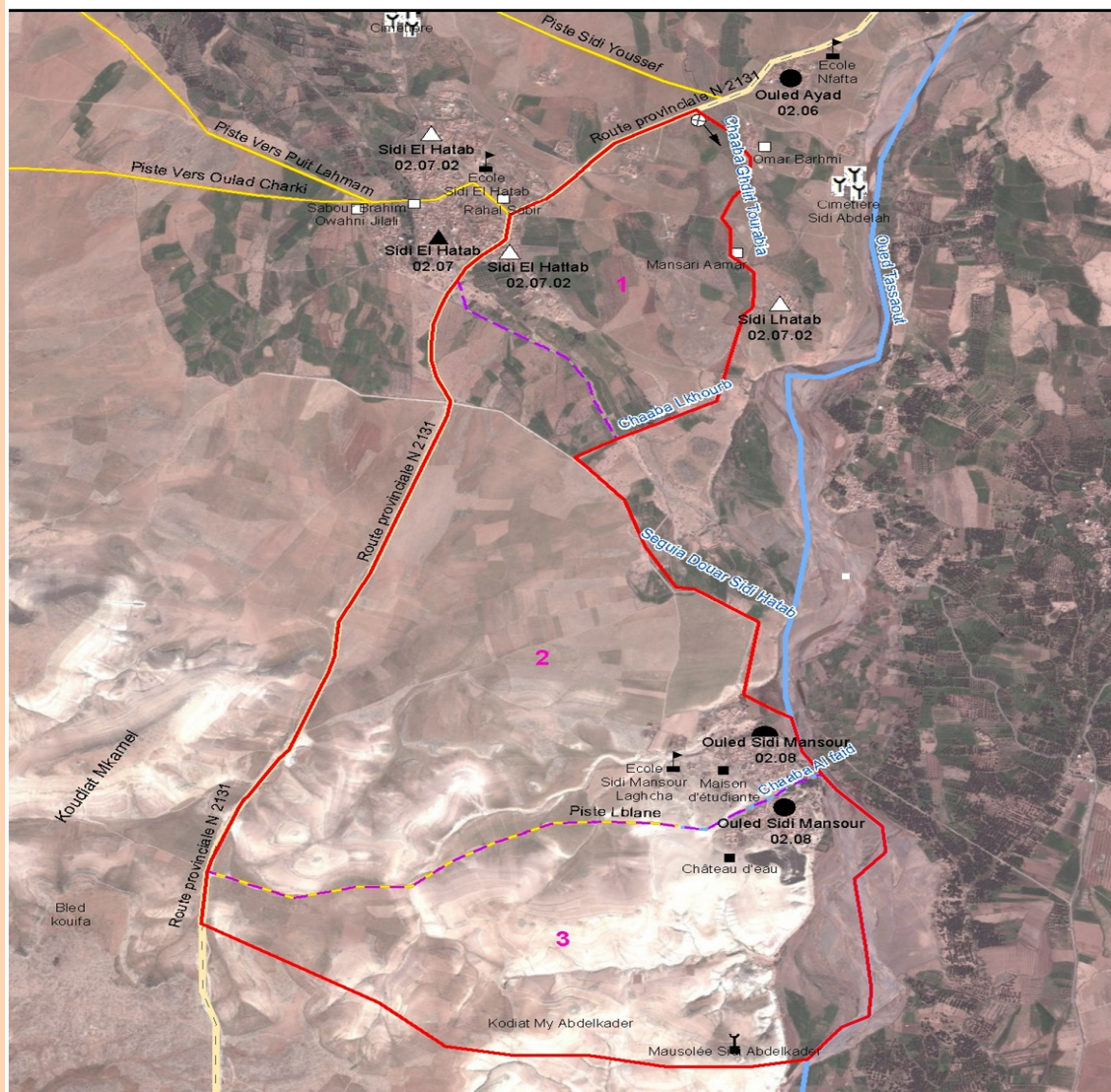
14 375 census district

Achievements

Région: MARRAKECH-TENSIFT-AL-HAOUZ (07)
 Province: EL KELAA DES SRAGHNA (191)
 Cercle: El Kelaa Des Sraghna (03)
 Commune: Sidi El Hattab (35)
 Autre Centre: (2)
 District : 2209
 Code National du District (CND) : 250122



