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MAPPING INITIATIVES IN MADAGASCAR

Presentation made by

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Mandates

AS THE NATIONAL MAPPING AGENCY

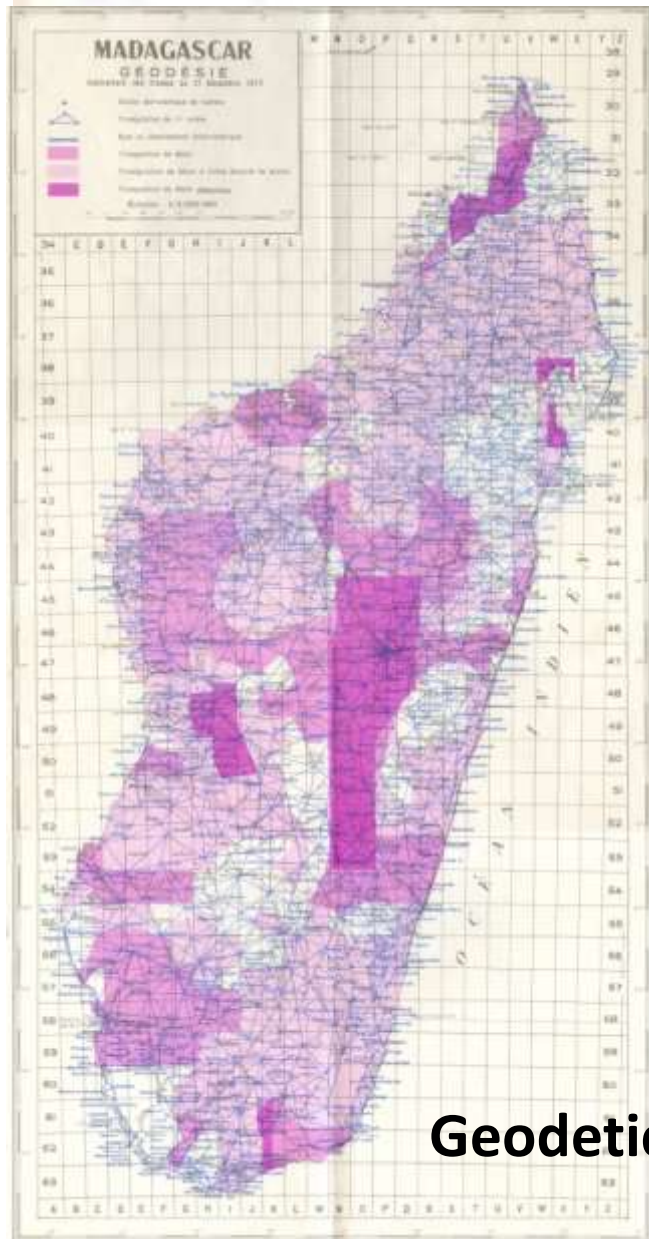
- Installation and maintenance of geodetic and levelling networks
- Aerial photography / satellite imagery coverage
- Basic topographic maps
- Administrative units boundary
- Geographical names

AS THE NATIONAL AUTHORITY IN GI

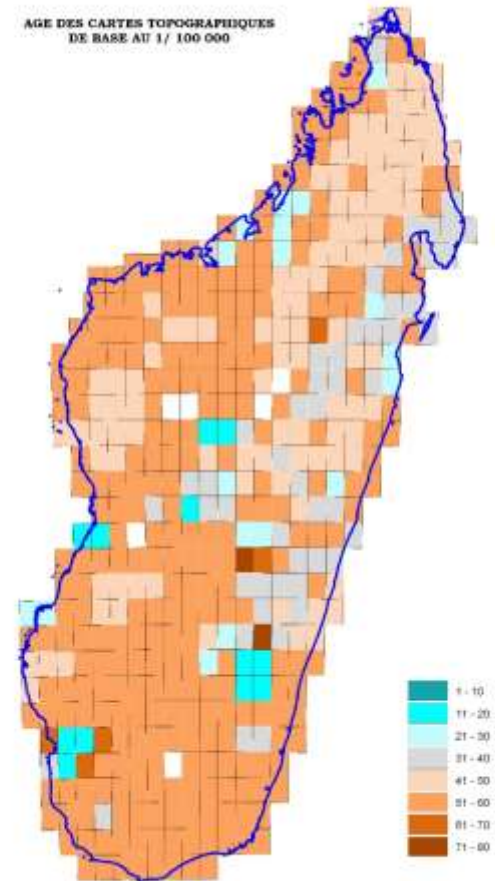
- Coordination of GI activities
- Technical specifications, regulatory texts
- Control of geospatial data produced on behalf of the administration
- Archiving
- Dissemination to users

Basic topographic maps
(average age around 50 years old)

- ❑ 1: 500,000: 12 sheets (100% of the territory)
- ❑ 1: 100,000: 456 sheets (100% of the territory)
- ❑ 1: 50,000: 172 sheets (20% of the territory)



