LAND CHANGE MODELER FOR PREDICTING LAND COVER CHANGE IN BANJARMASIN CITY, SOUTH BORNEO (2014 - 2022)

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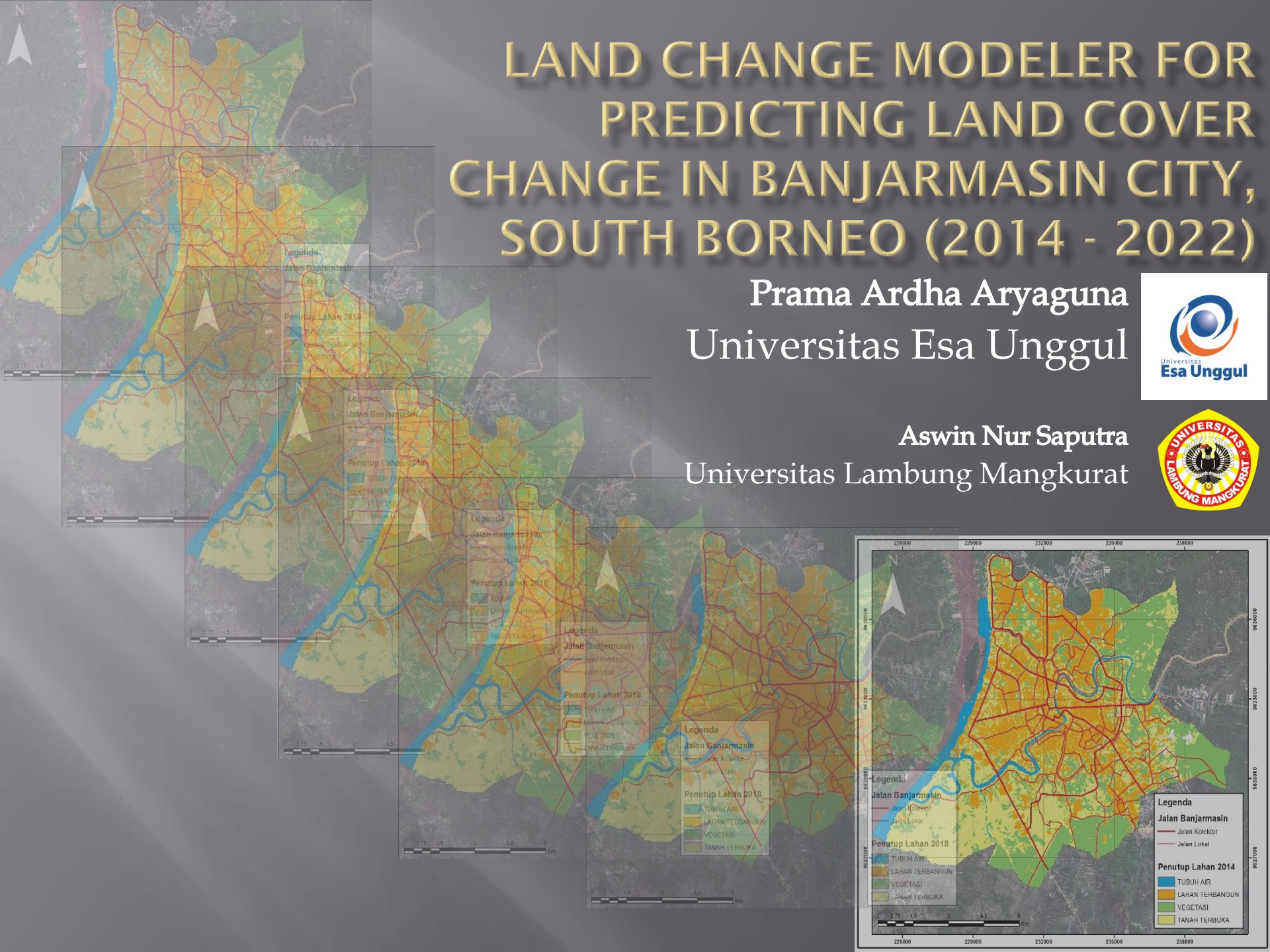


