The Nation Land Capacity Building Model for Informatization

– an ICT based model to strengthen human resource capacity for the sustainability of land administration modernization projects

Beckhee Cho, LX Korea Land & Geospatial Informatix Corp
What is Capacity Building?

“the ability of people, organization, and society as whole to manage their affairs successfully.” (OECD/DAC 2006)

“the ability of individuals and organization and organizational units to perform functions effectively, efficiently, and sustainably.” (UNDP, 1998).

“… (i) capacity is not a passive state but is part of a continuing process; (ii) it ensures that human resources and the way in which they are utilized are central to capacity development; and (iii) it requires that the overall context within which organizations undertake their functions will also be a key consideration in strategies for capacity development.” (“Capacity Building in Land Administration – A Conceptual Approach” by Enemark and Williamson 2004)
Increased demand of global "Land Informatization"

- Accurate and rapid processing of national land administrative work
- Improve business productivity of public officials & secure the expertise
- Support decision-making in a scientific way when establishing national policies
- Optimization of land resource utilization by data sharing

"Importance of informatization has been increased in national land area"
The foundation of land informatization project – “ownership is everything”

- Build the Infrastructure
- Data Digitization
- Technological Independence
- Establishment of Informatization plan
- Establishment of Policy and system

“Local land informatization capacity”

“The success or failure of the project depends on local land informatization capacity”
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NLCBM-i

Sustainability
Effectiveness
Independency
Professionalism

developing country’s developmental direction of
Land informatization through NLCBM-i
Experience in ICT capacity

1. Short-term accumulated experience
   - Developed not over a long period of time but successfully implemented in a short period of time

2. Experience of cadastral survey based on informatization
   - Along with technology development
     - Cadastral surveys based on informatization

3. Experience of informatization education for developing country
   - Not covering all land sector but focused-driven on Land informatization

4. KLIS Know-How
   - Through several trials and errors
     - *PBLIS + **LMIS = ***KLIS  experience & know-how
Construction of a nationwide ICT-based system using an ultra high-speed national network, linking the Ministry of Land, Infrastructure, and Transport with 17 metropolitan cities and provinces, and 229 cities, counties, and wards.

**Before 2006**
- **PBLIS** Project
  - Start: 198.08
  - Completion: 200.04
- **LMIS** Project
  - Start: 198.02
  - Completion: 200.05

**After 2006**
- **KLIS** Project
  - Integration Development with Office of Prime Minister’s Public Order (PBLIS + LMIS)
  - Completed in 2006
  - Maintenance & update on-going

<table>
<thead>
<tr>
<th>[KLIS Project Cost]</th>
<th>Before 2006</th>
<th>After 2006</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>LMIS</td>
<td>200</td>
<td>-</td>
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<tr>
<td>PBLIS</td>
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<td>KLIS</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>309</strong></td>
<td><strong>36</strong></td>
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What is NLCBM-i?
National Land Capacity Building Model for Informatization

Systematic Structure for NLCBM
- Tool of Capacity Assessment
- Tool of Capacity Development
- Methodology of Capacity Building

Capacity Building /Development
Capacity for National Land Administration

Laws and institutions Capacity
Planning Capacity
Administration Capacity
Informatization Capacity
Development Capacity
Governance Capacity

etc.
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Capacity Assessment
- Social Indicator: Laws and institutions, national strategy, plans, etc. which is applied to the state
- Organization Indicator: Structure of Organization, Manpower, education institutions, infrastructure and technologies in the system
- Individual: Retained & necessary capacity of individual

Capacity Development
- National Level: Customized road map for capacity building
- Individual Level: Customized by individual Curriculum

Road-Map and Curriculum
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Diagnosis and Assessment Tool

- Land Information Governance
- Land Information Infrastructure
- Technology and Knowledge

- Law & Policy
- Data
- System
- Field Survey & Data Acquisition
- Database Construction & Management

National Capacity Building

National Capacity Building Strategic Plan for Land Information
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1) Component: Major components that form each perspective
2) sub-Component: Segmentalized indicator for practically verifying whether the current status of the recipient country satisfies each level of the component
3) Indicator: A standard indicator for diagnosing whether the recipient country stands in
4) Question: Questions for the experts of the recipient country to verify the sub-indicator
5) Answer: Different answers to choose from when given the questions
6) Evaluation Method: Method to calculate evaluation score of each question according to the chosen answers
7) Scoring rate: Weighted the scoring rate so that there is a distinction in scores according to which answer was chosen
### Key Assessment

| 1 | The basic right to access land information is guaranteed |
| 2 | Land information is not standardized |
| 3 | Administration of land information is conducted under legally defined roles and responsibilities |
| 4 | Lack of clearly defined legal framework pertaining to usage of digital land information |
| 5 | Preparation for utilizing spatial information is inadequate |

