



1. Introduction

In connection with the exponential increase of big data, the Internet and distributed computing provide the technical framework for processing geospatial data. Web-based GIS provides a gateway to explore and access geographic WEB services, which help to visualize and analyze the geographic data for GIS users. In particular, to measure and compare the urban growth process of big cities in a multidimensional way, the Web-GIS can inspire and assist in understanding the urbanization process in a more comprehensive manner.

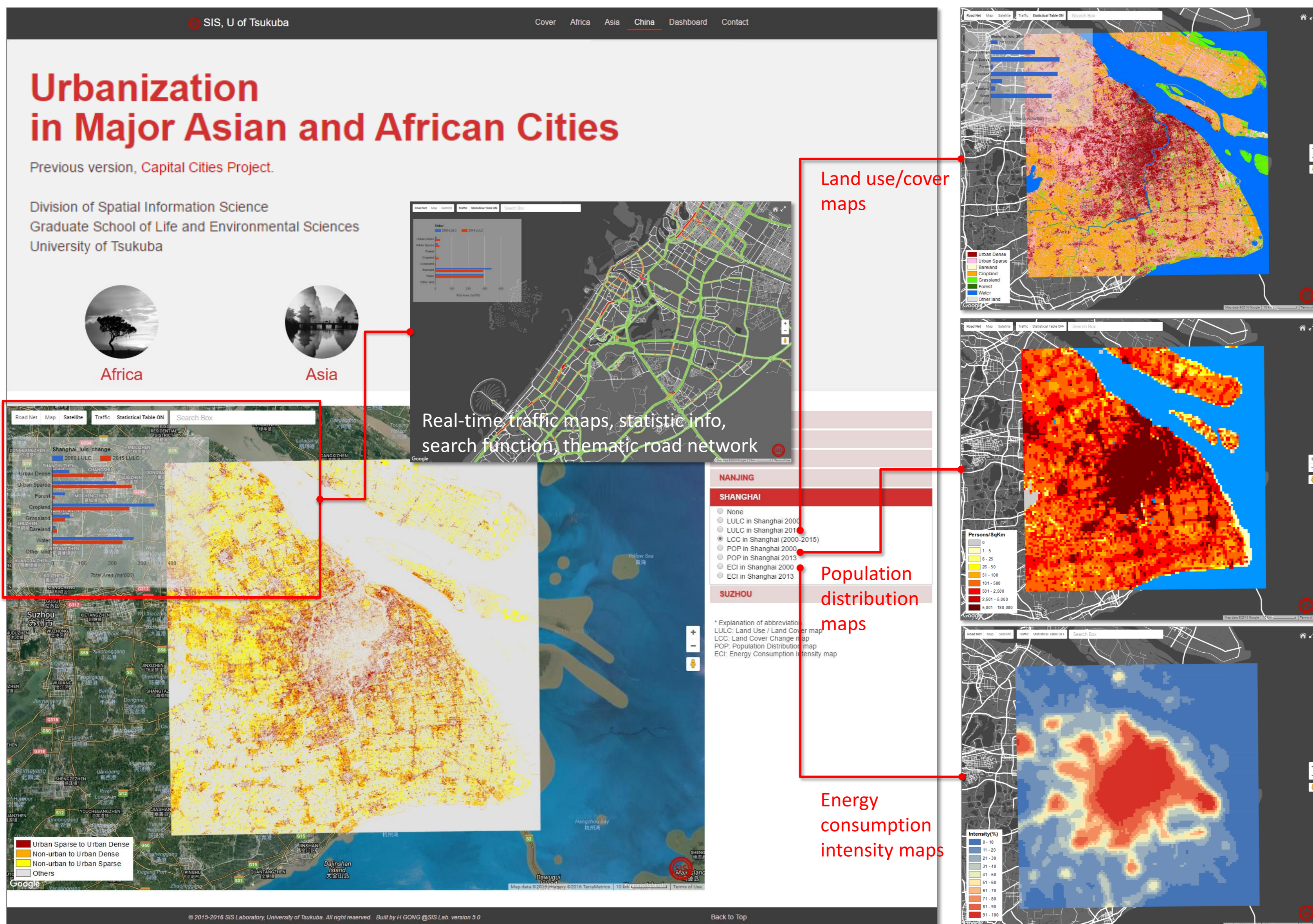


Fig.1: Overview of the Web-GIS platform. (<http://giswin.geo.tsukuba.ac.jp/mega-cities/>)

2. Data and Methods

Both geospatial data (three kinds of optical image data, cloud-based vector data) and statistical data are utilized to extract the indicators. The optical imaged data utilized are listed:

- Land use / cover (LULC) map: Landsat TM/ ETM+/ OLI satellite imagery.
- Energy consumption intensity map: DMSP-OLS nighttime imagery.
- Population data: ORNL's LandScan global population distribution data.

