

## Land Cover Changes of Maubin Township, Ayeyarwady Region

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### Abstract

Maubin Township is located in the Ayeyarwady delta, occupying southeastern part of Ayeyarwady Region. Maubin Bridge was opened on 10<sup>th</sup> February 1998. After the construction of Maubin Bridge, road transportation emerged and rapidly changed. As transportation improvement made the growth of population and residential area was extended the consequences of population growth affect on the land use patterns of Maubin. The location of this township is favorable for fish culture development. Maubin Township has an area of 1334.8 square kilometres (515.18 sq miles), comprising three main parts.

**Keywords:** Land cover, landsat, satellite image

### Introduction

Road transportation is easier and transport duration is shorter than that of waterways. Road transportation is more accessible from Yangon to Maubin and other townships. Maubin Township is replete with rivers, creeks, and natural lakes. Before 1988, Maubin Township depends heavily on the cultivation and production of paddy as the main economic activity. After the adoption of market-oriented economic policy, intensive cultivation was practiced by cultivating paddy two times in a year where irrigation water is available in the dry season, together with the use of chemical fertilizers and pesticides. The economic condition of this area is mainly based on the agriculture and fishery sectors.

### Aim

- To apply GIS and RS techniques for land cover classification of Maubin Township.

### Objectives

- To examine the present land cover patterns of Maubin Township.
- To analyse the extent of land cover conditions, using satellite images
- To study relationship of the land cover patterns.

### Sources of data

- Landsat 7, 133-048, 1999 and Landsat 8 TM– 133-048 ,2018
- Google Earth image, UTM Topographic map, DEM map, data from field survey and Administrative Department of Maubin Township.

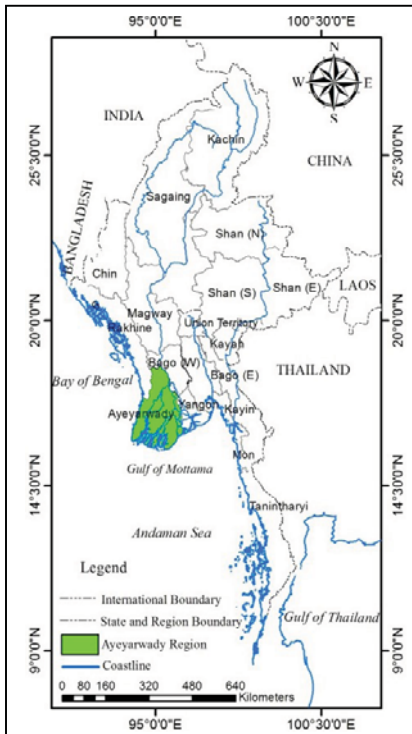
### Definition

Land cover, observed physical cover, as seen from the ground or through remote sensing, including the vegetation (natural or planted) and human construction which cover the earth's surface. (FAO, 1998)

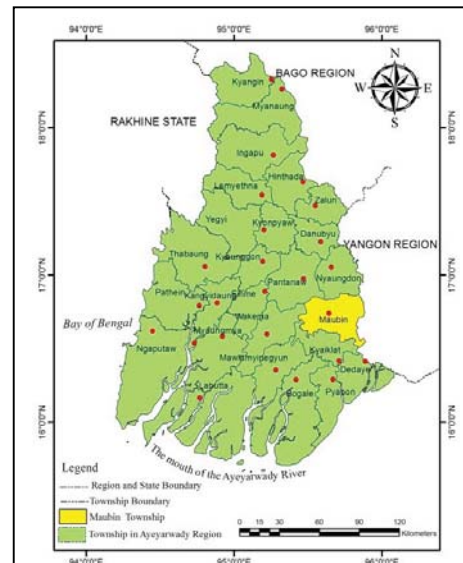
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**Figure 1.a Location of Ayeyarwady Region**  
Source: Myanmar Survey Department

