MONGOLIA’S EXPERIENCE ON INTEGRATING GEOSPATIAL INFORMATION WITH ADMINISTRATIVE RECORDS TO PRODUCE OFFICIAL STATISTICS

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Workshop on Integrating Non-traditional data sources in the production of the SDG Indicators
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CONTENT

• Quick facts about Mongolia
• Geospatial statistical development at the NSO Mongolia
• Integrated statistical database
• Preparation for the 2020 census
Key facts about Mongolia

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
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<tbody>
<tr>
<td>Territory</td>
<td>1.5 million sq.km</td>
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<tr>
<td>Population</td>
<td>3.1 million</td>
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<td>Population density</td>
<td>2.0</td>
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<tr>
<td>Rate of natural increase</td>
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<td>GDP per capita</td>
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<td>HDI</td>
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SOCIO-ECONOMIC EFFECTS OF POPULATION DISTRIBUTION

Over-population in urban areas

VS.

Under-population in rural areas

Internal migration towards Ulaanbaatar

Ulaanbaatar population 1.4 million (46% of total)

UB population density 306.5

Insufficiency of education and health services

Poverty, unemployment, crime rate

Air pollution, traffic jam, water and soil

Political and economic transitions of 1990s

Insufficiency of education and health services
NUMBER OF OFFICIAL STATISTICAL INFORMATION NSO MONGOLIA RELEASES

SOURCES OF STATISTICAL INFORMATION NSO COMPILES

- National Censuses - 5
- Household sample surveys - 10
- Administrative statistics from ministries and agencies

Macroeconomic statistics
- 8 topics
- 58 indicators

Population and social statistics
- 17 topics
- 157 indicators

Industry, science and technology statistics
- 13 topics
- 93 indicators

Legal statistics
- 5 topics
- 20 indicators

Environmental statistics
- 5 topics
- 18 indicators
DEVELOPMENT OF GEOSPATIAL STATISTICAL FRAMEWORK AT NSO MONGOLIA

• GIS was first introduced at the NSO Mongolia for the 2010 Population and Housing Census: used throughout all stages
• Before 2010, geographic information in statistical undertaking mainly served as planning and monitoring tools in forms of roughly drawn basic cartography.
• The development of GIS at the NSO Mongolia brought the inter-agency government collaboration to a new level.
  – Changes in legal basis were carried out in regards to enabling the use of certain scale topographic and cadastral maps, which were otherwise considered as classified and not shared.
GEOSPATIAL DATABASE AT THE NSO

- Use of GIS in censuses
  - Location of enumeration unit (e.g. household) was captured and digitized without the use of GPS devices
  - Development of web-based GIS
  - Dissemination of census results on an interactive web maps
  - National Atlas

The 2010 Population and Housing Census
Agricultural Census of 2012
Business Establishments Census of 2011 and 2016
INTEGRATED STATISTICAL DATABASE

- In 2015, Population and Housing by-Census was conducted for the first time since the enactment of the Law on Population and Housing Census in 2008.
- It was the first ever register-based census approach for Mongolia.
- Based on existing local database of population and household register booklet recorded and kept at the primary level administrative units, real-time and online Population and Household Register Database was created.
VISION OF INTER-AGENCY INTEGRATED GOVERNMENT DATABASE

BASELINE DATABASE

Population and Household Database

Civil registration
Legal entity
Real state
Cadaster

Currently established

To establish in near future

Geocoded address

Users by level:

Government organizations
Research institutes
Other advanced users
General public: Online, Publications, Posters
USE OF SATELLITE IMAGERY FOR STATISTICAL PRODUCTS AND DECISION MAKING

• Geospatial statistical database established at the NSO Mongolia comprises of individual census databases and the Population and Household Register Database.

• Administered online by local officers at primary level administrative units, the Population and Household Register Database displays high resolution satellite imagery as its base map.

• Local officers can digitize household locations on it while keeping the demographic and socio-economic records of the household members.
BENEFITS OF USING SATELLITE IMAGERY IN THIS DATABASE

- Latest physical location of herders who are highly mobile unit of enumeration can be determined prior and during census and survey enumeration.
- Accurate: Contrary to using handheld GPS devices
- Cost-efficient: no field exercise for collecting waypoints
- Huge potential to be used as the basis for planning, producing official statistics and conducting researches
  - When linked with administrative records, such as education, health, border patrol, emergency and so on
- The biggest challenge when linking different databases remains in the alignment of key indicators, coding standards and classifications.
Each household is assigned with a unique ID number that stays with the household when moved to a different place.

With this feature, lifetime migration can be captured and analyzed which was otherwise possible based on decennial census results only.
INTEGRATION OF CENSUS DATABASES

- Incorporation of **household ID number** into the Livestock Census and Agricultural Census enabled further use of the geospatial statistical database to produce non-traditional statistical products.
EXAMPLE OF USING INTEGRATED GEOSPATIAL STATISTICAL DATABASE FOR INFORMED DECISION MAKING

Locations of nomadic households with livestock in Sums with bad winter condition

- Households in Sums with extremely bad winter
- Households in Sums with bad winter
Enter Parcel ID's

Incorporating administrative records into geospatial statistical framework

For businesses and establishments:
Quarterly report questionnaire on agricultural activities

Define location using AgricultureDatabase by joining Parcel ID
INTEGRATED URBAN DEVELOPMENT GEOSPATIAL DATABASE OF THE CAPITAL CITY ULAANBAATAR

Apart from the development of the National Geospatial Infrastructure, the Capital city of Ulaanbaatar has been working on its own creation of state of the art Integrated Urban Development Geospatial Database.

www.ulaanbaatar.maps.arcgis.mn
The 2020 Population and Housing Census
DATA COLLECTION STEPS

1. Establish inter-agency integrated government database matched by key indicators.
2. Conduct address based Building and Housing Census.
3. Deliver a unique code to each housing unit for accessing the e-census questionnaire.
4. Enumerators visit households that have not answered the e-census questionnaire to collect information.

Methods:
- CAPI
- Citizens participate the census via online (CAWI)
PREPARATION FOR THE BUILDING AND HOUSING CENSUS

- Evaluation of existing geospatial database for building and housing information;
- Establishment of statistical units that are not linked with administrative units for sole statistical purpose;
- Integrated coding standards;
- Establishment of geocoded address database;
AVAILABILITY OF BUILDING RELATED GEOSPATIAL DATABASES

- Capital city Master Planning Agency
  - Buildings
  - Addresses
  - Urban planning

- Heating & Electricity Companies
  - Households
  - Addresses
  - Supply system

- Authority of State Registration
  - Real estate
  - Legal entity
  - Civil registration
  - Hospitals
  - Schools

- Administration of Land Affairs, Geodesy and Cartography Agency
  - Addresses
  - Cadaster
  - Maps

- NSO Mongolia
  - Establishments
  - Livestock
  - Population
  - Households
CONCLUSION

• NSO Mongolia is trying hard and quite successful.
• Point data in censuses created possibilities
  – improved its geospatial statistical framework
  – enabled visualization
  – dissemination of more effective statistical products for informed decision making.
• Satellite imagery for geo-referencing point data has been a cost-efficient mission while the database is highly regarded by local administrative officers as the key tool for statistical and administrative purposes.
• National interest on geospatial development has been rising
• NSO Mongolia is one of the leading agency for the improvement of geospatial statistical framework.
THANK YOU FOR YOUR ATTENTION.

Please visit
www.nso.mn for general information
www.1212.mn for statistics
www ulaanbaatar.maps.arcgis.com for UB maps