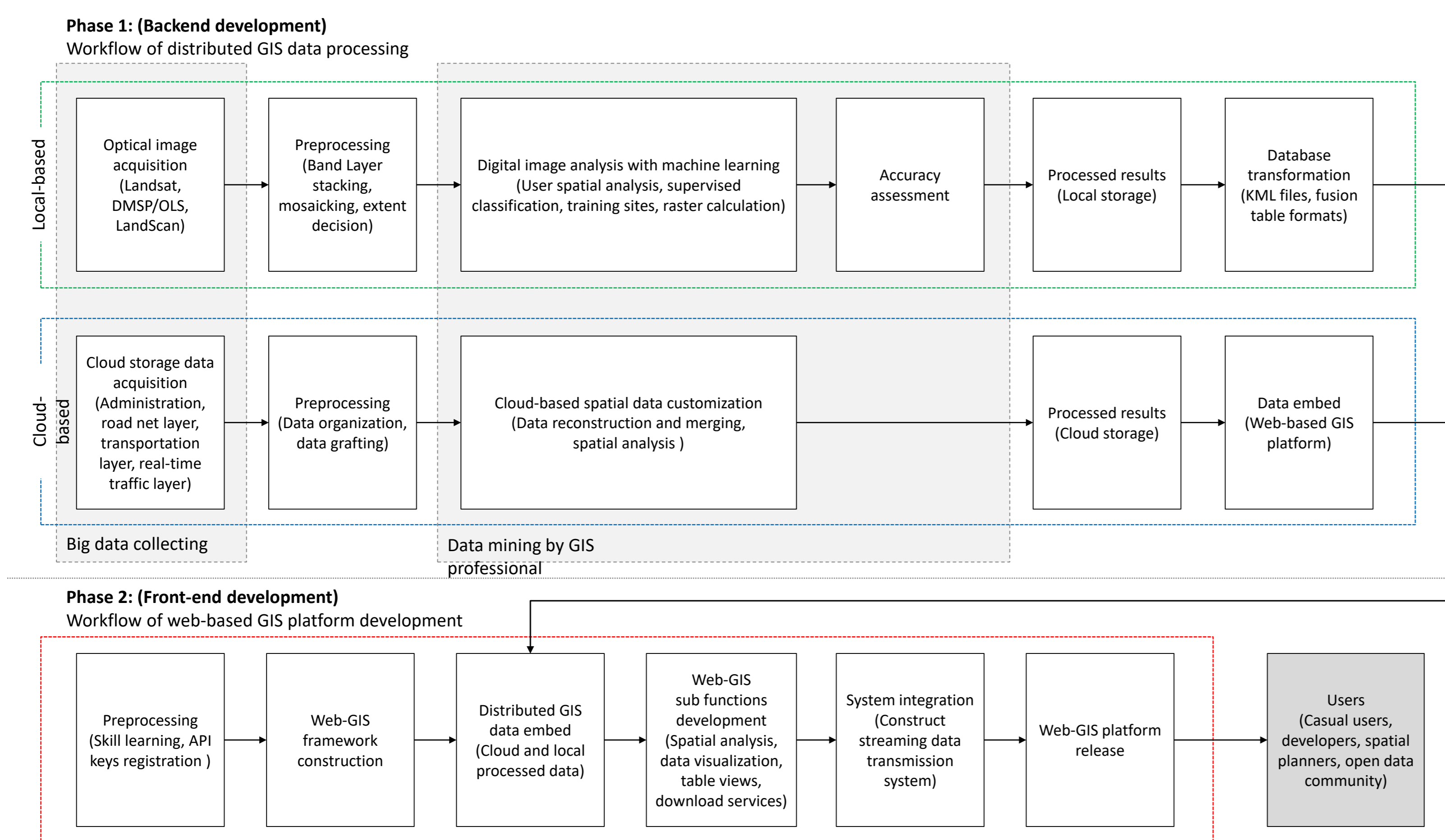


Fig.2: Workflow of the system development.

3. Results

In this project, an open access web-based GIS platform was established (Fig.1). 35 major cities in Asian and African regions (Fig.3) were selected to examine the urban sprawl of mega-cities during the 15 years (2000-2014). In order to quantify and measure the urbanization process, all of these cities were separated into three groups (African cities, Asian cities and Chinese cities), and the size of the target area is a 100×100 km extent for each city. All of the processed datasets could be downloaded from the website.

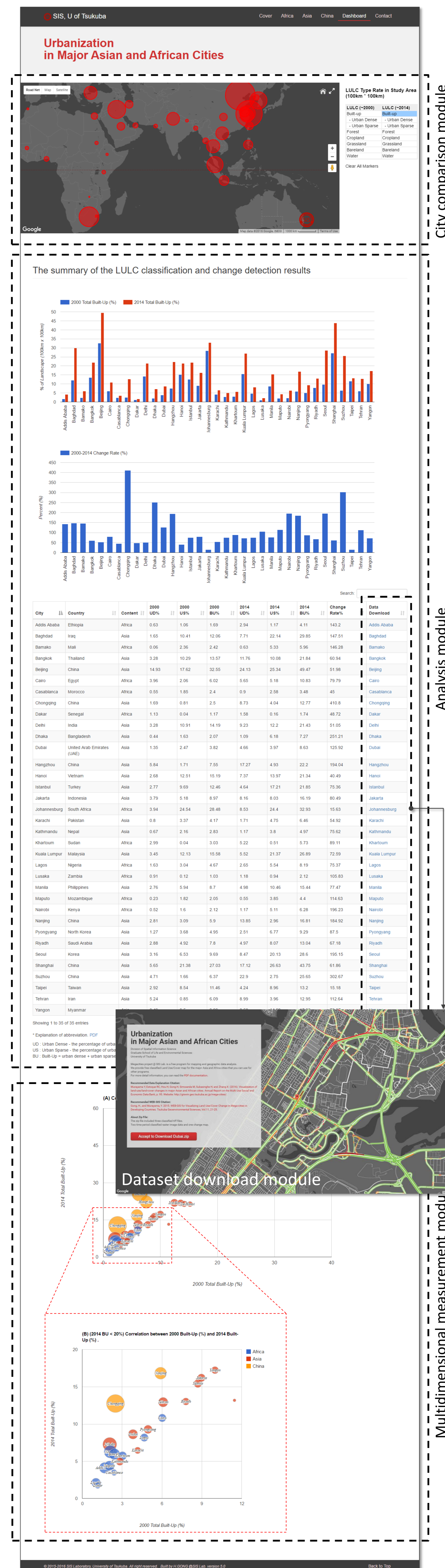


Fig.3: Summary and analysis page for all cities.

4. Acknowledgement

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