Research Background

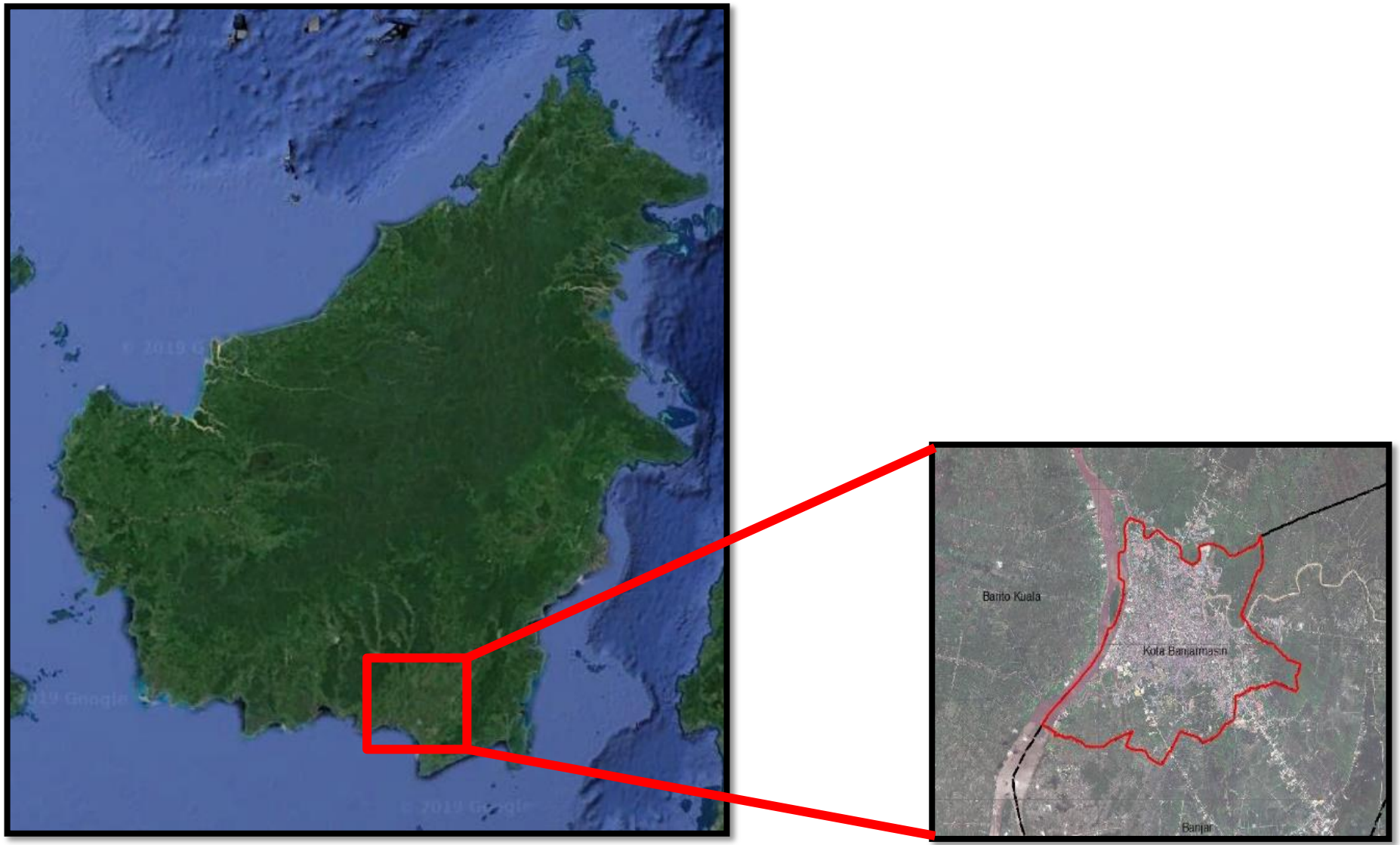
- Land change is a phenomenon that often occurs in urban areas in the province.
- Banjarmasin city is one of several provinces that have experienced rapid land changes.
- The rate of change is feared to have an impact on the ecological conditions in Banjarmasin City

Research Aim

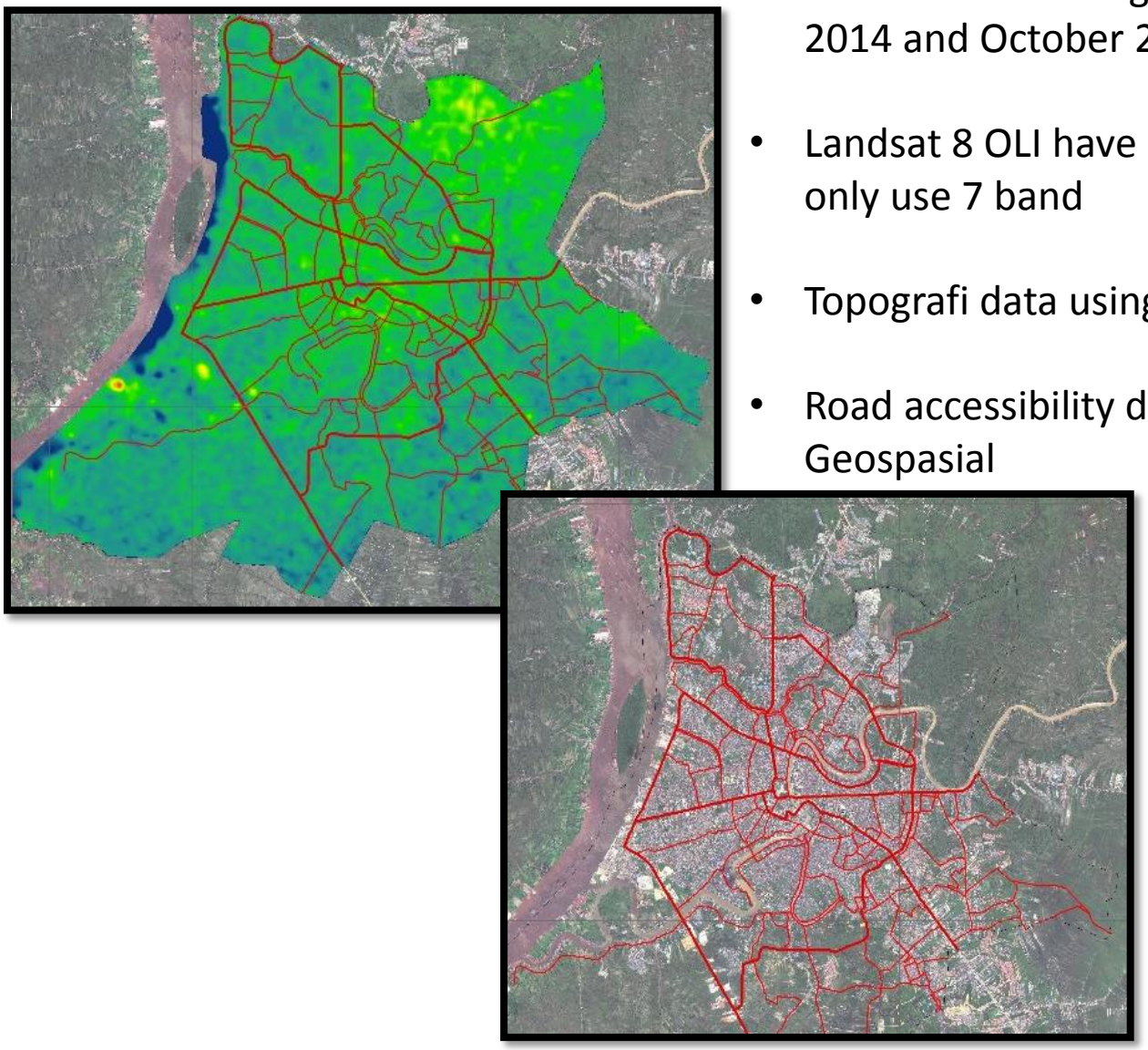
- To map, land changes in Banjarmasin city at 2014 and 2018 using LCM
- Make a prediction map of land cover in 2022 based on the trend of land changes that occurred in the previous year

Research Location

- Research location in Banjarmasin city.



