REPUBLIC OF RWANDA

RWANDA WATER RESOURCES BOARD

Rwanda Water Resources Board Strategic Plan (2021-2030)

Brief

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I. SUMMARY

1. Rwanda Water Resources Board (RWB) is mandated to ensure the availability of enough and well managed water resources for sustainable development and to reduce soil erosion and the impact caused by flooding and landslide risks.
2. To realise its mandate, RWB through a broad-based consultative process, designed a Strategic Plan (2021-2030) which is arranged in 5 strategic objectives, 11 strategic outcomes and 129 strategic actions.
3. An implementation plan with clear institutional arrangements, sustainability plan, communication strategy, logical framework, human and financial requirements, is provided to avoid ambiguity during the implementation process. An indicative budget was proposed to guide resources mobilization. The Strategic Plan also makes a provision for periodic review to ensure it remains relevant.

II. BACKGROUND

4. Since the introduction of the water and sanitation policy in 2004, the water resources have undergone significant legal, political and institutional reforms. In 2008, the Government of Rwanda enacted a law N°62/2008 of 10/09/2008 putting in place the use, conservation, protection and management of water resources regulations.
5. In 2010, there were other significant institutional reforms which substantially changed the context for managing water resources. These include the separation of the institutional arrangements for water resources management from those for the provision of water supply services and infrastructure in line with the decentralization policy and the creation of Rwanda Natural Resources Authority (RNRA) through a law N°53/2010 with the overall mandate of managing natural resources composed of land, water, forests, mines and geology.
6. In 2011, the Government of Rwanda approved a National Policy for Water Resources Management. This policy aims to manage water resources in an integrated and sustainable manner. The policy also highlights the importance of a catchment-based approach to management.
7. The central role of water resources as a key driver for Rwanda's social and economic development was fully acknowledged in Rwanda's flagship strategic documents (both old and new ones).
8. For example, Rwanda's Vision 2020 stated as follows: ***"The country is endowed with reserves that could provide enough water for both human consumption and agricultural purposes. These include substantial rainfall (900 to 1800 mm per year) and the abundance of lakes, streams and watercourses".*** The Economic Development and Poverty Reduction Strategy- EDPRS 2 (2013-2018) set priority on full coverage of quality water and sanitation services and irrigation expansion to increase productivity and enhance food security.
9. Under the National Strategy for Transformation, NST1 (2017-2024) which replaced EDPRS-2 and Vision 2050 which replaced Vision 2020, water resources utilization for growth is expected to increase with the country targets: (i) 100% access to energy by 2035, per capita consumption of energy increasing from 50 kwh in 2019 to 3,080 Kwh in 2050, a need for about 3,788 MW and 13,981 MW of energy capacity in 2035 and 2050 respectively (from less than 300 Mw today) to cater for the growing industrial demand; (ii) 100% access to clean water by 2024 and (iii) Irrigation area of 600,000 hectares by 2050.

Vision 2050 target of renewable water resource availability is 1,700 m^3/capita/annum in 2050 from 670 m^3/capita/annum in 2015.

10. In 2015, the Government of Rwanda approved the National Master Plan for Water Resources Management which came up with a catchments' division and the country was subdivided into 9 level 1 catchments and 22 level 2 catchments.
11. In 2017, RNRA was split into three independent and specialized bodies: Rwanda Mines, Petroleum and Gas Board (RMB), Rwanda Land Management and Use Authority (RLMUA) and Rwanda Water and Forestry Management Authority (RWFA).
12. In 2020, Rwanda Water Resources Board (RWB) was created with a large and ambitious mandate to ensure the availability of enough and well managed water resources for sustainable development and to reduce soil erosion and the impact caused by flooding and landslide risks so that Rwanda can reach Vision 2050.
13. The justification for developing this Strategic Plan is fourfold:
    - 13.1. First, "*if you do not know where you are going, you will end up someplace else*". This quote illustrates the importance of Strategic Plan for a new institution with an ambitious mandate. The Strategic Plan is meant to provide guidance on effective coordination for optimal use of water resources to manage competing priorities and interests over water resources use across sectors in alignment with the strategic orientations of the country.
    - 13.2. Second, over the last fifteen years, there have been significant achievements in water resources management as previously stated. Going forward and sustaining what has been achieved in terms of taking into account the current national development context and addressing water resources related emerging issues, require a strategic plan that shapes the direction of RWB in the next ten years.
    - 13.3. Third, Rwanda is currently undergoing a very crucial planning phase of its long-term transformational development. The year 2018 marked the end of EDPRS-2 while the Vision 2020 ended in 2020. At the same time, NST1 was developed in 2017 and Vision 2050 was approved at the end of 2020. This Strategic Plan is therefore designed within the context of the national transformative journey.
    - 13.4. Fourth, the Strategic Plan (2021-2030) needs to be developed in order to reflect the wider global and regional commitments such as Sustainable Development Goals (SDGs), Sendai Framework for Disaster Risk Reduction, Paris Agreement on Climate Change, African Union Agenda 2063, Transboundary agreements, East African Community (EAC) Vision 2050, EAC Climate Change Master Plan (2011–2031).

III. CONTEXT

14. Water resources in Rwanda are threatened by multiple issues and challenges associated with the management of the finite resources. These include, but not limited to:
15. **Soil degradation, erosion and pollution:** The assessment conducted in 2018 highlighted that over 55% of the country's lands are under threat of soil erosion. This was further evidenced by the heavy sediments in rivers, pollution from agricultural chemicals and fertilizers, industrial effluents and mining activities.
16. **Climate change and extreme hydrological events:** There are recurring floods and landslides in many parts of the country resulting from climate change and extreme hydrological events. The causes are closely related to the steepness of terrain (hilly

topography) and intense rainfall leading to increased soil erosion and reduced land availability for agriculture that impacts food security and export earnings.