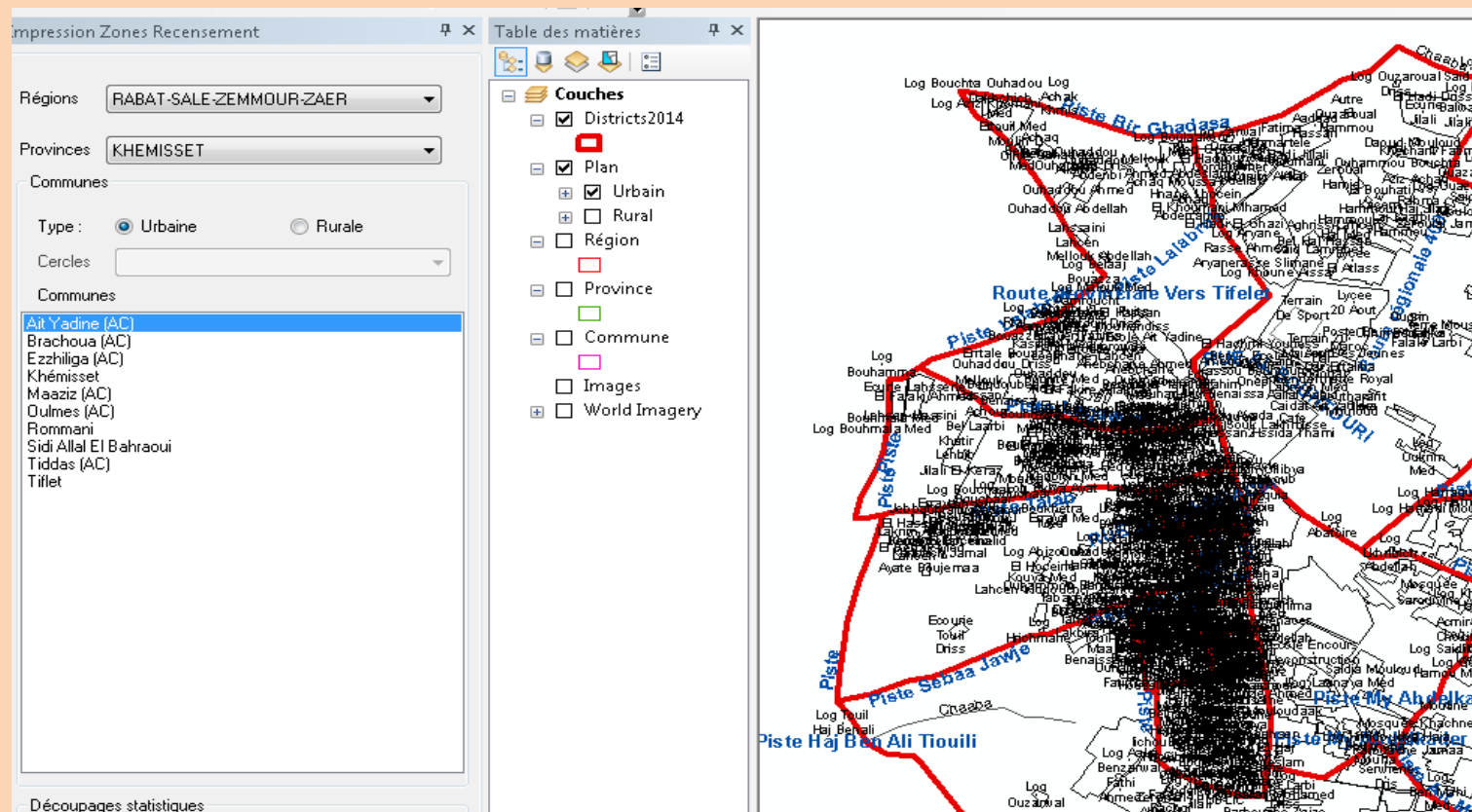
1:20 000

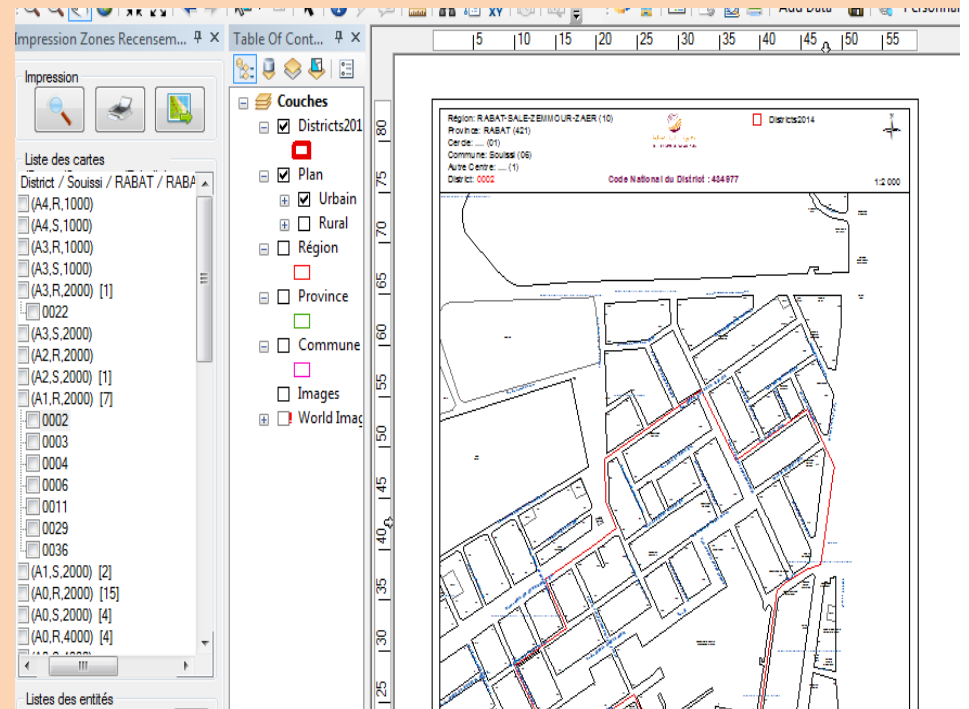
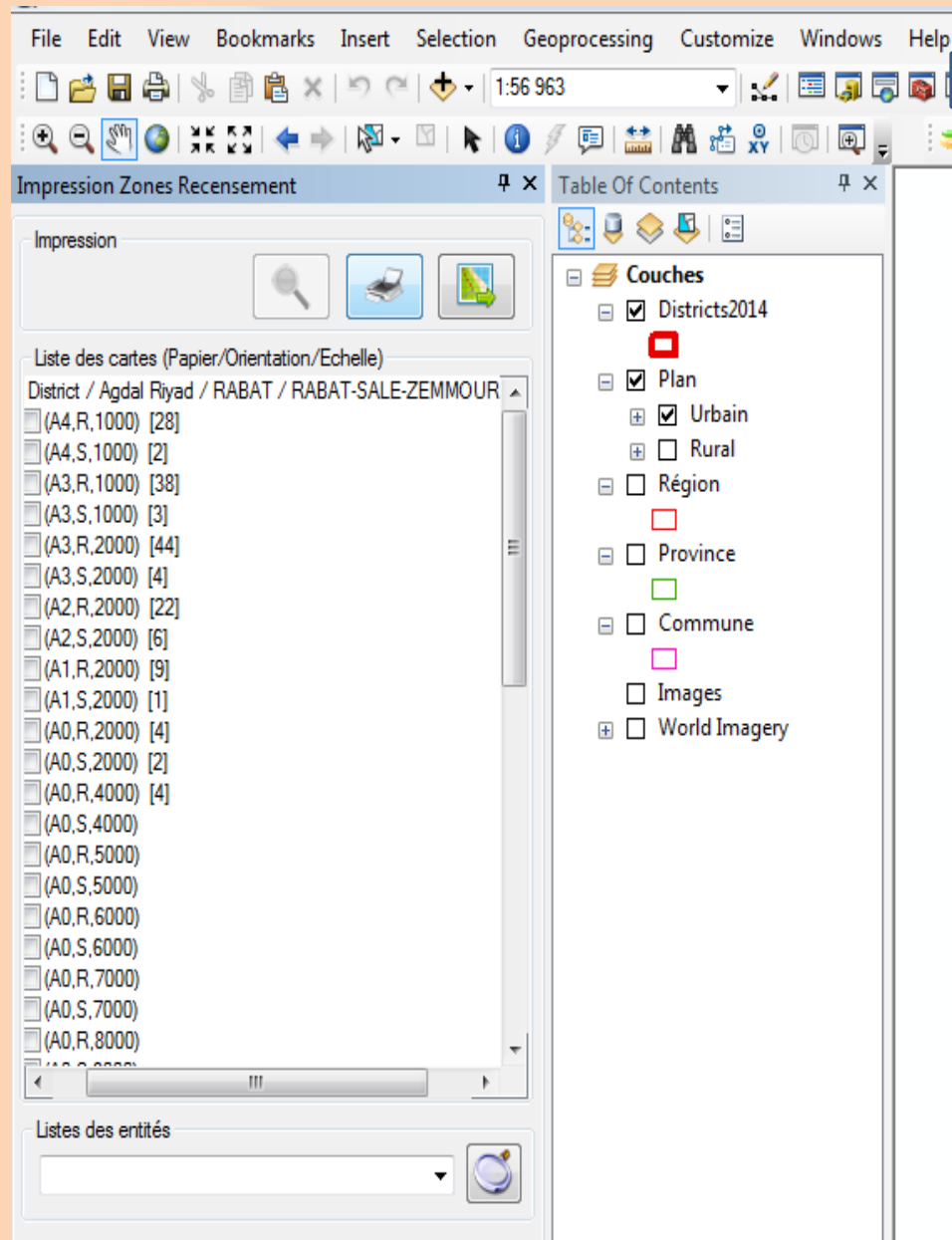


