

Introduction

Mapping Rwanda Wetlands Cover Changes between 2008 and 2018 is part of a two-year project termed "Using Wetland Ecological Integrity Assessment and Information management to Guide Wetland Management Decisions in Rwanda". A rapid mapping of wetlands cover change was conducted within 8 main wetland complexes of Rwanda namely the City of Kigali, Akanyaru, Rweru-Mugesera, Upper Akagera, Muvumba, Rusizi and Rugezi Wetland Complexes while a detailed assessment focused on the City of Kigali, Akanyaru downstream, Rweru-Mugesera and Upstream of Akagera Wetland Complexes. During the rapid assessment, 4 classes namely Agriculture, Natural vegetation, Water body, and others were the main cover types. Within 10 years (2008-2018) Wetlands used for agriculture reduced by 2.63%, the natural vegetation reduced by 6.62%, while the water body class increased by 3.82% and others probably bare soil, settlement and mining/quarry areas increased at 5.42%. The detailed assessment provided the current status, identified pressures on wetland landscapes based on seven classes namely Intensified agriculture, Traditional agriculture, Clear water, Water covered by aquatic flora (water hyacinth), Dense papyrus, Non dense natural vegetation, and Not typical for wetland vegetation. And possible solutions brought by different stakeholders like irrigation scheme were identified and mapped while new sites for irrigation were recommended. Rapid population growth, climate change, mining, agricultural intensification and wetland pollution were identified as the most threats to key wetland complexes like Rweru-Mugesera, Akanyaru and Akagera

Keywords: Wetlands, land cover change, Decision making, remote sensing, Information management

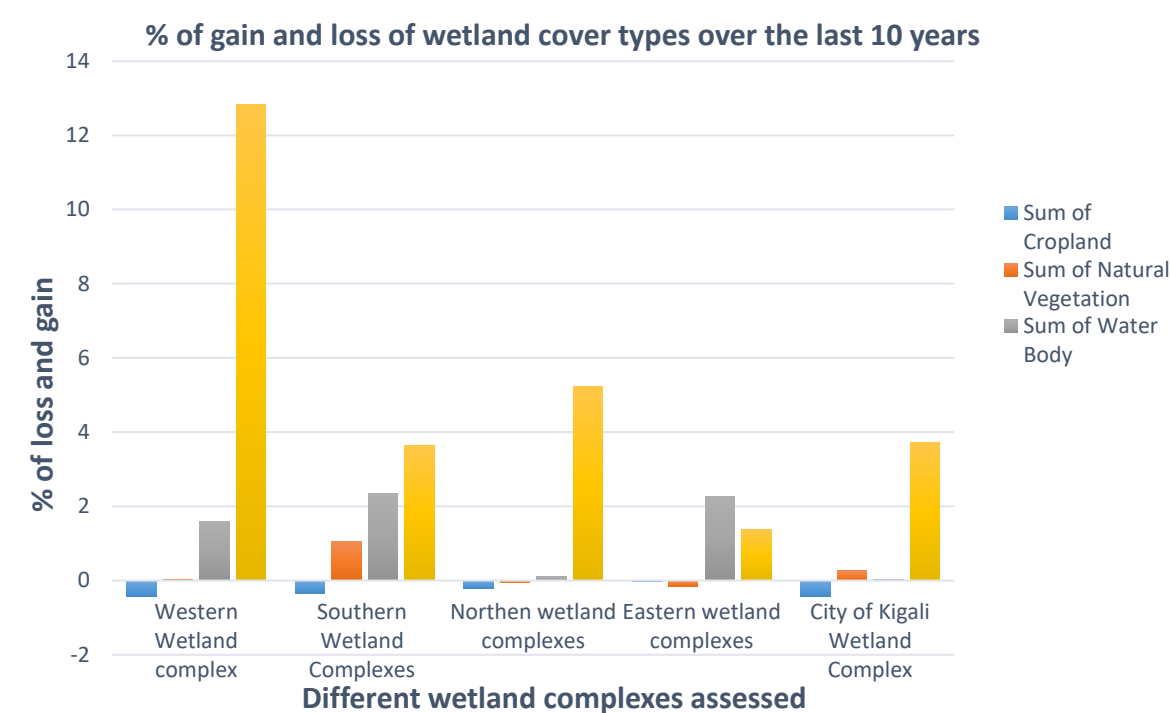
Aim

The objective of the research was to (a) analyze digital wetland mapping and summarize information on current status of Rwanda Wetlands and b) assess landscape characterization of the distribution of anthropogenic stressors such as land use land cover change over time

