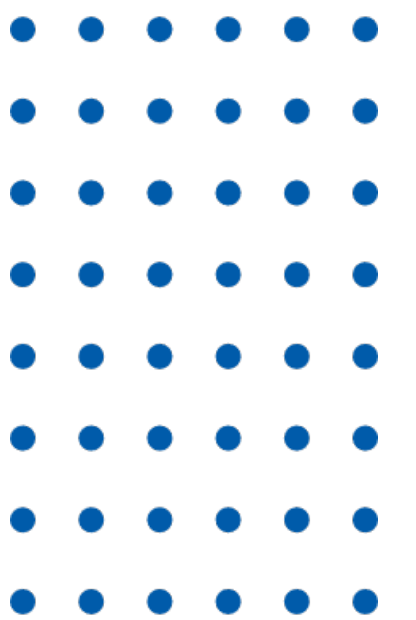




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MONGOLIA'S EXPERIENCE: THE USE OF BIG DATA FOR THE PRODUCTION OF OFFICIAL STATISTICS



2024.10.03



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CONTENT



1. Legal Environment

2. The Experience of Mongolia

2.1. Administrative Statistics – The Government's Integrated Database

2.2. Big Data – Agricultural Statistics

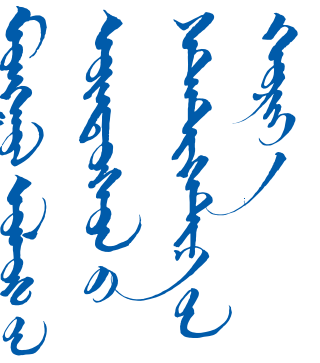
3. Key Considerations

4. Future Plan



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I. LEGAL ENVIRONMENT



Laws on Set of Digital Development

Law on Public Information Transparency

On the Protection of Private Information

Law on Statistics

Vision 2050 Long term Development program, Mongolia

5.3.5. A unified big data-based information repository will be established, providing the technological infrastructure for citizens, the government, and businesses to electronically exchange and utilize information.



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II.1. THE GOVERNMENT'S INTEGRATED DATABASE



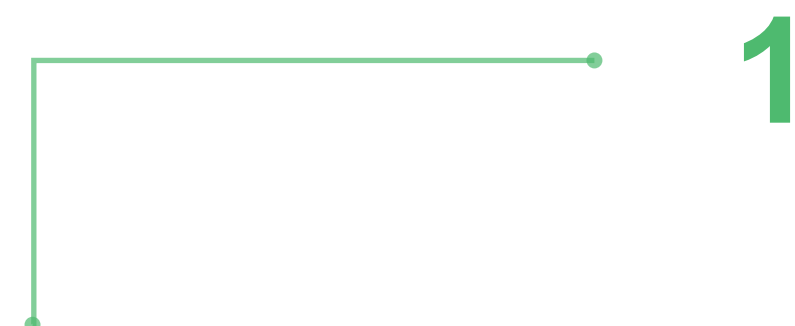
**ESTABLISHING A COMMON
DATA STANDARDS**