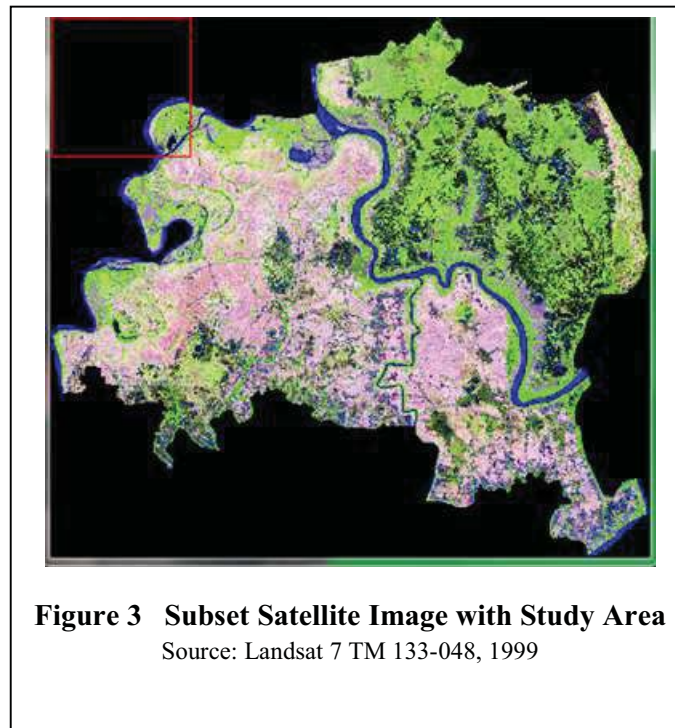
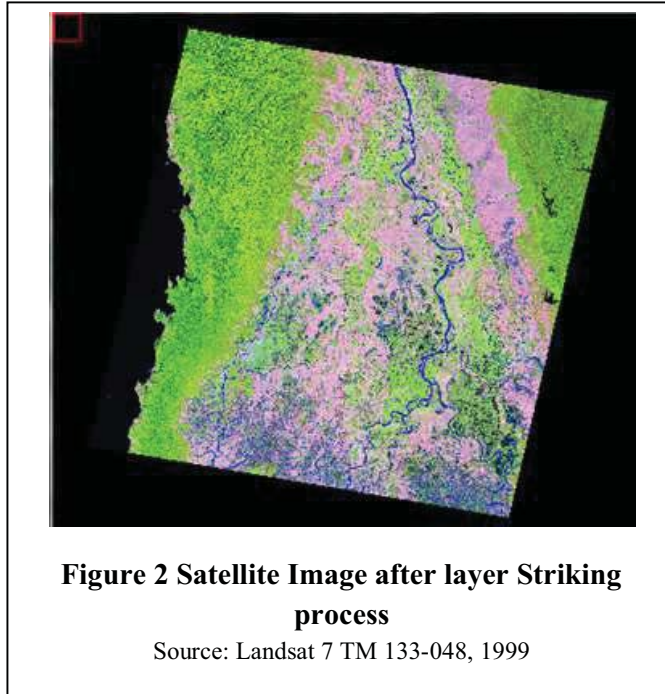


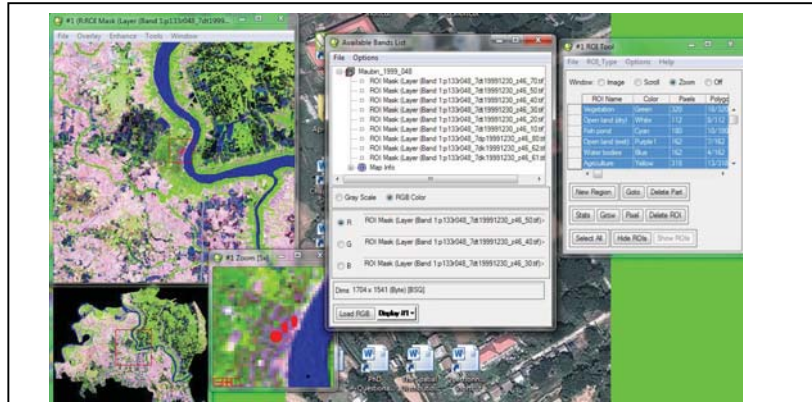
**Figure 1.b Location of Maubin Township in Ayeyarwady Region**  
Source: Myanmar Survey Department