Materials and Methods

For mapping the status of four main cover types (Natural vegetation, Agriculture, Waterbody, Others (bare land, settlement, forest, fallow, etc) in 2008, we used 0.25 m resolution aerial photos while for the status of 2018, mainly a 2 m resolution Sentinel-2 data was used and double checked, with 30 m Landsat 8, and visually corrected/complemented using VHR satellite images from CNES/Airbus and Maxar technologies through google earth while running image classification coupled with existing field-based data. Threat mapping used Existing official datasets – CROM + analysis

Results - Rapid assessment & nationwide assessment



Over the last 10 years, wetlands in the eastern province lost some cover types at the expense of others. The assessment discovered a decrease of natural vegetation and increase of cropland and water body in Muvumba wetland complex. We observed a big loss of cropland and a high increase on settlement, fallows, ..) in the City of Kigali, Southern and Western wetland complexes with a high increase in water body for the Eastern, Southern and Western wetland complexes. Critical sites were identified to have lost a considerable cover of water body and special solutions should be brought to restore them. They include Wetlands in Nyarugenge District, Mukungwa wetlands at the side of Gakenke and Burera Districts, the side of Rubavu District in the Western wetlands, as well as the side of Huye and Nyamagabe Districts in the Southern wetland complexes

Results - Detailed assessment on selected cases. E.g.: Akanyaru Downstream wetland