**EVIDENCE-BASED POLICY AND
DECISION-MAKING SYSTEMS**



GOVERNMENT INTEGRATED DATABASE



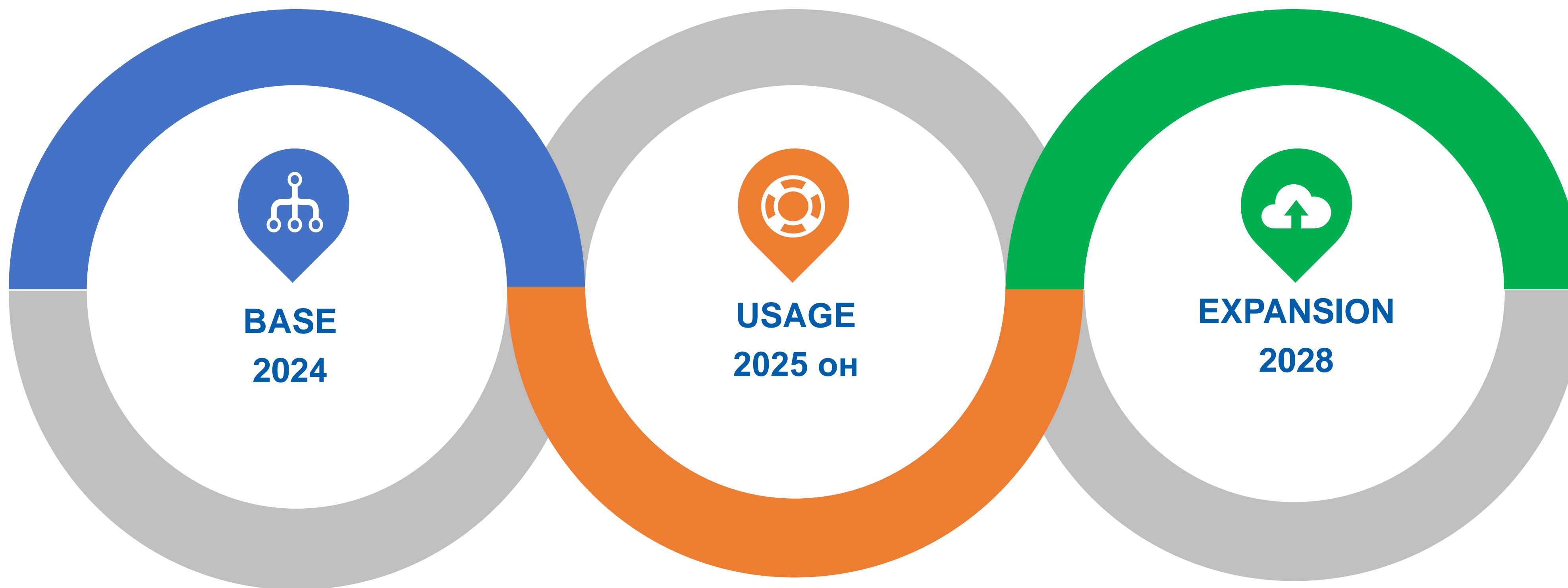
**OFFICIAL STATISTICS'
MODERNIZATION**

**SPECIALIZED GOVERNMENT
ORGANIZATION**



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The Government's Integrated Database – Implementation Plan



Foundation of GIDB.
Implement GIDB in the NSO and
2 government organizations

Expand GIDB infrastructure.
Integrate other government
organizations to GIDB

Remove data duplication in
government organizaions,
Implement AI and eGIF.



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The Government's Integrated Database – Process to establish



Data governance
Human resource capacity
IT infrastructure

02

Develop a road map and
plan for its implementation

04

 ISSUES

 ASSESSMENT

 ROADMAP,
PLAN

 IMPLEMENTATION

01

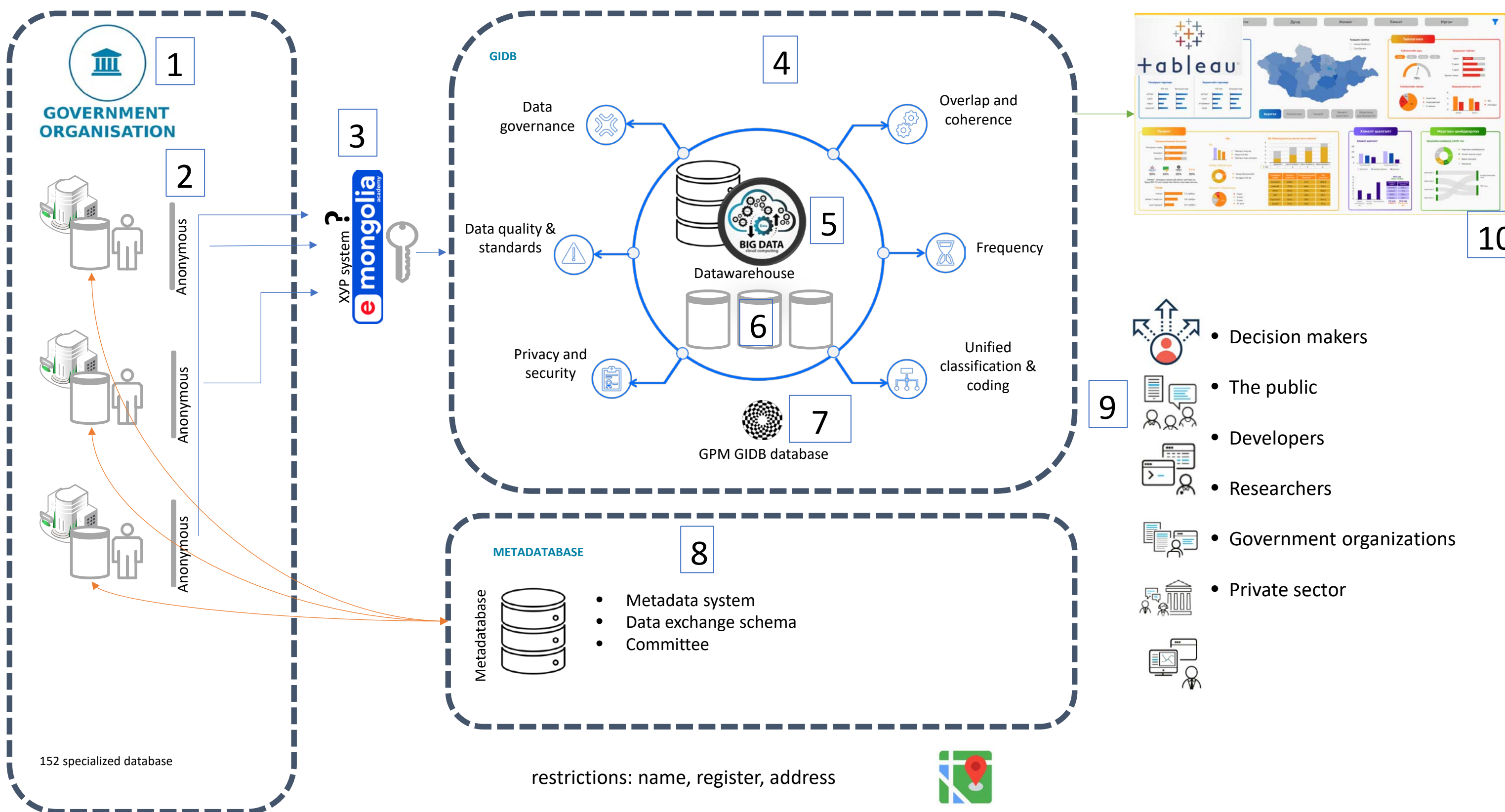
Methodology development
and survey-based
assessment

03

2024, start the activities of
integrating the first 3
organizations (NSO+2) into
GIDB