### Key Issue

1. **[Category for Basic Land Use]**
   Land use category is not clearly defined by law. And also, the role to register the category is not clear among ministries

2. **[Category of Land Taxation]**
   There is no taxation on land. Only local tax exist in municipality

3. **[Standardization of Land Measure]**
   OTC recommends land measure system for land survey. But many surveyors still don’t follow the system

4. **[Digitized Land Information Use]**
   There is no law and policy on usage and sharing of digitized Land information
## Key Assessment

1. Land information is managed in paper-based format, and land transactions are conducted with government validated paper-based document.

2. Map production taking place independently with agencies often focus only on their short-term objectives. As a result, quality of maps are substandard and updates are not performed regularly.

3. Land information is coded with identifiers in order to link information between organizations. Nevertheless, there are difficulties in linking use of information between organizations due to varying levels of sophistication among them.

4. The environment is not fully developed to produce and manage digital land information.

5. A new registration request is estimated to take at least nine months to complete.

## Key Issue

1. **[Accuracy of registered land information]**
   - There is no belief on the accuracy of land survey results. Because, in case of private company’s land survey, there is no review process to check their results.

2. **[Land Information Digitalization]**
   - 50% of OTC data is managed as analog.

3. **[Digitalization of Land administration]**
   - Most administrative proceedings and reports are process by hand.

4. **[Data integration & Update]**
   - Because of lack integration between other agencies, headquarters and branch offices, there is a difficulty of integration and update.
### Key Assessment Check List

1. Tunisia operates a software application developed in-house that supports administrative tasks related to recording and managing land attributes information, and to register land, as well as certificate issuance.

2. Even though cadastral maps are produced using Auto CAD, there is no single system that records and manages those cadastral maps.

3. There is no integrated land information system that links access to and usage of major land information such as land attributes, cadastral maps, topography, etc.

### Key Issue

1. **[Digital mapping]**
   Most surveyors use CAD for drawing cadastral plan, but they are lack of capacity to develop the digital seamless map. There is only digital seamless map for small area through a pilot project.

2. **[Information system for land administration]**
   There is tailored information system for reception and registration in CPF. But this system can not support full process for land administration.

3. **[Geographic cadastral information system]**
   There is no information system which is operated based on geographic data, and no information system for supporting land surveying, mapping, and land data processing.
Key Assessment Check List

1. Land surveys are conducted using modern surveying equipment including GPS
2. Even though cadastral maps are produced using Auto CAD, there is no single system that records and manages those cadastral maps
3. There is no integrated land information system that links access to and usage of major land information such as land attributes, cadastral maps, topography, etc.

Key Issue

1. [Utilization of aerial/satellite images]
   OTC is difficult to acquire its own aerial/satellite images, but CNCT uses aerial/satellite images
2. [Distribution of PC for land administration]
   Ti has a significantly lower PC distribution rate, but OTC and CPF have a high distribution rate of PCs.
3. [Institutional data integration infrastructure]
   There is no data center for the integrated management of data within the OTC organization, and there is no network for data linkage between headquarters and branch offices.
Key Assessment Check List

1. Total stations are actively used to conduct cadastral surveys
2. CAD technology is available to all OTC surveyors
3. Geodetic Control Point (GCP) are well distributed across regions and 23 GNSS CORS are installed and fully operational
4. The technology to create Cadastral maps by processing aerial and satellite images is substandard
5. Only about 15 percent of OTC’s cadastral and land diagram records are maintained in scanned form
6. Shortage of ge-referencing experts to perform coordinate conversion

Key Issue

1. [Analog data digitization]
   Vectorizing is in progress, but most of the drawing data is simply scanned and archived / archived data is also simply scanned and archived

2. [Utilization of aerial image and satellite imagery]
   Lack of equipment makes it difficult to acquire aerial and satellite imagery and lacks image processing capability

3. [GNSS CORS]
   There are 23 CORS, but lacks operational and management capabilities and no training courses for installation / operation
### Key Assessment Check List