17. **High population density:** Rwanda's population is approximately 12 million people who live currently in an area of 26,338 square kilometres, resulting in a population density of 456 inhabitants per square kilometre that largely depend on natural resources. The National Institute of Statistics of Rwanda (NISR) projects the population to increase by more than 50% to 17.6 million by 2035 and to double to about 22.1 million people by 2050. This population growth is expected to add pressure to the already strained water capital resources which is being subjected to overwhelming pressure from competing land uses activities such as agriculture, industry, water supply, human settlements that deplete water resources.
18. **Stormwater management in urban areas:** The urban areas are characterised by a high proportion of impermeable surfaces, which are the basis of high concentration of rainwater and consequently, of an intense runoff. This situation is further aggravated by the insufficient storm water collector channels or poor functioning of the existing storm water drainage systems.
19. **High competition among water users as a source of conflicts:** Managing water use is a complex challenge that needs to take into account high competition among different water users with different interests.
20. **Lack of accurate information on the amount of water used:** Information on water use by big water users is not reported on a regular basis to the RWB and many of the users are neither registered nor entitled to use water resources.
21. **Insufficient financial resource:** The key challenges include raising the level of domestic and international resource mobilisation for water resources. Developing capacities and a robust mechanism to tap into green financing, including from the private sector and foreign direct investments is also critical for the successful implementation of the Strategic Plan.
22. **Human technical capacity:** In the process of ensuring the availability of enough, quality and well managed water resources, RWB has to attract well trained and skilled personnel to meet expectations in terms of modelling and forecasting for water availability, quality and demand, interpretation of hydrological data, monitoring and evaluation, generating timely, reliable and accurate data (ecological, hydrological and climate) to inform decision-making process and citizens.
23. **Ownership and sustainability:** Local entities and communities have gaps in ownership of infrastructure projects (e.g. inadequacy of road maintenance) which has also been found to be a factor limiting sustainable long-term results. This remains a major challenge across the key sectors (e.g. road with no drainage leading to flooding and erosion, terraces with no regular maintenance).

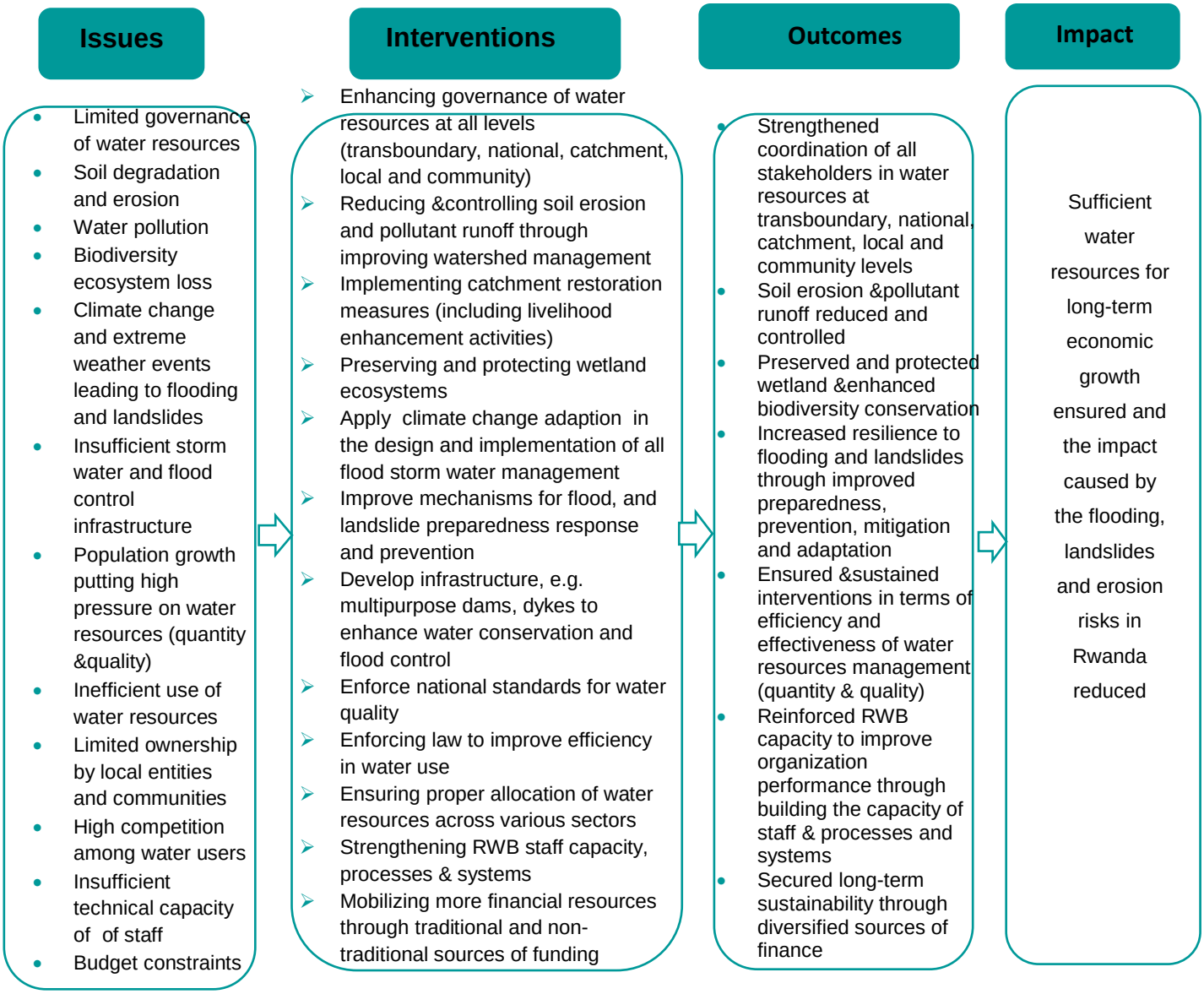
IV. STRATEGIC FRAMEWORK

24. **Vision:** The vision for Rwanda is a country where sound environmental management and the rational use of natural resources are promoted to contribute to national sustainable development.
25. **Mission:** The mission is to ensure the availability of enough and well managed water resources for sustainable development through executing a number of specific objectives as articulated in the Article 6 of Law N° 71/2019 of 29/01/2020 establishing RWB.

