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## GIS MODELLING APPROACH FOR ENVIRONMENTALLY SUSTAINABLE URBAN LAND USE PLANNING IN COLOMBO URBAN AREA

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Rapid urbanization is proceeding and pushing up the demand for various land uses mainly residential, commercial industrial etc. Land is an essential ingredient in this process, as in all urban growth. This growth has been associated with increasing pressure on land for human settlements and related urban services. The problem in Sri-Lanka like most developing countries, is not a shortage of developable land, but the ineffective and unplanned mechanisms the use to ensure supply of suitable land for urban expansion. The trend of the development of this nature bears a heavy impact on the urban land development as evident from the horizontal expansion of urban centres. As a result of that increased development pressure on agricultural lands in immediate surroundings of urban centres as further aggravated the problem of conservation of the natural environment. The above shows that in the past insufficient attention have been paid to the land use planning for identification of conservation and development. As a result of that ecologically valuable lands are converting to urban development without consideration of the environment. With in this contex, present land use planning necessitates to pay attention of environmentally sustainable land use land use planning. When considering the sustainable development of land, land use change management is an important phenomenon. The content of land use change management can be described in terms of three value sets (ecological, social and market values) that must be brought into by land planning.

The rapid population growth in Colombo Urban Area has been associated with increasing pressure on land for human settlements and related urban services. As a result, *ad hoc* development which has been taken place in the past due mostly to unplanned land uses inappropriate use of land in Colombo Urban Area. Therefore increased development pressure on agricultural lands in immediate surroundings of urban centres has further aggravated the problem of conservation of the natural environment. The above shows that in the past insufficient attention has been paid to the planning for conservation and development.

GIS is a powerful tool for land use planners in their effort to make land development processes more efficient and attractive. Conventional geographic database design is based on Boolean logic, and it created so many shortcomings. Fuzzy logic screen as the basic for representing and manipulating in exactness in a relational geographic database hence, recent developments of models in geographic information systems have been drawn upon concepts of fuzzy set theory and multi-criteria methodology. Saaty's Analytic Hierarchy Process (AHP) (1980) is compatible with both these research directions. This paper demonstrates the application at Fuzzy set theory in GIS for environmentally sustainable land use planning. The results indicate the future land requirements and allocations in case study area so that planner can make sound judgment on land allocation.