The Government's Integrated Database - Structure



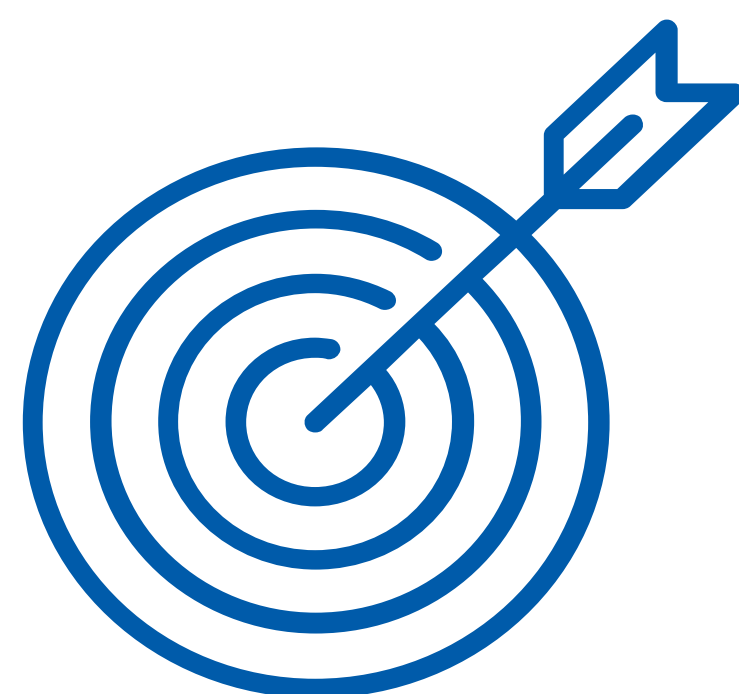
1. Data source government organizations
2. De-Identification system
3. XYP system for government organizations data exchange
4. Government Integrated Database
5. BigData
6. DataWarehouses
7. Generic process model of the GIDB (GPM GIDB)
8. Metadatabase
9. Users
 - Decision makers
 - The public
 - Developers
 - Researchers
 - Government organizations
 - Private sector
10. Data analysts BI tools

Leading organizations in establishing GIDB



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The Government's Integrated Database-Expected Results



EXPECTED RESULTS

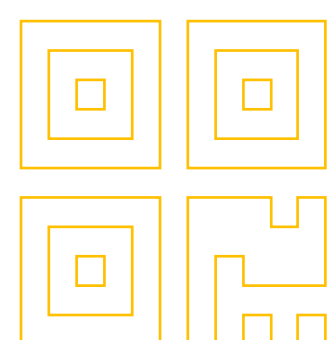
- Evidence-based policy decision-making will improve.
- It will save costs and time required for policy formulation.
- The quality of information in government organizations will improve, eliminating its duplication and discrepancies.



ҮНДЭСНИЙ
СТАТИСТИКИЙН
ХОРОО

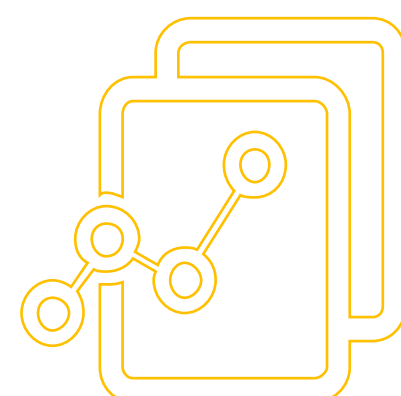
MONGOLIA'S EXPERIENCE: BIG AND ADMINISTRATIVE DATA FOR THE PRODUCTION OF OFFICIAL STATISTICS

Scanner data: VAT database



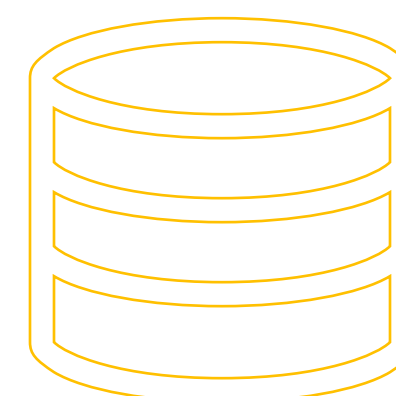
- **Consumer price:**
 - Commodities coding have been harmonized
- **Domestic trade:**
 - Approximately 40,000 enterprises
- **Household consumption:**
 - An analysis of poverty, inequality, and related attitudes was conducted based on the purchasing data of 4,463 households.
- **Sales and market analysis**

Web scrapping Usage



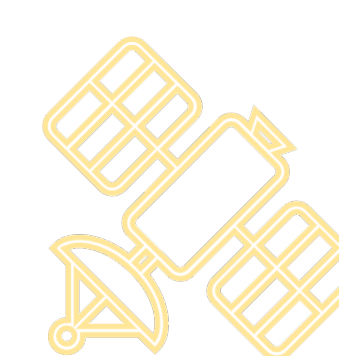
- **Residential property prices:**
 - On average, 100 companies used to collect news from organizations in a traditional way, but the number of indicators for distribution increased by calculating from 7,000-8,000 ads and news on the website, improving the coverage and quality.

