



Regulatory Impact Statement

December 2023

Republic of Kenya



MINISTRY OF WATER AND SANITATION

PROPOSED NATIONAL WATER HARVESTING AND STORAGE REGULATIONS, 2023

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CLERK AT THE TABLE	Beinda

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Regulatory Impact Statement

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Prepared by:

Ministry of Water, Sanitation
and Sanitation

Maji House, Upper hill, Nairobi.

P.O BOX 49720 – 00100, Nairobi.

Telephone: +254 020 2716103, 4900000

Email: ps@water.go.ke

Web: <http://www.water.go.ke/>

PROPOSED
NATIONAL WATER HARVESTING AND STORAGE
REGULATIONS 2023

Regulatory Impact Statement

Prepared by the Ministry of Water, Sanitation and Irrigation (MWS&I)

2023

This Regulatory Impact Statement (RIS) has been prepared in compliance with the Statutory Instruments Act, 2013 (Acts *No.* 23) requirement for Regulatory Impact Statement on the proposed National Water Harvesting and Storage Regulations 2023.

The purpose of the RIS is to enable the Cabinet Secretary, Members of Parliament, and the Kenyan Community to be informed of the environmental, social and economic implications of the implementation of the proposed National Water Harvesting and Storage Regulations 2023.

Public comments from stakeholders and submissions were invited on the proposed regulations.

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ABBREVIATIONS

CS	Cabinet Secretary for water
KWSCR	Kenya Water Security and Climate Resilience Project
MWS&I	Ministry of Water, Sanitation and Irrigation
NWCPC	National Water Conservation and Pipeline Corporation
NWHA	National Water Harvesting and Storage Authority
RIS	Regulatory Impact Statement
WRA	Water Resources Authority
WSI	Water Service Institution

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EXECUTIVE SUMMARY

This Regulatory Impact Statement (RIS) examines the impact of reforming the regulation of national water harvesting and storage in Kenya and recommends that the current suite of subsidiary legislation under the Water Act 2002 be repealed and replaced with these new regulations.

The regulation of water by both the county and national government helps to ensure that water remains available in the long term and that the environment is protected. This endeavor will help maximize the long term value of water to the broader community and ensures its sustainable storage, harvesting and use.

This RIS examines the costs and benefits of implementing a suite of regulatory reform measures in Kenya in order to further develop national public water works for water resources storage and flood control; the maintenance and management of national public water works infrastructure; the collection of information for the formulation of national water resources storage and flood control strategies and their enforcement; the development of water harvesting policy and the undertaking and implementation of strategic water emergency interventions.

This RIS advises that this would lead to better investments in water use, higher value use of water, greater flexibility to deal with climate and rainfall variability and population growth and further contribute to the improved protection of the condition of water resources in Kenya.

The Water (Resource Management) Regulations 2007 as amended by the Water Resource Management Rules 2012 (the current regulations) prescribe for the following –

- Water Resource Inspector (Rule 12)
- Water Resource Data (Rule 13)
- The construction of works (Rule 33 – 38)
- The prior right to water for storage (Rule 54)
- Need for storage (Rule 55)
- Classification of Dams (Rule 56)
- Dams to be designed by a qualified water resource professional (Rule 57)
- Dam to be constructed by the appropriate category of contractor (Rule 58)
- Dam safety inspection (Rule 59)
- Minimum net freeboard (Rule 60)

- Minimum spillway design flood (Rule 61)
- Release and use of stored water (Rule 62)
- Compensation flow (Rule 63)
- Dam design report (Rule 64)
- Dam construction progress report (Rule 65)
- Dam completion and dam operation reports (Rule 66)
- Notice downstream (Rule 67)
- Failure of or damage to a dam to be reported (Rule 68)
- Surface water data (Rule 70) and
- Works associated with fish movement for protection and control of fish (Rule 71).

The current regulations do not comprehensively address issues related to national water harvesting and storage and flood control, including the mandate of the newly established National Water Harvesting and Storage Authority pursuant to the provisions of the Water Act 2016.

The proposed National Water Harvesting and Storage Regulations 2023 (the proposed regulations) seeks to replace the current regulation with substantive amendments taking into account the mandate of the National Water Harvesting and Storage Authority.

The proposed regulations are underpinned by multiple rounds of consultations, which have shown support from various stakeholders within the water sector.

1. INTRODUCTION

The proposed National Water Harvesting and Storage Regulations 2023 should deliver improved services in the water sector including an increase in water capacity in Kenya.

The Water Act 2016 establishes the National Water Storage and Harvesting Authority (NWSHA) to be responsible for the development and management of national public water works for water storage, water resource management and flood control. It is also established as a national government agency but does not have an exclusive mandate over these functions. The storage facilities under the mandate of the NWSHA need not be for water consumption but could be for the purposes of regulating flood flow and other water conservation and flood management purposes.

Currently, there exists no subsidiary legislation covering national water harvesting, storage and flood control as is envisaged in the Water Act 2016 (Section 30-35).

Section 142 of the Water Act 2016 empowers the Cabinet Secretary (CS) to make regulations with respect to any matter required, or which is necessary or expedient to be prescribed for carrying out, or giving effect to the Act. As a result, MWS&I did not consider it appropriate to identify other options to achieve its objective under the Water Act 2016. Instead, this RIS sets out the substantive changes from the Water Act 2002 to the Water Act 2016 and the proposed legislation, namely the National Water Harvesting and Storage Regulations 2023, giving the mandates under new Water Act 2016 effect. The RIS identifies the proposed legislation's impacts, the gaps in the Water Act 2016 it seeks to fill, and the costs and/or benefits for stakeholders and Kenyans.