Geodetic network



Main issues for national development

- **Madagascar** : a country whose population is mainly rural (about 80%, 4 out of 5 Malagasy people depend on natural resources: land, water and forests for their substance
- **Strong attachment of Malagasy people to their land**
- **More than 60% of disputes dealt with at court level related to land disputes, often leading to social conflicts and a source of insecurity.**
- **Development and infrastructure projects are often faced with land issues : identification of potential sites, avoid expropriation of people from their land for public purposes as much as possible**
- **Madagascar is one of the countries most affected by the effects of climate change:**
 - **drought in the southern part,**
 - **Repetitive and increasingly intense tropical cyclone leading with infrastructure, agriculture, settlement damages**
 - **flood risk (Antananarivo, coastal cities), landslides (Capital area)**





GI, support for the national development

Facing the needs of the country's development projects : Production of reference geospatial dataset at a national coverage

1990

Land Use and Land Cover (LULC) Layer (Landsat, 30 m GSD)

1997

- Renovation of Geodetic Network by GPS technology
- Topographic database at 1:10 000 (Capital area)

2000

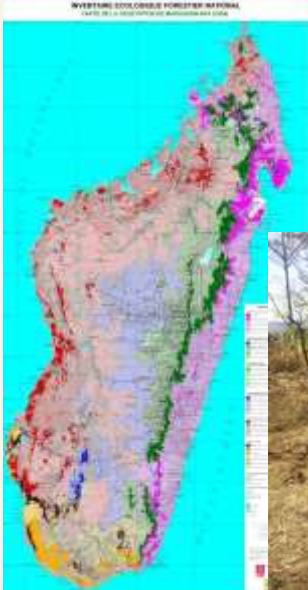
- LULC layer (Landsat, 30 m GSD)
- Vector Cartographic database
 - BD500 at 1: 500 00,
 - BD100 at 1: 100 000

2014

- Orthoimages SPOT 5 (2,5 meter GSD).
- Update of :
Transportation network,
Administrative boundary Layers of BD100 database,

2018

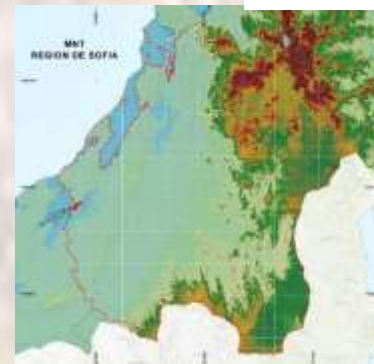
LULC Layer
Sentinel 2 (10 m GSD)





Ongoing project (National Coverage)

- Acquisition of high definition satellite orthoimages (50 cm GSD)
- Acquisition of precise DTMs (Type of Vricon type, at 4 m resolution)
- Aerial photography, LiDAR data acquisition, production of high resolution aerial TrueOrthophoto (20 cm GSD), LiDAR DTM and LiDAR DSM for the 76 urban centers of the country (34 000 Km²)
- Renovation and densification of the geodetic network using GPS technologies





Project implementation : Collaboration model

National Mapping Organization (FTM) :

- Technical specifications, Terms of References
- Establishment of the geodetic reference system : densification of the canvas by GPS, provision of a coordinate transformation grid between the national geodetic system and the global geodetic system WGS 84
- Quality control of final and intermediate products: Aero/Spatio-triangulation, DTMs, Orthoimages/Aerial TrueOrtho
- Field survey of Ground Control Points (GCPs) for quality control of final products

National and International private company

- Stereo-preparation
- Production of DTMs and Orthoimages/orthophotos
- LiDAR data processing



Reference regulatory texts

- **2015: Guidance laws on territory development and planning (article 36: obligation to link to the national coordinate reference system)**
- **2019: Ministerial decree on the technical specifications of photogrammetry survey in Madagascar**
- **2020: decree on the status of the FTM, confers on it, in addition to the traditional role of national mapping agency, the role of national authority (design project management: technical specifications, norms and standards, project management implementation: quality control of data produced on behalf of the administration, archiving, dissemination)**
- **2021: New decree defining the national reference system of planimetric and altimetric coordinates**