26. **Guiding principles:** The Strategic Plan will be guided by the following interrelated principles:
    - 26.1. **Integrated management of water resources within catchment**, taking into account the interests of all water users, land and other natural resources and related ecosystems.
    - 26.2. **Economic efficiency in water use:** Because of the increasing scarcity of water and financial resources, the finite and vulnerable nature of water as a resource and the increasing demands upon it, water will be used with maximum possible efficiency.
    - 26.3. **Environmental and ecological sustainability:** The present use of water resources will be managed in a way that does not undermine the life-support system so as not to compromise its use for future generations.
    - 26.4. **Cooperation in water resources management where** Rwanda has a responsibility to cooperate regionally and globally regarding water resources management and coordinated use of transboundary water resources.
    - 26.5. **Sharing of common goals** to all within RWB and all partners and stakeholders.
    - 26.6. **Integrity:** Professionalism, moral uprightness, honesty, incorruptibility and trustworthiness will guide RWB's work and the implementation of this Strategic Plan 2021-2030.
    - 26.7. **Accountability and responsibility:** RWB willingly takes responsibility and ownership of its actions and results.
    - 26.8. **Transparency and participation:** The work of RWB and engagement with other stakeholders and partners have to be open, transparent, professional and participatory.
    - 26.9. **Social equity:** Promotion of inclusiveness in all RWB' work and operations for sustaining human well-being.
    - 26.10. **Integration of strategic objectives and interventions** (Under Vision 2050, NST1, NLUDMP2020-2050, updated NDC 2020-2030, revised GGCRS, National Policy on Environment and Climate Change 2019, among others) in the Strategic Plan.

27. **Theory of Change:** The Figure below is a visual representation of RWB Strategic Plan's Theory of Change (TOC), articulated as the "*change or improvement RWB wants to see*" in terms of strengthening governance of water resources at all levels, ensuring the availability of enough and well managed water resources for sustainable development and reducing soil erosion and the impact caused by flooding and landslide risks. The TOC is presented with the issues, related key interventions, intermediate and long-term outcomes and an impact.

Figure 1. Theory of Change of RWB Strategic Plan (2021-2030)



28. Strategic objectives: Five strategic objectives will guide the Strategic Plan:

- **28.1.** Strengthening governance of water resources.
- **28.2.** Preventing, reducing and controlling soil erosion.
- **28.3.** Strengthening the availability of sufficient, quality water resources and water storage development for sustainable development of Rwanda.
- **28.4.** Strengthening resilience to flooding and landslides through improving preparedness, prevention, adaptation, mitigation and response mechanisms.
- **28.5.** Strengthening RWB capacity and financial sustainability.

Strategic Objective 1: Strengthening governance of water resources

29. The main expected outcomes under the first strategic objective are:

a) Enhanced coordination and collaboration of all stakeholders in water resources management at national level.
b) Strengthened coordination and collaboration of all stakeholders in water resources at local and community levels.
c) Enhanced transboundary water coordination and cooperation in the region.

Outcome 1: Enhanced coordination and collaboration of all stakeholders in water resources management at national level

30. This outcome will be achieved through the following strategic actions:

- ***30.1.*** *Operationalise the national water consultative committee.*
- ***30.2.*** *Promote networking and better organization of stakeholders at national level through formal working structures.*
- ***30.3.*** *Support the sectors in the setting of SMART targets in planning, going beyond the quantity and focusing on quality and outcomes, e.g. sustainability of terraces constructed, resilience of roads.*
- ***30.4.*** *Promote the active participation in non-state actors (e.g. private sector and NGOs) in water resources management.*
- ***30.5.*** *Mainstream water resource-related curricula into the education system.*
- ***30.6.*** *Collaborate with research and higher learning institutions in the establishment of Centre of Excellence on water resources management.*
- ***30.7.*** *Conduct countrywide awareness campaigns on the roles and responsibilities on water resources management with different stakeholders (communities, public, private, CSOs).*
- ***30.8.*** *Mainstream water resources across sectors in planning, budgeting, implementation, monitoring and evaluation.*
- ***30.9.*** *Organise an annual high-level dialogue on water resources related topics to provide a platform for sharing emerging water resources best practices.*
- ***30.10.*** *Organise annual water resource related events, e.g. World Water Day celebrations, soil erosion control campaigns, big water forums.*
- ***30.11.*** *Set up a coordinated central system to ensure that valid and reliable information on water resources from different sectors is collected and collated through working with National Institute of Statistics of Rwanda (NISR) in the generation of water resources data on some key SDG indicators, e.g. level of water stress, change in water-use efficiency over a given time, proportion of bodies of water with good ambient water quality.*
- ***30.12.*** *Explore unconventional ways to enhance the participation of youth, women, private sector, NGOs in water resource management activities.*

Outcome 2: Strengthened coordination and collaboration of all stakeholders in water resources at local and community levels

31. To achieve this, it is important to implement the strategic actions below:

- ***31.1.*** *Establish and operationalise the catchment committees.*
- ***31.2.*** *Promote community approach in implementation of catchment/watershed management interventions.*
- ***31.3.*** *Support the districts in the setting of SMART targets in planning, going beyond the quantity and focusing on quality and outcomes, e.g. sustainability of terraces constructed, resilience of roads.*
- ***31.4.*** *Organize regular campaigns using the existing platforms and community forums at the local levels for a clear understanding of water resources potential and problems, and improve the participation of citizens (including youth, women) in government programs/public awareness.*

