

### THE USE OF GIS TECHNOLOGIES IN ANALYZING CHALLENGES AND OPPORTUNITIES FOR THE MANAGEMENT OF URBAN GREEN SPACES IN KIGALI CITY, RWANDA

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This study was assessing the challenges and opportunities for managing Green Spaces (GS) of the Urban Part of Kigali City (UPKC). To find out the GS classes and their threats, the land use classes were identified using GIS technologies. Its output was completed by the field visit, questionnaire survey, informal interviews and desk review of the existing environmental and biodiversity policies and laws.

The land use assessment has shown that the built up areas is the most predominant and occupies 74.3%, while the green spaces occupy only 25.3% of the total areas of Urban Part of Kigali City (UPKC). Among the GS classes identified in UPKC, wetlands occupy about 62.6% of the total area of the GS, forests 25%, gardens that are combination of the road side trees, the roundabouts, and playgrounds occupy 12.4% of the total area of GS while the seasonal and perennial crops areas are not significant in the city. In addition, results have shown that GS play different roles in the city among others, the beautification of the city, the air purification and refreshment, waste water treatment, heat reduction, mind refreshment; act as habitat, food and corridors for a good number of animal, etc.

Even though there is no specific law or policy to the urban GS management and protection, the Government of Rwanda (GoR) has put in place a good number of opportunities that take them into consideration. Those include, (1) the governmental policies such as Environmental Policy, Biodiversity Policy, and Forest Policy; (2) the laws such as Organic Environmental Law and, (3) the plans such the master plans for the three districts that make Kigali City. Despite these opportunities, the management of GS in Kigali City is still facing some challenges that the Kigali City authorities are still trying to address. Those include the lack of policies on GS management, low level of awareness on GS management among local people, and the demographic pressure particularly caused by the rural migration that has led to inappropriate human settlement in some areas of the city, wastes management and pollution.

### TIME SERIES ANALYSIS OF GROUND LEVEL OZONE IN KIGALI CITY

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Ground level ozone is a secondary pollutant resulting from photochemical reaction of a variety of natural and anthropogenic precursor mainly volatile organic compounds (VOCs) and oxides of nitrogen (NO<sub>x</sub>). Under favourable meteorological conditions, ozone may accumulate in the atmosphere and reach a high concentration level that can impose adverse effects on human health and ecosystem.

The overall objective of the study is to evaluate the ground level ozone time series concentrations for three years period (From 18<sup>th</sup> June 2009 to 6<sup>th</sup> June 2011) in Rwanda with focus on Kigali city as it has an increasing number of vehicles and many industries which are the major potential sources of ground level ozone sources in Kigali City.