MWS&I considers that the proposed regulations will meet the water sector reform objectives and aligns with the Water Act, 2016. The legislation is not finalized and changes based on stakeholder comments in response to the Public Consultations will help to ensure that the final National Water Harvesting and Storage Regulations 2023 presented to Parliament delivers the best outcomes.

The regulations should deliver legislation that is outcomes-based and combines the requirements of the Constitution of Kenya 2010, the Water Act 2016, the National Water Master Plan 2030, the National Water Services Strategies, as well as the existing and proposed water sector policy.

2. OBJECTIVES OF THE PROPOSED NATIONAL WATER HARVESTING AND STORAGE REGULATIONS 2023

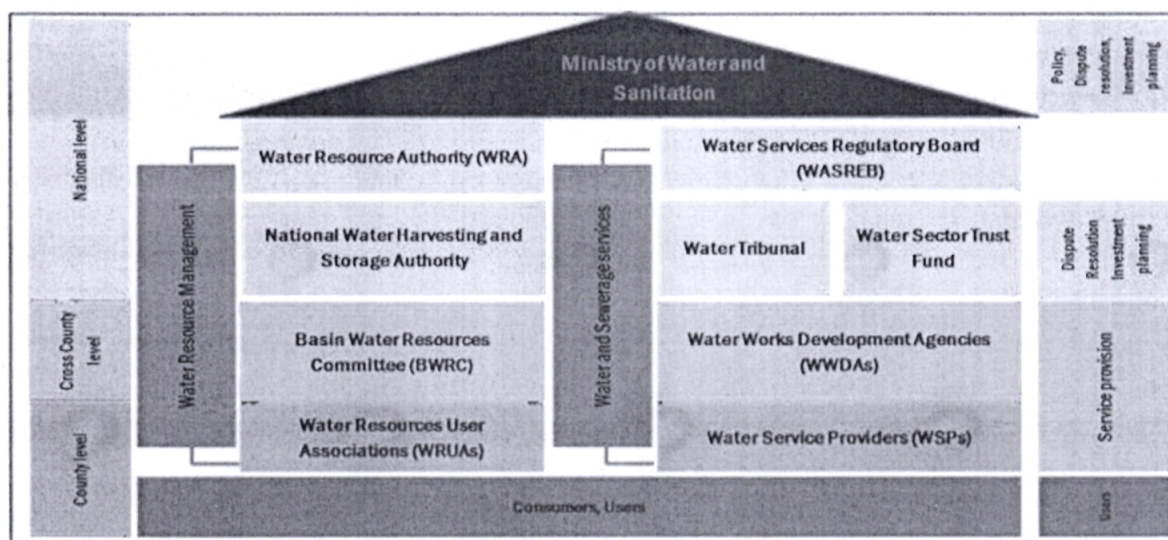
2.1 Compliance with the legal and institutional framework

The principles enshrined in the Water Act 2016 are the need to maintain the gains of the reform process and the alignment of the legal and the institutional framework to the Constitution of Kenya 2010.

The Constitution of Kenya 2010 created two levels of government: the national government and the county government. The Fourth Schedule distributes functions between the national government and county government. Whereas the national government is responsible for the use of international waters and water resources, the county governments are tasked with water and sanitation services provision. Pursuant to the Fourth Schedule, both the national and county governments may undertake public works.

The right to clean and safe water in adequate quantities and to reasonable standards of sanitation is a constitutional requirement enshrined in Article 43(1) of the Constitution 2010. Since the State and every state organ is obliged to fulfill these rights (Article 21), both the national and county government have a shared mandate to ensure universal access to water services. The Water Act 2016 (the Parent Act) was enacted to align the water sector to the Constitution of Kenya 2010 and to ensure that relevant institutions have mandates to respond to challenges of the water sector. Figure 1 below depicts the new institutional framework formulated in the Water Act 2016.

Figure 1: New Institutional Framework Formulated in the Water Act 2016



The development of the National Water and Storage Regulations 2023 is an imperative element in giving effect to the mandate and functions of the Water Storage Authority (Section 32) as established in the Water Act 2016 (Section 30) and are necessary for the commencement of the reforms introduced by the Water Act 2016. These regulations are in compliance with the overall objectives of the Constitution of Kenya 2010 to ensure universal access to water services.

2.2 Objectives of the proposed Regulations

Section 149 of the Water Act 2016 provides for the transformation and transition of the National Water Conservation and Pipeline Corporation (NWCP) into the NWSA. The NWCP was bestowed with the mandate for the development and management of water infrastructure towards enhancing water security and storage for multi-purpose uses and; mitigation of drought and flood effects in a substantial manner. This included the construction of dams, canals, dykes for flood control, artificial ground water recharge facilities and drilling, equipping and operationalization of boreholes.

The Water Act 2016, Section 32 confers to the NWSA the mandate of developing and managing national public water works and infrastructure for water resources storage and flood control. The Act also requires the Authority to formulate the national water resources storage and flood control strategies, develop water harvesting policy, enforce water harvesting strategies and undertake strategic water emergency interventions during drought.

