



Strengthening the Capacity with Modern Geospatial Technologies and Cartography

5 October 2015
Jeju, Korea

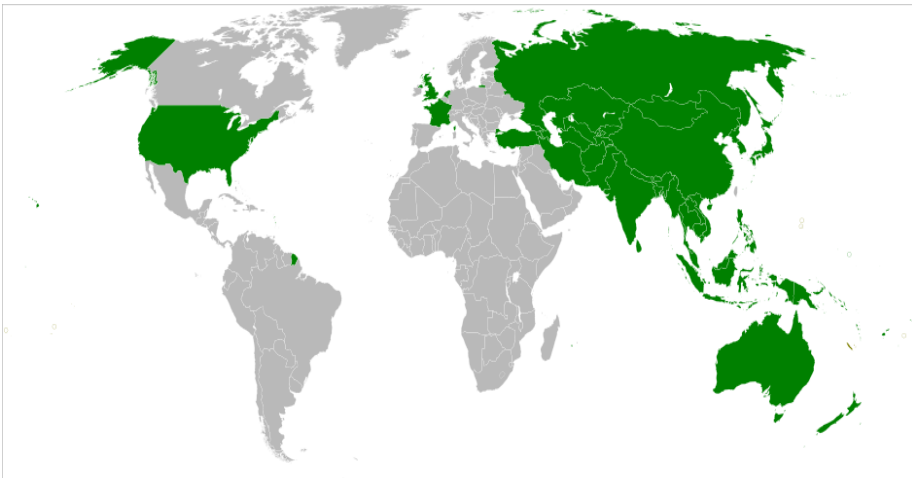
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UNESCAP

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Who is ESCAP?



United Nations
Economic and
Social
Commission
for Asia and the Pacific



ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC



Members:

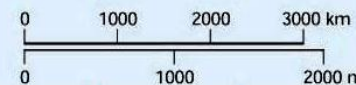
- Afghanistan
- Armenia
- Australia
- Azerbaijan
- Bangladesh
- Bhutan
- Brunei Darussalam
- Cambodia
- China
- Democratic People's Republic of Korea
- Federated States of Micronesia
- Fiji
- France
- India
- Indonesia
- Islamic Republic of Iran
- Georgia
- Japan
- Kazakhstan
- Kiribati
- Kyrgyzstan
- Lao People's Democratic Republic
- Malaysia
- Maldives
- Marshall Islands
- Mongolia
- Myanmar
- Nauru
- Nepal
- Netherlands
- New Zealand
- Pakistan
- Palau
- Papua New Guinea
- Philippines
- Republic of Korea
- Russian Federation
- Samoa
- Singapore
- Solomon Islands
- Sri Lanka
- Tajikistan
- Thailand
- Tonga
- Turkey
- Turkmenistan
- Tuvalu
- United Kingdom
- United States of America
- Uzbekistan
- Vanuatu
- Viet Nam

Associate members:

- American Samoa
- Commonwealth of the Northern Mariana Islands
- Cook Islands
- French Polynesia
- Guam
- Hong Kong, China
- Macau, China
- New Caledonia
- Niue

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.



● Capital city

What is ESCAP Doing?



1. Play as the **regional intergovernmental platform** for sustainable development (Resolutions)
2. **Policy and norm setting** to address sustainable development challenges (disaster, climate change)
3. ESCAP's role as **a regional knowledge hub** for sharing know-how, experience and practices



Areas of Work

Sustainable Development

Macroeconomic Policy

Social Development

Transport

Environment & Development

Trade & Investment

Information & Communications Technology

Disaster Risk Reduction

Statistics



What is IDD Doing?



1. Geo-DRM

- Geo-referenced information systems for disaster risk reduction (Geo-DRM)
- Evidence-based approaches for right decision making
- Geo-portals in pilot countries: Bangladesh, Fiji, Kyrgyzstan, Mongolia, Nepal, and the Cook Islands
- Software, capacity building



What is IDD Doing?



2. Regional Drought Mechanism

- Space-derived data + ground socio-economic data = monitoring and early warning of drought
- Regional service nodes: China and India (knowledge, data and satellite information)
- Pilot countries: Sri Lanka, Mongolia



What is IDD Doing?



3. Provision of satellite imagery

- Provide near real time satellite images to disaster affected country, region and communities
- Cooperate with other regional organizations and UN agencies like UNOSAT

Space and GIS for



1. Water resource management
- 2. Urban planning and disasters**
3. Energy management
4. Waste management
5. Traffic management
6. Eco-systems