Administrative database



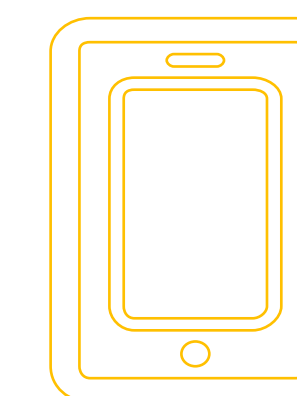
- **Foreign trade database (2023 он) :**
 - 14,457 citizen
 - 11,950 business entities and organizations
 - 784,320 records
- **VAT fund of the TEF (2020-2024) :**
 - Domestic trade - over 24,000 businesses.
 - Hotels- 289 business entities
 - Restaurant- 1066 business entities
 - Transport - 424 business entities

Using satellite imagery



- **Agricultural production:**
 - Cultivated land area
- **Animal Husbandry experiment:**
 - Livestock census monitoring experiment
- **Experimental environmental studies :**
 - Precipitation volume
 - Soil humidity
 - Land degradation

Data from mobile phone+StatGPT



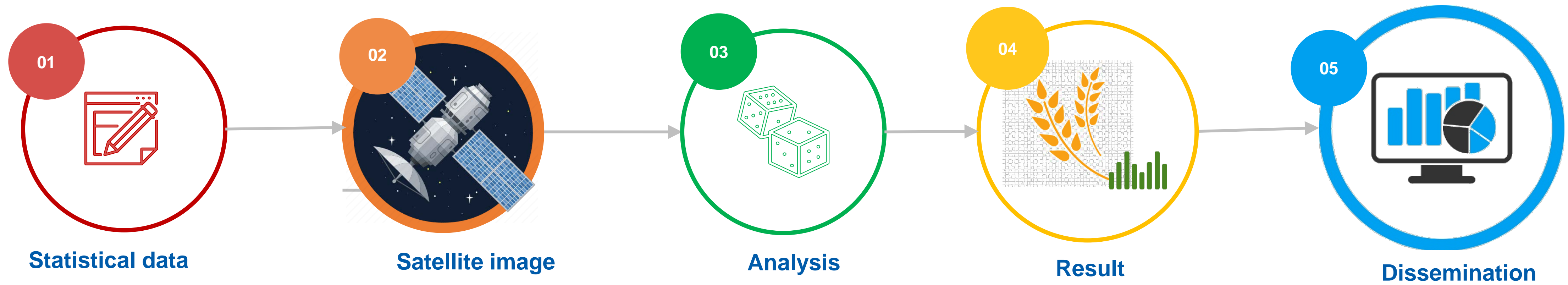
- **Potentially viable sectors :**
 - Population movement and migration
 - Tourism and travel
 - Urban and city planning
 - Disaster and emergency management, among other related areas
- **Utilizing artificial intelligence in the analysis of statistical information.**



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II.2. ESTIMATION OF THE CROP YIELD DATA USING REMOTE SENSING TECHNIQUES IN CROP STATISTICS

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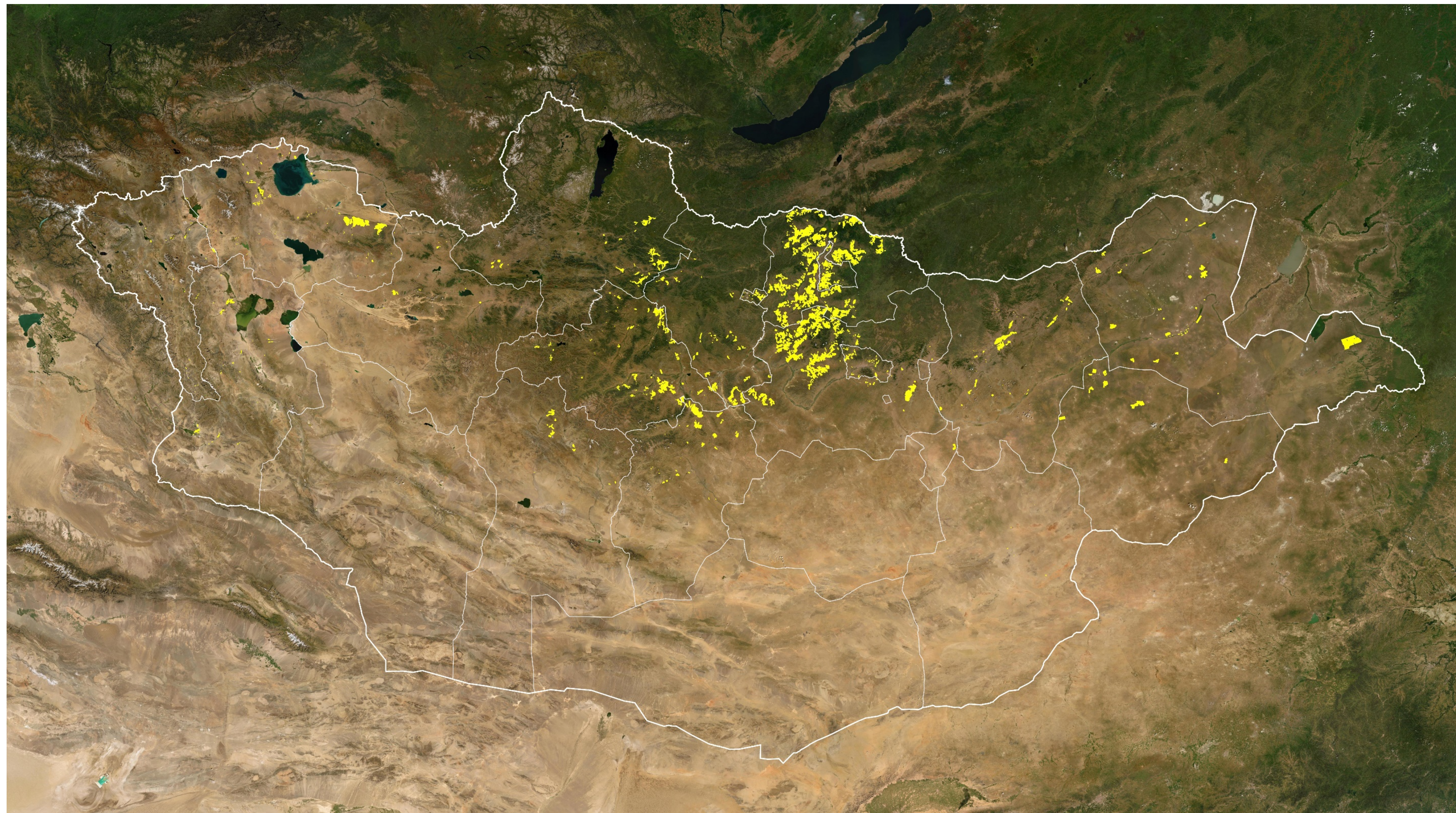