Table 1: Overview of the detailed changes in the Parent Act

NWCP		NWSA
1988 - 2002	Water Act 2002	Water Act 2016
1. Take over and manage a number of existing Government water projects	1. Construction of dams	1. Undertake on behalf of the National Government, the development of national public water works for water resources storage and flood control
2. Supply bulk water to such undertakers or persons as the Minister responsible	2. Construction of Canals	2. Maintain and manage national public water works infrastructure for water resources storage

for water matters may designate;		including through appointed agents
3. Do whatever is necessary for the management and development of the water projects and for securing an adequate supply of water	3. Construction of dykes for flood control	3. Collect and provide information for the formulation of the national water resources storage and flood control strategies by the Cabinet Secretary
4. Assist the Government in the formulation and execution of a National Water Development Policy	4. Construction of artificial ground water recharge facilities	4. Develop a water harvesting policy and enforce water harvesting strategies
5. Apply for permits and determine the price to be paid for the water by the consumers in its projects	5. Drill boreholes	5. Undertake on behalf of the national government strategic water emergency interventions during drought and;
6. Establish a National Water Conservation and Pipeline Fund into which all monies received by the Corporation would be paid and out of which payments made by the Corporation could be paid	6. Development works and management of assets for the purpose of state scheme for the provision of bulk water supplies for use by licensees and WSPs	6. Advise the Cabinet Secretary on any matter concerning national public water works for water storage and flood control
		7. Section 32(2) of the Water Act provides that NWHSA may appoint agents for the operation, management, maintenance and safety of any storage infrastructure it has developed.

The stated objectives of the proposed National Water Harvesting and Storage Regulations 2023 are –

- (a) to deal with the details and modalities that are left out or left open in the Water Act 2016;
- (b) to fill in the gaps in terms of the mandate of the NWHSa and the transition process;
- (c) to put in place the timeframe for achieving the transition objectives that are open-ended in the Water Act 2016;
- (d) to specify persons and/or class of persons and/or qualified professionals that may undertake the development of water works;
- (e) to specify the procedure for the operation of dams and storage facilities;
- (f) to detail the manner in which maintenance and management of water works is to be undertaken;
- (g) to promote the development of water harvesting policies and strategies and undertake their enforcement;
- (h) to undertake strategic water emergency interventions; and
- (i) to facilitate the effective and sustainable management of water generally.

These objectives are consistent with the stated purposes of the Water Act 2016 which is to provide for the regulation, management and development of water resources.

While developing the proposed National Water Harvesting and Storage Regulations 2023, MWS&I considered the existing legislative framework including those used in other jurisdictions to govern water storage and harvesting and flood control. A range of legislative structures are used for maintenance and management of national public water works.

Under the previous regime (Water Act 2002) there were no regulations governing the functions of the NWCPC as such, the proposed National Water Harvesting and Storage Regulations 2023 are necessary to give effect to the requirements under the Water Act 2016. Table 2 highlights the detailed issues addressed by the proposed regulations.

Table 2: Detailed table of issues addressed by the proposed legislation

No.	Topic/Key Principle	The Parent Act	Proposed Legislation: National Water Harvesting and Storage 2023	Comments/Explanation
1	Applicable Legislation	The Water Act, 2016	National Water Harvesting and Storage Regulations 2023	Legislation is based on the Water Act 2016 and gives it effect.
2	Application of the National Water Harvesting and Storage Regulations		The regulations apply to and govern: a. policies, plans, programmes, activities and discharge of mandate of the national government, county governments as well as NWHSA b. public and private works for water harvesting and storage; reservoirs for impounding surface run-off and for regulating stream flows to synchronize them with water demand patterns; and structures and devices for flood control and management c. water works constructed before commencement of the Water Act 2016	ALL: Scope aligns with the Water Act 2016 and the Constitution of Kenya 2010; the National Water Master Plan 2030, the National Water Services Strategies, as well as the existing and proposed water sector policy
3.	Development of National Public Water Works	Section 32(a) requires the NWHSA to undertake on behalf of the National Government, the development of national public water works for water	The Cabinet Secretary (CS) is empowered to identify and designate water works. The financing of the works is by the national government and all projects must satisfy EIA requirements.	

No.	Topic/Key Principle	The Parent Act	Proposed Legislation: National Water Harvesting and Storage 2023	Comments/Explanation
		resources storage and flood control	Dams constructed are classified, must meet the regulatory requirements and must be constructed by a qualified water resources professional. The dam design report, dam construction progress report, dam completion report and dam operation report are also required to be provided by operators and/or owners. These are enforceable and living documents under the regulations.	
4.	Operation of Dams And Other Water Resource Storage Facilities	The Act does not make any specific reference to how dams are to operated.	The prior right to storage, the need for storage and the release and use of stored water has been retained from the previous Water Resource Management Regulations 2012. The rules governing compensation flow and notice downstream have also been maintained from the previous legislation.	
5.	Maintenance and		Water works operations will be required to prepare maintenance and management plans and emergency management plans for dams	Maintenance and management activities are to undertaken by any

No.	Topic/Key Principle	The Parent Act	Proposed Legislation: National Water Harvesting and Storage 2023	Comments/Explanation
	Management of Water Works		affected by floods. Owners and operators will be required to undertake maintenance analyses and document maintenance outcomes. These are enforceable and living documents under the regulations. All maintenance activities will be scheduled and controlled under a Water Works Infrastructure Maintenance System, Owners or operators will continuously maintain structures and facilities for flood control works including maintenance of levees, flood walls etc. Dam owners and/or operators will cause inspections of dams and prepare an inspection report to be submitted to the NWWSA. In the event of serious damage, a Dam Damage or Failure Report must be submitted to the NWWSA. Failure to do so constitutes an offence.	owner or operator of a water works. Such activities include the preparation of relevant operation and management plans, documentation of maintenance outcomes and analyses,
6.	Licensing of Qualified Professionals	The Act provides for the licensing of professionals by	WRA undertakes the role as the regulatory authority in the issuance of licenses to qualified professionals in respect of water works.	