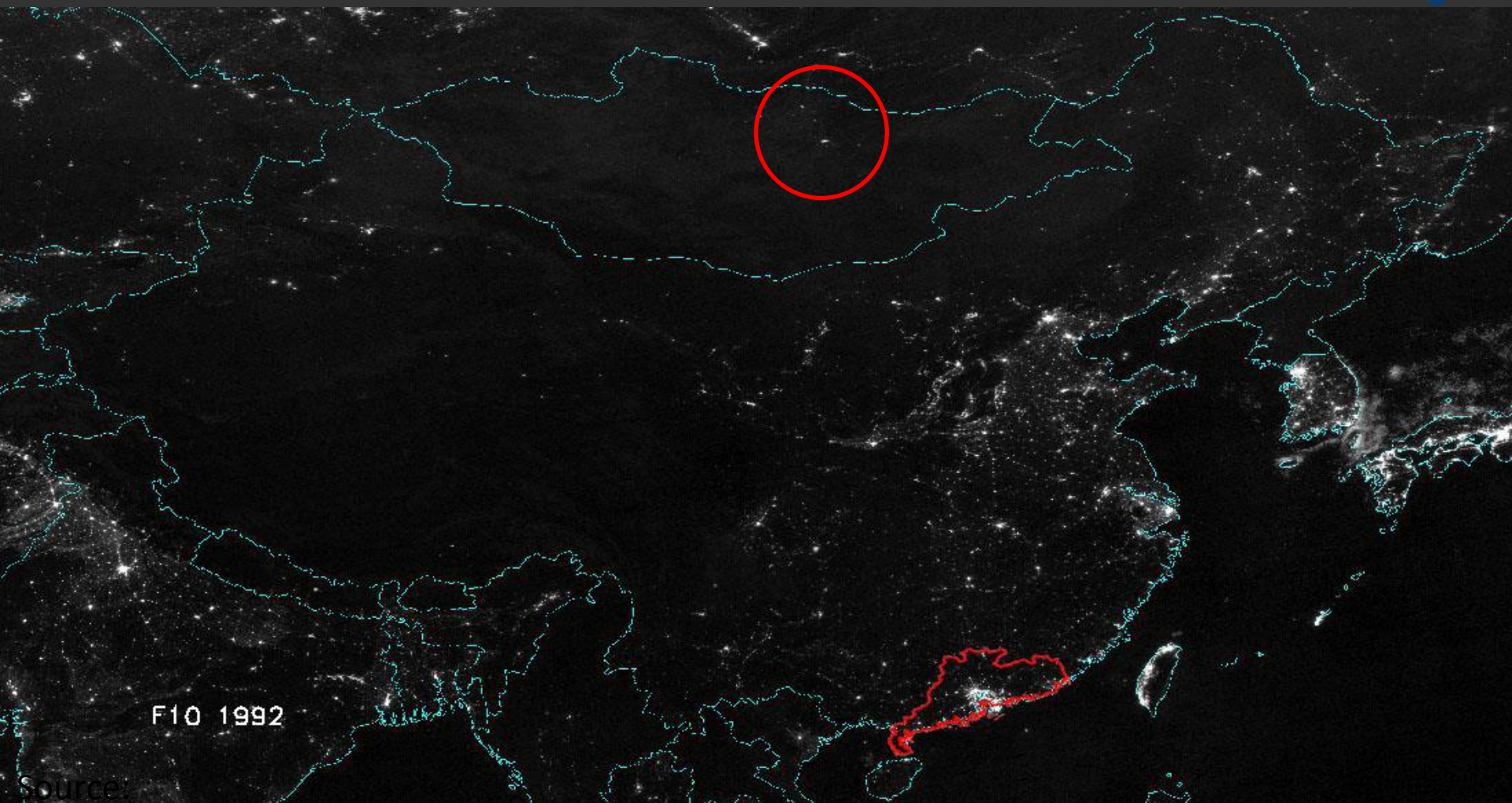
Cases



GIS applications for urbanization in Ulaanbaatar Mongolia and in Nadi, Fiji

- with support of Korea-ESCAP Cooperation Fund

Mongolia in 1992

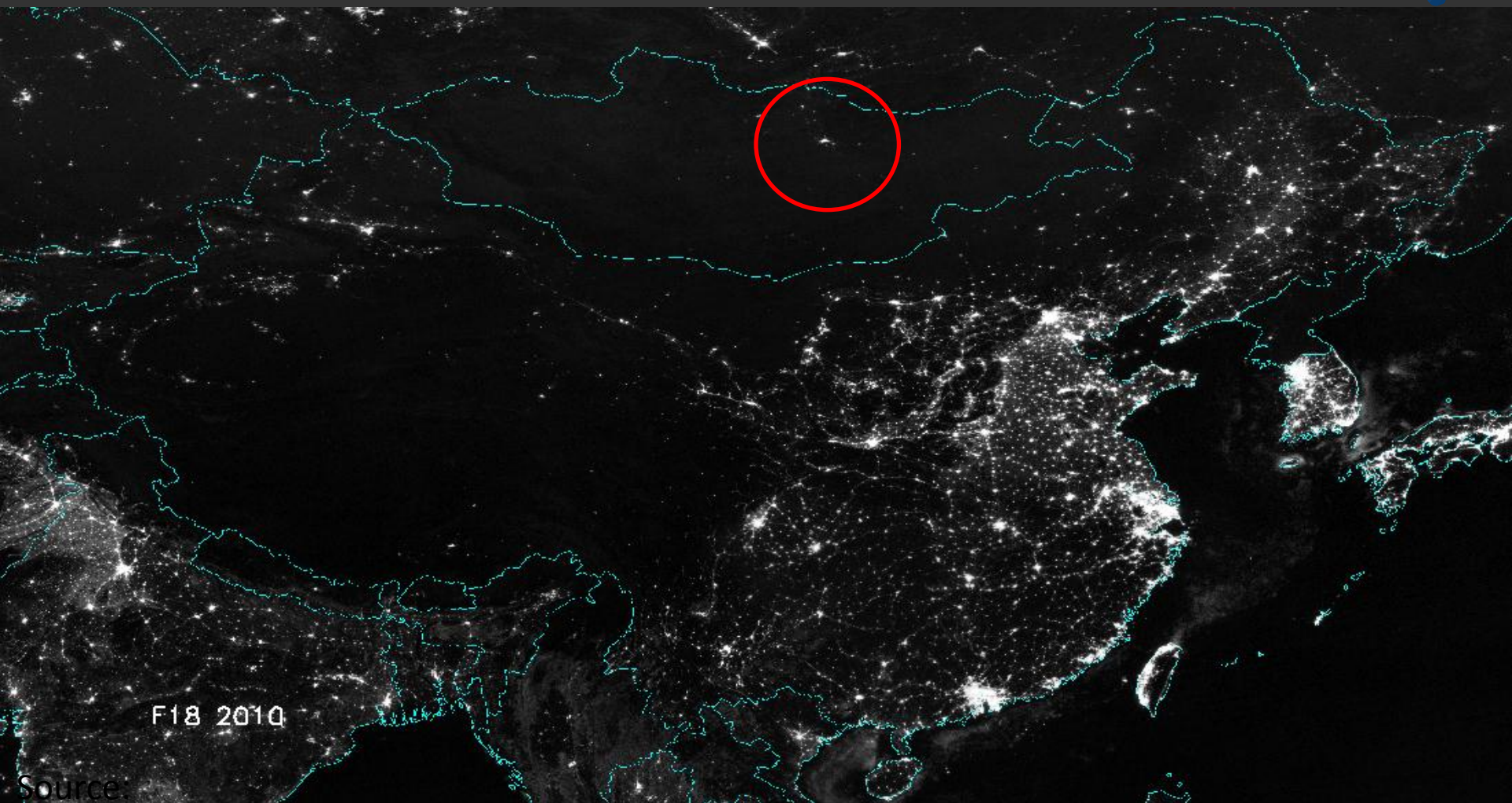


F10 1992

Source:

http://ngdc.noaa.gov/eog/data/web_data/china_movies/china/China_movie.html

Mongolia in 2010

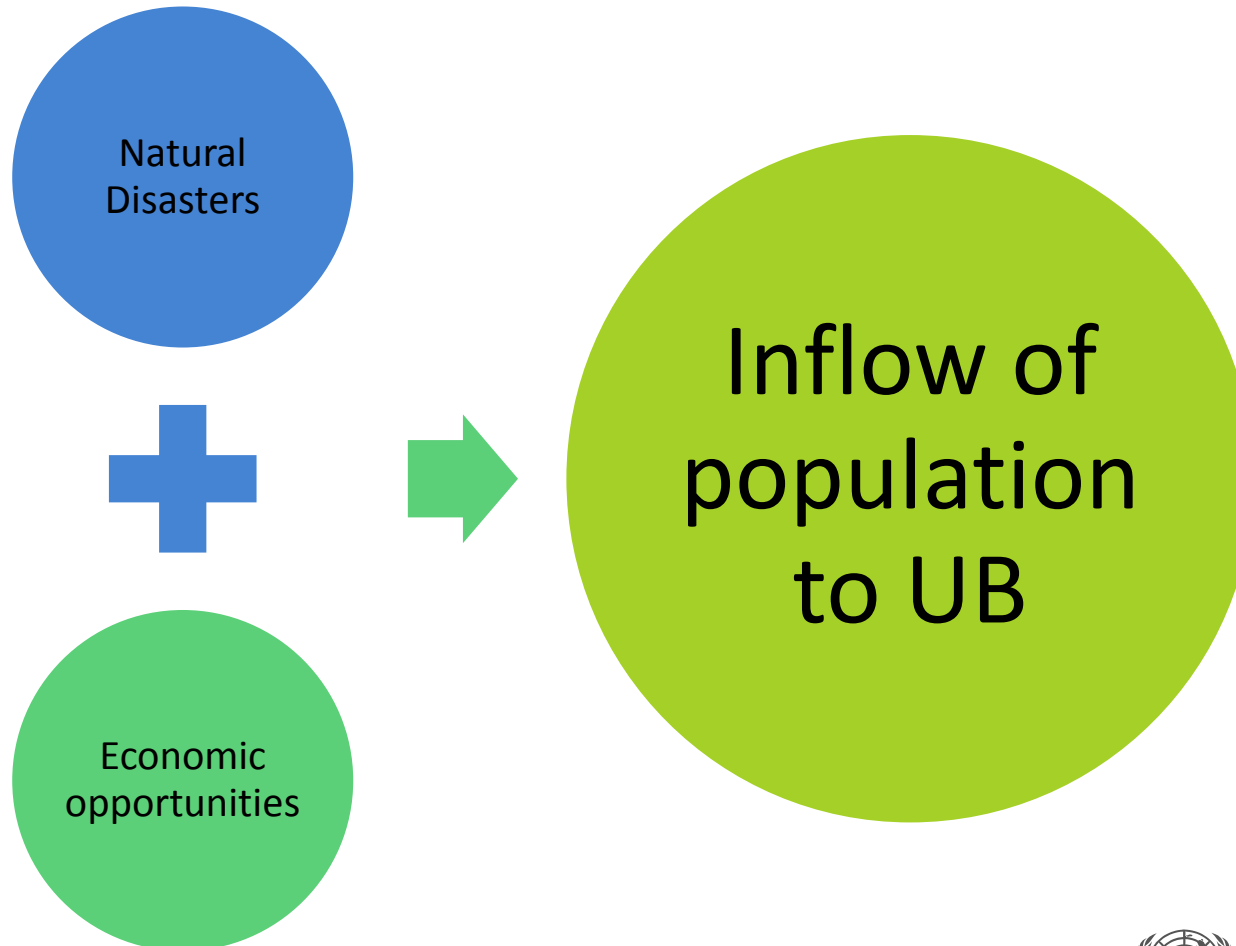


F18 2010

Source:

http://ngdc.noaa.gov/eog/data/web_data/china_movies/china/China_movie.html

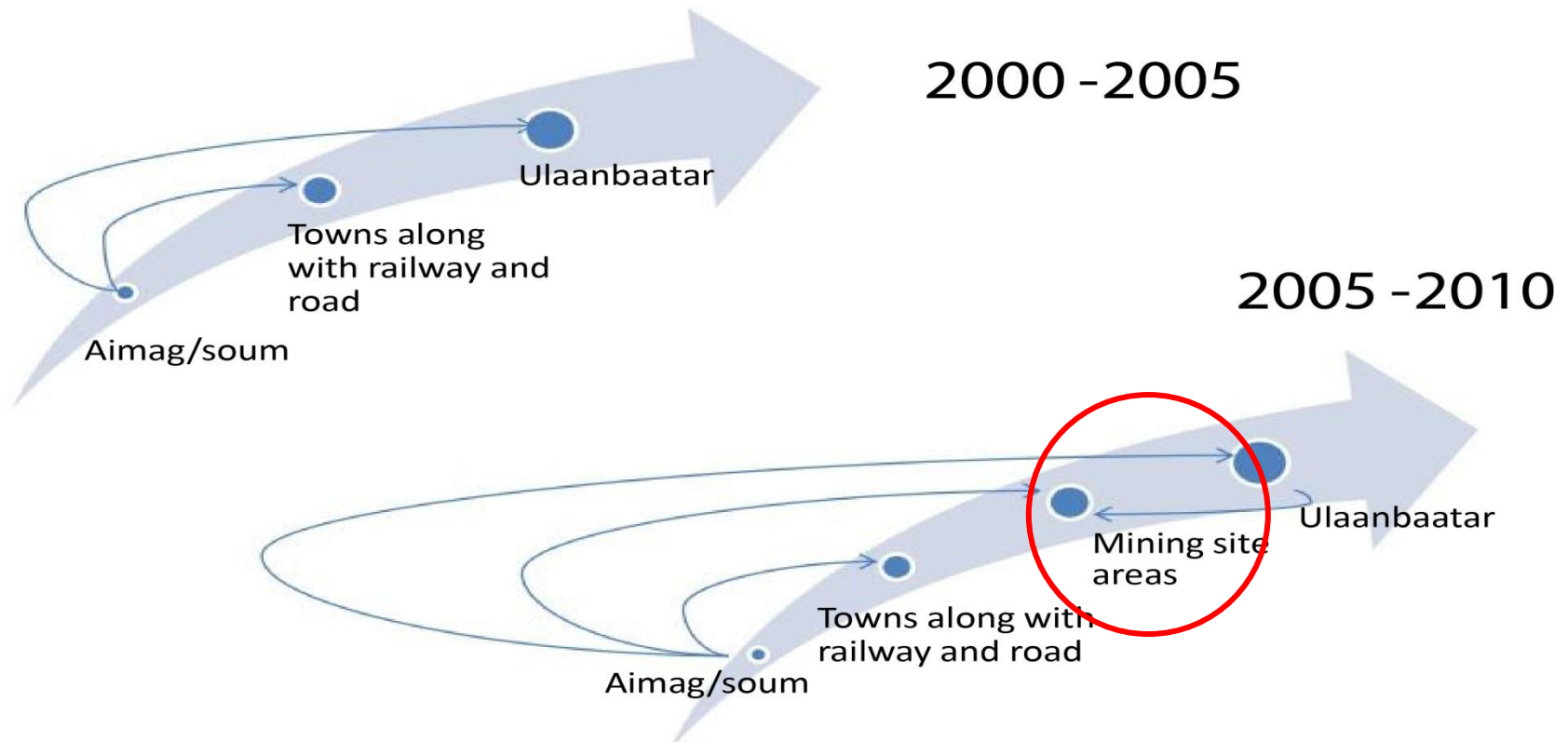
Disaster and Urbanization



Migration Pattern in UB



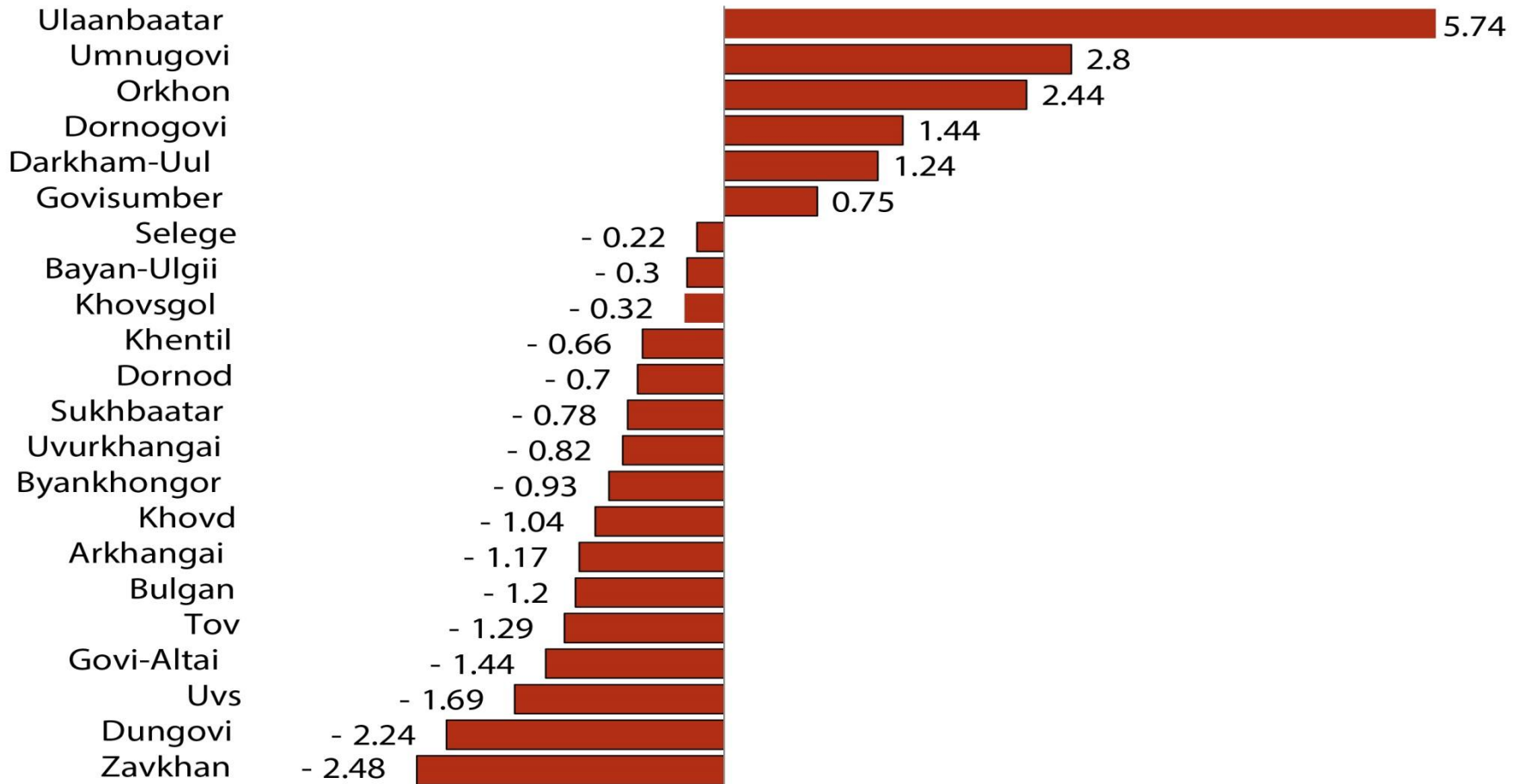
Migration Pattern



Population Change in Mongolia



Annual Growth Rate of population, 2000-2010



UB Economy



- 65% of total companies are based in UB
- 88.% of total universities are located in UB
- 95.3 % of total students study in UB

Disaster to Urbanization



1. Population inflow because of Natural Disasters
2. Major cause of population inflow to UB is
DZUD
3. Dzuds effected 14000 households and 70,000 people
4. Dzud in 2010 killed 7.8 million heads of livestock (17% of total livestock)