Achievements

GIS, tool of collection

To accelerate and facilitate the printing of maps, HCP uses an application of automatic printing:





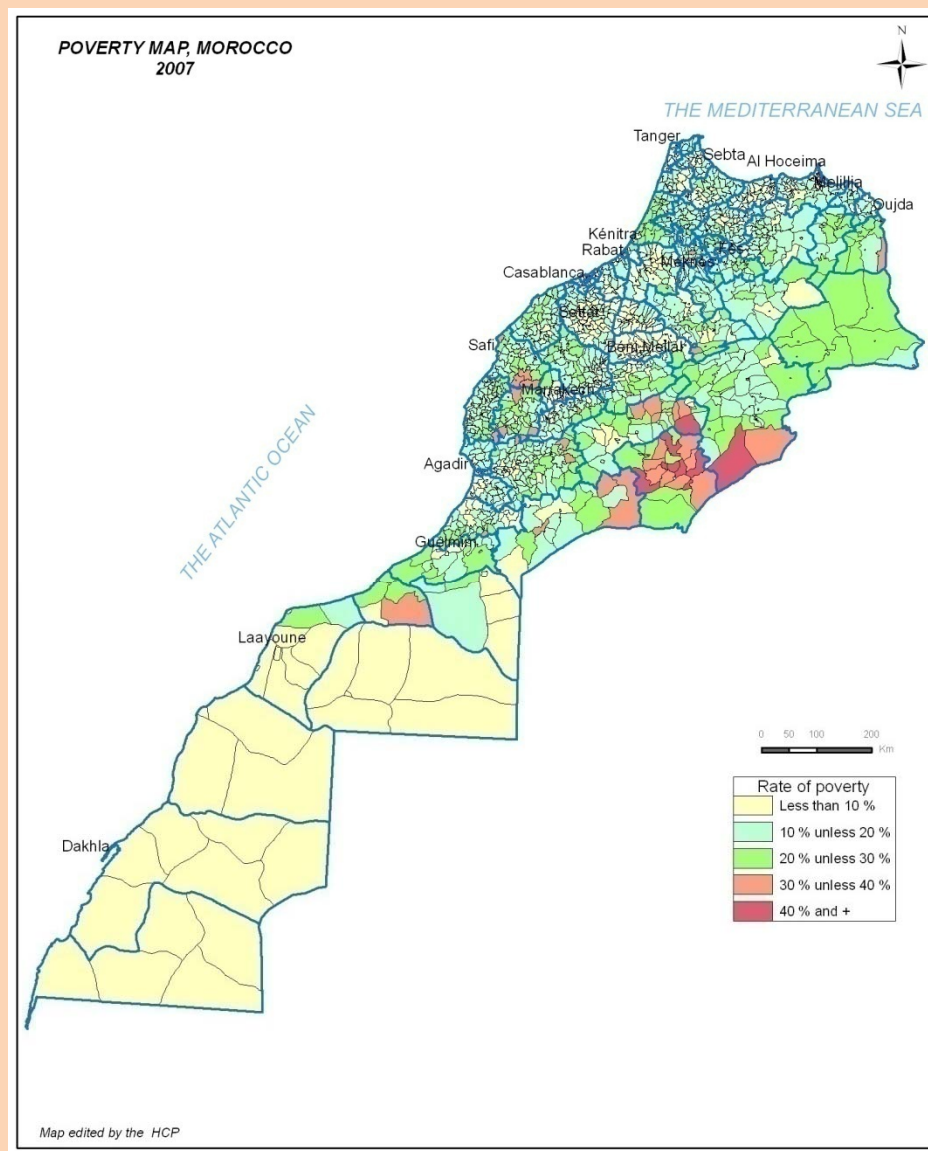
Achievements

GIS, tool of dissemination

Since its setting up, the GIS has also contributed to the dissemination of:

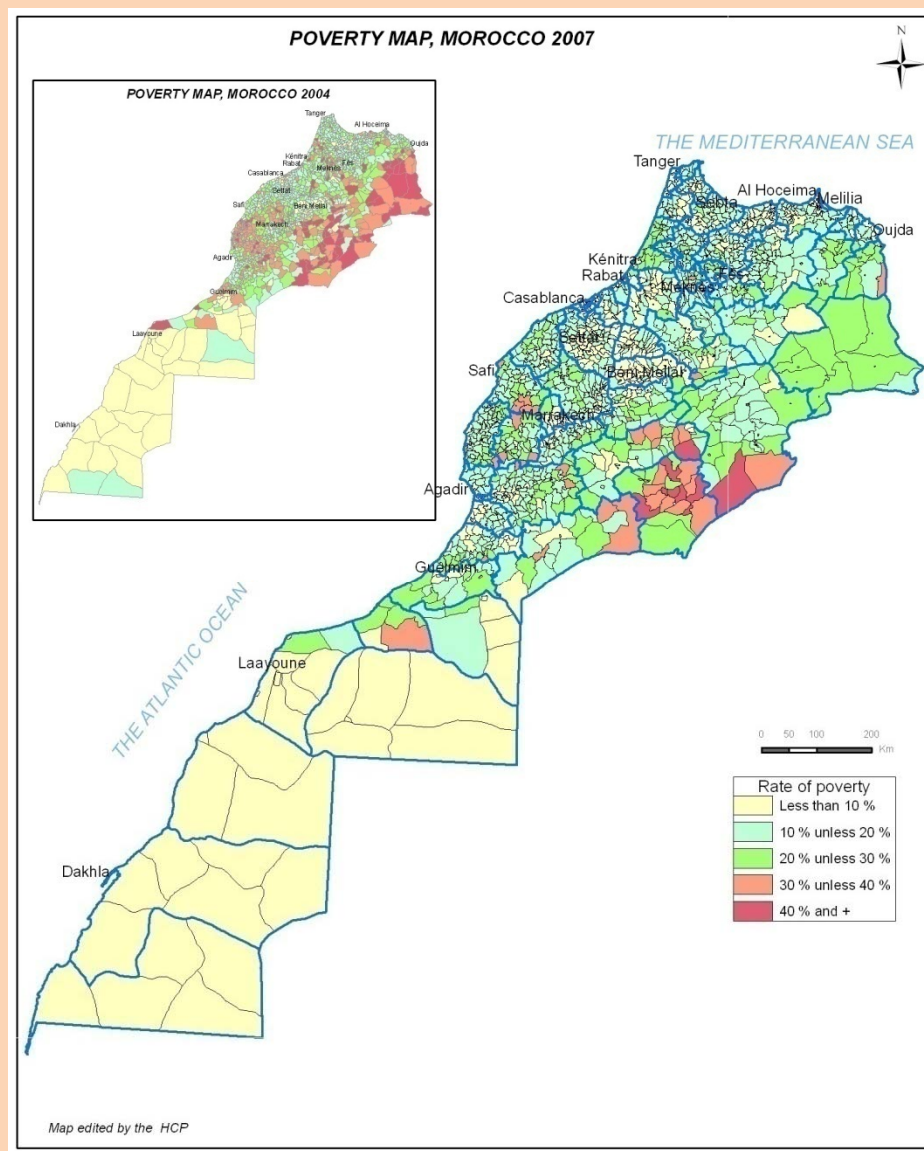
- Poverty maps of 2004, 2007 and 2011;
- National and regional socio-demographic Atlas for the census of 2004;
- Several thematic maps at the request of internal and external users operating in the fields of research, territorial development , health, telecommunications, ... etc.