Data Sharing Agreement

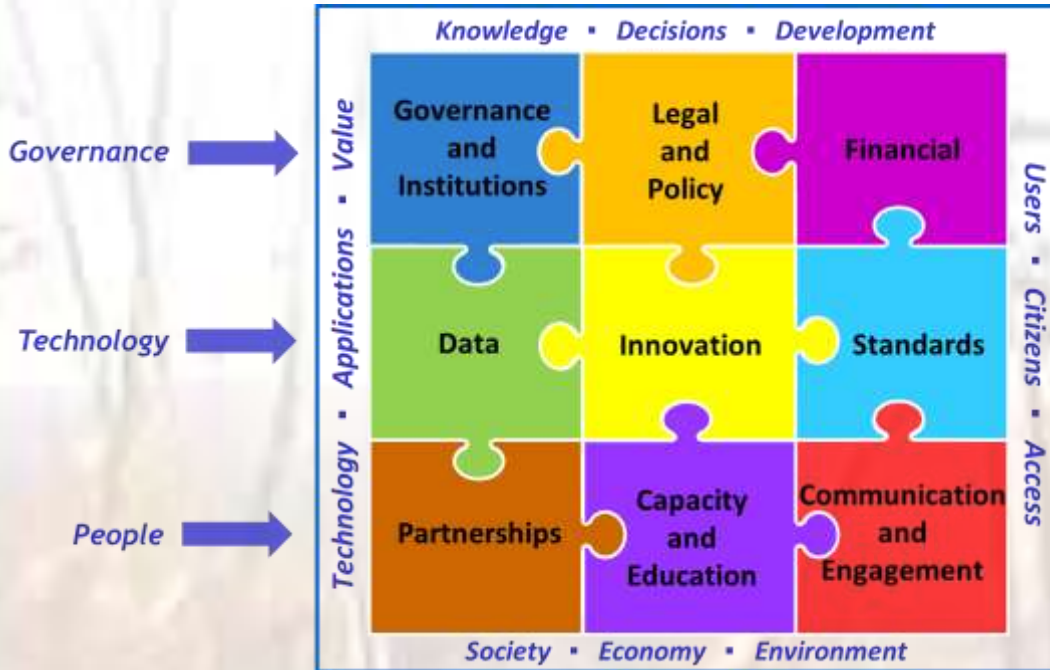
- **National Mapping Organization (FTM):** responsible for disseminating reference data to users
- **Earth Observation products (Orthoimages from SPOT 5, LULC Layer from Sentinel 2, Satellite Orthoimages at 50 cm resolution)**
: free access to public sector users, after making a request specifying: geographical area concerned, the detailed use
- **User agreement established between the FTM and the public entity specifying: scope, rights granted to users (internal and external use), intellectual property, responsibilities (Malagasy State represented by the FTM, users), distribution of derived products**
- **Act of commitment drawn up between the service providers (private sector) and the public entities holding the rights of use**



Challenges

- **Raising awareness and Buy-in of decision-makers (usefulness and importance of geospatial information, allocation of public resources)**
- **Development Capacity of a critical mass of professionals on NSDI Concept, IGIF framework, GKI Concept**
- **Coordination of geospatial information stakeholders at all levels : ministerial departments, local authorities, NGOs, technical and financial partners**
- **Establishment of a sustainable funding mechanism**
- **Ensuring better accessibility of quality and timely geospatial data to users**
- **Technical challenge : features extraction from high definition imagery**

- **Develop an IGIF Country Level Action Plan**



Prior actions from our point of view :

- **Communication** with professionals, decision-makers about the concept, its importance and benefits
- **Training** of a critical mass of professionals on the concept

Actions initiated

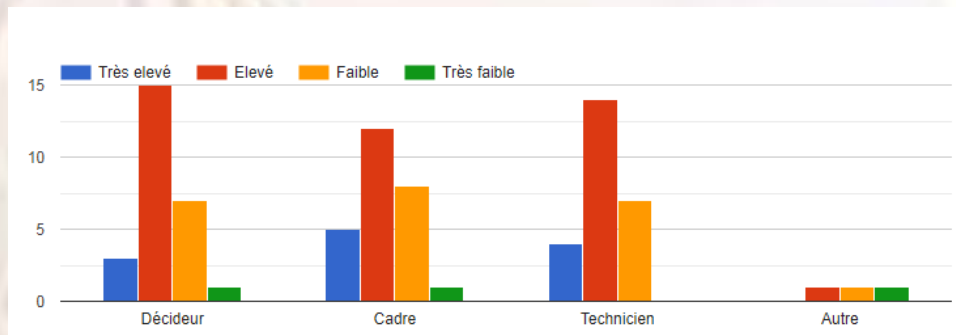
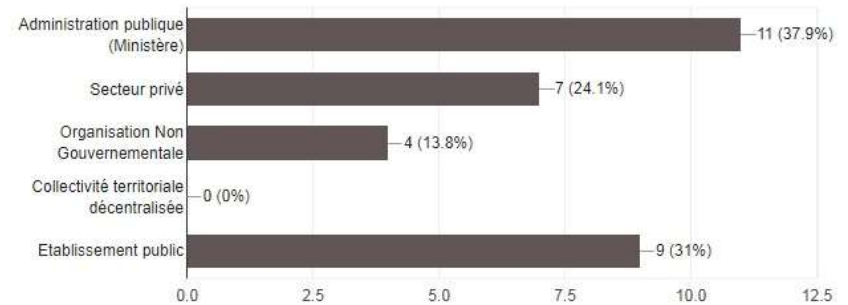
- Questionnaire on baseline assessment comprising 7 sections:

- policy and legal framework,
- strategy framework,
- Funding, business model,
- fundamental data set,
- norms and standards,
- technology and networks,
- capacity development

- 30 responding entities

Type d'organisation :

29 responses



A photograph of a dirt road in Madagascar, lined with tall baobab trees. The road is reddish-brown and leads into the distance. Several people are walking on the road. The sky is blue with some light clouds. The text "THANK YOU FOR YOUR ATTENTION" is overlaid in yellow.

**THANK YOU FOR
YOUR ATTENTION**