Disaster to Urbanization



1. In 1969, 44% population lived in urban areas.
2. In 2010, 67.9% population lived in urban centers (48% of total population lives in UB)
3. Average increase speed of population per annum in UB: **9.5%**
 - For US it has always been under 2% after 1990

Challenges because of Urbanization

1. Problems of rapid urbanization
 - Concentration
 - Inequalities and vulnerabilities
 - Air pollution
2. Results
 - Pressure of social and public services
 - Pressure of infrastructure services
 - Migrants challenges

All these challenges lead to **decrease in the disaster resilience** of the city

Pilot Research



To address these challenges and questions UNESCAP has conducted a study to

- Measure the degree of association between land transitions in UB with infrastructure, socioeconomic and biophysical driving factors
- Identification of areas prone to urban flooding and earthquake in UB
- Development of urban growth prediction maps for UB of 2025, 2035 and 2050

Results of Geospatial Modelling



1. A careful understanding of their relation with land transitions is critical for estimating, modeling or predicting urban growth
2. Another important thing to consider is the non-linearity of the relationship between land use types and factors driving land change.
3. Results could be used as input for approved UB City master plan of 2020

Simulation Methods



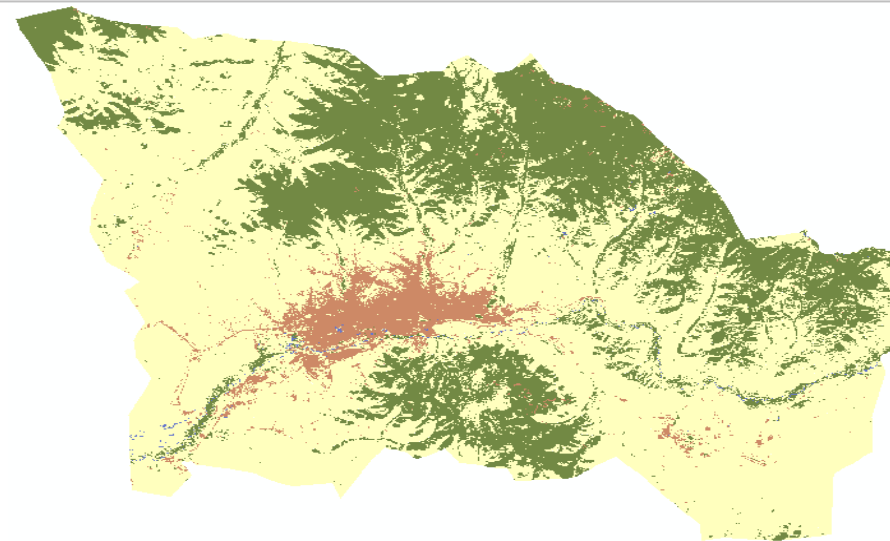
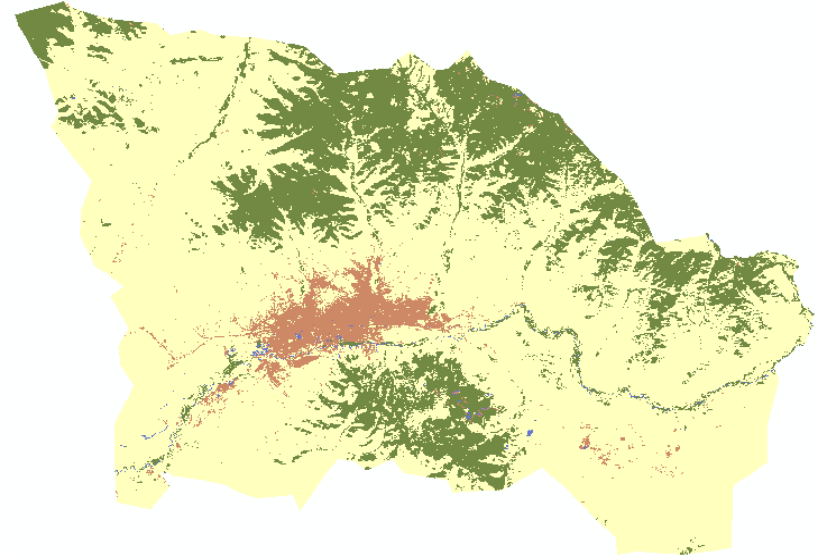
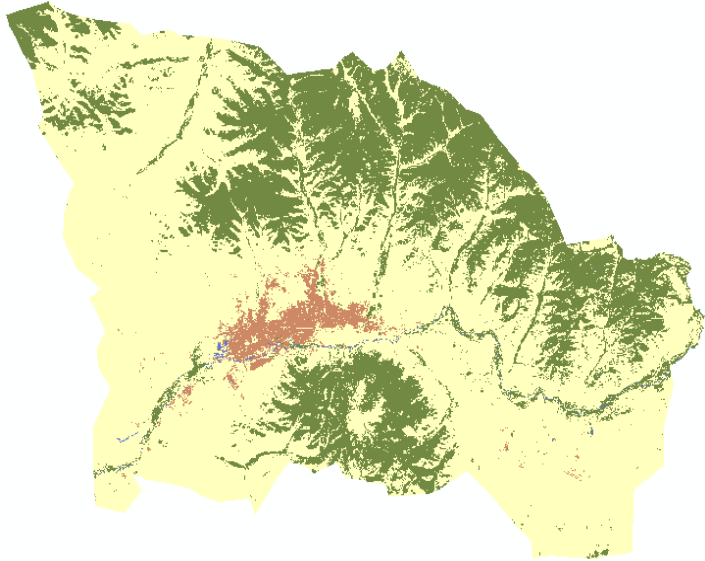
- Existing urban planning and simulation methods
- Integrated models
 - MC + ANN
 - MC + CA + regression
 - MC + regression
 - CA + fuzzy logic
 - The resultant models are capable of handling complex land use dynamics