No.	Topic/Key Principle	The Parent Act	Proposed Legislation: National Water Harvesting and Storage 2023	Comments/Explanation
	In Respect To Waterworks	the Water Resources Authority.	Qualified professionals under the proposed regulations must be registered with an accredited body, namely the Engineers Board of Kenya. The rules provide for the modalities for making an application to the WRA to undertake tasks provided for by the regulations.	
7.	Data Gathering and Collection	The Act provides that the NWHS Act is to collect and provide information to the CS but does not specify what type of information may be necessary for policy formulation by the CS of the national water resources storage and flood control strategies. The modalities for obtaining such information is also not provided for.	A database for the purposes of water resources storage and flood control management is established. Information sourced by the database include the state of the works infrastructure, climate reports, base flood data, and any other data relevant to the management of the national public water works. Applications may be made to the Water Storage Authority for information stored in its database.	This is a new requirement under the Water Act 2016.
8.	Water Harvesting	The Act requires the NWHS Act to develop water harvesting	Strategies will be developed based on stakeholder consultation.	

No.	Topic/Key Principle	The Parent Act	Proposed Legislation: National Water Harvesting and Storage 2023	Comments/Explanation
		policy and enforce water harvesting strategies.	Both national and county state organs are to give effect to water harvesting policy. Oversight over the enforcement of the water harvesting and storage policy and strategy at the national and county level will be performed by designated agents of the NWHSA.	
9.	Strategic Emergency Interventions	The Act requires the NWHSA to undertake interventions during drought but does not specify the means by which the WSA is to achieve this objective.	The NWHSA will maintain a Drought Response Plan to be prepared and implemented in collaboration with the National Drought Management Authority Water resources availability will be monitored on a continuous basis particularly during periods of drought. The CS and the NWHSA will consult, adopt and implement strategic interventions and further adopt measures to improve system efficiency in order to conserve water in storage facilities.	
10.	Penalties	The Act provides for a general penalty upon conviction under Section 147	Penalties will be aligned with Section 147 of the Water Act 2016.	These penalties are consistent with the Water Act 2016.

No.	Topic/Key Principle	The Parent Act	Proposed Legislation: National Water Harvesting and Storage 2023	Comments/Explanation
		i.e. a fine not exceeding one million or to imprisonment for a term not exceeding two years or to both. The Act does not provide for specific offences in relation to the mandate of the NWHSA.	The regulations provide for specific offences left out in the Act. • Failure to comply with any condition attached to operation and maintenance • Failure to comply with orders or directives ; unlawful and intentional or negligent interference with works, seals or measuring devices • Failure or refusal to provide data; giving false or misleading information • Refusal to perform duties or obstruction of appointed agents • Acts or omissions detrimental to waterworks	
11.	Complaints	The Act is silent on the mechanism for handling complaints regarding any decisions and/or actions by the NWHSA or its agents. <i>Other applicable legislation include the proposed Water Tribunal Rules 2019 and the Environment and Land Court</i>	Complaints will lie with the NWHSA and the decision of the Chief Executive Officer is final. A dissatisfied complainant has recourse to the Water Tribunal under Section 121 (2) of the Act.	A two tier dispute resolution mechanism is established under these regulations. Complainants may have further appeal to the Environment and Land Court if dissatisfied with a decision of the Water Tribunal.

No.	Topic/Key Principle	The Parent Act	Proposed Legislation: National Water Harvesting and Storage 2023	Comments/Explanation
		<i>Act and the rules established thereunder.</i>		
12.	Transitional Arrangements	The Act makes no provision for transitional arrangements and the modalities thereof.	Compliance with the regulations is required within twelve months of commencement or such period as determined by the Water Resources Authority. Owners and operators of existing and ongoing water works are required within a twelve month period following commencement of the regulations, to lodge an application for a water use permit with the Water Resources Authority.	

3 IMPACT OF NEW REQUIREMENTS

MWS&I describes the proposed National Water Harvesting and Storage Regulations 2023 as a modernized, outcomes-based legislation that is based on the Water Act 2016.

The main impact of the proposed National Water Harvesting and Storage Regulations 2023 is its contribution to the ongoing development of a national public water works for water resources storage and flood control, the maintenance and management of national public water works infrastructure, the collection and provision of relevant water resources storage and flood control data, the development of water harvesting policy and enforcement of water harvesting strategies and the undertaking of strategic water emergency interventions during drought.

Following comments on the proposed National Water Harvesting and Storage Regulations 2023 from stakeholders, MWS&I will review the changes in terms of their advantages and disadvantages to Kenya. The cost-benefit analysis is a key step in evaluating the potential impacts on business, consumers and the economy. A broader impact assessment will examine effects on individuals, the community as a whole and the environment where these are relevant. Key areas have been identified to assist stakeholders understand the changes and assess likely impacts.

3.1 COST-BENEFIT ANALYSIS

This section presents an analysis of the costs and benefits associated with the proposed National Water Harvesting and Storage Regulations 2023. This includes a characterization of the potential benefits and a qualitative assessment of benefits (monetized where possible). The section will also identify the costs associated with the implementation of the proposed Regulations.

3.1.1 Benefits

The broad kinds of benefits resulting from the proposed National Water Harvesting and Storage Regulations 2023 are highlighted in Table 3 below.