**Figure 1.c Location of Village Tracts in Maubin Township**

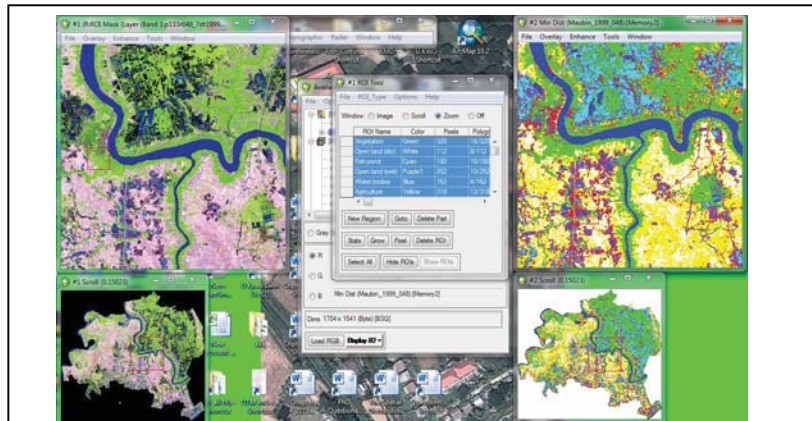
Source: Boundaries based on Topographic Map (1:50000)





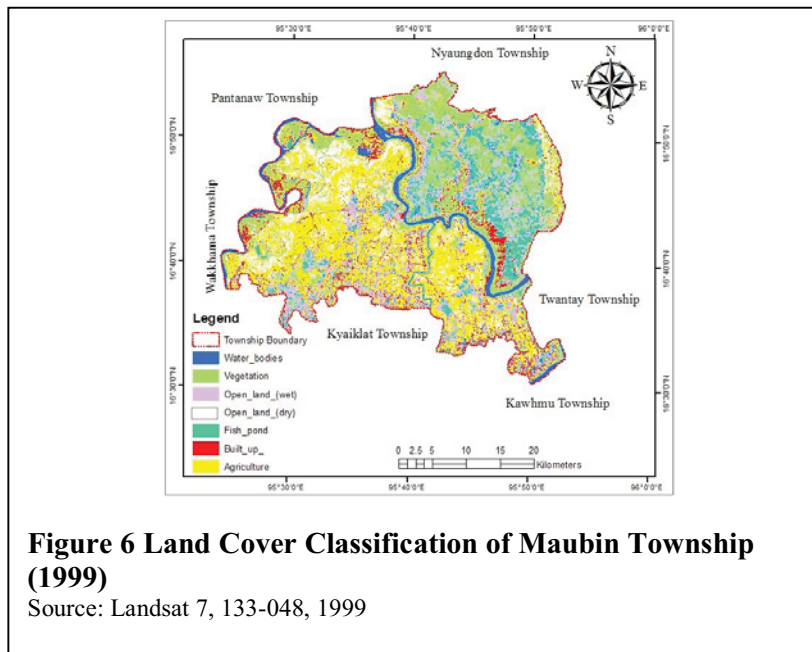
**Figure 4 Defining Region of Interest (ROI) on the Study Area (1999)**

Source: Landsat 7 TM 133-048, 1999



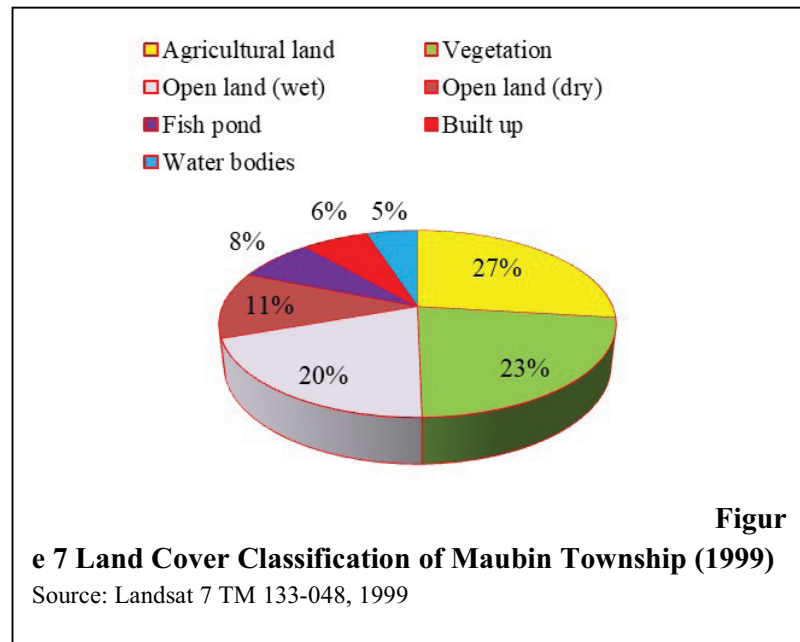
**Figure 5 Supervise Classification of the Study Area in 1999**