31.5. *Organize district interactive forums to dialogue on challenges in soil erosion, water resources protection, among others.*

31.6. *Engage local entities and communities to ensure the sustainability of water resources related infrastructure* ***(e.g. dams constructed, surface hydrological stations, groundwater stations, automatic water monitoring infrastructures like real-time automatic stations, real-time water quality and turbidity monitoring equipment such as telemetric stations)*** *throughout the country.*

31.7. *Strengthen the role of catchment committees and local leaders in the monitoring of water resources related activities at local level.*

31.8. *Follow up an effective execution of projects with wider impacts on the water resources (e.g. mining, road, irrigation, or all projects implemented in sensitive areas, etc.).*

Outcome 3: Enhanced transboundary water coordination and cooperation

32. This outcome will be achieved through the following strategic actions:

32.1. *Promote speedy ratification of ABAKIR convention.*

32.2. *Conduct a joint analysis (with other Member States) of the current and projected future water balance.*

32.3. *Participate in the development of Basin-wide and cross-sector investment programmes.*

32.4. *Participate in the development and implementation of Basin-wide hydrological monitoring system.*

32.5. *Harness the shared freshwater resources of transboundary basins through investments in shared Infrastructure such as storage reservoirs (hard solution) and multipurpose dams.*

32.6. *Ensure cooperation, collaboration and partnerships through exchange of information, monitoring and evaluation, negotiations, agreements, joint ventures with other regional and international institutions with a similar mission.*

32.7. *Coordinate with neighbouring countries and international organizations for implementation of transboundary water related agreements for wise use of shared water resources.*

32.8. *Enhance water diplomacy and ensure permanent consultations and engagements with countries in the region to deal with emerging issues in the management of the shared water resources.*

Strategic Objective 2: Preventing, reducing and controlling soil erosion

33. The expected outcome under this second strategic objective is:

Outcome 4: Soil erosion prevented, reduced and controlled

34. This outcome will be achieved through the following strategic actions:

i. *Engage concerned stakeholders in the development of technical guidelines for effective erosion control and catchment protection measures based on the guidance from the updated version of CROM-DSS model.*

ii. *Improve coordination of watershed management through operationalizing catchment committees.*

iii. *Conduct awareness and education activities for local entities, communities and catchment committees.*
iv. *Develop catchment plans for all the remaining level 1 catchments.*
v. *Revise the existing catchment plans.*
vi. *Identify the critical level 2 catchments that require specific catchment plans.*
vii. *Implement catchment restoration measures proposed in the catchment plans to reduce soil erosion using the guidelines of CROM-DSS model, e.g.:*
    a) *Progressive terraces & agroforestry.*
    b) *Bench/radical and progressive terraces & agroforestry.*
    c) *Afforestation/tree planting and re-afforestation with cut-of drains.*
    d) *Buffer zone/river and lake banks protection on different streams.*
    e) *Road downstream ditch protection.*
    f) *Gullies rehabilitation and – afforestation, check dams.*
viii. *Train staff in all districts on usage of GIS software and creation of accurate shapefiles on the existing restoration measures.*
ix. *Monitor regularly catchment restoration through shapefiles and satellite imagery and conduct an inventory of degraded catchment/ ecosystems.*
x. *Scale up Catchment Based-Village Land Use Action Planning in all catchments as a foundation for community participation in landscape restoration.*
xi. *Support and empower local communities (e.g. landowners, farmers), including women and youth in the construction and maintenance of terraces through:*
    a) *Hands training on construction and maintenance of terraces, early detection of erosion, reporting, simple but efficient water harvesting and conservation systems.*
    b) *Increasing landowners and farmers' awareness in soil erosion prevention and control using the existing extension channels, e.g. Farmer Field School (FFS),farmer promoters and community approaches, e.g. Umuganda, Itorero, media campaigns.*
    c) *Joint-participatory planning, implementation and monitoring.*
    d) *Promotion of income-generating and livelihood enhancement activities.*
    e) *Management and protection of water catchments to mitigate erosion, gullies and water related disaster risks (e.g. Landslides, flooding) in partnership with local communities.*
xii. *Establish pilot model sites of catchment restoration and soil erosion control measures for the farmers and communities to learn appropriate techniques and scale up good practices from the pilot.*
xiii. *Establish permanent experimental plots across different level 1 catchments in different agro-ecological setting to help getting evidence based facts on the efficacy of restoration measures, productivity and level of control in a different time series.*
xiv. *Prevent, reduce and control erosion hotspots (pronounced gullies) through:*

    a) *Improving gully catchments to reduce and regulate the run-off rates (peak flows).*
    b) *Ensuring diversion of surface water above the gully area.*
    c) *Stabilising gullies by slope structural measures (e.g. check dams, stone terraces, wattles and revegetation in areas with high intensity rainfall, etc.) and accompanying revegetation in areas with high intensity rainfall.*
    d) *Ensuring proper retention and infiltration of surface water (e.g. retention and infiltration ditches, terraces, wattles, fascines and staking, etc.).*
    e) *Rehabilitating gullies (where they have begun to form) as soon as possible to minimize further damage and restore stability.*

f) *Providing special initiatives on identifying and protecting water point mountain areas.*

xv. *Promote innovative extension models, business models, financial instruments (e.g. livelihoods options such as revolving funds, saving cooperatives) that foster private, local entities and communities' investment in infrastructure development, operation and community-based erosion control and maintenance of terraces to ensure that each stakeholder (landowners, farmers, mining companies, infrastructure developers, etc.) owns and implement soil erosion control measures.*

xvi. *Initiate and implement innovative methods to protect river banks, river buffers and wetlands, including maintenance and repair where damages are identified.*

xvii. *Operationalise water fees payment scheme and other potential cost recovery options to support water catchments' protection.*

xviii. *Develop and disseminate erosion control-tailored toolkits, modules, brochures and posters for all types of erosion in different districts, sectors, and cells.*

Strategic Objective 3: Strengthening the availability of sufficient, quality water resources and water storage development for sustainable development of Rwanda

35. The main expected outcomes under this third strategic objective are:

a. Sustained sufficient quantity of water resources.
b. Ensured good quality of water resources.
c. Managed demand and use of water resources.