Data



- This Research using Landsat 8 OLI September 2014 and October 2018
- Landsat 8 OLI have 11 band, but for. This research only use 7 band
- Topografi data using SRTM
- Road accessibility data from Badan Informasi Geospasial

Method

- Scheme Classification

Table 1. Anderson Land Cover Classification Scheme
Source : (Anderson et al. 1976).

Land cover types	Description
Built-up	Residental, commercial and services, industrial, socio-economic, infrastructure and urban and other urban
Bare Soil	Exposed soils, landfill sites and area of active excavation
Vegetation	Deciduous forest, mixed forest lands, palms and other
Water Bodies	River, permanent open water, lakes, ponds and reserirs
Agricultural Land	Cropland, Field rice, plantation

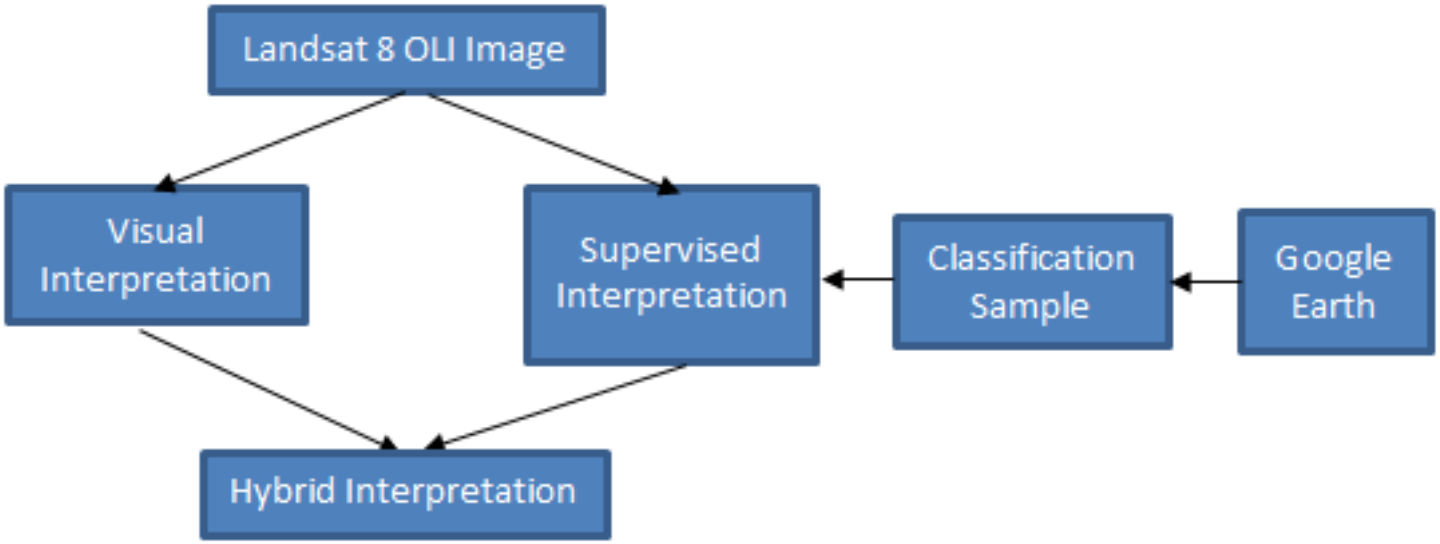
Method

- Pre Processing
  - Radiance at sensor
  - Reflectance at surface
- Digital Classification (Supervised)
  - Maximum likelihood
- Visual Classification

1

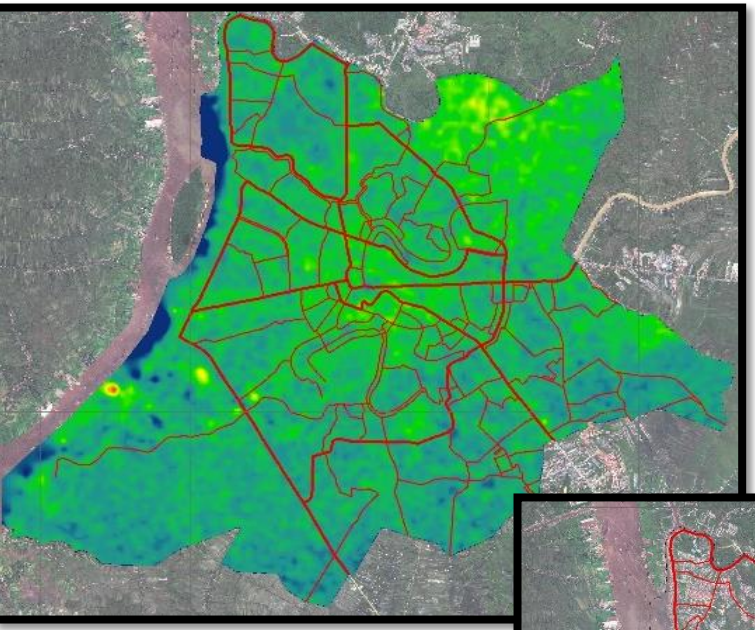
- Euclidean Distance & Interpolation → 2
- Land Change Modeler → 3