Poverty maps





Poverty maps

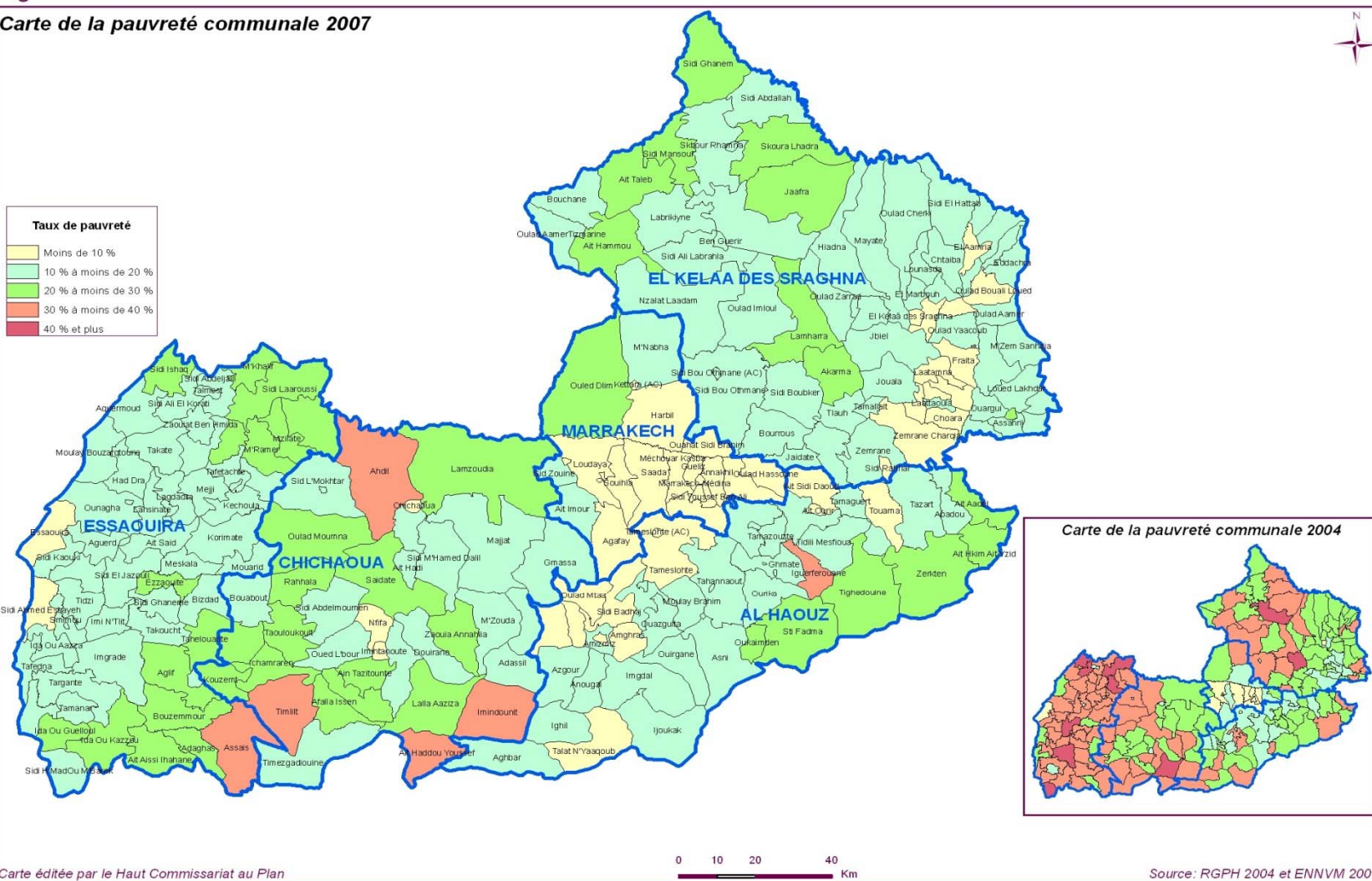




Poverty maps

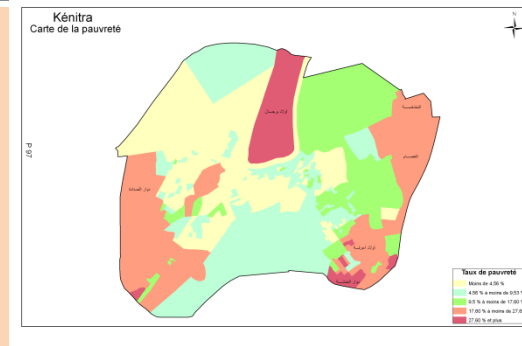
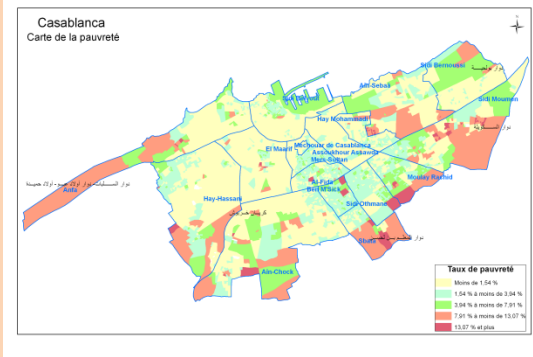
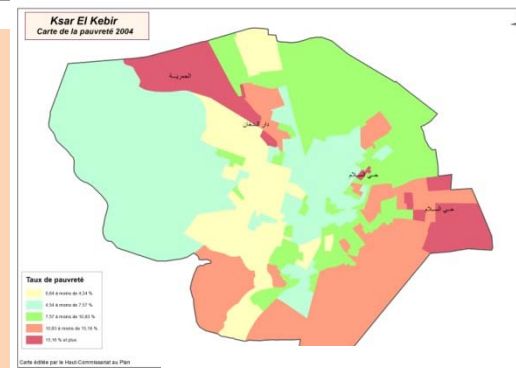
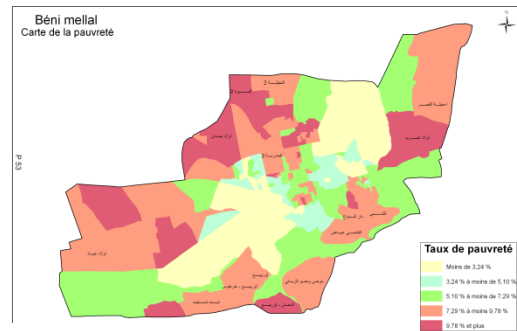
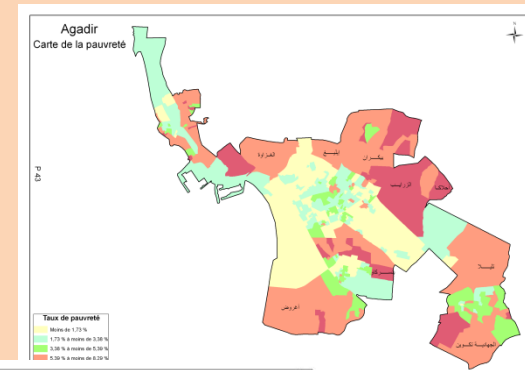
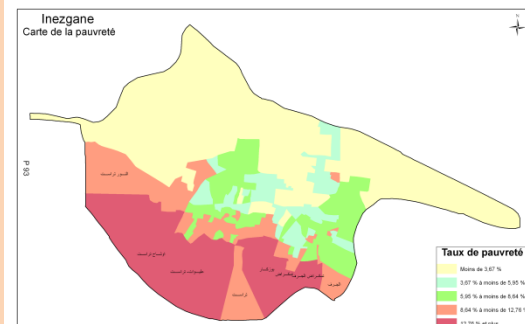
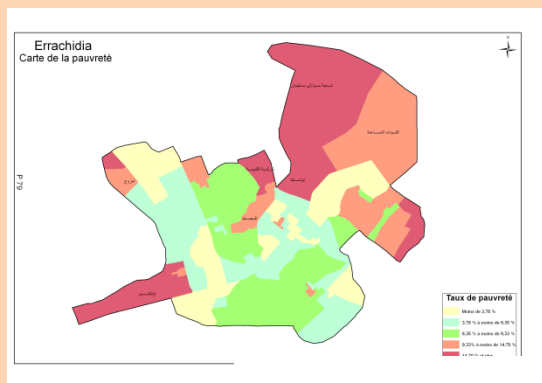
Région : Marrakech-Tensift-Al Haouz