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STUDY AREA

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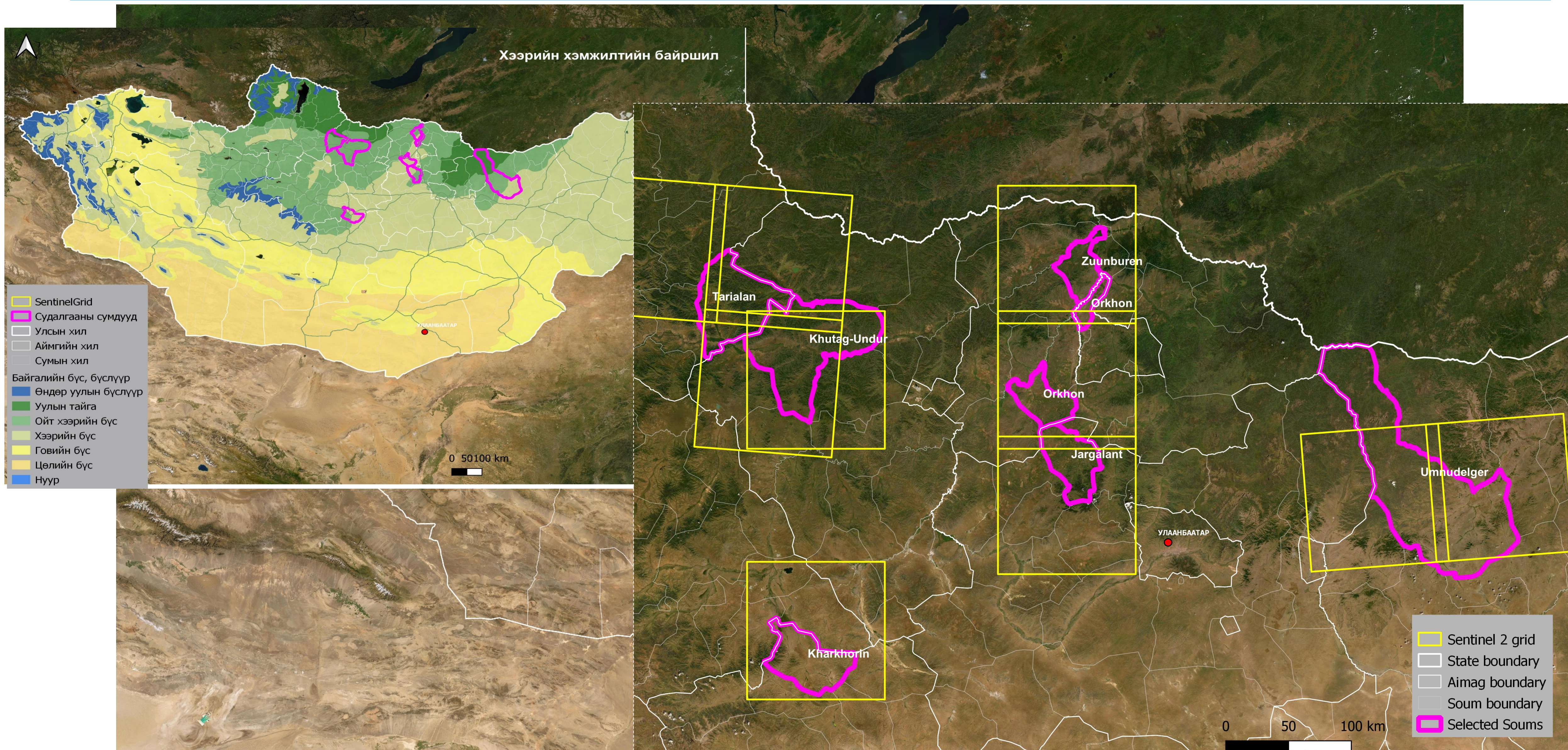