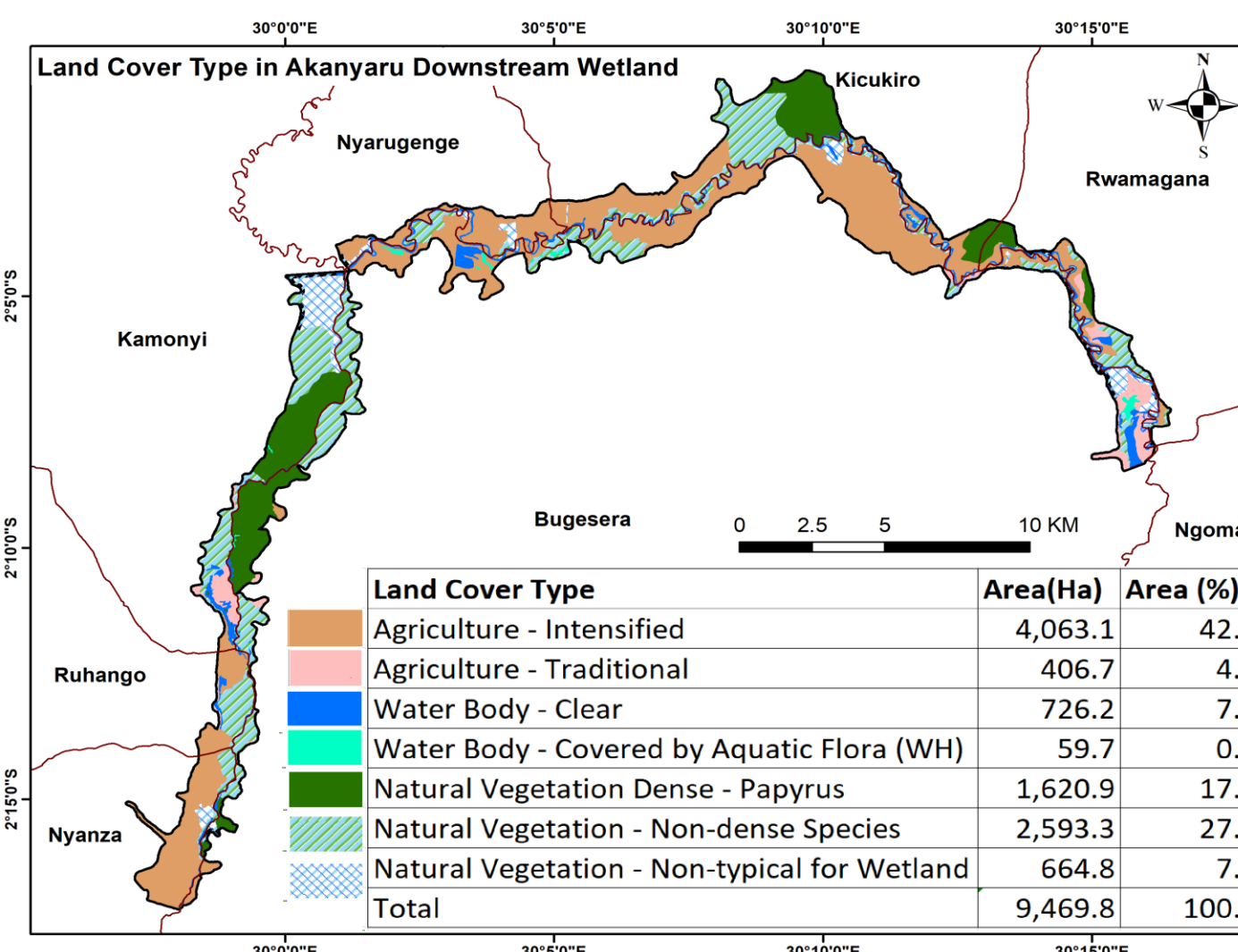


Figure2: Status of LULC for the downstream of Akanyaru Wetland 2018

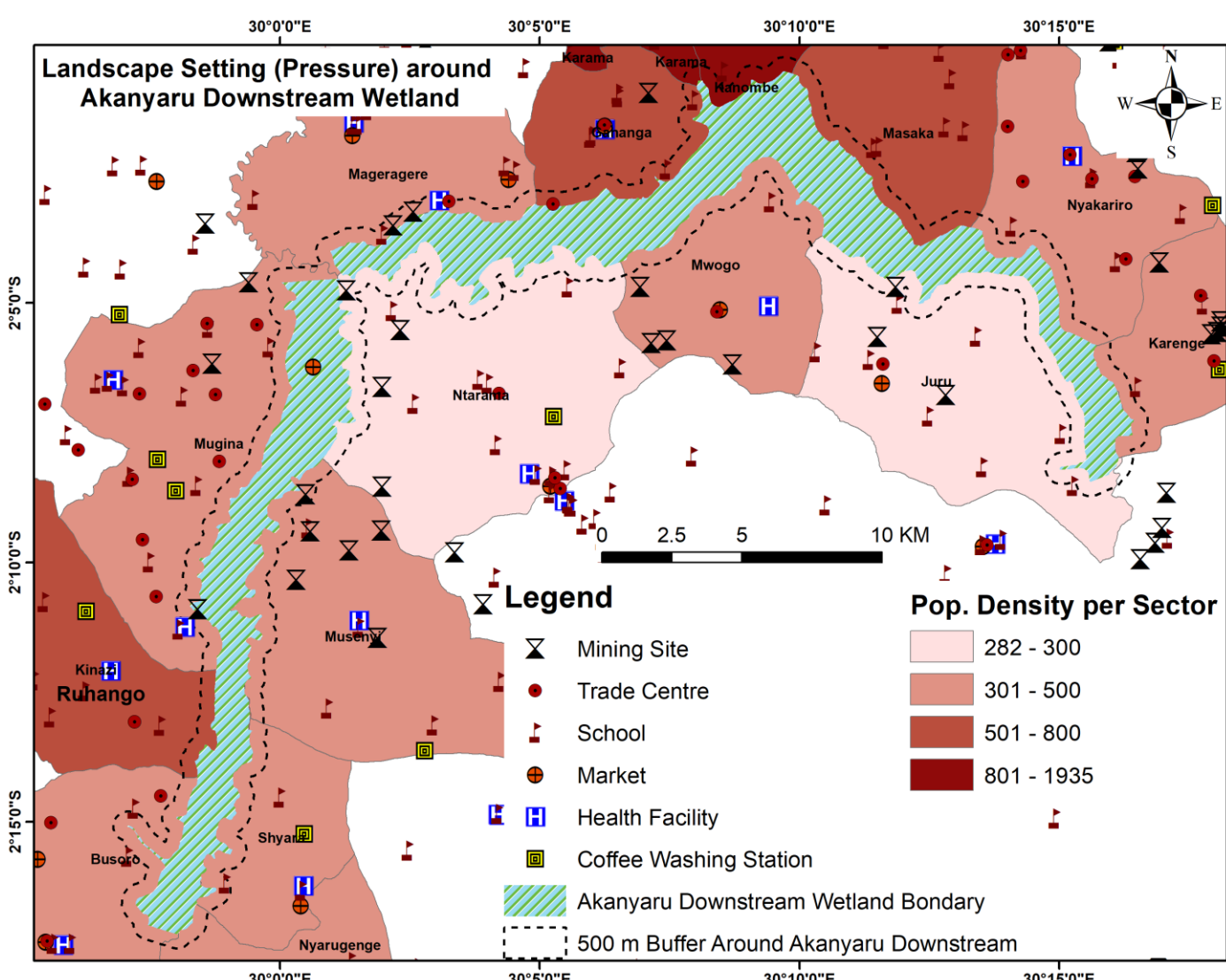


Figure3: Identified pressures around downstream of Akanyaru Wetlands

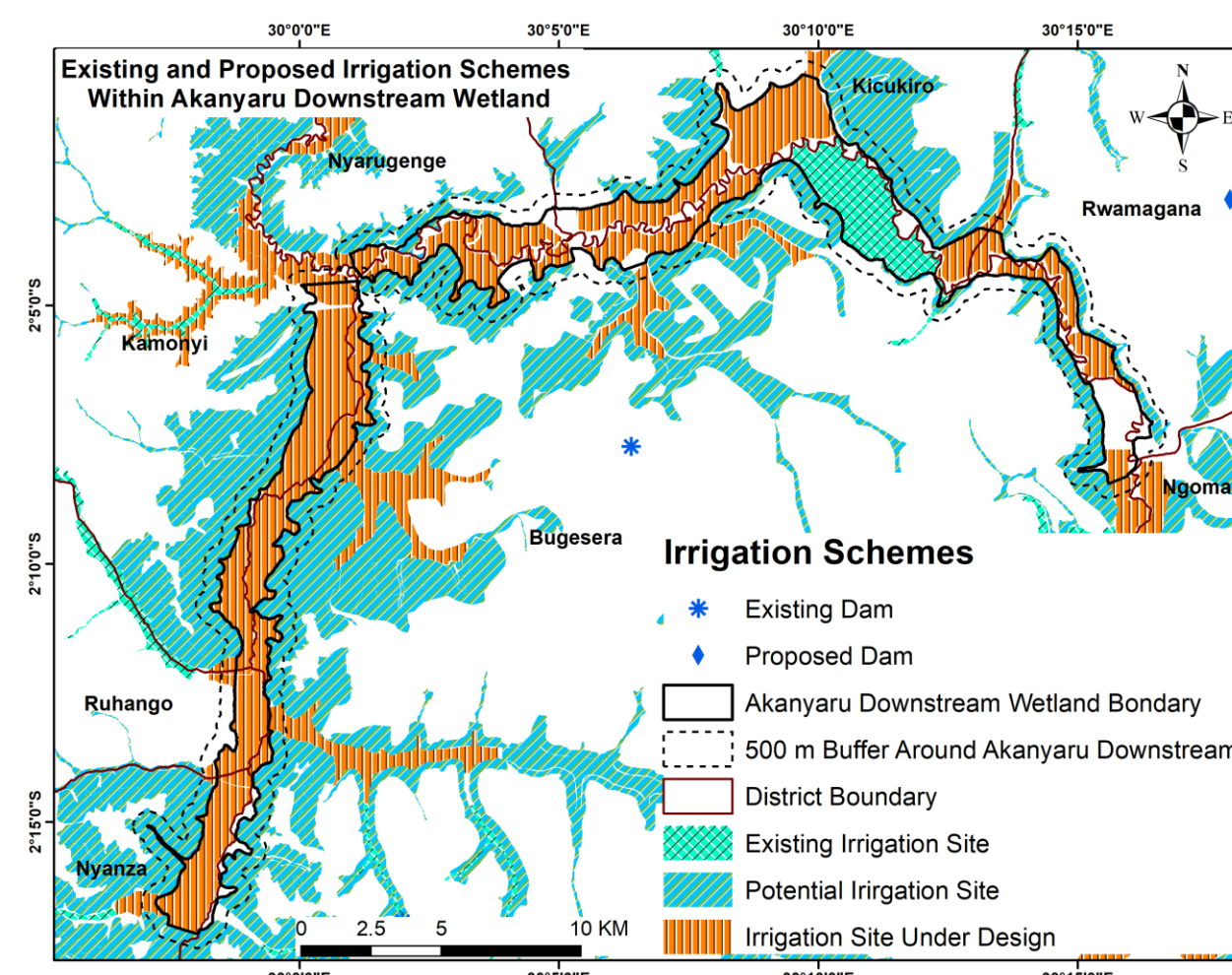


Figure 4: identified solutions around downstream of Akanyaru wetland

Conclusions and Recommendations

The team managed to cover a Large-scale wetland assessment, thanks to very high-resolution aerial photographs and satellite imageries. We have identified a Significant wetland cover changes between 2008 & 2018 and overall, the primary driver of wetland cover change in Rwanda is the demographic pressure, exacerbated by Climate change whereby prolonged drought push local communities to claim wetlands for agriculture, mining and sand extraction while heavy rains cause flooding, sediment deposition and spreading of invasive species in wetlands areas.

The study recommends

- Management plan for specific wetlands, floods control and wetland rehabilitation
- Evaluating wetland covers change using different RS data, should be considered.

References

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