

## **ABSTRACT**

**A Method for Planning Land Use Sustainability (MPLUS):  
Land Use Planning for Sustainable Resource Utilization  
and Sustainable Development**

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The contribution of this thesis is the development of a new approach, MPLUS, to integrating all three subsystems (social, economic and natural) in a single planning process. MPLUS is also developed as a general software tool for planning.

The thesis begins by examining the usefulness of the concepts of sustainable development and resource utilization with land use planning. The contention throughout is that the achievement of sustainable development depends on being able to integrate all three subsystems of the ecosystem in a single planning and decision-making process. A review of two case studies, the first by Ruslan Rainis in the Big Darby Creek, Ohio, and the second by the World Bank in Uganda pointed to the use of Geographic Information Systems (GIS) in integrating two of the three subsystems.

The development of MPLUS advances the science by (a) integrating all three subsystems in a single planning process; (b) using the open system approach to predict land requirements for future generations through a process of system description, modelling, projection, and synthesis/ response; and (c) resolving the previously difficult spatial and temporal scales in a simple, cost-effective way that facilitates the means to implement and operationalize national and local Agenda 21 goals toward the achievement of sustainable development.

MPLUS is then applied in a stand alone Test Case Study Area in Region No. 3 - West Demerara, Guyana, which requires the development of a GIS database comprising 40 years of data. Three major categories of land uses - residential, industrial, and commercial, are allocated in the formulation of a Sustainable Land Use Plan for West Demerara. Areas for further research priorities including the continued refinement of MPLUS and the importance of information in planning are also discussed.

**Keywords:** Cheryl Alma Gopaul; Ruslan Rainis; Uganda; Guyana; Region No.3-West Demerara; sustainable development; sustainable resource utilization; sustainable land use planning; systems planning process; geographic information systems; and Method for Planning Land Use Sustainability (MPLUS).