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Terms, specifications and creation of base maps to achieve the NSDI objectives

AI-Powered Geospatial Solutions: Integrating NSDI for Effective Land and Asset Management

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المملكة المغربية
ROYAUME DU MAROC
وزارة إعداد التراب الوطني والتعمير والإسكان وسياسة المدينة
MINISTERE DE L'AMENAGEMENT DU TERRITOIRE NATIONAL DE L'URBANISME, DE L'HABITAT ET DE LA POLITIQUE DE LA VILLE

برنامج الموئل

الاراضي العربية مبادرة
Arab Land Initiative

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NSDI - Egypt Base Map

Egypt has faced many difficulties and challenges in the information infrastructure related to Geographic Information Systems (GIS), as it is one of the few countries worldwide that started late in implementing a stable system for collecting and exchanging geographic data (NSDI).

These challenges arising from the absence of unified base maps for the entire Republic of Egypt, and this gap in spatial information infrastructure has negatively impacted in various aspects such as:

Financially:

- The repeated purchase of the same maps by different agencies costs the country vast amounts of money.
- Some entities invest in costly GIS infrastructure for their specific needs, which could be met with simpler applications if NSDI were available.

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Absence of unified base maps for the entire Republic of Egypt,

Planning-wise:

- The Egyptian government lacks a detailed vision of the current status of state resources, assets, activities, and development efforts across various sectors, including their geographical distribution.
- Differences in technical map specifications across different entities.
- The isolation of each entity prevents the assurance of data accuracy, continuity, and updates.
- The emergence of "information chaos" and inconsistencies in data, leading to confusion in decision-making.
- Loss of government credibility due to occasional conflicting decisions resulting from this unclear and fragmented data landscape.

absence of unified base maps for the entire Republic of Egypt,

Security-wise:

- Variations in the levels of GIS implementation and security measures across different entities.
- Differences in the expertise of personnel managing these systems, making it difficult to ensure that system content does not leak beyond its intended use.

Hence, there was a critical need to provide
a unified base map
for government entities.

Establishing Egypt’ s Official Unified Base Map:

The Egyptian government provided an official, unified base map for the entire country through the establishment of the National Spatial Data Center, This initiative will be supported financially and technically to ensure its implementation and sustainability.

The base map will serve as the core for developing National Spatial Data Infrastructure (NSDI),

To enable:

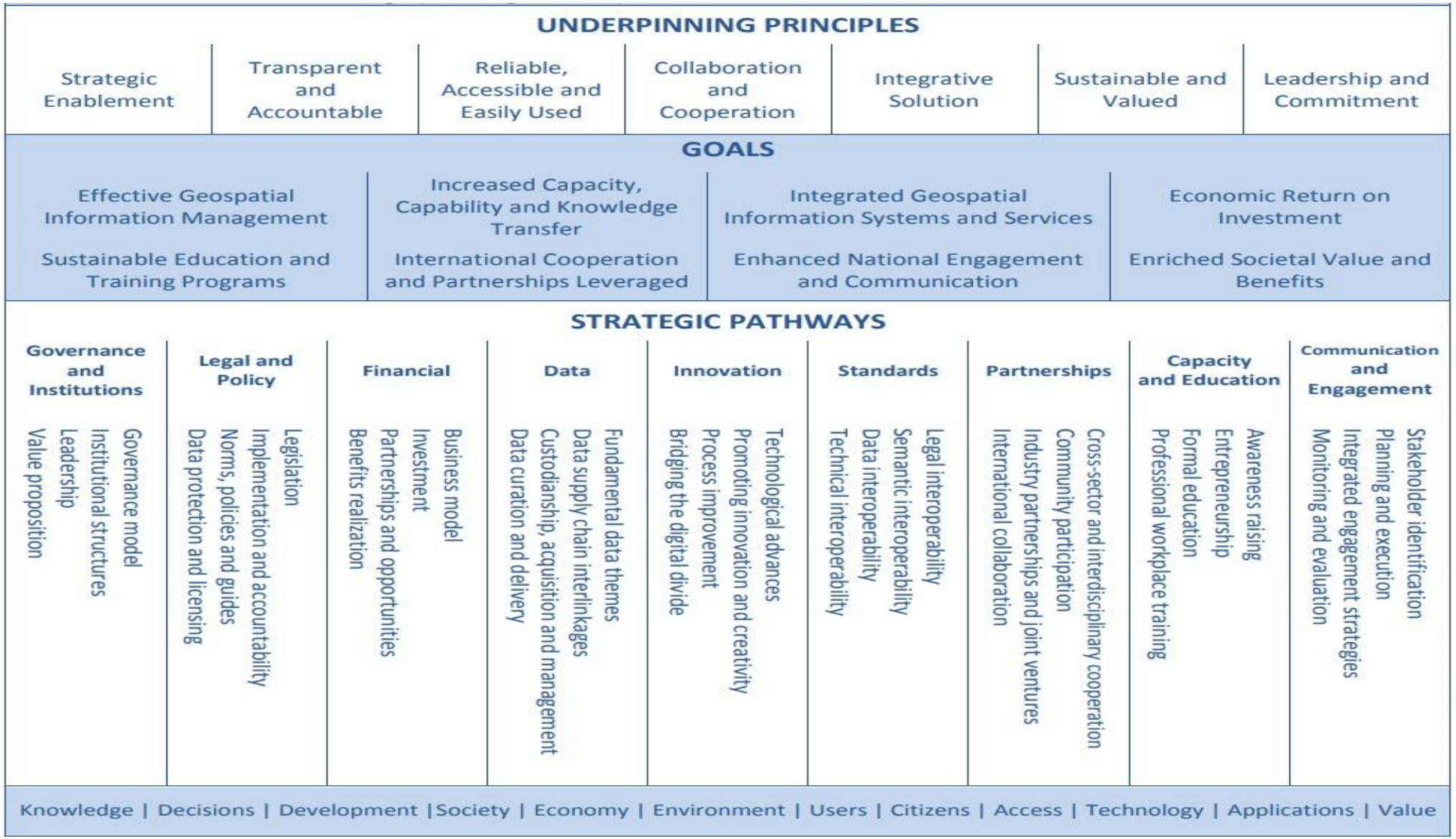
•Providing secure spatial data exchange between government entities.

•Integration of each entity's spatial data using modern technologies, communication systems, policies, and administrative procedures

•Development of GIS applications, spatial and descriptive analysis, indicator visualization, and spatial reporting

Taking into consideration that it aligns with **the principles and strategic directions of the Integrated Geospatial Information Framework (UN-GGIM-IGIF)**

INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK - IGIF



UN-GGIM
UNITED NATIONS COMMITTEE OF EXPERTS ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT

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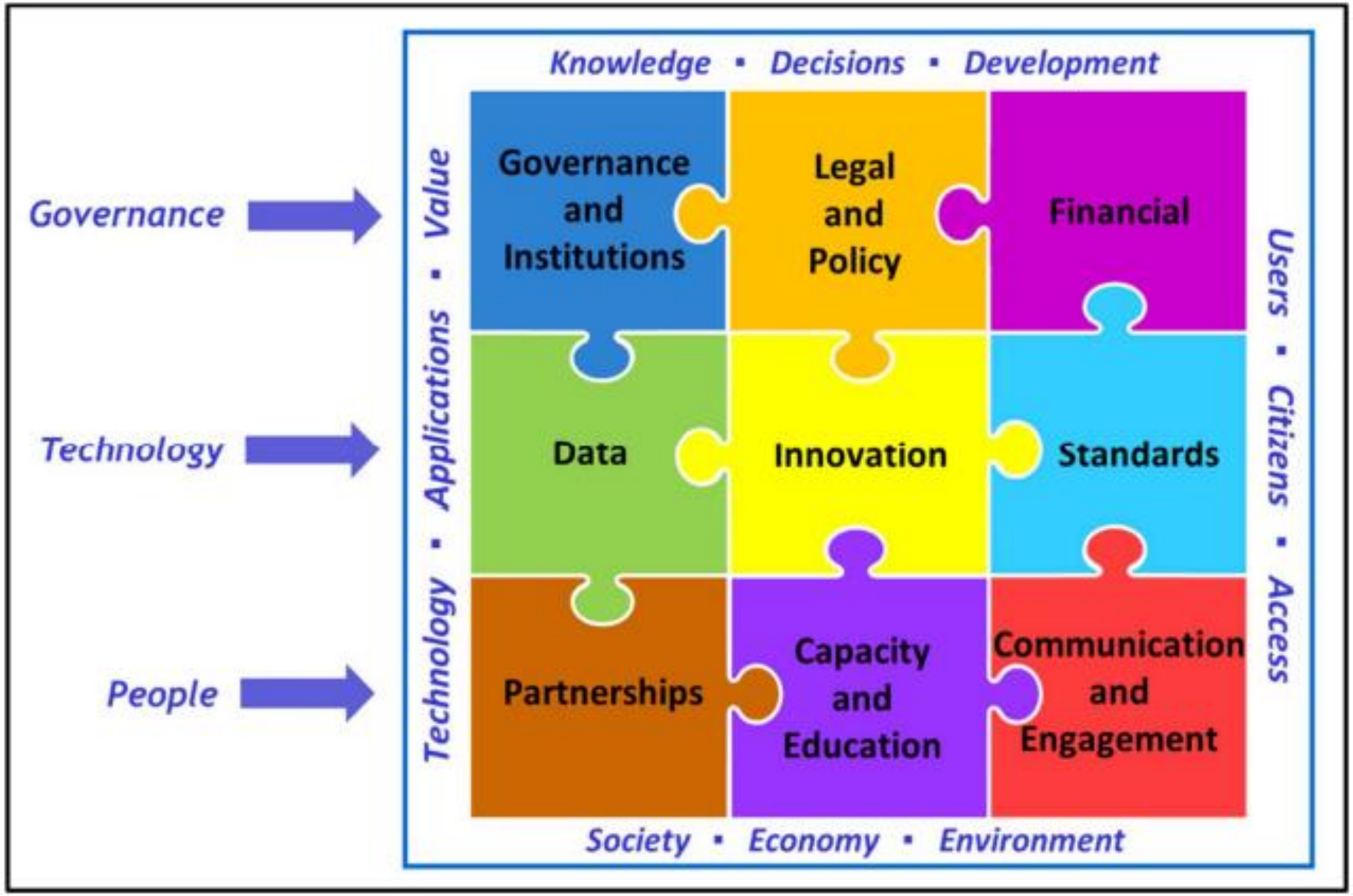
STRATEGIC PATHWAYS



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NSDI - Egypt Base Map

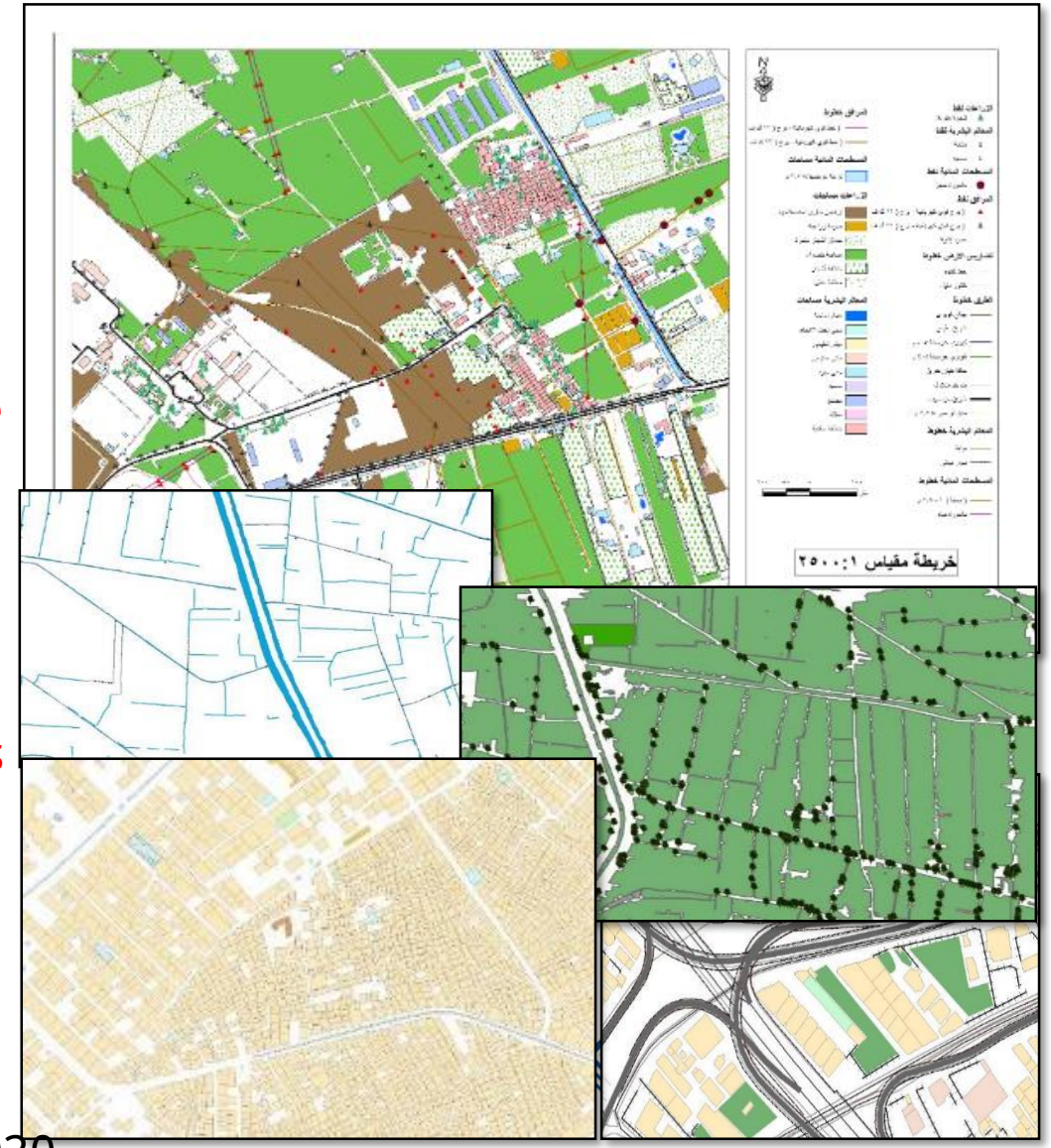
Objective of Creating the Base Map:

1. Comprehensive Coverage of Urban and Rural Areas with Detailed Maps
   - Achieve full coverage of Egypt with detailed base maps at scale 1:2500 to serve various entities.
   - regular and continuous updates of these maps.

2. Integrating Government Data into a Unified Geospatial Database
   - Link data from various government agencies into a comprehensive geospatial database.
   - Provide fast and efficient access through an electronic platform, enabling search, queries, and digital services.

3. Standardizing Survey References & Establishing Survey Networks
   - Unify survey references to align with global systems.
   - Establish Egyptian survey networks as a foundation for planning and effective spatial analysis.

4. Providing Data to Support Egypt’s Vision 2030
   - Offer comprehensive spatial data to aid in strategic decision-making related to development changes and Egypt’s Vision 2030.



NSDI - Egypt Base Map

Stakeholders:

- Egyptian General Survey Authority
- Armed Forces Engineering Authority (Military Survey Dept.)
- Ministry of planning, Economic Dev. & International Cooperation
- Private Sectors (such as Edge-Pro for Information Systems)

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➢ Egyptian General Survey Authority

Key Components of the Unified Digital Mapping Framework

1.Legal Accreditation of Digital Maps

2.Regular Updates and Resurveying of Geodetic Networks

- ➢ Continuous monitoring, updating, and reconstruction of vertical and horizontal geodetic networks

3.Quality Control and Standardization of Digital Maps

- ➢ Reviewing and ensuring the quality, preparation, and updating of digital maps.
- ➢ Ensuring alignment with projection and coordinate systems.

4.Training and Supervision for Data Collection Technologies

- ➢ Overseeing and providing training for participating entities in the use of digital data collection methods for building application layers.
- ➢ Utilizing advanced surveying technologies, such as GPS, digital surveying, satellite imagery, and other global and local mapping techniques.

5.Project Tendering and Execution

- ➢ Preparing and issuing the tender specifications document, launching the project.