Table 3: Characterization of Potential Benefits

Use Benefits	
Development of National Public Water Works and Water	Increased water resources capacity

Use Benefits	
Harvesting Strategies	
Maintenance, Management Operation of Dams	• Management and mitigation of floods downstream
Data Collection and Information Gathering	• Relevant and timely information for disaster management
Non-Use Benefits	
Existence values	• Biological productivity of natural resources e.g. fish farming etc.
Bequest values	• Intra- and Intergenerational equity

The following sections provide information on possible areas costs associated with the proposed legislation.

3.1.2 Compliance Costs

Public Authorities

The proposed regulations may result in an increase in compliance costs for public authorities. These changes may occur in 'set-up' costs or in 'ongoing' costs associated with the changes.

Establishment costs will relate to the implementation of the legislation, such as new processes and updating systems that will be required when the legislation is implemented. These costs will fall to the national government in the transition and implementation of the legislation.

The implementation of the proposed regulations will require stakeholders to familiarize themselves with the provisions of the regulation. Associated costs will also further include designing of implementation systems and developing and implementing staff-training and adapting to new internal process. Establishment costs could therefore also include updating training modules for operation and dam maintenance, amendment of work processes and the provision of updated training to employees and key staff.

The proposed regulations may require the procurement of goods and services and/or the recruitment of additional staff. The development and publication of guidance material for regulated parties such as dam owners and operators will also be required.

The NWHSA is mandated to gather and collect information for the formulation by the Cabinet Secretary of the national water resources storage and flood control strategies. Additional compliance costs related to the implementation of the proposed regulations in data collection include the preparation of official notices, transmitting and publishing data, confirming receipt of data/information or obtaining missing data/information, finalizing information, carrying out content-related checks, calculations and evaluations, implementing monitoring and supervisory measures and classifying risks

It is also acknowledged that some additional work associated with streamlining site visits and maintenance and management functions related to NWHSA's new role would be required in the transition period.

Citizens

Dam owners, operators and other effected individuals will incur compliance costs in the implementation of the proposed regulations which will include familiarization with the obligations.

Dam owners and operators are required to supply the NWHSA with information, as such they will incur costs related to gathering and compiling and processing data and information. Associated costs will therefore also include transmission of information or data to the NWHSA.

The dam owners and/or operators are further obligated under the regulations to undertake regular inspections. The associated compliance costs will therefore include co-operation with safety inspection conducted either by public authorities and/or independent inspectors.

Other compliance costs to dam owners and/or operators include the purchasing of equipment for proper maintenance and management of water storage facilities; provision of certain services or commissioning them to third parties; verifying the implementation of obligations; drafting correspondences to the NWHSA; obtaining advice and making necessary payments as required by the NWHSA.

Business

The business sector will have to incur compliance costs associated with the familiarization with the regulatory requirements. In addition, businesses may have to identify, assess, choose compliance options and develop a compliance strategy. Businesses may undertake review of compliance performance.

Businesses and construction firms involved in the development of water works will have to recruit qualified staff and train them; procure the specified materials and equipment as required; and disclose pertinent information to the NWHSA.

Qualified Professionals in respect to water works under the regulations will have to comply with the necessary registration requirements and associated costs for licensing by the Water Resources Authority.

3.1.3 Resource Allocation Costs

The acquisition, construction, alteration, operation, maintenance and control of the public waterworks listed in the First Schedule of the proposed National Water Harvesting and Storage Regulations 2023 will be financed out of the national government's share of national revenue pursuant to the provisions of the Public Finance and Management Act, 2012 (Act No.18 of 2012).

3.2 ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

3.2.1 Social Impacts

The availability of water is linked to poverty in terms of access to water for household use, farming and industrial activities. Such access has direct social impacts including those on health, family welfare and higher living standards.

The increased availability of water that would be facilitated by the implementation of the proposed regulations would have a direct impact on the availability of adequate and nutritious food which would greatly impact on the health of the community.

There is potential for negative social impacts that may arise through the implementation of the proposed regulations which may include disruption of livelihoods, increase in local populations and threats to human health. The construction and operation of rainwater harvest and use systems can pose potential risks from the pollutants and toxins found in rainwater and harvest and use system materials. Individuals may become exposed to chemical pollutants and pathogens in rainwater before and during harvest. This includes nutrients, sediment, microbes, salts, oil and grease, and metals typically found in rainwater runoff; pollutants associated with spills; metals or other chemicals leaching from rooftops, conveyances, or tanks; bacteria or other pathogenic organisms colonizing in the collection or storage systems; waterborne diseases; bacterial pathogens (e.g., *Escherichia* spp., *Salmonella* spp., *Campylobacter* spp., *Legionella*

sp.); parasites (helminths); opportunistic pathogens (e.g., *Mycobacteria* spp., *Pseudomonas* spp.) and mosquito-borne diseases (e.g., West Nile virus, La Crosse Encephalitis).¹

These risks however may largely be addressed through water quality standards, plumbing and building codes, and the proposed National Water Harvesting and Storage Regulations 2023. The primary regulatory impact of the proposed regulations will be on the proper design, operation and maintenance of rainwater harvesting systems (Part VII – Water Harvesting) in order to mitigate the associated health risks in water harvesting and storage.

3.2.2 *Environmental Impacts*

Storage of water in bulk in large dams is necessary for the achievement of an increase in sustainable water capacity. However, such water works if not properly planned and managed may cause irreversible environmental degradation over wide geographical areas and thus potential for significant impact.

Construction of dams or reservoirs alters the hydrological regime upstream and downstream of the designed obstruction. The area of influence of the dam project may in some cases extend from the catchment area upstream to the estuaries and off-shore zones located downstream. This also include watersheds and river valleys located below the dam. Table 4 highlights the general impacts of dam construction.