Data and Data Sources

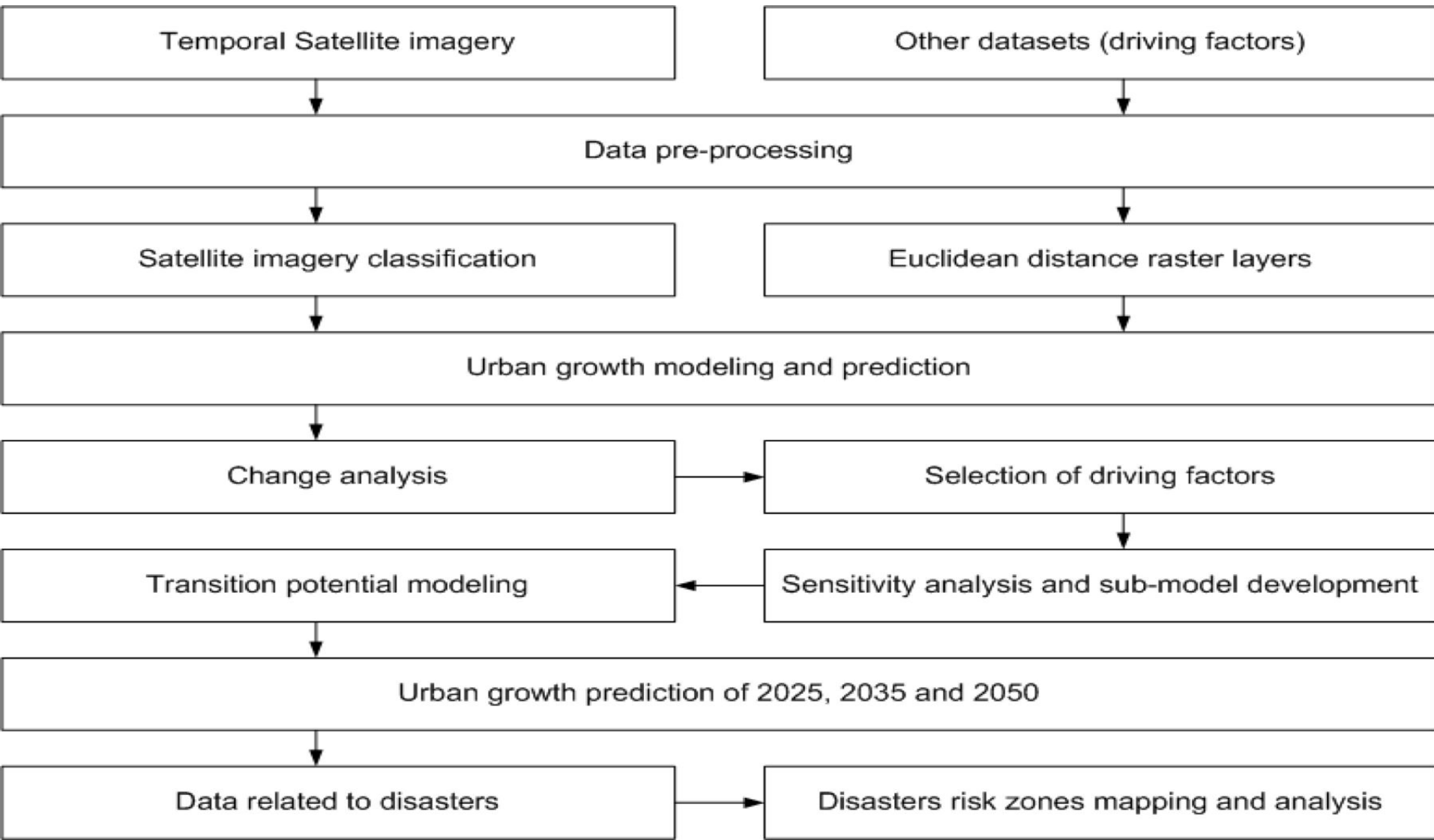


- Land cover maps
 - September 2001 and 2011
 - August 2014 land cover map was used for accuracy assessment
- Land cover maps
 - ASTER DEM, Drainage network, Rivers, Built up area, Location of city center, Hospitals, Kindergartens, Schools, Human population, Employment percentage