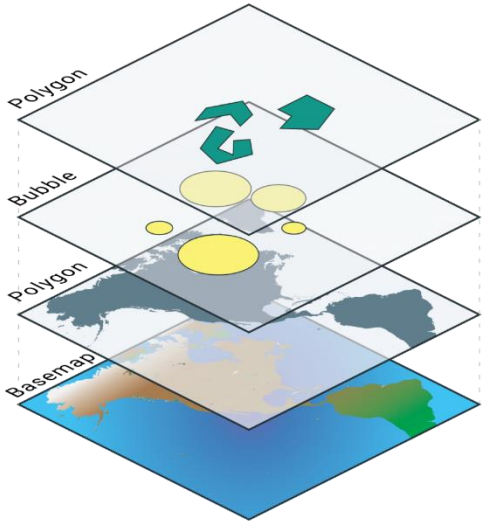
6.Alignment with Sustainable Development Goals (SDGs) and Strategic Pathways

- ➢ Ensuring that all mapping initiatives align with sustainable development goals and national objectives.

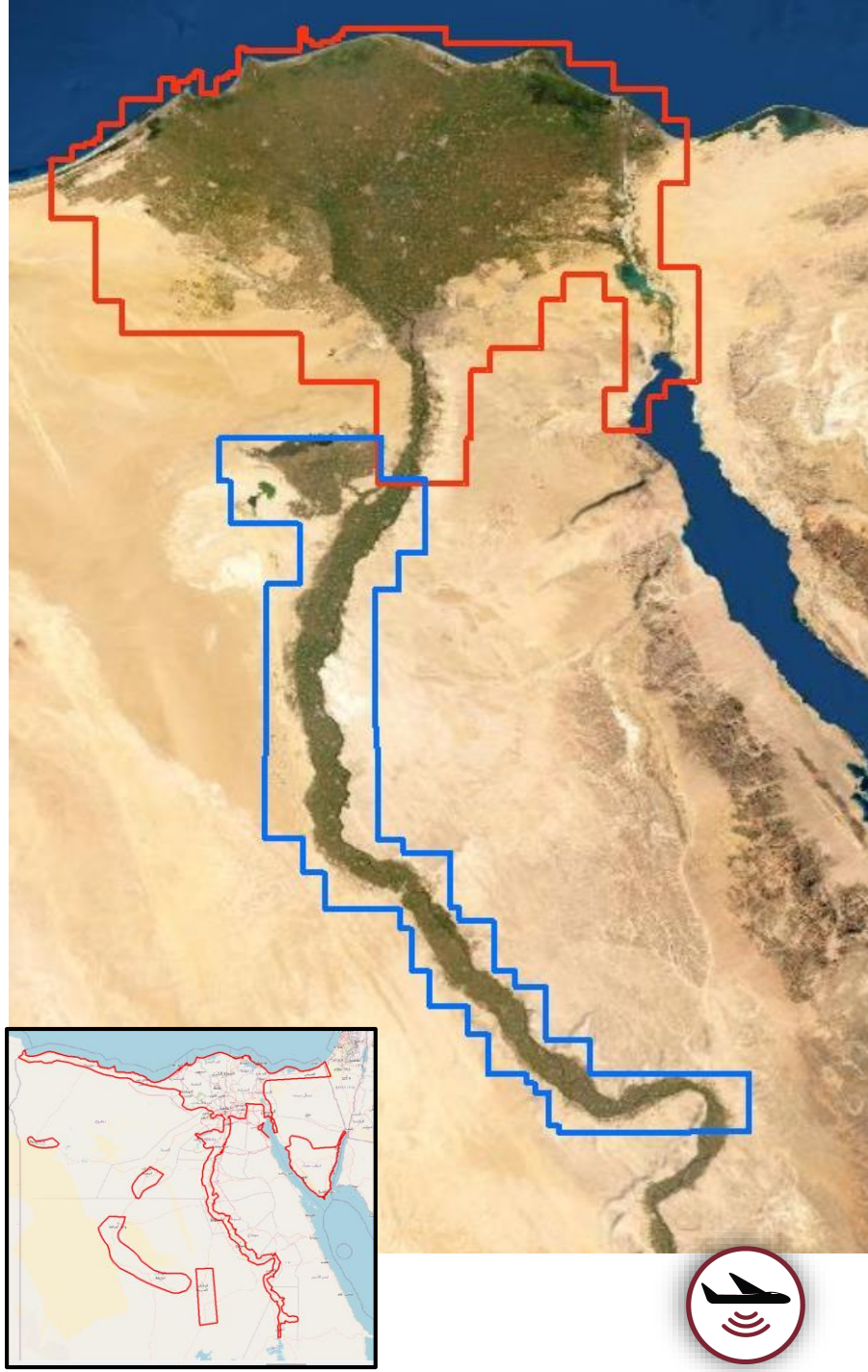
NSDI - Egypt Base Map

High resolution aerial photographs (30 cm)
Is the basic source to generate the national base map.