Table 4: General impacts associated with dam construction

	General	Above dam	Below dam	Barrier Effect
Category	Loss of terrestrial habitats/farmland/settlements	Loss of river section	Reduced flows	Blocking of migration of vertebrates
General Impacts	Local rise in water table	Changes in flow regime	Reduced oxygen levels	Blocking of migration of invertebrates
	Visual impacts of retaining walls	Siltation	Floodplain siltation	
	Water borne pathogens			
	Failure risks			

¹

https://stormwater.pca.state.mn.us/index.php?title=Environmental_concerns_for_stormwater_and_rainwater_harvest_and_use/reuse

The greatest impacts are associated with the impoundment of the water flow downstream. These include the loss of productive land; noise pollution; soil erosion; distortion of flow patterns and sediment loads of the water resource; distortion of the landscape; air pollution; destruction of vegetation, loss of wildlife and wild habitat; change in river discharge among others within the project area.

3.2.3 *Economic Impacts*

The proposed National Water Harvesting and Storage Regulations 2023 seek to have an impact in the improved availability of water resources, through the regulation, development and effective management of water storage facilities and the enforcement of water harvesting strategies.

The construction of large dams is likely to increase tourism at both the local and regional level taking into consideration the aesthetics of the landscape and its functionality as a learning resource for institutions.

Investment by the national government in national public water works infrastructure creates economic activity for businesses directly involved in the design, engineering and construction of water resources infrastructure. The proposed regulations will have an impact on employment. Gains in employment would be primarily evidenced in construction-related occupations, thus creating employment for both skilled and unskilled labour from individuals within and outside the community. These construction projects will further enable the transfer of skills to local people through on the job training, observation and trial under supervision. The indirect effects from the construction of dams include those associated with the construction of buildings, maintenance and functioning of the dam (e.g. access roads, irrigation facilities made possible by the dam).

The proposed regulations will have a further economic impact through indirect expenditures made by construction businesses. The regulations make provision for regular repair and maintenance of water harvesting and storage and flood control infrastructure. In order to undertake such activities the purchase of necessary equipment and machinery from manufacturers will be required. This will also further create demand for primary materials from other suppliers thus spurring sector-wide economic activity. Investment in national public water works will increase spending by inter-related industry and add to Kenya's national economic activity.

In short, water storage and harvesting and flood control infrastructure is crucial to achieving economic health. The proposed National Water Harvesting and Storage Regulations 2023 seek

to not only construct and develop infrastructure, but to keep it in a state of good repair. Investments will generate high quality jobs, increase the competitiveness of Kenyan businesses and lead to a significant injection of economic activity throughout the country.

In the long-term numerous sectors will benefit from improvements in the reliability and efficiency of water storage and harvesting systems.

3.3 KEY AREAS ADDRESSED BY THE REGULATIONS AND THE ASSOCIATED IMPACTS

3.3.1 Water Storage, Flood Control and Dam Safety

Water Storage

The proposed National Water Harvesting and Storage Regulations 2023 will have an impact on the supply of water through the development of designated national public water works for water harvesting and storage. The building of new dams is a key measure for the national government's efforts to meet increasing water scarcity. Supply augmentation can address any increases in water demand or reductions in availability.

The investment in water storage capacity both large and small-scale as provided for in the proposed regulations will enhance resilience to better cope with erratic rainfall. This will provide substantial benefits to the Kenyan poor and to the broader community. The benefits of the regulations include an increase in safe water supplies for households, agriculture and food production and for industry at large.

Dam Safety

The proposed National Water Harvesting and Storage Regulations 2023 means to provide safety evaluations and periodic inspections of existing dams; submission of dam design reports, dam construction reports, dam completion reports and dam operation reports, review of maintenance and management plans, maintenance analysis and maintenance outcomes; and the review and approval of Emergency Preparedness Plans.

The reservoirs created by dams supply water to a variety of different users throughout Kenya. Large water storage facilities are necessary and feasible for MWS&I's ongoing promotion of irrigation, drainage or flood control. The storage provided by large flood control dams enables the reduction of high peak flows in rivers.

A primary impact of the proposed National Water Harvesting and Storage Regulations 2023 is that the construction of water works will only be undertaken by

- qualified and licensed water resources professionals;
- with thorough environmental impact assessments; and
- public consultation with the effected communities and all relevant stakeholders.

The proposed National Water Harvesting and Storage Regulations 2023 will also have a significant environmental and social impact through its expected reduction of the potential risks to life and property from dam failure. The regulations prescribe for maintenance and management mechanisms that will lead to an effective national dam safety regulation that will lead to a reduction in national dam safety hazards. The regulations achieve these aims by establishing an inventory and designation of all dams and public water works according to their potential risks based on their impoundment capacity as highlighted in Table 5.

Table 5: Classification of Dams

Class of Dam	Maximum Depth of water at NWL (m)	Impoundment at NWL (m ³)	Catchment Area (km ²)
A (Low Risk)	0-4.99	<100,000	<100
B (Medium Risk)	5.00-14.99	100,000 to 1,000,000	100 to 1,000
C (High Risk)	>15.00	>1,000,000	>1000

The data collection mechanisms which prioritize the screening, characterization and prioritization of dam safety information and other pertinent data under the proposed regulations will have an impact on MWS&I and the NWHSA's ability to assess and interpret information related to critical assets and national public water works (Part IV- Data Gathering and Collection). Timely and up-to-date information will facilitate the improved regulation of national public water works in order to mitigate any potential risks and hazards to human health, life and property.