Carte de la pauvreté communale 2007



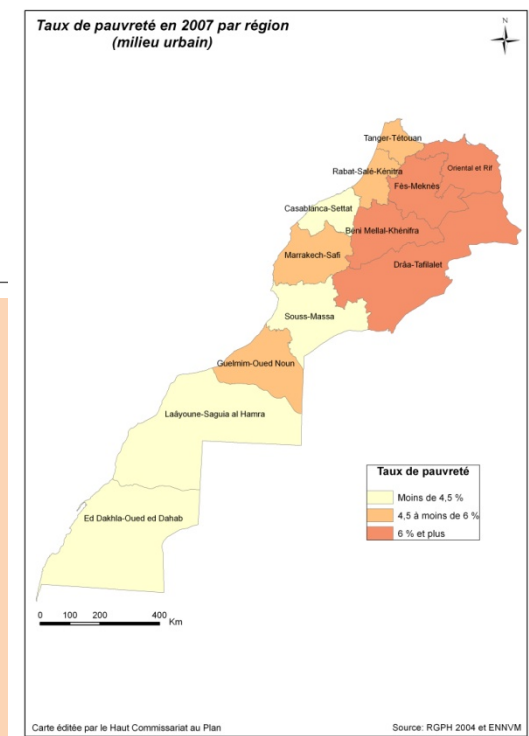
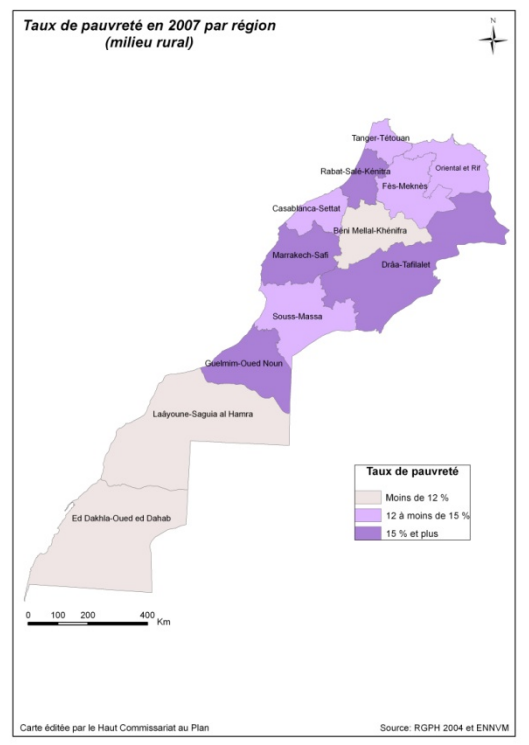
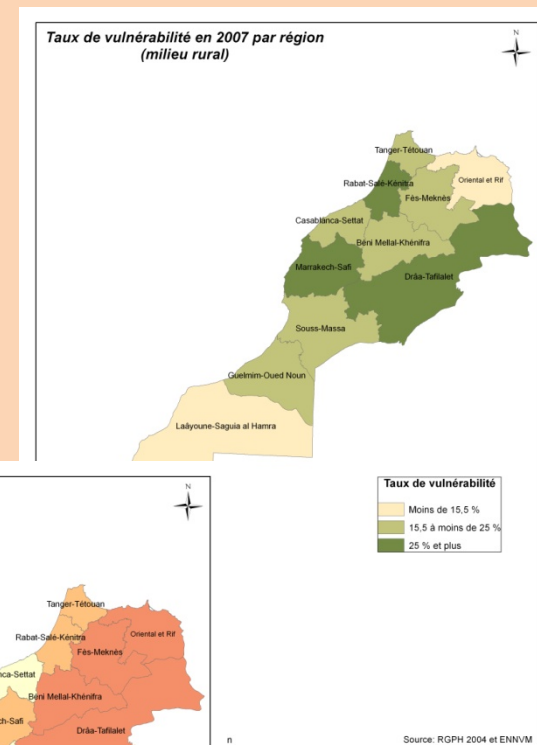
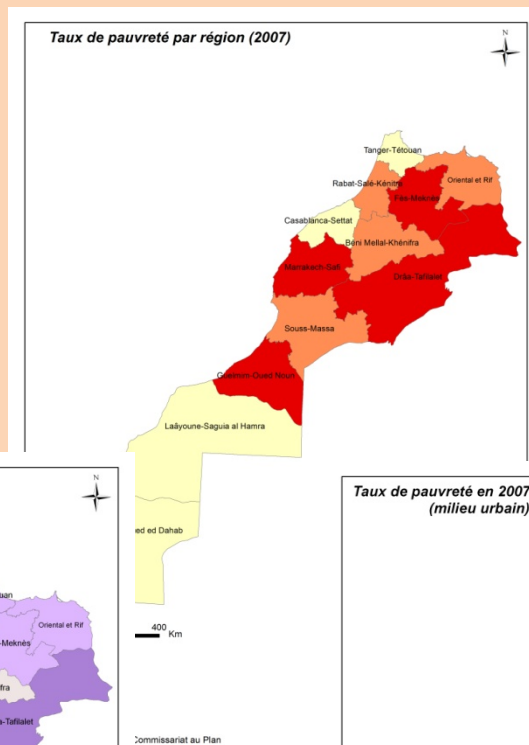
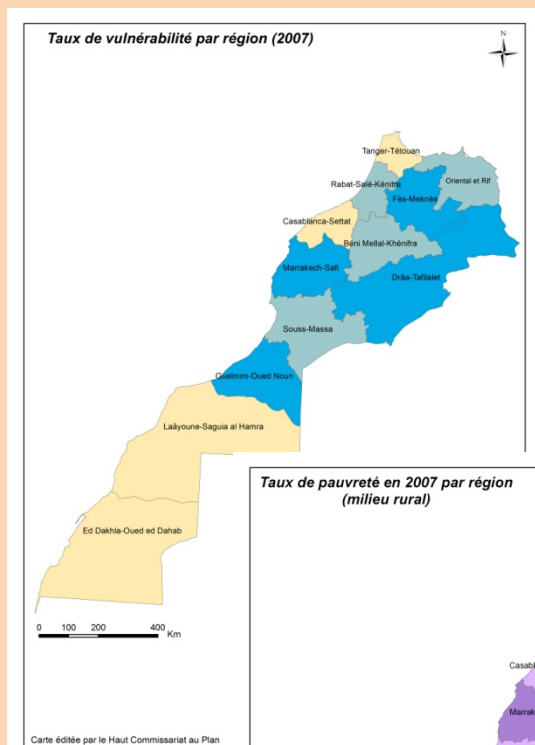