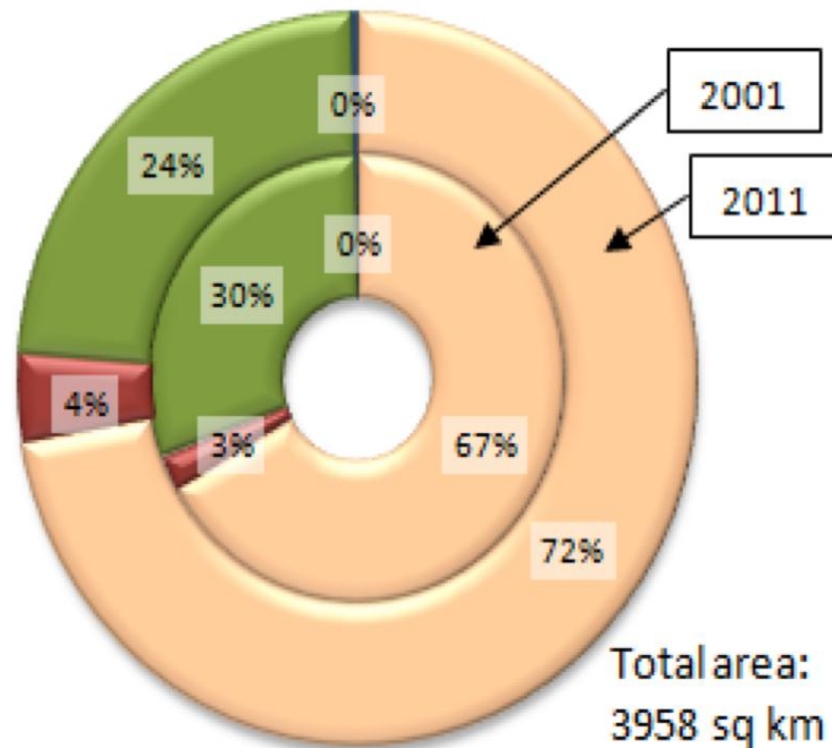
Land Cover Map in 2001, 2011 and 2014



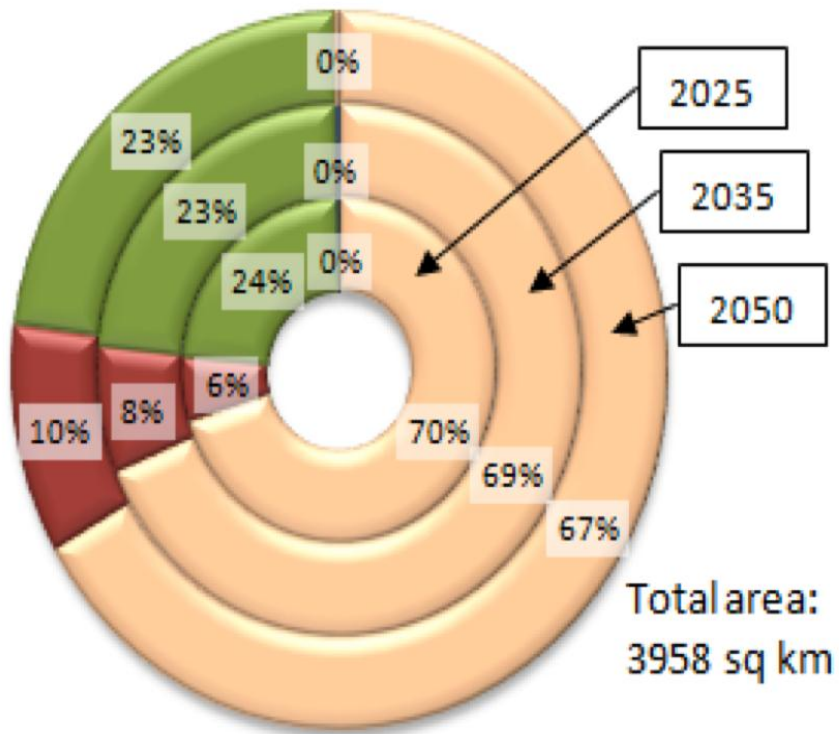
Methodology



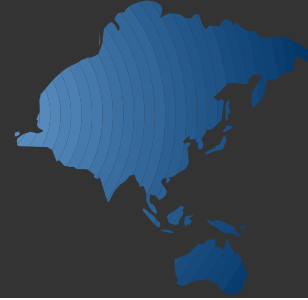
Findings



Findings



Findings



- UB City government
 - Weak in disaster issues
 - Hold city data alone

- National Emergency Management Agency
 - Weak in urbanization
 - Low level of city data

- Need to check findings again through second study

- ESCAP plans to make detail prediction maps subject to budget



Thank you !

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