1. Introduction

Generally speaking, the coastal plain and lacustrine plain are including several important remnants for showing long period natural environmental change and also short term environmental change impacted by human activities since prehistory to modern period. One of the archeological sites where are located on the northern part of Nile delta, Kom al-Diba’a archaeological site, is recently facing to the wide spread lacustrine plain around Iduk lake connected with Nile delta, and this lake and lacustrine plain show several environmental change remnants linked together with sea level changes in Holocene and construction of the foundations of local people’s livelihood and occupation.

Already, the authors explained the existence of former lagoons and swampy areas around present Iduk lake and widely distribution of sand dunes and sand ridges around the lake. In the modern period, also the surrounding area of Iduk lake has been changed in drastically under the climate change with sea level changes in this study area and recent agricultural development and canal excavation (Hasegawa, 2015, Nishimoto, 2015, Haruyama et al. 2014 and 2015, Haruyama, 2014). Hasegawa (2015) explained that the Iduk lake transformation process using topographic maps. Using several kinds of satellite images and field study with surface measurement and core samples analysis, we tried to prepare geomorphologic land classification map of the eastern part of Iduk lake including to lacustrine plain. Regarding to the results of sediment faces analysis of Iduk III coring point, we found that the surface sediment has a high content of silt and clay, organic clay with indicators living in seawater/muddy tidal flat and the environment indictor of Iduk III-295 is showing the embayment area and the indicator of Iduk III-190 is showing the lowest river basin including lagoon or embayment (Haruyama, et al. 2014 and 2015).

2. Geomorphologic land classification mapping of the eastern plain of Iduk lake and land use landscape

The satellite image and topographical maps of Damanhur province are the important basic geographical information for the geomorphologic survey in 2013 and 2014. The lacustrine plain and coastal plain including to Kom al-Diba’a archaeological site have been studied for aim of clarification of micro-landform for trying to find the structure of landform components for preparing geomorphologic land classification map.

There are conspicuous four lines of sand dunes facing the Mediterranean Sea showing the different faces of relief structures near Iduk lake. The other lines of inland sand dune are located surrounding the archeological sites behind the former lagoon and lacustrine plain. The sand dunes are following features; 1) present active sand dune without vegetation along the coastal line and few relief, 2) sand dune covered by grass and few relief behind the active sand dune, 3) sand dune covered by few shrub or bush behind the second sand dune type, 4) high-stand sand dune but these sand dunes are now destroyed because of sand gathering for aggregate materials for construction. The inland sand dunes are interspersed southern and eastern part of lacustrine plain and the direction of the sand dune formation have different axis of the coastal sand dune at right angles. The inland sand dunes are usually target places for historic sites and the surface of sand dunes are disturbed by human activities because of present dwelling place construction. The fragile foundation of inland sand dune has sometimes fluvial layer near archaeological site and estimated in the some distributaries flow to the lake before forming inland sand dune line. The erosional sand dunes are distributed behind the inland sand dunes. The knotting place of transportation and local commercial town, Iduk town is located on the third line of sand dune, however, the base or fundamental structure of sand dune is coastal sediment of complex layers.

The flood plain is composed of lacustrine delta, lacustrine wet land, lower lacustrine terraces facing to the former lagoon around Iduk lake. The lacustrine terraces are located around inland sand dune line and these places make an offer the present residence zones in rural villages. The lacustrine wetland has been developed agricultural area with irrigation and drainage canals construction, and the border zone between lake and wetland has been developed for aquaculture. Still now, the lacustrine plain has been changing rapidly for fishery and agricultural landscape with cutting and reclamation process.

3. Future study

The changing sand dune and wetland-lagoon system is under the environmental changes related with global climatic change and recent rapid human disturbance of earth surface. The landform process of the lagoon and lacustrine plain in this study area should be more clarified for interface between the Nile fluvial system and local response of lacustrine plain.

References