Source: Landsat TM 133-048, 19997



**Figure 6 Land Cover Classification of Maubin Township (1999)**

Source: Landsat 7, 133-048, 1999



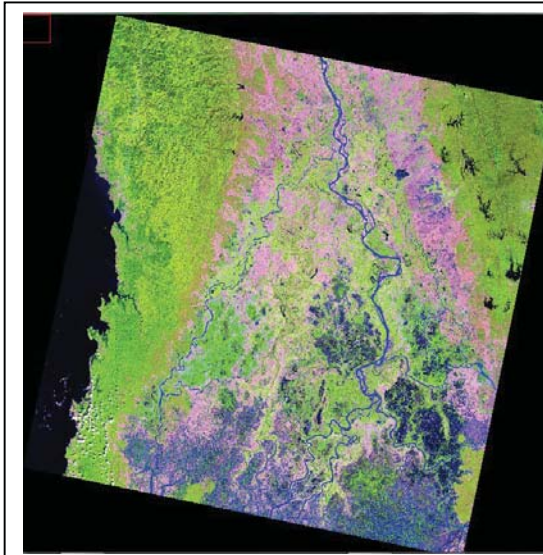
In 1999, agricultural land covers 27 % of the total area. These areas are cultivated lands. Most of them are located in Maubin Kyun and Thonegwa Kyun. 23% of the total study area is covered with vegetation. They are located in Nyaungdon Kyun.

### Geographical Background of the Study Area

Much of the township area is low and flat with an elevation of 10 meters (30ft) above sea level. The western and northwestern parts are slightly elevated with above 10 meters, where the southern and northern are slightly low with less than 6 meters (20ft). This depressed part has the characteristics of wetland manifested by permanent small creeks, water-logged lakes and inns and mudflat.

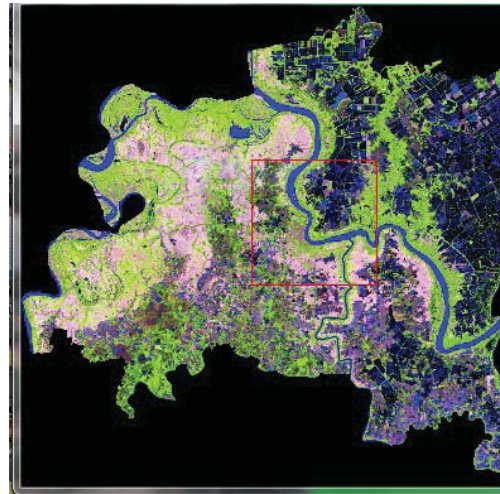
The Ayeyarwady flows along the western margin of the townships as a boundary line between Maubin and Wakhema and Pantanaw Townships. The Toe River is one of the distributaries of the Ayeyarwady and flows across the middle part of the township for 56.3 Kilometers (35 miles). Maubin Township is liable to get tropical monsoon climate with small range of temperature.

Physical condition of study area is lowland, and most of the areas are flooded during the rainy season. Low elevation with a number of lakes, inns and the presence of permanent streams which serve as water sources for fish pond induce the development of fish culture. Therefore over 80 percent fish farming activities are being carried out on Nyaungdon Kyun. There are a number of small creeks in northeastern part of Nyaungdon Kyun.