Method 1

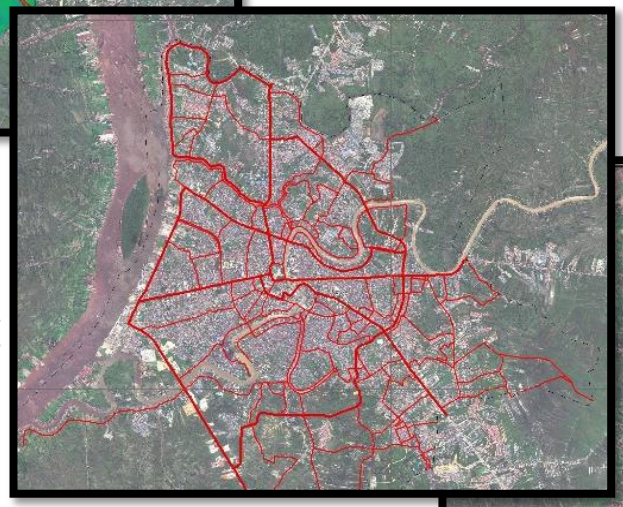


Classification Method : To get Landcover data using Hybrid classification (Digital + Visual Intepretation)

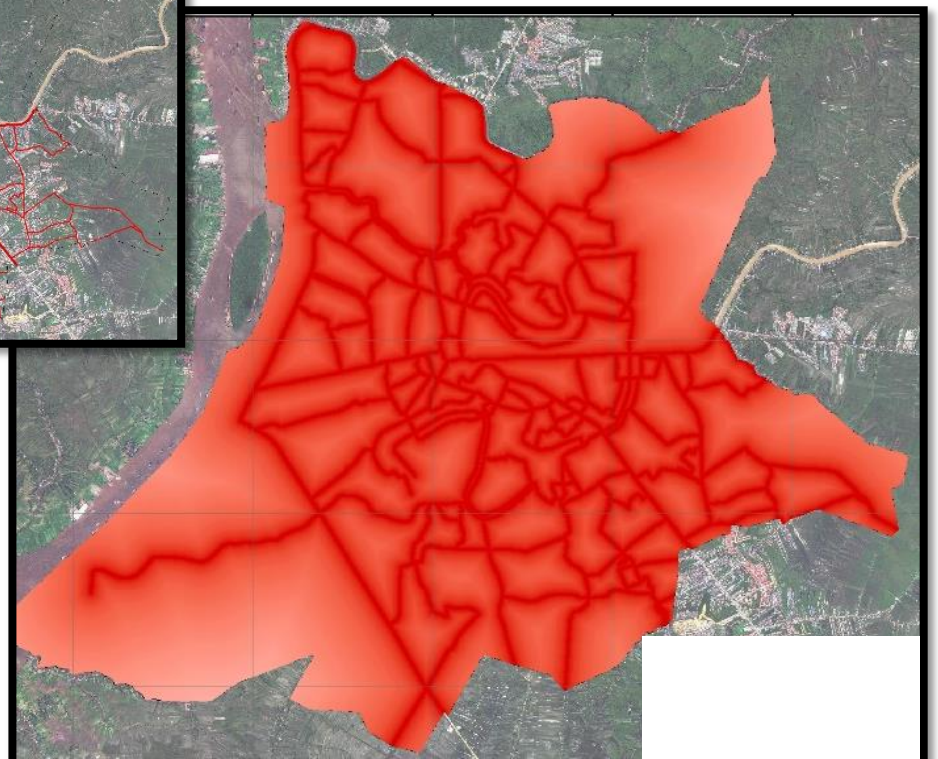
Method 2



Digital Elevation Model (DSM)