Flood Control

Pervasive flood events are a regular occurrence in Kenya. Such flood events are caused by heavy rains that cause tributaries and river channels to flood where the channel capacities are

inadequate to contain the runoff; when excessive rainfall occurs in areas with inadequate off-channel storage, rainwater runoff cannot be stored to prevent flooding in the tributary and river channels; and if excessive rains fall downstream of flood control reservoirs, they cannot store the floodwaters to alleviate flooding.

Most of the dams in Kenya were not built for flood control and provide limited or no flood control benefit. The risk of dam failure remains for communities that are located downstream. The proposed National Water Harvesting and Storage Regulations 2023 will result in valuable social and environmental benefits. The proposed regulation will impact dam safety and the maintenance and operation of flood control structures and facilities; and in particular the maintenance of levees and flood walls and the preparation of emergency preparedness plans for dams affected by floods. In addition, the requirements for inventory of dams includes an assessment of each dam based on inspections caused by dam owners or operators which are to be submitted to the NWHSA.

The flood risk to downstream communities will also be impacted by the proposed regulations particularly with regard to the modalities prescribed for the release of and use of stored water, compensation flow and prior notification to downstream communities (Part III – Operation of Dams and other Water Resource Storage Facilities). These interventions will allow communities located below dams to be better prepared for any potential risks to life and property.

The proposed regulations seek to increase the frequency of dam inspections, the submission and review of Emergency Actions and Preparedness Plans, the improved coordination of dam owners and operators with the county government, local communities and the relevant disaster management authorities, and the identification of dams requiring repair or removal. In summary, the proposed National Water Harvesting and Storage Regulations 2023 seek to prioritize dam safety and dam hazard risk management as part of a comprehensive national flood risk management relevant to both upstream and downstream communities.

3.3.2 Water Harvesting

Water shortage in Kenya is a serious obstacle to poverty reduction because it limits the extent to which crop and livestock producers can take advantage arising from emerging markets, trade and globalization. Furthermore, Kenya is in the process of rapid population growth which places an increased burden on its existing water resources. Table 6 highlights the populations in 2010 and 2030 based on Kenya Vision 2030s projection and the 2009 Census.

Table 6: Projected Population

Year	2009 (Census)*		2010		2030		2050	
Area	Population	%	Population	%	Population	%	Population	%
Urban	12.29	32.8	13.08	33.9	46.02	67.8	65.69	67.8
Rural	25.21	67.2	25.45	66.1	21.82	32.2	31.20	32.2
Total	37.50	100.0	38.53	100.0	67.84	100.0	96.89**	100.0

Note: * Census 2009 Population adjusted for eight anomalous Districts

** UN World Urbanisation Prospects: The 2011 Revision

Source: JICA Study Team based on Kenya Vision 2030 and UN projection

At the same time as the population increases, the overall demand for potable water will increase. The effects of climate change means there is also a further increased vulnerability to rainfall variability. Table 7 highlights the projected mean annual rainfall and the actual evapotranspiration expected in Kenya.

Table 7: Projection of Mean Annual Rainfall and Actual Evapotranspiration

(Unit mm/year)

Item	2010	2030	2050
Mean Annual Rainfall	679	750	801
Mean Annual Actual Evapotranspiration estimated by Hamon method	549	613	659
Mean Annual Actual Evapotranspiration adjusted by FAO Penman-Monteith method	608	675	723

Note: Figures are ensemble means of 11 GCMs.

Source: JICA Study Team (Ref. Sectoral Report (B), Section 5.4 and 5.5)

Effective and proper water management strategies and policies makes the economy more resilient to hydrological variability and is an important factor in sustainable economic growth and development.

Water Harvesting policies and strategies have been used for many years in different areas around the world to solve the problem of water scarcity. Efficient rainwater harvesting in catchments (large surface areas), storage tanks, boreholes etc. is therefore a necessary alternative to provide sufficient supply including during periods of droughts and dry seasons.

The regulatory impact of the proposed National Water Harvesting and Storage Regulations 2023 will be on the rainwater harvesting capabilities in both rural and developing urban centers in light of rapid population growth and the increased variability in rainfall. The proposed regulations that relate in particular to water management in dams, storage of rainwater in tanks, the collection of rainwater in buildings from roof-tops and agricultural establishment using water resources for commercial irrigation (Part VII – Water Harvesting) will significantly increase water resources capabilities for both domestic and commercial or industrial uses.

Generally, the ultimate goal of the proposed National Water Harvesting and Storage Regulations 2023 will be to address the necessity of alternative, simple, effective, low cost and environmentally sound water resources through the formulation of policy objectives, plans, guidelines and procedures and strategies for rainwater harvesting.

3.3.3 Strategic Water Emergency Interventions

Droughts are major natural hazards that have far-reaching economic, social and environmental impacts. These include the proliferation of conflicts and civil unrest, migration, gender disparities, food insecurity and famine, poverty and negative short and long-term health risks.

The proposed National Water Harvesting and Storage Regulations 2023 will have an important impact on the national government's ability to manage water shortages. The regulations provide for the establishment and maintenance of a Drought Response Plan by the NWHSA in collaboration with the National Drought Management Authority (Section 39, Part VIII). The Drought Response Plan will serve as a guide for the NWHSA and its member agencies to identify areas for drought response with progressive water-use restrictions that are designed to align demand with supply during water shortages within Kenya. Water demand management measures may be more cost-effective than supply augmentation. Implementation of drought response infrastructure has significant costs and was considered an operational constraint.

In summary, the impact of the proposed National Water Harvesting and Storage Regulations 2023 will include access to relatively safe, clean water at local points, and sustained water demands in times of precipitation failures.

