GIS FOR RURAL PLANNING IN HAMBANTOTA DISTRICT

A PROJECT REPORT PRESENTED BY
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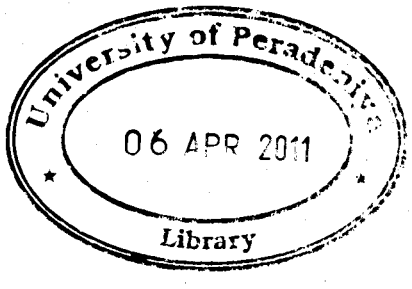

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ABSTRACT

The Geographical Information System (GIS) has many facilities for proper analysis, management, monitoring and modeling of information in any field with geographical reference. The field of rural planning is one of them. Accordingly, the GIS and its integrated facilities were used as the major tool for conducting this study. The study area was Ambalantota Divisional Secretary Division (DSD) in Hambantota District.

The main objective of this study was to update the Grama Niladari boundary in the DSD since the boundaries of these units are not gazetted and they change frequently. The most important and very essential need of the rural administration and also the process of making the entire rural planning are making outlying the Grama Niladari Division (GND) boundary accurately. Therefore, a new boundary map was prepared using the knowledge on boundary of Grama Niladari officers (GNOs) and GIS and GPS technology. According to the updating results, at least there is an area deviation of all GND. However, to assess the reliability of the updated boundary, all boundaries were checked by the participation of all GNOs. They have certified that the updated boundary map of divisions was more accurate and all the GNOs were satisfied with the map.

This research presents the results of a study to demonstrate a methodology to identify the distribution of infrastructure facilities in the selected area. The selected variables for the study included drinking water, sanitation, electricity, housing, road density and common services. The key spatial unit of identifying infrastructure was Grama Niladari Divisions (GNDs). All the GNDs were classified in to three categories "high', "moderate" and "low" densities according to such variables. This Categorization helped to develop composite

index to capture broadly the spatial variation of infrastructure facilities among GNDs. In Some Divisions, like Deniya, Pingama, Godakoggalla, Ethbatuwa, Punchihenayagama and Modarapiliwela, the infrastructure facilities are very much constraint while in some Grama Niladari Divisions such as Ambalantota North, Ambalantota South, Mamadala South, Ekkassa, Malpettawa, Bolana North and Bolana South, the infrastructure facilities are relatively in abundance. Because of the inequalities of the disbursement of the funds for infrastructure development, the availability of infrastructure facilities of the GND shows a poor distribution with in the DSD. In order to have some degree of uniformity in infrastructure availability, a series of development projects need to be implemented in selected GNDs. In this process, the GNDs which show receive priority have been identified and classified as "priority", second selection" or third selection".

Under rural planning in this project, final objective was to establish model in land evaluation for rice using GIS, as rice is the main cultivated field crop in this DSD. The evaluation of land in terms of the suitability classes was based on the method as described in FAO guideline for land evaluation for rainfed agriculture. A land unit resulting from the overlay process of the selected theme layers of the rice included water availability, nutrient availability, land form, soil texture and salinization of soil. The thematic layers were collected using existing information. Water availability was obtained by analyzing rainfall data and irrigation area. Spatial information of nutrient availability was formulated using soil map. Land form of the area was prepared using land use map and Soil texture and salanization of the soil were based on soil map. Each of the above mentioned layers with associated attribute data was digitally encoded in a GIS database to create thematic layers. Overlay operation on the layers produce a resultant polygonal layer, each of which is a land unit with characteristics of the land. The result indicated that the highly suitable land cover is an area of about 20 km^2 and corresponds to the high irrigated areas with nutrient availability index. The 55.08% of the DSD is unsuitable areas for rice cultivation which is restricted to the irrigated areas. Land suitability rating model applied to the resultant polygonal layer provided the suitability classes for rice. The resultant suitability classes were checked against the rice yield which collected by the divisional agrarian service center in the division. According to them, the rice yields in the study area were on average 4171, 2968 and 2078 kg\ha for the unit of class generated highly, moderately and marginal area respectively in year of 2008. It was found to be satisfactory.