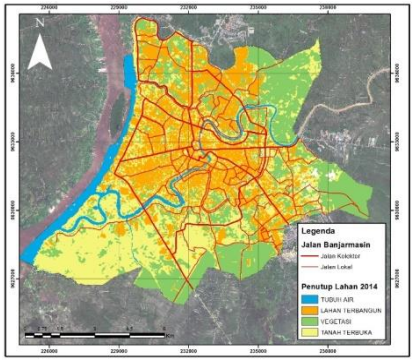


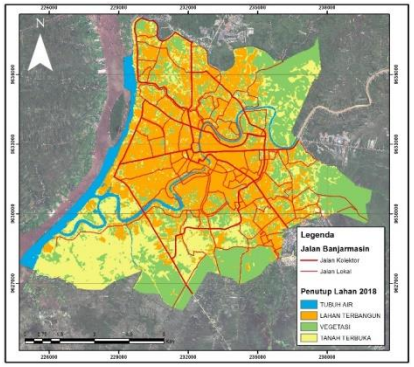
Road Development



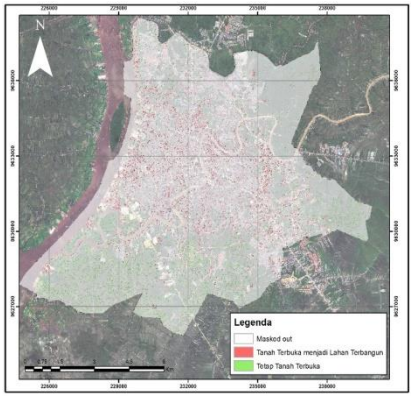
Road Euclidean Distance

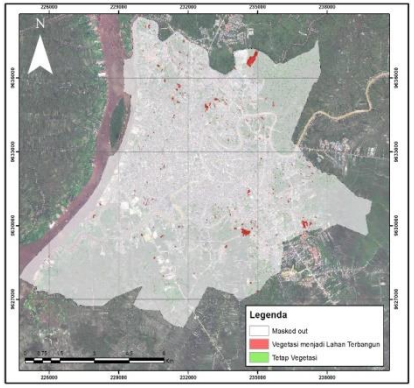
Method 3



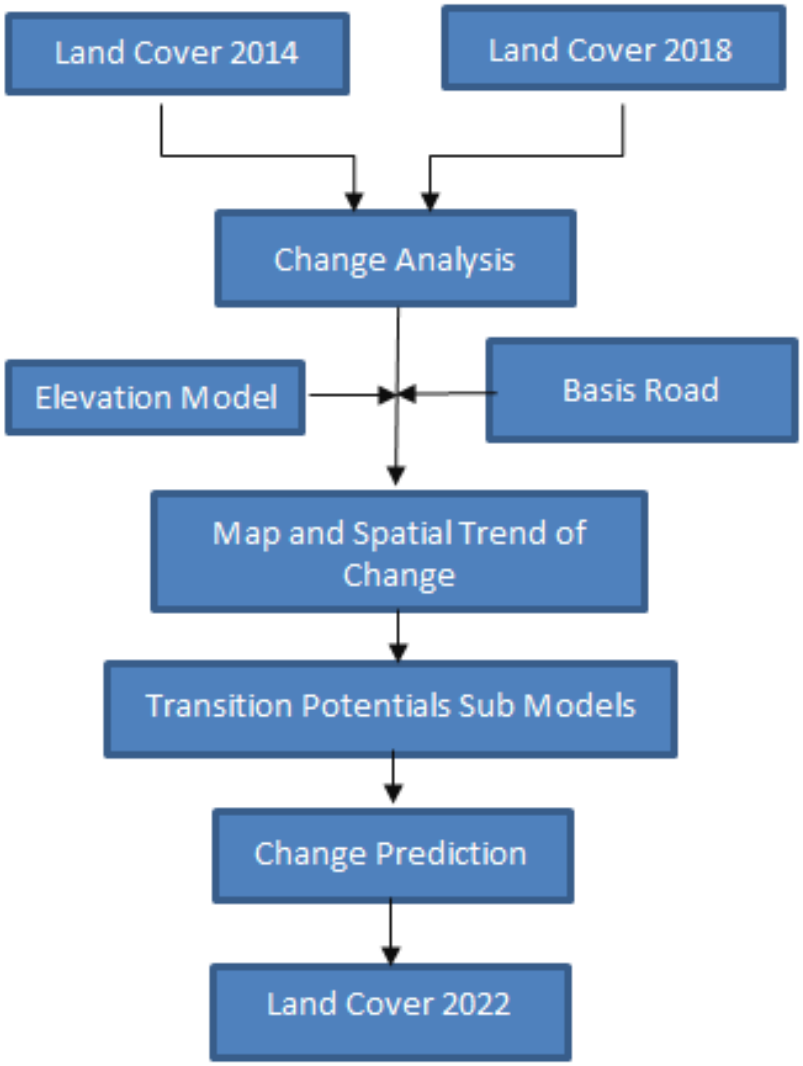


Landcover Interpretation
(a) 2014, (b) 2018

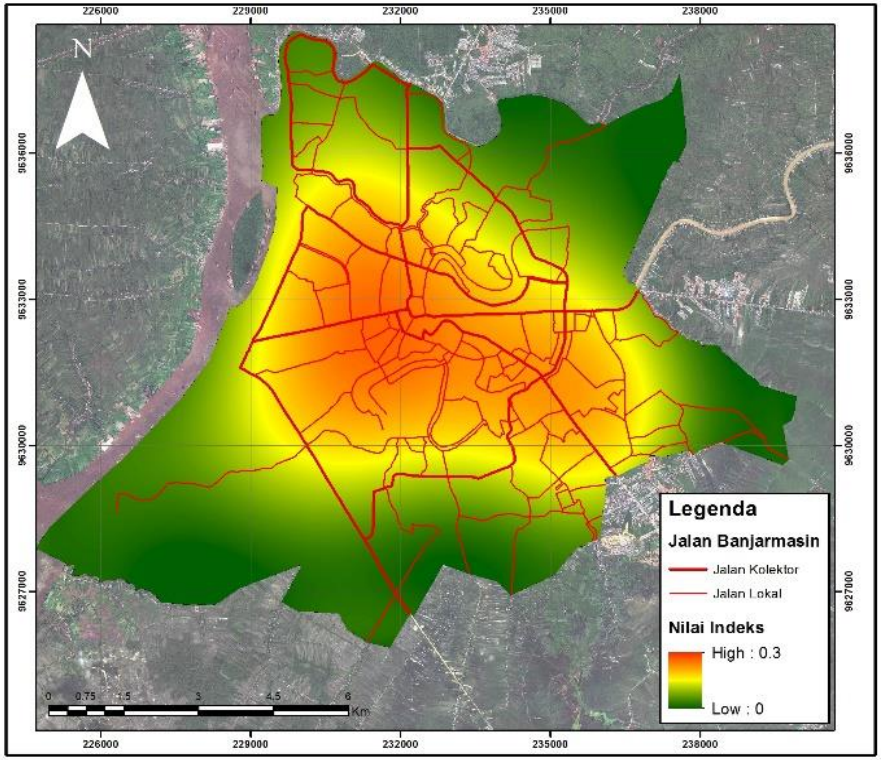




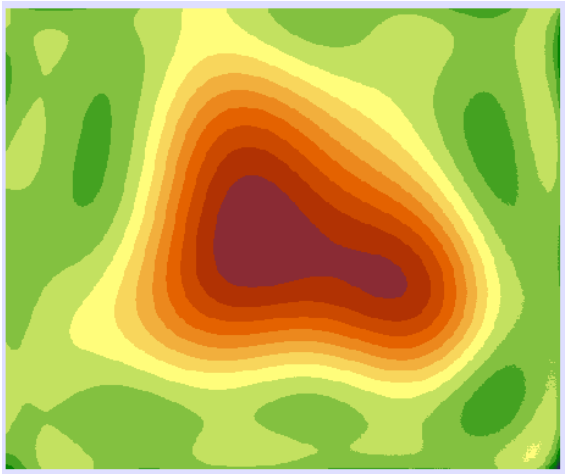
Distribution Land Cover Change
(a) Bareland-Build up, (b) Vegetation-Build up

