

High resolution 2019 land cover map of Southeast Asia

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Abstract. This research article presents the high-resolution land cover map of Southeast Asia with methodology and accuracy assessment. The map was produced from Landsat 8 OLI data for the summer season of 2019. The study area covers Myanmar, Laos, Vietnam, Thailand, Cambodia, and North Malaysia Southeast Asia countries. Analysis work used image processing work and identifies eight land cover classes as barren land, cultivated, developed, forest, grassland, shrubland, water, and wetland. The resulted map's overall accuracy is more than 85%. These high-resolution land cover maps are useful for national to international level policy and decision-makers to sustainable utilization of natural resources as well as protection of the fragile environment.

1. Introduction

The last three decades medium to low-resolution land cover maps produce at regional to the global level [1, 2]. There are lots of land cover changes due to development in Southeast Asia so every time scientific organizations provide new land cover maps but they are coarse to medium resolution and have lack of information [3]. The recently rapid growth of the population in the region increases the market demand for food which rises pressure on food production and natural resources as well as encroachment and miss-use of land in Southeast Asia [4]

This research article presents a new land cover map of Southeast Asia at 30m resolution based on Landsat OLI satellite data. Based on author knowledge there is not any other land cover map of this region at this scale [5]. Basic eight land cover classes were identifying in this map to maintain high accuracy. This map is useful for policy and decision-makers in the region as well as local to a national and international level organization for proper utilization and protection of natural resources and to avoid miss-use of land [6].

2. Materials and methods

Landsat 8 operational land imager (OLI) at 30m resolution images were used in this research work for the summer session of 2019. This data was downloaded from the USGS website at free of cost. Before start, to land cover classification all basic image pre-processing steps were done such as georeferenced, error removing, and appropriate band combination and in last supervised maximum likelihood classification and finally generate a land cover map of Southeast Asia for the year of 2019.

For accuracy assessment, very high resolution google earth images and some specific site visits were used as a ground-truth. Author also used ancillary data, old low-resolution land cover maps, and topographic sheets.

3. Results

Figure 1 shows the land cover map of Myanmar, Laos, Vietnam, Thailand, Cambodia, and North Malaysia Southeast Asia countries for the year 2019. Eight land cover classes including barren land, cultivated, developed, forest, grassland, shrubland, water, and wetland wear shown on the map with more than 85% overall accuracy based on multiple ground observations. 50 percentage area covered by forest area, cultivated and grassed land covered 12% respectably and more than 5% area covered by settlements.

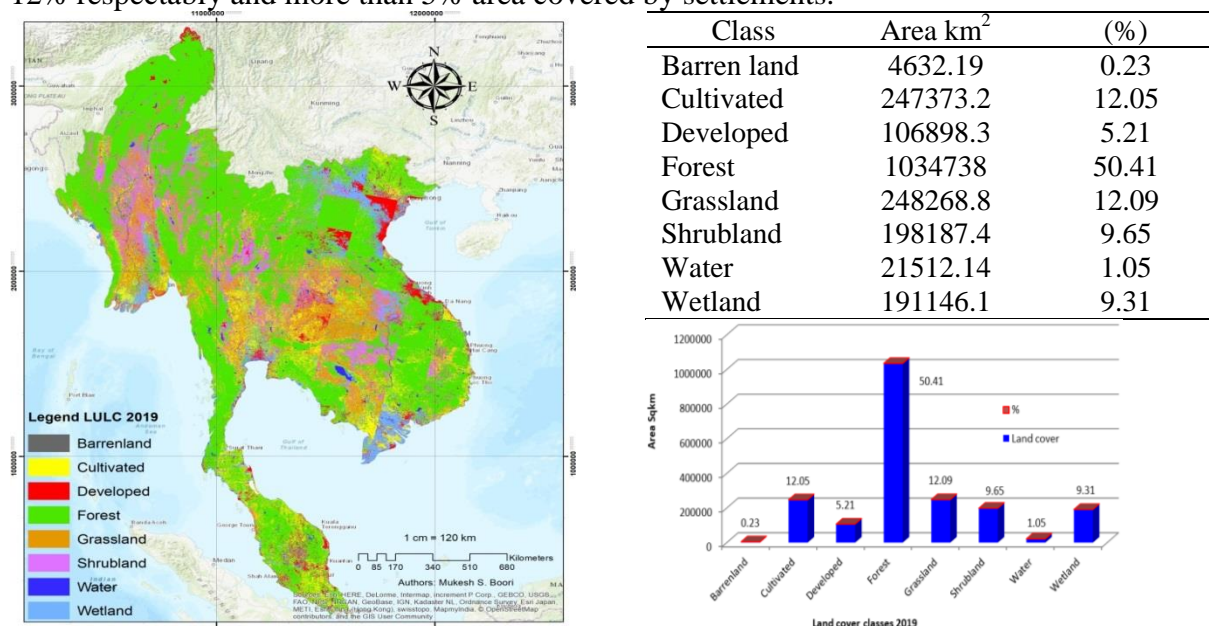


Figure 1. Land cover map with percentile cover area of Southeast Asia at 30m resolution for the year of 2019.

4. Conclusions

A 30m resolution Southeast Asia land cover map was generated through satellite remote sensing and GIS technology. This research provides the latest land use/cover information of the area, which is under a highly changing stage due to development, the rapid growth of industrialization, dramatically increasing population and socio-economic activities. This map provides useful information for policy and decision-makers as well as researchers who need the latest high-resolution land cover map of Southeast Asia for multipurpose.

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