Irrigation Master Plan for Rwanda

Irrigation Domains at National Level

Background

The IMP partitions the country into six irrigation domains. Each domain is defined by the category, availability and accessibility of a given water resource vis-à-vis the biophysical and climatic features that influence its mode of abstraction and utilisation. The domains serve as a general guide for locating the ideal water resources for a given area. Rwanda’s irrigation domains are thus categorized as:

Runoff for small reservoirs, dams, river and flood water, lakes, marshlands and groundwater resources.

Runoff for dams

This domain is dominated by slopes that range between 0% and 40%. The slopes have good potential for generating runoff that can easily be harnessed into dams and floodplains. The runoff often accumulates into small perennial streams classified as 3, 4 and 5 under the hierarchical system developed by MINELA.

The relief in this domain allows for supplemental or spate irrigation.

River and flood water domain

This domain is characterised by riparian lands on major rivers. It falls into classes 1 and 2 of MINELA’s classification system. Main rivers contain adequate water resources that can be accessed and abstracted to the command areas through pumping.

Depending on the width of the river, a vegetative strip of at least 10m is reserved on both sides to prevent erosion of the riverbanks.

Lake water resources domain

This domain is characterised by lands adjacent to lakes. Vegetative strips of 50 m along the banks are reserved for conservation of the lakes.

From the GIS and engineering analysis, 16 lakes have been identified as potential sources of irrigation water. These lakes are located in Eastern and Western Provinces. They include Lakes Bima, Nasiro, Cyuhoba, Cyumbye, Muhazi, Mpanja, Mugera, Sake, Bilira, Gashanga, Rumira, Mirayi, Kilimbi, Gaharwa and Kivo.

Groundwater resources domain

This domain is characterised by low-lying areas situated in sub-humid to semi-arid zones. Because rainfall is erratic, the generation of runoff for either supplementary or full-scale irrigation is unreliable. Moreover, the topography is not conducive for damming.

However, these areas may receive underground flows originating from infiltrated and percolated rainwater following upstream rainfall events.

Runoff for small reservoirs domain

This is a cross-cutting domain, with slope ranges between 2% and 60% and traverses the other domains of dams, rivers and lakes.

It is occupied by 7.6 million small-scale rural landholders with farms averaging about 1 ha per farmer. The total irrigable area for this domain would thus be 125 627 ha.

Runoff can be harvested from in situ roof and ground catchments, including water from external upstream catchments. This water can be stored in small reservoirs such as above ground masonry tanks, underground spherical or sausage tanks, lined or unlined ponds and trapezoidal underground tanks.

Marshland resource domain

Like the domain for small reservoirs, marshland is a cross-cutting domain with slopes up to 2%. It traverses the other domains of dams, rivers and lakes.

The estimated total area of marshes in the country is 275 689 ha, of which 55 896 ha are fully protected, 204 198 ha are non-protected but with limitations while 15 595 ha are non-protected without limitations. The latter two categories add up to 219 793 ha which is the marshland potential for irrigation.

Forty percent of the inventoried marshlands are covered by natural vegetation, 53% (148 344 ha) are under cropping and about 6% are fallow fields. This inventory is based on satellite analysis that can take into account marshlands as small as 3–5 ha.