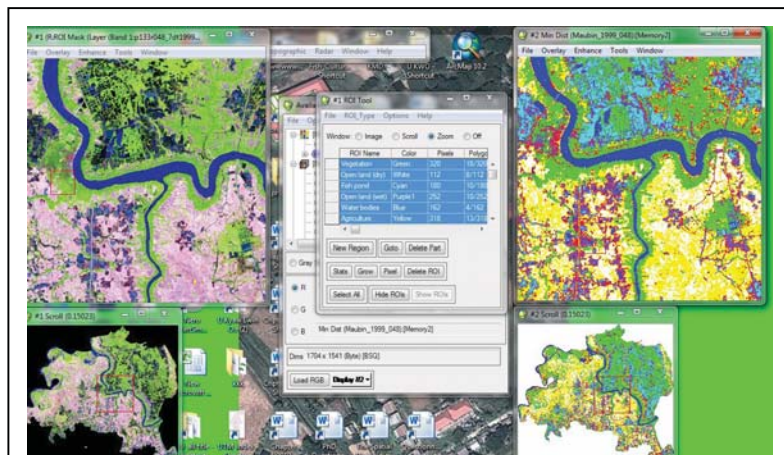
**Figure 8 Satellite Image after layer Striking process**

Source: Landsat 8 TM 133-048, 2018



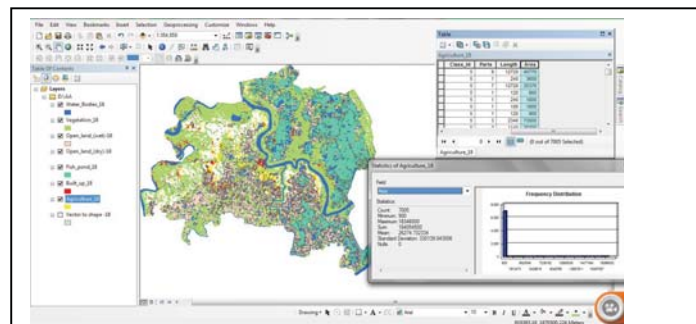
**Figure 9 Subset Satellite Image with Study Area**

Source: Landsat 8 TM 133-048, 2018



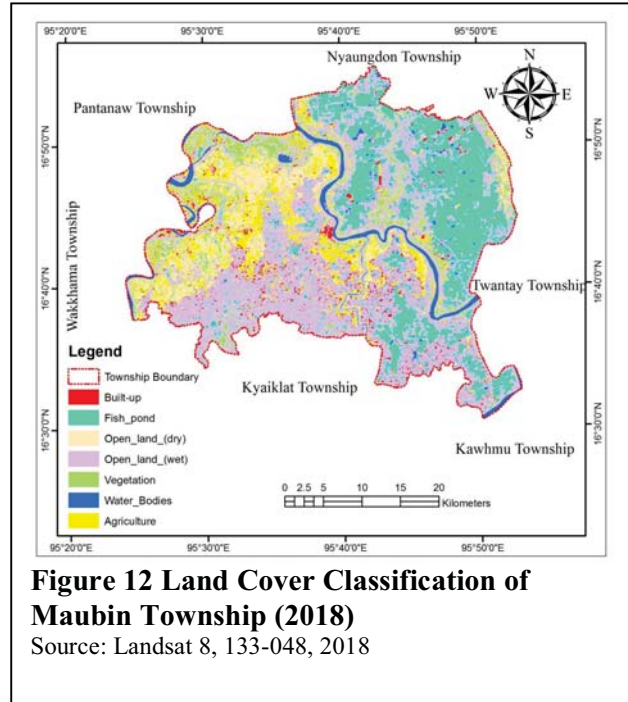
**Figure 10 Supervise Classification of the Study Area in 2018**