Outcome 5: Sustained sufficient quantity of water resources

36. This outcome will be achieved through the following strategic actions:

i. *Develop key strategic documents:*
- *a) National Water Resources Master Plan.*
- *b) National Water Resources Atlas.*
- *c) Rainwater harvesting guidelines.*
- *d) Dam safety guidelines.*

ii. *Increase artificial water channelling & water storage through the development of resilient multipurpose dams (in collaboration with WASAC, REG, RAB and other big water users), reservoirs and ponds to enhance water conservation and water efficiency practices.*

iii. *Collect information on water requirements of the various sectors and forecast future trends, e.g. modelling of artificial intelligence for water variables: rainfall-runoff, evaporation and evapotranspiration, streamflow, and dam or lake water level changes.*

iv. *Develop a strong set of modelling and forecasting tools for water supply and demand.*

v. *Develop and mainstream guidelines for the efficient use of water resources.*

vi. *Upgrade, expand and maintain the hydrological stations and automatic water monitoring infrastructure (real-time automatic stations).*

vii. *Ensure that for all big water users (e.g. hydropower stations, water supply plants, and irrigation schemes) have specialised infrastructure to monitor streamflow, water level, water quality for both ground and surface water.*

viii. *Observe and monitor regularly water resources (both underground and surface water).*

ix. *Compile information and identify knowledge gaps in monitoring base flow, modelling hydraulics and water budgets.*

x. *Conduct studies:*
   - a) *Potential and feasibility for inter–catchments water transfers.*
   - b) *Advanced feasibility for potential inter-catchment water transfers.*
   - c) *Impacts of water control and discharge structures, demands on water resources and management practices.*
   - d) *Analysing changes in extreme weather events, land use and land management and how they influence on water quantity.*
   - e) *Assessing all types of water resources, e.g.: in arid areas, non-renewable water resources (water available from aquifers with a negligible rate of recharge).*

xi. *Collaborate with the universities and research institutes undertaking research and studies in line with the agenda and priorities of RWB.*

xii. *Increase renewable groundwater resources through:*
   - a) *Promoting the infiltration of rainwater by using permeable pavement, e.g. open jointed paver blocks (with 25% - 50% gaps).*
   - b) *Regulating or limiting the quantity of pumped water.*
   - c) *Constructing check dams along the streams at regular intervals so that water stored for a longer duration allows it to percolate into the ground.*
   - d) *Constructing small tanks in the fields. This helps in percolation and increases the ground water level and also helps the livestock for drinking water.*
   - e) *Planting trees in open fields and hillocks so that the running water is arrested and helps in percolation.*

xiii. *Collaborate with other institutions (RHA, COK, Districts) in the enforcement of Rwanda's building code including rainwater harvesting practices at different levels (institutional, households, roads).*

xiv. *Carry out bathymetry for reservoirs to understand their safety, water volume and hydrological regimes.*

xv. *Rehabilitate the existing dams and collection ponds.*

xvi. *Ensure that the industries (e.g. textile industry, industrial meat complex, beverage industry, etc.) and mining companies use properly available water resources through reuse, recycle and zero release of their wastes in water resources.*

xvii. *Enforce law determining the use and management of water resources in Rwanda, including water permits requirements.*

Outcome 6: Ensured good quality of water resources

37. This outcome will be achieved through the following strategic actions:

i. *Identify rivers, lakes and other water bodies with increased need for water quality monitoring.*

ii. *Enforce national standards for water quality and implement water quality guidelines.*

iii. *Develop guidelines on preservation of the quality of water resources.*

iv. *Strengthen capacity and infrastructure to monitor, enforce and regulate water pollution through:*
   - a) *Installing operational real-time water quality and turbidity monitoring equipment (e.g., telemetric stations) to monitor the quality of both ground and surface water.*
   - b) *Conducting regular water quality testing (e.g. focusing on hotspot areas such as sites with intense agricultural activities, industrial activities, Urban*

Wastewater Treatment Plants, protected areas) and improving hydro-related information systems.

c) *Assessing long-term water quality trends including sources, transport and accumulations of key parameters identified in level 1 catchment using catchment-wide initiatives.*

v. *Maintain frequently the water quality monitoring networks.*

vi. *Compile information in monitoring known point and non-point surface water and groundwater sources of key water quality and aquatic health parameters.*

vii. *Conduct studies:*

a) *Evaluating main activities and practices, e.g. agriculture, mining, industry, tourism (marine, beaches) that impact water quality to provide broad geographical recommendations for point and non-point pollution sources to ensure water quality thresholds are met within all level 1 catchments.*

b) *Cost-benefit analysis of most polluting activities (e.g. mining).*

viii. *Use the existing committees (catchment committees, environmental committees) as informants at the local level to watch and prevent encroachment of water sources and public streams.*

ix. *Manage and protect sustainably wetland through implementing the following actions:*

a) *Ensuring that all the water bodies and their buffer zones and the protected wetlands and their buffer zones are fully protected, particularly prohibition of settlements in 50m from lakeshores, 10m for rivers and 20m buffer for wetland boundaries and buffer zones to be used for forestry and conservation efforts.*

b) *Managing and protecting all the water catchments through catchment restoration and improvement programs to mitigate disasters and efficient stormwater management.*

c) *Promoting and intensifying wetland protection, restoration and rehabilitation of degraded wetlands.*

d) *Strengthening collaborative and participatory management of wetland resources.*

e) *Supporting existing wetland research and encouraging conservation and restoration of ecosystems critically threatened by climate change.*

f) *Ensuring that developmental activities within wetlands or in the buffer of wetlands conform to EIA process and procedures.*

x. *Raise awareness on the protection of water resources against all types of pollution.*

xi. *Put in place measures to eradicate destructive invasive vegetation in water bodies (especially in lakes).*