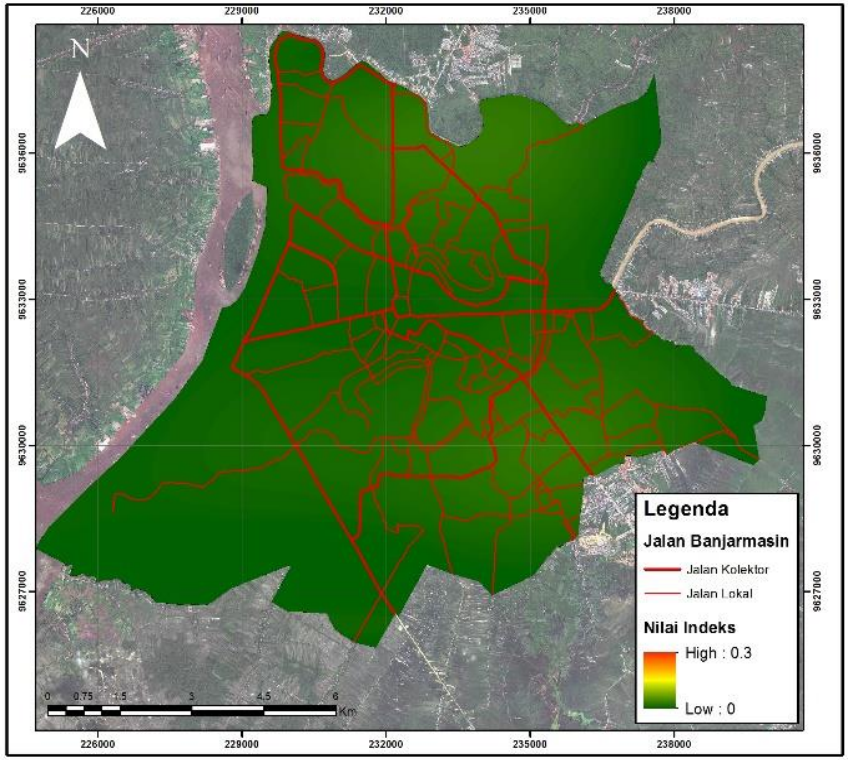


Spatial Trend Change



Bare Soil-Built up

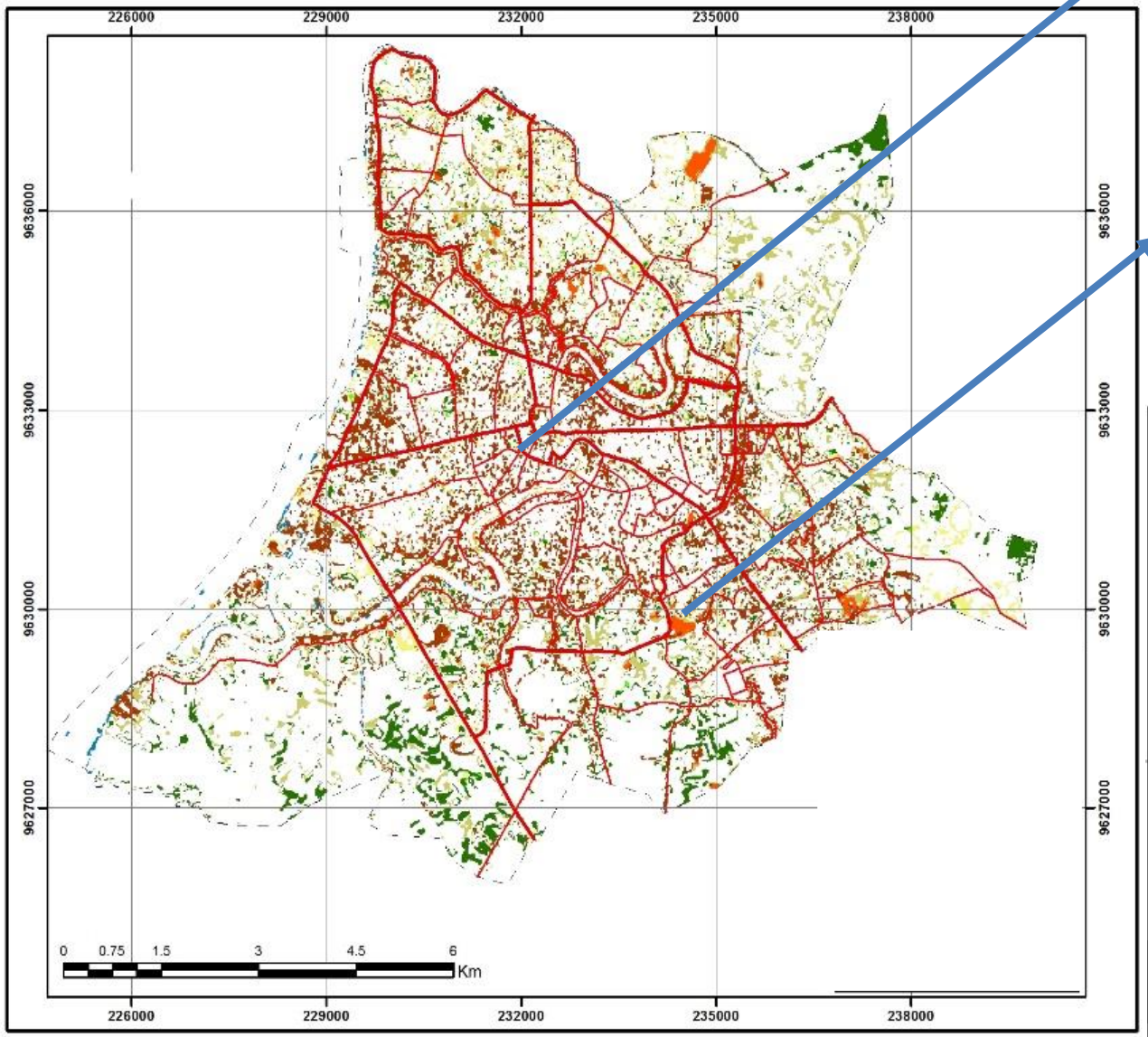




Vegetation-Build up

All Class Landcover – Build up

Landcover Change Distribution



Legenda

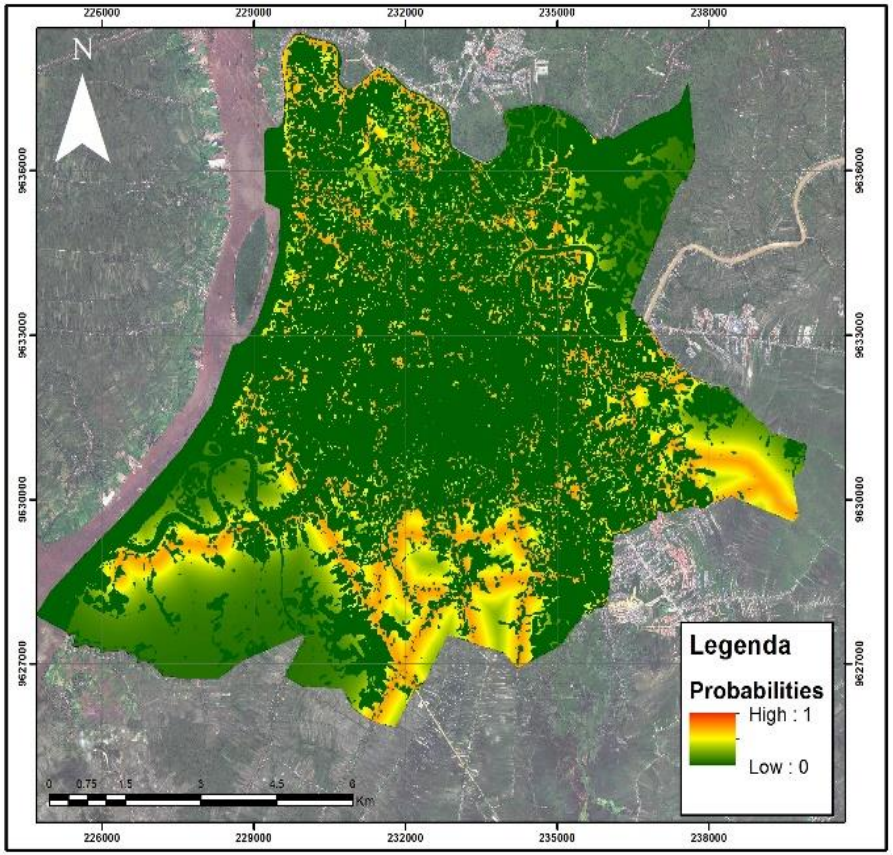
Jalan Banjarmasin

- Collectors
- Local Roads
- No Change
- Built Up to Water Bodies
- Bare Soil to Water Bodies
- Water Bodies to Built Up
- Vegetation to Built Up
- Bare Soil to Built Up