Source: Landsat 8 TM 133-048, 2018

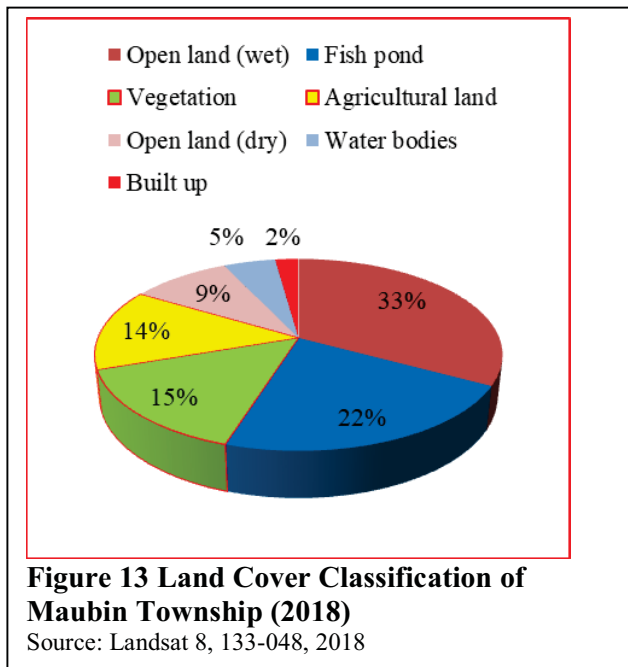


**Figure 11 Selection Statistics Result of Study Area**

Source: Landsat 8 TM 133-048, 2018

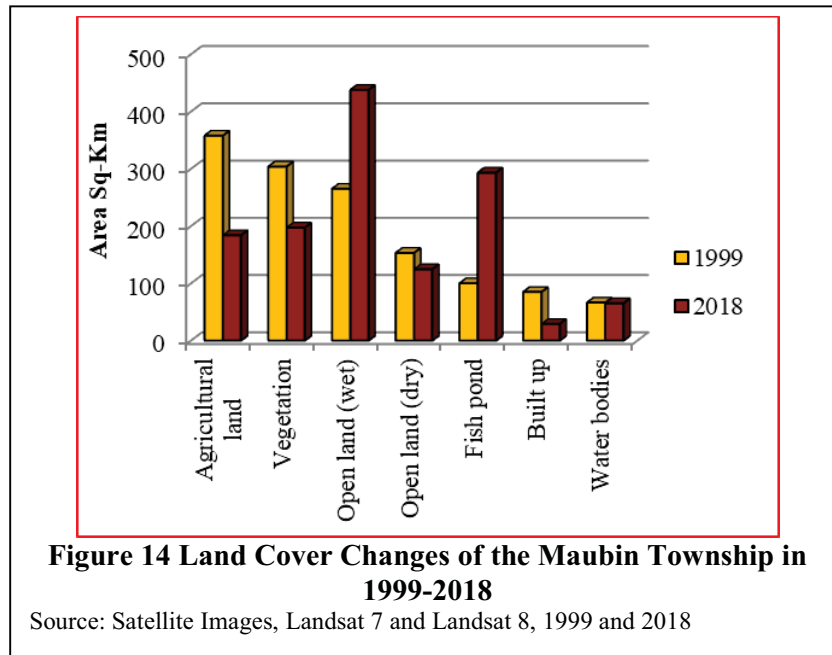


**Figure 12 Land Cover Classification of Maubin Township (2018)**  
Source: Landsat 8, 133-048, 2018



**Figure 13 Land Cover Classification of Maubin Township (2018)**  
Source: Landsat 8, 133-048, 2018

In 2018, open land (wet) is the largest area which is 33% of the total area. The second largest area is fish pond which is 22% of the study area. The Nyaungdon Kyun and Thonegwa Kyun are mostly occupied by fish ponds and *inns*. Number of fish ponds and fish production increased in this study area. In this delta region, paddy is mainly cultivated in Myanmar. But, paddy cultivated areas were changed into areas of fishery. Number of fish ponds and fish production increased in the study area.



### Conclusion

After the year 2000, fishery sector has developed under the market oriented economy. Most of the population is engaged in fishery in the northeastern part of the Maubin Township. Over 80 percent of the total population of Maubin Township live in rural area. The greater number of population is favourable for local fish culture, it tends to reduce the agricultural land. The conversion of the land and inn land into fish ponds has resulted in the decrease of paddy production and which in turn leads to the increasing number of daily wage earner.

The extension of fish pond area decreases the area of natural fishing for the local inhabitants. Generally, climate conditions of Maubin Township are suitable for commercial fish culture. Therefore, fish culture of the study area is controlled by the optimum condition of the climatic condition and it is one of the important factors for the fish culture activities of the township.

Land cover changes of Maubin Township based on Landsat 7 TM, 133-048, 1999 and Landsat 8 TM, 133-048, 2018. There are seven categories in land cover classification on the study area. Geographic Information System (GIS) and Remote Sensing (RS) application also helps for examination of the distribution of land cover. Physical factors and human functions influenced on the land cover changes on the study area.

### Acknowledgements

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### References

- F.A.O (1996): F.A.O Land Cover Classification
- NASA (2012): The NASA Land –Cover and Land –Use Change Program (LCLUC)