Outcome 7: **Managed demand and use of water resources**

38. Under this outcome, it is important to implement the following strategic actions:

38.1. *Assess water use across different water users (e.g. agriculture, industries, mining, domestic use, etc.).*

38.2. *Allocate water for the various sectors under the framework of catchment plans (water allocation plans).*

38.3. *Optimize allocation of water resources to meet the needs of all users, including the environment.*

38.4. *Develop base flow, hydraulic and water budget modelling, demands on water resources and management practices.*

38.5. *Promote wise water use by all users (with the focus on big water users, e.g. agriculture, mining, industries including mining, energy, water supply, etc.) through:*

a) *Collaborating with other institutions (MININFRA, WASAC, etc.) in the promotion of resource recovery and reuse in big water users, e.g. re-using of treated wastewater for irrigation to replace and release scarce fresh water for domestic uses and the environment.*
b) *Working with other institutions (MINAGRI, RAB) in the promotion of innovative technologies with respect to the wise of water, e.g. the use of efficient irrigation technologies.*
c) *Setting financial incentives/disincentives (e.g. higher price of water for irrigation can encourage farmers to improve their efficiency of water use, e.g. Israel).*
d) *Enforcing measures to improve water use efficiency (e.g. through monitoring compliance with permit stipulations and revoking permits in case on non-compliance).*
e) *Raising public awareness on water permit and water use efficiency through initiatives involving the community, local entities, water users, private sector.*

38.6. *Sensitize investors, big project developers in terms of investing in multipurpose dams.*

38.7. *Ensure that all water users (focusing on big ones) have water permits before water use.*

38.8. *Regulate and streamline water use to avoid conflicts among all water users.*

38.9. *Reinforce compliance of water use especially for big water users through monitoring, inspecting and punishing water users with no water permits.*

38.10. *Implement provisions of building codes related to water resource efficiency (e.g. use of efficient water saving equipment, water harvesting, smart flush toilets, etc.) and storm water management.*

38.11. *Set up an operational and user-friendly online database for all water users.*

38.12. *Ensure that the big water users provide regular reports on their water use.*

38.13. *Incorporate of water quality monitoring station in the issuance of water permit for critical projects.*

38.14. *Train big water users (e.g. hydropower stations, water supply plants, large scale irrigation schemes) on the appropriate use of water resources.*

Strategic Objective 4: Strengthening resilience to flooding and landslides through improving preparedness, prevention, adaptation, mitigation and response mechanisms

39. The main expected outcomes under the fourth strategic objective are:

a) Increased resilience to flooding and landslides through improved preparedness, prevention and effective responses.
b) Reduced risk of flooding, landslides or hybrid disasters.

Outcome 8: Increased resilience to flooding and landslides through improved preparedness, prevention and effective responses

40. This outcome will be achieved through the following strategic actions:

40.1. *Improve mechanisms for flood, storm water, drought and landslide preparedness response and prevention countrywide through:*

a) *Identifying the high-risk zones for flooding and landslides in order to reduce the impacts of hazards.*
b) *Enhancing data recording and information management systems, particularly of hydrological extreme events to enable design for protection against floods.*
c) *Working with other institutions (e.g. MINEMA, Meteo Rwanda) to develop a harmonised and coordinated flood forecasting and Early Warning Systems (EWS) at National, District and grassroots' levels.*
d) *Using remote sensing to provide improved predictions of droughts and flooding, real-time monitoring of water quantity and quality within watersheds.*
e) *Sensitizing citizens to implement disaster-preventing measures such as retaining rainwater off rooftops.*
f) *Managing surface run-off through promoting and enforcing porous pavers rather than impervious pavement.*

40.2. *Monitoring execution of flood-smart construction through spot checks.*

40.3. *Ensure that the City of Kigali, Satellite cities of Bugesera, Rwamagana and Muhanga (also a secondary city), secondary cities of Nyagatare, Musanze, Rubavu, Rusizi, Huye have detailed storm water master plans and ensure their effective implementation.*

40.4. *Conduct a detailed study on the effects or effectiveness of water retention pits dug at household level to retain grey and storm water.*

40.5. *Ensure that during upgrading of informal urban settlements, storm-water is managed in a way that prevents, controls, cleans storm-water runoff; reduces flooding, erosion and sedimentation and helps in replenishing groundwater.*

40.6. *Develop infrastructure design parameters and regulations to ensure that structures can sustain flooding.*

40.7. *Assess road designs to ensure compliance with flood and storm water management guidelines.*

40.8. *Develop flood control infrastructure e.g. dams, dykes, hillside drainage system, bridges in the context of flood mitigation.*

40.9. *Develop strategy to minimise the economic liabilities of floods, landslides and droughts.*

40.10. *Control floods using nature- based solutions for conservation of wetlands as collection points and filters for storm water.*

40.11. *Develop guidelines on preparedness for flood and landslide restoration processes.*

40.12. *Package flood real-time and actionable communication messages for key partners (MINEMA, Rwanda National Police-RNP, Rwanda Defence Force-RDF, Rwandan Red Cross -RRC).*

Outcome 9: Reduced the risk of flooding, landslides or hybrid disasters

41. To achieve this, it is important to implement the following strategic actions:

41.1. *Develop engineering guidelines for climate resilient infrastructure (taking into account climate change aspects, e.g. Intensity, Duration and Frequency- IDF of rainfall).*