Poverty maps

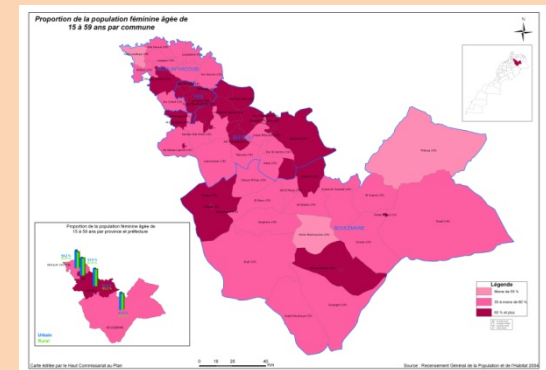
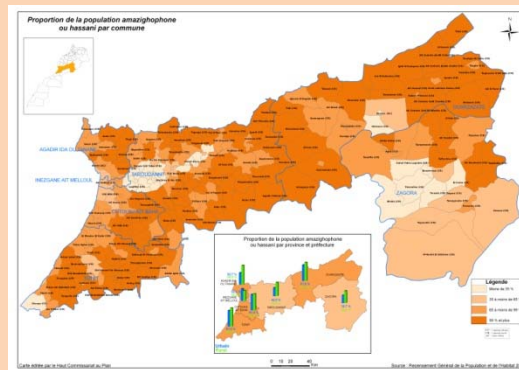
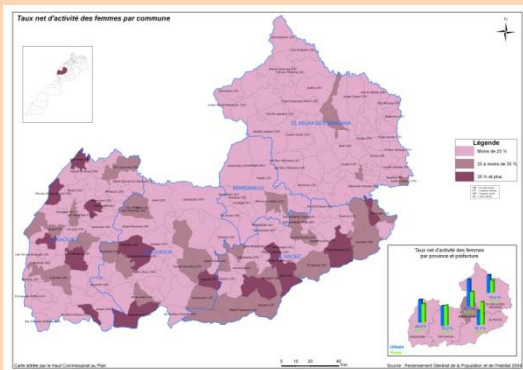
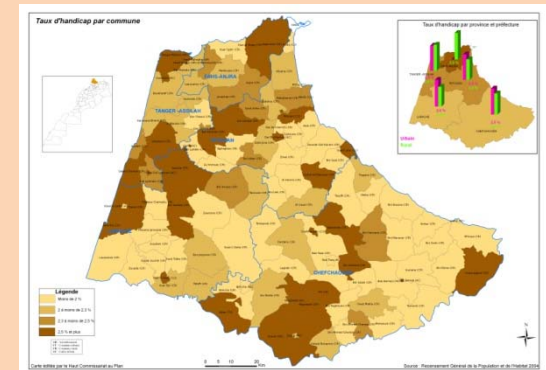
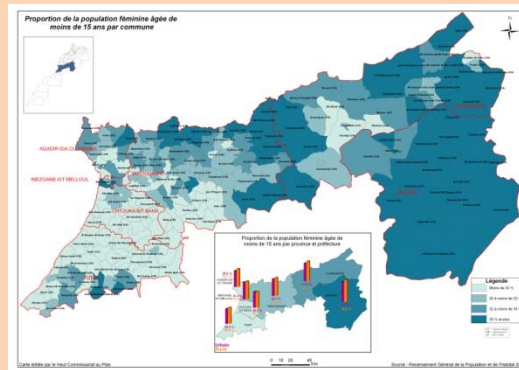
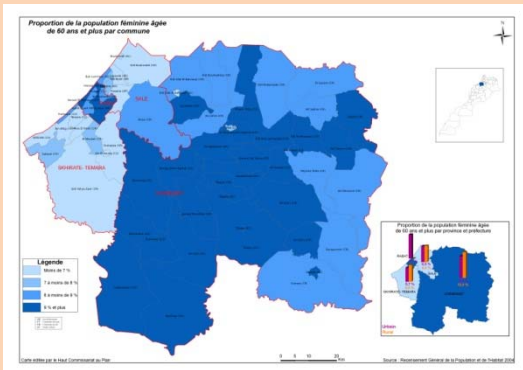
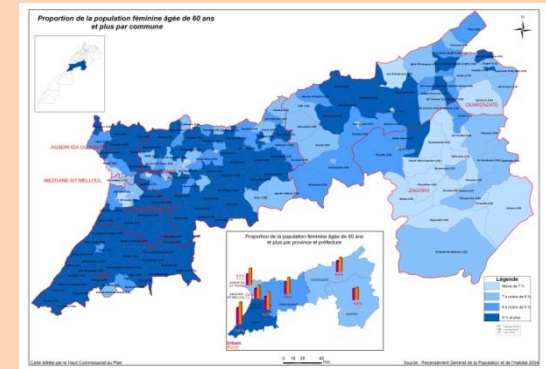
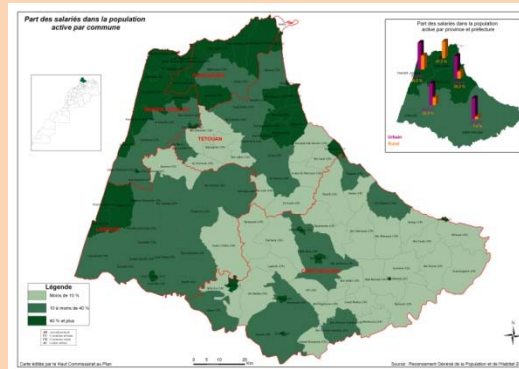
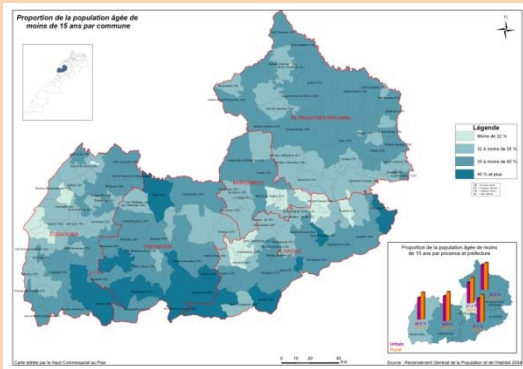