- Built Up to Vegetation
- Bare Soil to Vegetation
- Built Up to Bare Soil
- Vegetation to Bare Soil

Matrix Probability of Land Cover Changing

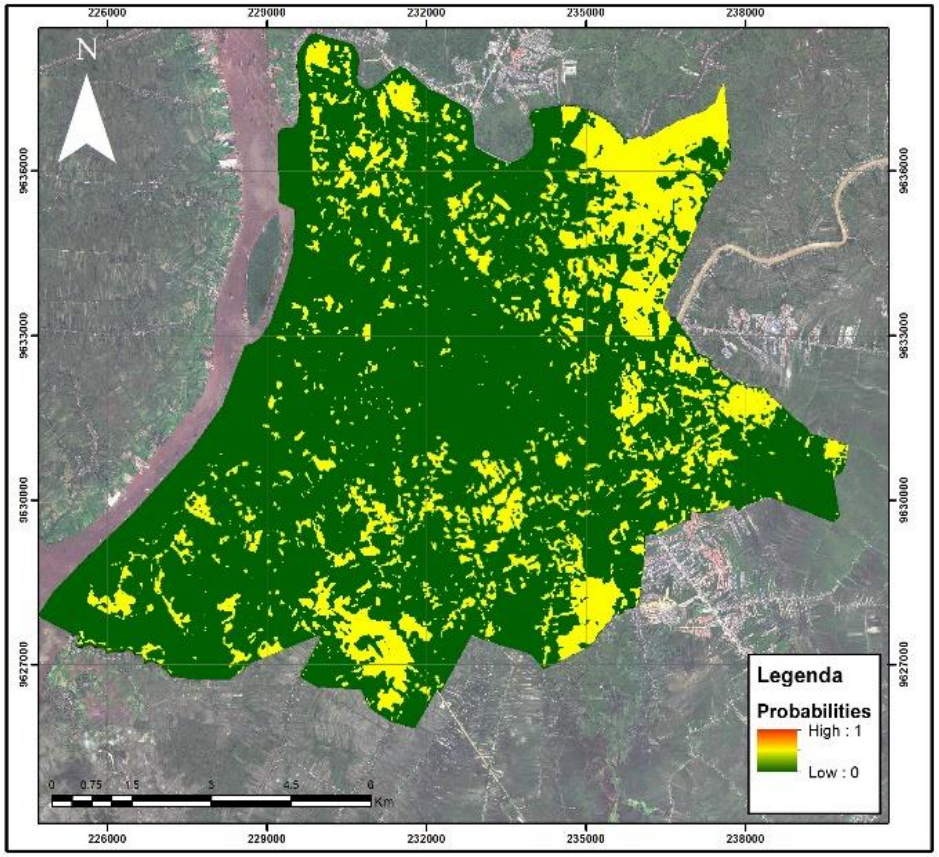
		2018				
2014		Water body	Build up	Vegetation	Bare Land	Cloud
	Water body	0.9370	0.0506	0.0000	0.0124	0.0000
	Build up	0.0051	0.8808	0.0164	0.0973	0.0005
	Vegetation	0.0000	0.0459	0.7697	0.1841	0.0003
	Bare Land	0.0060	0.2714	0.1139	0.6077	0.0010
	Cloud	0.0469	0.1738	0.2893	0.4738	0.0161