41.2. *Monitor completed or under construction infrastructure to ensure compliance with the existing guidelines and other applicable regulations related to storm water management and flood control.*

41.3. *Establish database of flood management (e.g. flood water depth, flood extent, flood velocity, river profile, IDF, drainage size, dimension, infrastructure, land use, elevation, etc.).*

41.4. *Apply climate change adaptation, flooding and storm water management in the planning and design of all flood storm water management structures through:*

a) *Revisiting design criteria for flood control structures to ensure that capacities of structures are adequate to handle the expected increase on flood water volume.*
b) *Developing and reviewing protocols on dam-water release during high peak flow.*
c) *Implementing downstream interventions that are strongly complemented by upstream activities such as watershed management to minimize siltation in different infrastructures.*
d) *Establishing facilities for storage of excess water during rainy seasons for future multipurpose use.*

41.5. *Develop and maintain flood prevention structures such as:*

a) *Retention reservoirs and channel improvements.*
b) *Runoff reduction and groundwater recharge.*
c) *Alternative storm water management approaches (e.g. natural drainage and landscaping, urban nature-based solutions to reduce flood risk, reducing imperviousness, enhancing infiltration, etc.) more on upstream than downstream.*
d) *Storm water management such as capturing and using storm water for localised irrigation to support agriculture and green space vegetation.*
e) *Water storage infrastructure to retain and manage water resources.*

41.6. *Implement non-structural measures such as:*

a) *Regulating development to keep it away from the floodplain.*
b) *Detaining storm water on the sites of new developments.*
c) *Removing flood prone structures from the floodplain.*
d) *Acquiring flood prone lands for open space.*
e) *Minimizing flooding and landslide through flood plain regulation, flood forecasting and warning, retaining wall (for landslide).*

41.7. *Managing water flows from the volcano region and other rivers to mitigate related disasters and improving water resource management.*

Strategic Objective 5: Strengthening RWB capacity and financial sustainability

42. The expected outcomes under this strategic objective are:

a) Reinforced RWB capacity to improve organisational performance.
b) Secured long-term sustainability through diversified sources of finance or mobilising financial resources from various sources.

Outcome 10: Reinforced RWB capacity to improve organizational performance

43. To achieve this outcome, the following strategic actions will be implemented:

43.1. *Conduct comprehensive capacity building needs assessment for RWB.*

43.2. *Establish and implement medium- and long-term capacity building plans addressing the human resource knowledge and skills deficit, and institutional technical capacity weaknesses.*

43.3. *Provide staff training programmes with a focus on:*

a) *Induction training for new staff.*
b) *On-job hands-on training.*
c) *Short training courses.*
d) *Exchange visits and study tours (in the country and abroad).*

43.4. *Build the capacity of staff based on the capacity building need assessment.*

43.5. *Strengthen RWB processes and systems.*

43.6. *Develop annual individual and divisional action plans, which are in line with the strategic plans.*

43.7. *Procure adequate logistical support (e.g. Software e.g. GIS, SPSS, Stata for quantitative data; NVIVO for qualitative; Endnotes for references/bibliography; tablets for data collection, mobile real-time monitoring toolkits or devices as earlier indicated).*

43.8. *Always communicate on time all manuals and procedures to staff when they are updated.*

43.9. *Develop an effective M&E system for RWB (including related tools for efficient monitoring of implemented activities and documentation of best practices).*

43.10. *Develop and implement staff retention guidelines and effective mechanism to monitor its implementation to ensure that RWB attracts and retains competent and experienced staff.*

43.11. *Implement staff incentives (e.g. capacity building, reward excellence, welfare scheme establishment, sports and recreational activities).*

43.12. *Develop and implement annual communication plans.*

43.13. *Assess operating frameworks in relation with emerging issues at both national and global levels and develop adequate response mechanisms.*

Outcome 11: Secured long-term sustainability through diversified sources of finance or mobilising financial resources from various sources

44. This outcome will be achieved through the implementation of the following strategic interventions or actions:

i. *Strengthen the internal capacity in resource mobilisation through technical assistance.*

ii. *Write high quality proposals that are funded to increase internal income.*

iii. *Secure at least five big projects, e.g. proposals on catchment restoration in Nyabugogo, Lower Akagera, Mukungwa, Rusizi, Akanyaru and Kivu catchments, rain water harvesting, multipurpose dams (2).*

iv. *Build networks with potential donors through workshops, campaigns and research uptake events.*

v. *Diversify sources of funding through traditional European and US sources of grant funding and non-traditional partners including China, Gulf States, Qatar, among others.*

vi. *Engage members of Board of Directors to support in resource mobilisation.*

vii. *Organize regular donors' round tables and strategic partnership meetings.*

viii. *Sustain relations with the existing donors and partners.*

ix. *Explore new potential funders and investors in water resources.*

x. *Encourage big water users to contribute in the restoration activities in the catchment where they operate.*

xi. *Ensure that all water users have paid water permit fees.*

xii. *Mobilize local partners through Joint Action Development Forum (JADF) to finance the implementation of catchment restoration activities at district level.*

xiii. *Leverage the existing and potential opportunities from the carbon markets, multilateral funding mechanisms (e.g. for multipurpose dams), Kigali International Financial Centre (KIFC) and new potential funders through traditional European and US sources of grant funding and non-traditional partners including China, Gulf States, Qatar and other potential funders and investors in water resources.*

V. IMPLEMENTATION FRAMEWORK

45. The effective implementation of this Strategic Plan will depend on the following:

45.1. Clear institutional roles and responsibilities:

(i) **RWB:** *Provides an overall oversight on water resource management countrywide; coordinates all stakeholders involved in water resources, supports sectors and districts in setting water resource related smart targets for their annual imihigo; monitors the implementation of various projects and programmes related to water resources management, strengthens the enforcement on the efficient use of water resources, water pollution control.*