Poverty maps

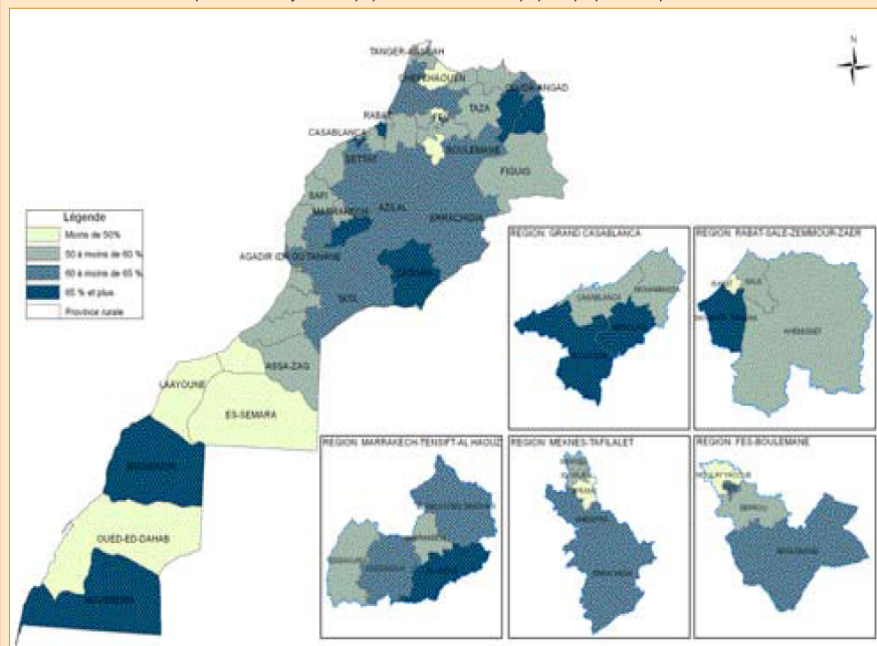


Regional socio-demographic Atlas



National socio-demographic Atlas

Proportion des ménages urbains propriétaires ou accédant à la propriété par province et préfecture

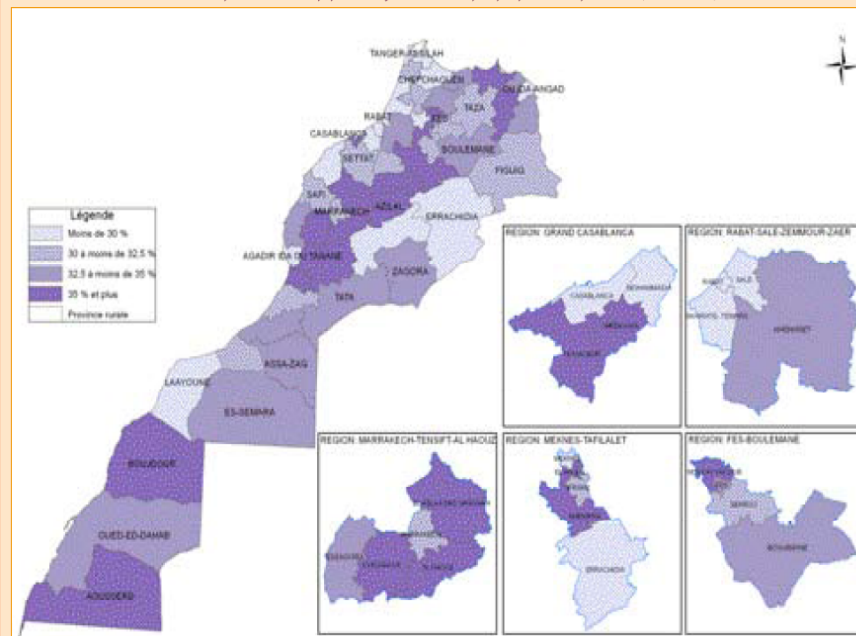


Carte éditée par le Haut Commissariat au plan

0 100 200 400 Km

Source : Recensement Général de la Population et de l'Habitat 2004

Taux d'analphabétisme de la population âgée de 10 ans et plus par province et préfecture (Milieu urbain)



Carte éditée par le Haut Commissariat au plan

0 100 200 400 Km

Source : Recensement Général de la Population et de l'Habitat 2004

Difficulties

- Frequency of update of census cartography (each 10 years);
- Difficult access to the digital cartographic files belonging to the specialized departments in cartography and geographical information;
- Lack of coordination between the different departments that are producing the geographical information;
- Shortage in skilled human resources for geographical information processing.

Despite all these achievements, the road is still long to install a platform that will gather all the GIS operators, this platform can reduce the costs of collection and dissemination of geographic information at all levels.

Thank you very much

Rachid Zoubir

High Commission for Planning – Morocco.



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High Commission for Planning

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