The project cover more than 100,000 km2.



Layers & spatial data integration between different organization



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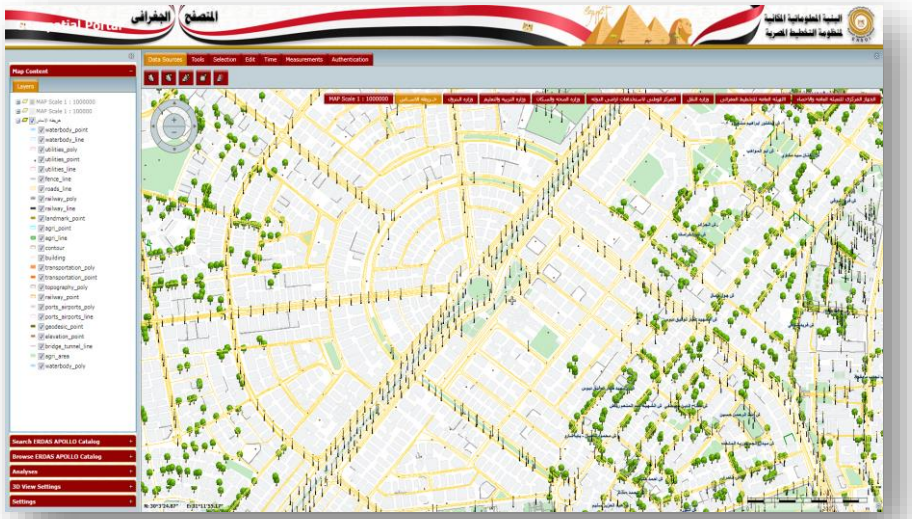

- Produce base map with scale 1:2500
- Updating the base map periodically using Arial Photos 30 cm
- More than 60 groups of layers (Residential buildings , land marks, streets, transportation, water surfaces ….)
- Geo-database INSPIRE standard

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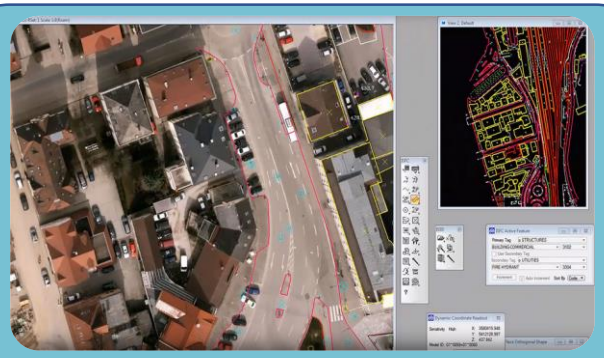
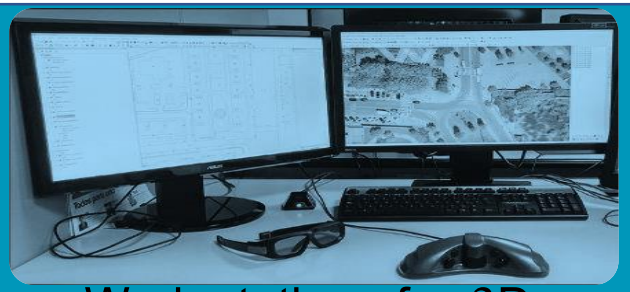
Software

Map production Data Center



Arial Photos



Work stations for 3D drawing

GIS Specialist

NSDI - Egypt Base Map

Results

✓ **Production Egypt base map of 125.000 km2**

at scale 1:2500

The base map was drawn and updated in the following stages:

- ✓ Phase 1: Mapping 49,000 km2 with aerial photos (2015-2017) (completed)
- ✓ Phase 2: Mapping 25,000 km2 with aerial photos (2015-2017) (completed)
- ✓ Phase 3: Mapping 50,000 km2 with aerial photos (2022-2023) (completed)
- ✓ Phase 4: Updating 49,000 km2 with aerial photos (2023-2024) (completed)