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STUDY AREA

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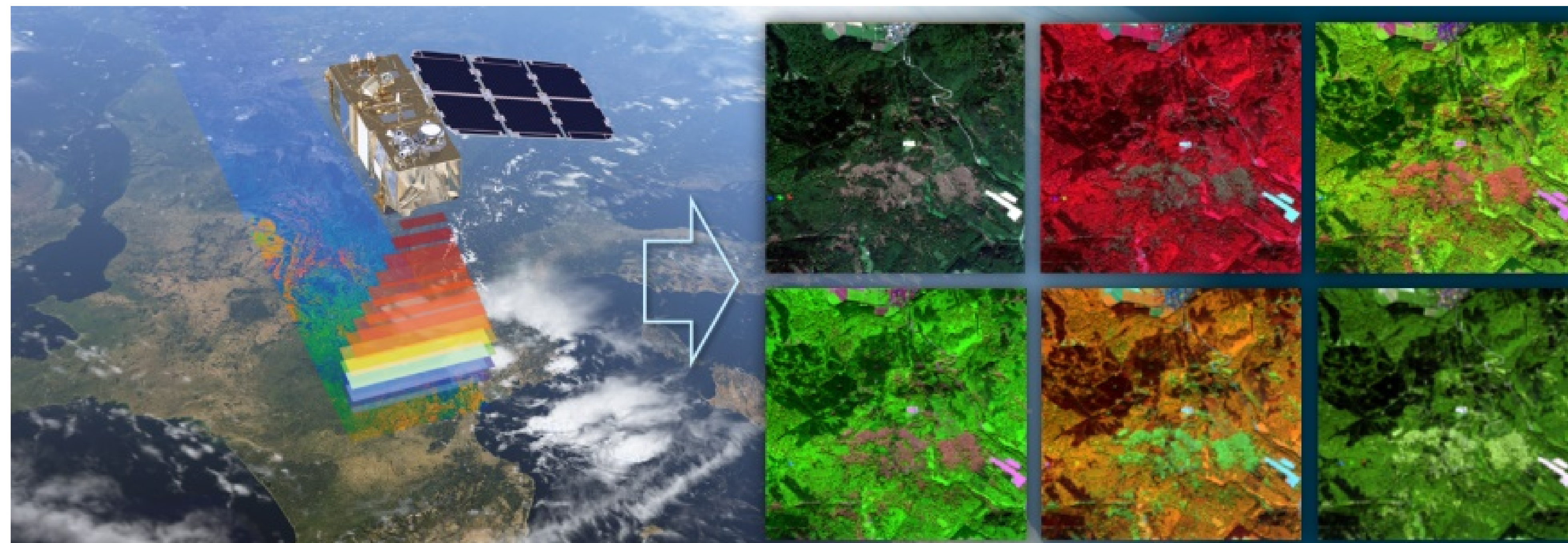


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SATELLITE IMAGERY – SENTINEL2

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- The Sentinel-2 consists of the twin satellites 2A and 2B, high-resolution optical imagery, multi-channel spectral data
- Spatial resolution 10m, 20m, 60m
- The optical payload it carries has visible, near-infrared, and infrared sensors, which provide a total of 13 spectral bands.
- Temporal resolution - 5 days





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METHODOLOGY #1. Random Forest

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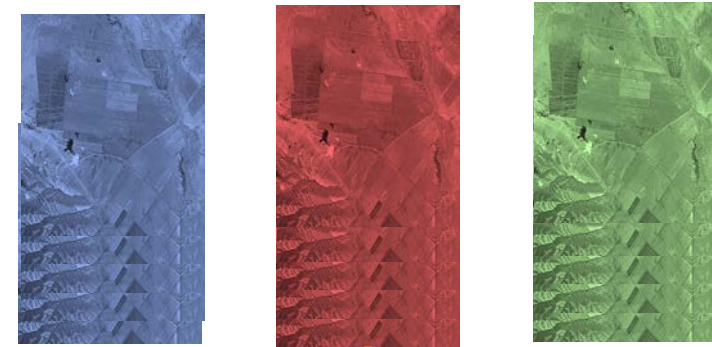
Band combination