4. CONSULTATIONS

The proposed National Water Harvesting and Storage Regulations 2023 have been subjected to a series of consultations processes wherein stakeholders have been allowed the opportunity to identify and correct faulty assumptions and reasoning and to provide information and suggestions that have enriched the drafting process. The following section provides a summary of the consultations that have been held and are supported with annexures of workshop reports.

4.1 CONSULTATIONS

4.1.1 Stakeholder Exploratory Consultation held on 22nd and 23rd August 2023

A stakeholder exploratory and consultative meeting was held on 22nd and 23rd August 2023, which brought together staff from the MWS&I and from Water Sector Institutions (WSIs) namely the Water Services Regulatory Board (WASREB), Water Regulatory Authority (WRA), the WaterSector Trust Fund (WSTF), the National Water Harvesting and Storage Authority (NWHSA) and Water Services Boards (WSBs) prior to the development of the Water Services Regulations 2023.

The aim of the consultative meeting was to gain preliminary insights into what were viewed by this group of stakeholders as prevailing issues or concerns to be addressed by this legislative reform process. Issues raised at this stakeholder consultation were factored in the drafting and development of the proposed National Water Harvesting and Storage Regulations 2023. The details of the consultations were provided in [Appendix I](#).

The meeting proposed the following as the key issues for inclusion in the proposed rules:

- Regulations governing development, maintenance and management of national public water works
- Regulations governing undertaking of strategic water emergency interventions during drought
- Regulations governing rain water harvesting and household water storage
- Regulations governing construction, extension or improvement of dams and licensing of persons carrying out business as dam contractors
- Regulations should govern the utilization of water stored in infrastructure developed by the Authority.
- The rules should facilitate control, management and cost recovery.
- Rules should govern the planning, implementation and safety of storage infrastructure

- A data centre for national water storage and flood control infrastructure should be developed to make it possible for the Authority to meet its mandate.

The feedback received at the consultation forum provided insights as to the content expectations of the stakeholders; hence providing guidance on what should constitute the broad chapters/parts of the proposed National Water Harvesting and Storage Regulations 2023.

4.1.2 Regional Stakeholder Consultation for the Developed Draft Regulations

A second phase of consultations which focused on the developed Draft Regulations were held in Kakamega, Kisumu, Eldoret, Nakuru, Mombasa, Machakos, Nyeri and Garissa between 5th to 9th September 2023 and 25th to 29th September 2023. The aim of these consultations was to present a draft of the proposed Water Harvesting and Storage Regulations 2023 to participants, obtain their feedback, and to address any issues or concerns raised by the stakeholders. The meeting participants included staff from the MWS&I and representative of technical and legal departments of Water Sector Institutions (WSIs) namely the Water Services Regulatory Board (WASREB), Water Regulatory Authority (WRA), the Water Sector Trust Fund (WSTF), the National Water Harvesting and Storage Authority (NWHSA) and Water Services Boards (WSBs), members of the civil society, religious groups, county governments representatives' and general members of the public. The details of the second phase of the consultations are provided in Annex 2. The workshop participants proposed the following for inclusion in the draft Regulations: -

- A requirement that flood prone areas be mapped out nationally;
- Provision on identification of dam sites and with appropriate compensation made to owners.
- Reservoirs should be multi-purpose (hydropower, fish farming etc.) where possible.
- Provisions be made to facilitate collaboration amongst key stakeholders in catchment areas.
- Clarify that policy matters are a function of the Ministry and the Water Harvesting and Storage Authority should only be responsible for implementation of policy.

Issues raised at this stakeholder consultation were factored in revising the Regulations, which are presented as the current draft of the National Water Harvesting and Storage Regulations 2023.

4.1.3 Further Consultations

Further consultations on the proposed draft Regulations were held on 15th January 2024 between the MWS&I and Kenya Private Sector Alliance (KEPSA), Kenya Association of Manufacturers (KAM), Water Services Providers Association (WASPA) and KEWASNET, an NGO with vast interests in water sector regulation. Additional consultations were held on 23rd January 2023 between the MWS&I, the Water Sector Institutions and the Secretariat to the Council of Governors (CoG). This was a virtual meeting.

No concern was raised over these set of Regulations.

5. NATIONAL VALIDATION OF THE DRAFT REGULATIONS

The Ministry organized for a National Validation Forum, of the Draft Regulations on 25th January 2024. This exercise was held after the Regulations had been circulated through the Ministry's website and that a paid up advertisement over the validation exercise had been issued.

The feedback received from all these consultations has informed the current version of the draft Regulations.

6. CONCLUSION

The proposed National Water Harvesting and Storage Regulations 2023 will provide an operational procedure for the management and maintenance of national public water works infrastructure for water harvesting and storage and flood control and in effect contribute towards the protection and realization of the constitutional rights to clean and safe water in adequate quantities (Articles 43). It is a policy objective for the MWS&I to promote and facilitate the protection and realization of the above-mentioned right, hence it considers that a regulatory approach, as opposed to a non-regulatory approach, is best placed to achieve this policy objective. The streamlining of dam safety standards and the water capacity-building efforts will in the long-run result in net positive environmental, social and economic impacts for the Kenyan society as a whole.

7. APPENDICES

- 7.1 Stakeholder Exploratory Consultation Held on 22nd and 23rd August 2023, Workshop Report
- 7.2 Regional stakeholders Consultations held in Kakamega, Kisumu, Eldoret, Nakuru, Machakos, Mombasa, Garissa and Nyeri. Held on 5th - 8th of September 2023 and

25th – 28th of September 2023 – Executive Summary of the Workshop Report