Transation Potensial

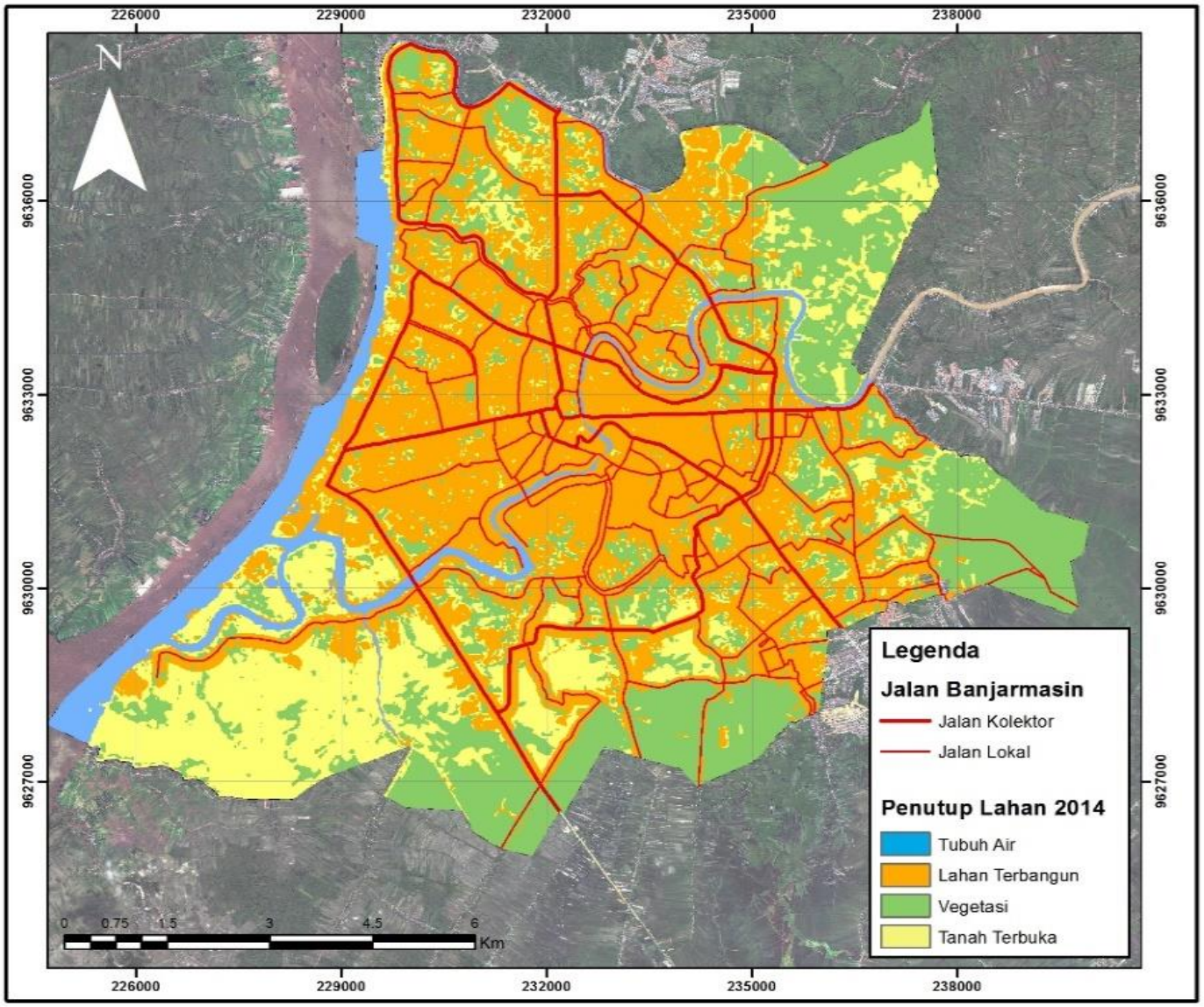


Bareland-Build up

Vegetation-Build up



Land Cover Prediction 2022
Banjarmasin City



Conclusion

- Land Change Modeler can be used to see land changes that occur in the Banjarmasin city in 2014-2018 about ± 800 Ha for Bare Soil – Build up and < 20 Ha from Vegetation – Build up.

- Based on land changes that occurred in 2014-2018, predictions of land cover that occurred in 2022 can be analyzed based on road development parameters, road distance and the topography of the Banjarmasin city.

- The development of the city of Banjamasin in 2022 was increasingly crowded in the center of the city and developed to the north especially as residential land