1. More than 90 percent of the working documents follow a standard format
2. Land documents are managed under separate process explicitly dedicated to update and maintain documents
3. PCs are utilized to input and save land data
4. Data architecture and standardization have not been implemented
5. No specialized personnel trained in DMBS
6. A comprehensive data base system has not been established

### Key Issue

1. **[Data architecture/ standardization]**
   Knowledge of data architecture absent and capacity is deficient

2. **[Data architecture]**
   Knowledge of data architecture absent and capacity is deficient

3. **[Build-up Maintenance]**
   Data maintenance level limited to scanning / enhancement is necessity
## Key Assessment Check List

1. Operational procedures and functional standards are defined
2. Use of GIS to perform administrative functions
3. Endowed with basic PC skills
4. Deficient knowledge of system architecture and standardization planning
5. Most organizations do not have an operational land information system
6. Most organizations do not have an IT room

## Key Issue

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<thead>
<tr>
<th>1</th>
<th>[System Architecture/Standardization]</th>
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<tr>
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<td>Lack of Architecture and Standardization knowledge / need for standardization</td>
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<th>2</th>
<th>[GIS S/W utilization]</th>
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<td>GIS S / W is used for specific tasks but lacks knowledge about software tools</td>
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<th>3</th>
<th>[PC and Data Management]</th>
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<td>Organizations that need to use PCs have a high penetration rate of PCs but not all organizations are not managed due to lack of dedicated IT department</td>
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<th>4</th>
<th>[Data Server Management]</th>
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<td>There are data server, but lacks maintenance and operation capabilities</td>
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**EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:**

**ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES**

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<th>Assessment Items for Priority</th>
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<th>Strategic Importance</th>
<th>Korea</th>
<th>Strategic Importance</th>
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<td>The legal basis for ensuring the scope and use rights of digitized land information should be secured</td>
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<td>Land information system and land informatization plan should be established from the long-term perspective of spatial information convergence and integration</td>
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<td>4.25</td>
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<td>Systems and procedures must be established to produce and manage accurate land information</td>
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<td>Facilities and networks are needed for data integration management within main organizations</td>
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<td>Train personnel to maintain and manage land information systems</td>
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<td>Strengthen capacity to utilize digitized land information</td>
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**Average**

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**ORGANISED BY**

**MAIN SUPPORTERS**

**PLATINUM SPONSORS**
<table>
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<th>Assessment Result</th>
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<td>PC and modernization surveying equipment should be additionally supplied for computerization of land information.</td>
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<td>Facilities and networks are needed for data integration management within main organizations.</td>
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<td>Train personnel to maintain and manage land information systems.</td>
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**Assessment Result**

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**Land information system and land informatization plan should be established from the long-term perspective of spatial information convergence and integration**

- It reflects the opinion of the Tunisian expert who understands the situation of the present Tunisia.
- Since the data is in a state of insufficient data, it is determined that data acquisition is the priority and a low score is assigned. However, it is reasonable to maintain the opinions of the existing Korean experts considering the national level.

**To link and update the data, the land information data of the major agencies and their relationship should be structured and managed**

**Due to the use of low-resolution orthographic and aerial photographs, there are some problems such as land disputes. Therefore, the reliability of orthographic and aerial photographs is low, and they are not urgently required at present.**

**Ortho-photo applications should be introduced for mapping**

**Facilities and networks are needed for data integration management within main organizations.**

**Securing data is more important than network construction. It is true that the network should be established for sharing, managing, utilizing, and securing the collected data after the data is collected to some extent, but the importance is low, now.**
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<td><strong>T01</strong></td>
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Stage 1. Enhancing land Informatization capacity

1) Securing legal basis for ensuring the scope and use rights of digitized land information
2) Training of land information system maintenance and management personnel
3) Strengthening land information utilization capacity

Stage 2. Land information digitization

4) Establishment of procedures and procedures for land information production and management
5) Digitized land information and land administration

Stage 3. Building the land information system

6) Design and construction of land information system based on GIS
7) Establishment of national land information data architecture
8) Establishment of facility and network for data integration management
ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES

1. Securing legal basis for ensuring the scope and use rights of digitized land information.
2. Training of land information system maintenance and management personnel.
4. Establishment of procedures and procedures for land information production and management.
5. Digitized land information and land administration.
6. Design and construction of land information system based on GIS.
7. Establishment of national land information data architecture.
8. Establishment of facility and network for data integration management.
Thanks for your attention!
Q & A