(ii) **MINALOC:** *Ensures that water resource related targets are well integrated into annual imihigo of districts, mobilise local governments to implement the government programmes, including water resources related activities at local levels, ensuring that districts are enforcing laws related to water resources management.*

(iii) **MOE:** *Formulates environment and climate change policy, related laws and guidelines on environment, land, water, forestry; supports in the advocacy on water resource related activities.*

(iv) **REMA:** *Develops regulations and ensures protection and conservation of the Environment and natural resources, plays a prominent part in ecosystems rehabilitation, monitoring and regulation; lead in national response to Climate Change; lead in Environmental Audits (EAs) and Strategic Environmental Assessments (SEAs).*

(v) **RURA:** *Ensures that the operations, especially for water and energy utilities comply with set national standards and water allocation quotas; ensures that IWRM issues are integrated into the generation/production licensing, tariff setting and distribution regime for all utilities.*

(vi) **RFA:** *Ensures the availability of quality trees seedling and agroforestry species to be used in restoration activities, promotes farm forestry, forestry extension to enable farmers to get species easily, fights against deforestation and ensures that the survival rates of trees is secured.*

(vii) **Meteo Rwanda:** *Provides meteorological EWS, produces seasonal weather forecasts and disseminates severe weather warnings.*

(viii) **FONERWA:** *Supports in the mobilisation of green investments and financing.*

(ix) **RLMUA:** *Advises on optimised land use (land use planning, especially with regards to flood plans, water availability for urbanisation, industry, agriculture, high erosion risk zones and land use changes as part of catchment restoration).*

(x) **MINEMA:** *Provides forecasting to support flood early warning, supports risk assessments for floods and landslides, implement post disaster risks (focusing on social aspects).*

(xi) **MINAGRI/RAB:** *Mainstream IWRM principles (planning, budgeting, implementation and monitoring) into agricultural priorities, budgets and interventions; participate*

actively in the water sub-sector sector working group; report regularly on IWRM activities implemented in the agricultural and livestock (e.g. Soil erosion control and reduction, terraces, etc.); advises on optimal irrigation sites, informs on multipurpose dam development, playing a big role in catchment restoration.

(xii) **MININFRA/WASAC/ REG/RTDA/ RHA:** *MININFRA has a particularly unique role since all the 4 sectors under its supervision are directly related to water resources use:*

- ***a.*** *Water supply and sanitation to prepare water use plans, request for abstraction and development license, and promote equitable and efficient water use (across all strategic outcomes).*
- ***b.*** *Energy sector to align the hydropower development plan with RWB plan.*
- ***c.*** *Housing and Urbanisation sector to ensure that the construction' permits cater for appropriate rainwater harvesting, re-use and waste management and enforce the green building codes.*
- ***d.*** *The transport sector to plan for water use in large scale construction and monitor water-related disasters, ensure that infrastructure is flood resilient and does not intensify flood risks.*

(xiii) **MINECOFIN:** *Provides strategic guidance on national development planning processes; leads in the resource mobilisation, ensuring that the sectors and districts integrate water resource interventions in their imihigo, ensures that sectors and districts prioritise and allocate sufficient funds to IWRM activities (e.g. budget for the rehabilitation of gullies).*

(xiv) **MINAFFET:** *Foreign and diplomatic relations including regional and international cooperation over shared waters.*

(xv) **MOH:** *Puts in place environmental health and hygiene guidelines, supports the local entity in the promotion of public health, hygiene and sanitation at household and health centre levels, and supports the local entity in ensuring compliance with hygiene standards.*

(xvi) **MINICOM:** *Policy formulation and promotion of investments by the private sector in water resources management; encouraging industries and manufacturing to invest in clean production.*

(xvii) **RDB:** *Leads issuance of EIA certificates for water resources related projects according to the required standards and regulations, attracts investments in water resources management and supports in capacity building.*

(xviii) **RMB:** *Integrates soil erosion control and pollutant runoff reduction in mining operation guidelines.*

(xix) **RSB:** *Responsible for quality regulation and standards setting based on local context; provides effluent limits for domestic, industrial, mining wastewater discharges, leading in the formulation and enforcement of water quality standards.*

(xx) **Development partners:** *Provides technical and financial supports for implementing IWRM activities; advises in strategy development.*

(xxi) **NGOs and CSOs:** *NGOs CSOs will play a lead role in public education and conducting awareness and behaviour change campaigns on water resources management, supplement the public sector efforts in water resource management and development.*

(xxii) **Media:** *Media to play a central role in awareness creation, mass mobilisation and education. Media houses/practitioners will be empowered with knowledge, skills and information, and facilitated logistically to ensure accurate and sustained mass communication of IWRM activities.*

(xxiii) **Private sector:** *Private involvement in service provision in water supply and sanitation; technology generation and supply; water abstraction, and water treatment and use; resource extraction and heir innovativeness, entrepreneurship skills in the control pollution; private sector groups - water vendors, horticultural farmers, industrialists, will be mobilised, sensitised and incentivised to promote good IWRM practices. Informs on water levels, river flows and turbidity to reduce cost of feasibility study, balance supply and demand.*

(xxiv) **Academia and research institutes:** *Supports and assists with the capacity development initiatives on IWRM; carries out applied research projects and innovations on IWRM.*

(xxv) **Local entities (Districts, sectors, cells and villages):** *Plans, mobilises resources, implements and supervises government programmes, including the water resource related activities, enforces existing and future standards.*

(xxvi) **Local communities:** *Management of water resources in the course of their productive, consumptive and non-consumptive activities on a day-to-day basis (User communities).*

45.2. Sustainability plan.

45.3. A communication strategy with clear strategic communication actions.

45.4. Log-frame.

45.5. Available human and financial resources, an estimated budget of **Rwf 933,629,873,564.**

45.6. Regular monitoring and evaluation.

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