1. Atmosphere correction
2. Cloud masking

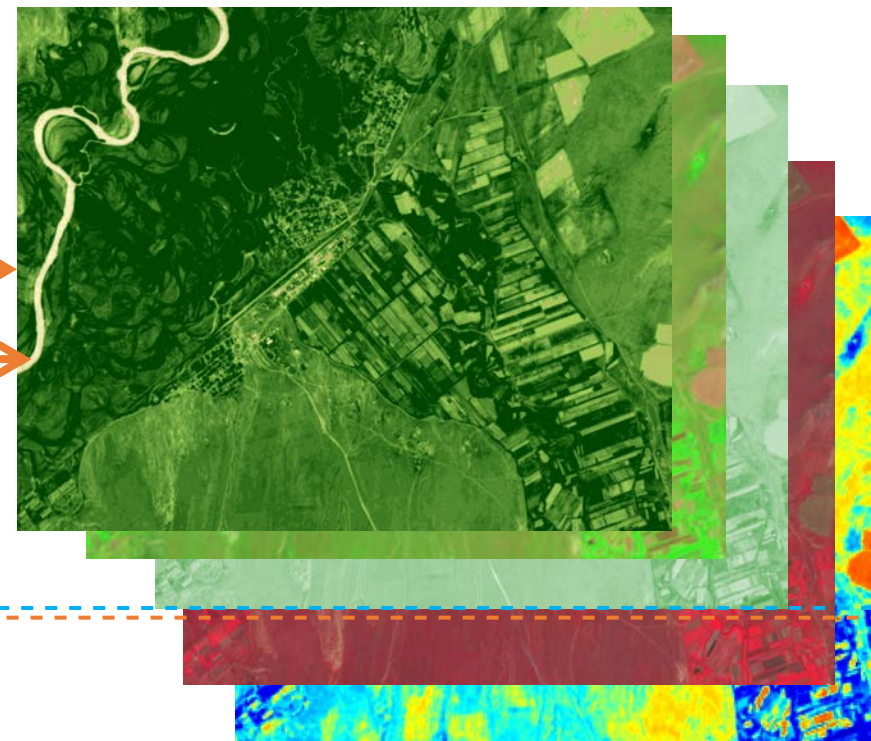
Sentinel
2



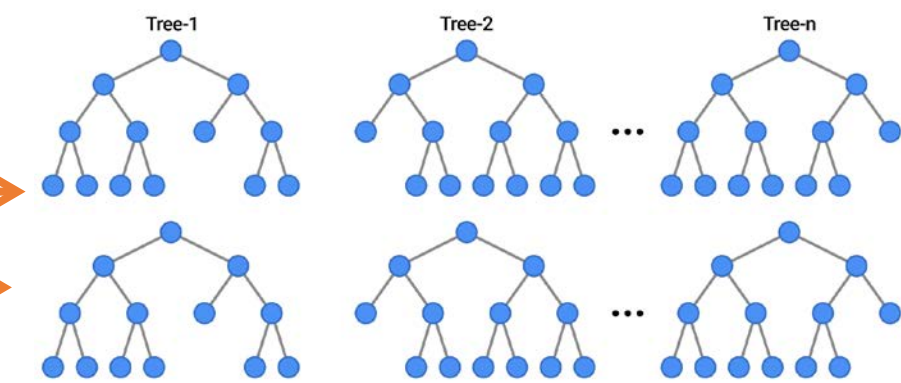
Processing



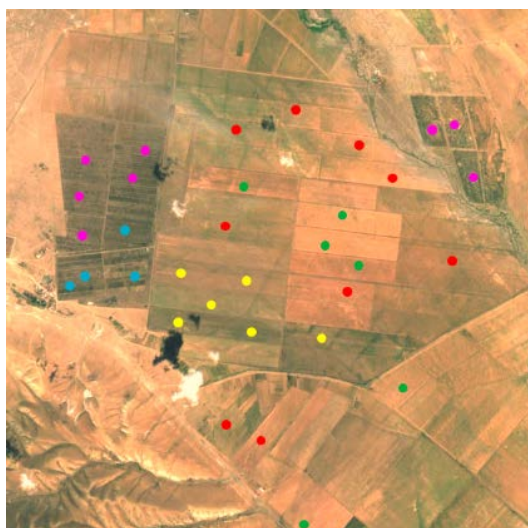
Vegetation index



Random forest
Classification



Samples

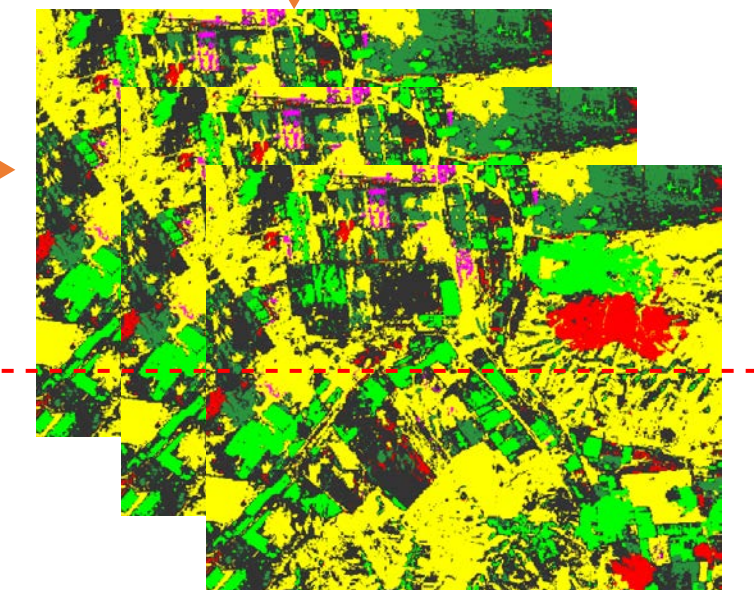


Samples on
crop type

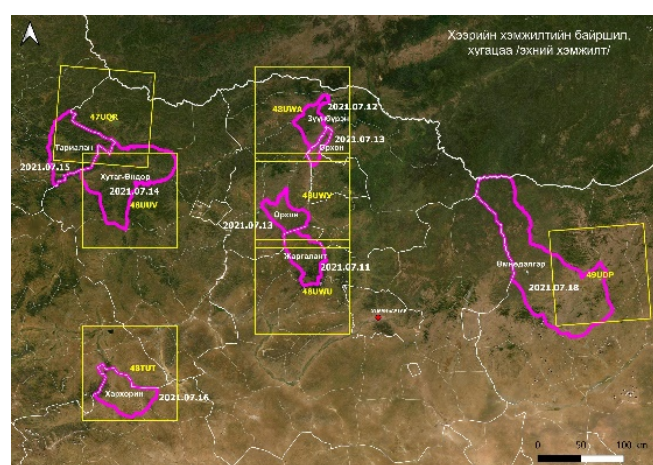
Training
samples

Test
samples

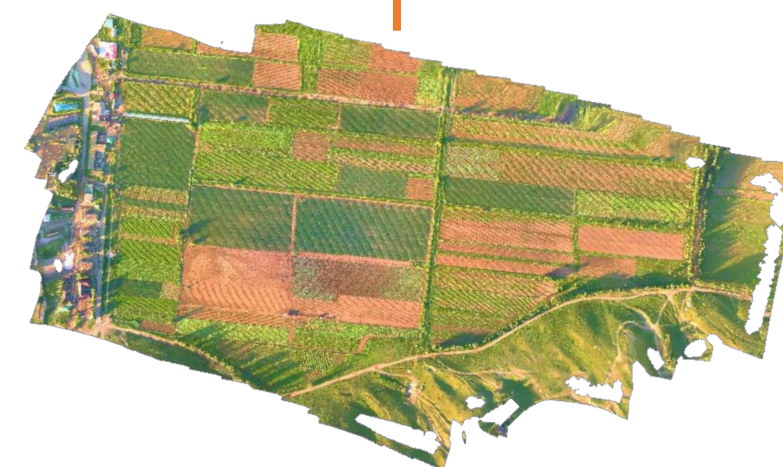
Accuracy
assessment



Field
measurement



Processing



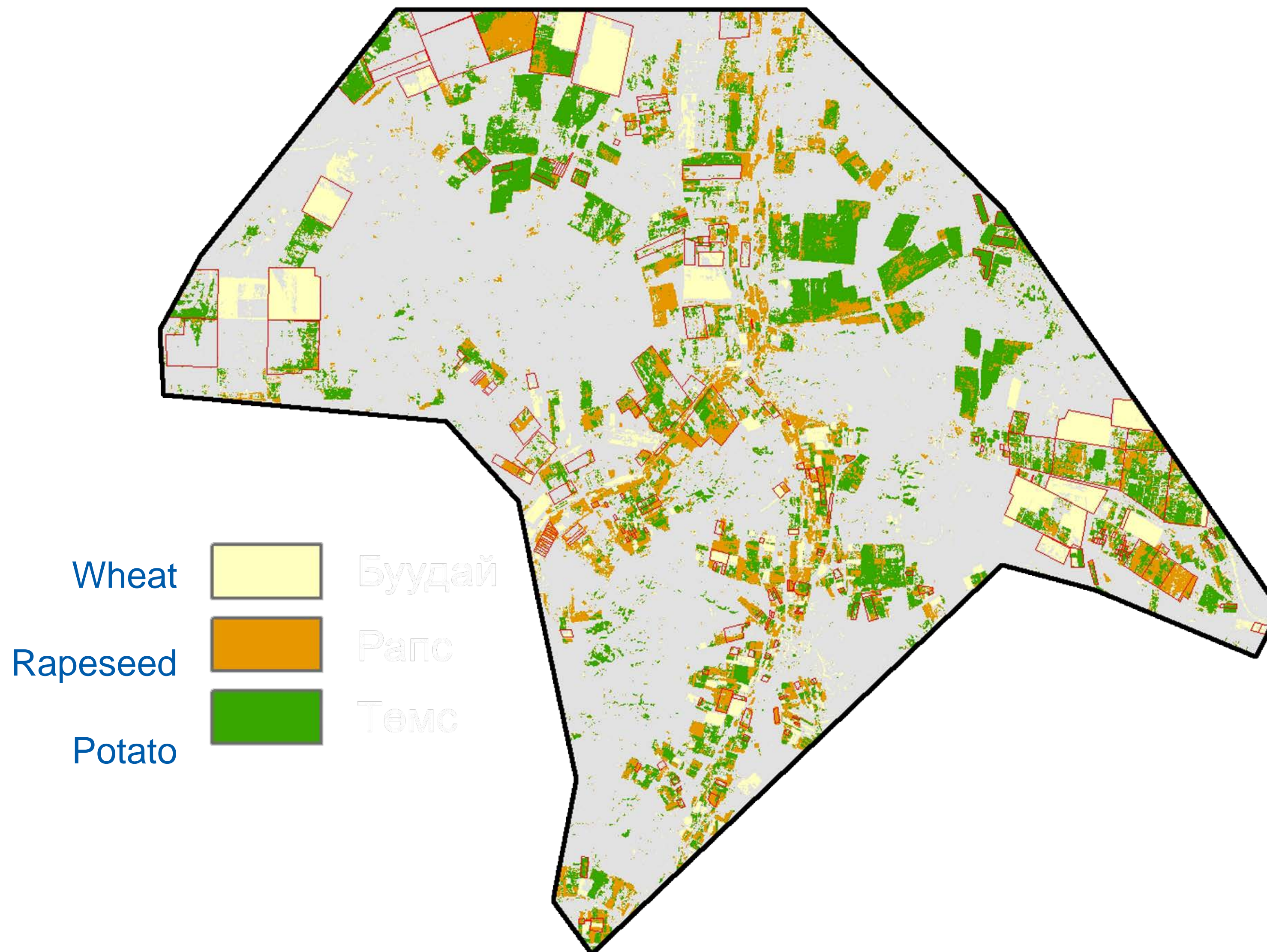
Map of
arable land



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RESULT

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III. KEY CONSIDERATIONS



- Improve laws and regulations related to big data;
- Research and introduce big data analysis techniques;
- Train for staff; cooperate with international organizations for improving the skills of staff and study good practices of other countries.



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IV. FUTURE PLAN



- **Data from mobile phone** – Working in collaboration with JICA to analyze and calculate statistics related to migration and agricultural activities;
- **Residential property prices** – Employing web scraping techniques to collect data on the market prices of buildings and residential properties.



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**THANK YOU
FOR YOUR ATTENTION**