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"An integrated approach to wastewater management in the Wider Caribbean Region using innovative solutions and sustainable financing mechanisms"

Review of Wastewater Policy and Legal Framework in St. Kitts and Nevis

National Strategy and Action Plan on Wastewater Management

Final Report

March 2025

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Project Details	
Consultancy Assignment	Review of Wastewater Policy and Legal Framework in St. Kitts and Nevis
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Acronyms and Abbreviations

CAWASA	Caribbean Water and Sewerage Association Inc.
CWWA	Caribbean Water and Wastewater Association
CSO	Civil Society Organizations
DOE	Department of Environment
DPP	Department of Physical Planning
EHD	Environmental Health Department
FAMRA	Fisheries, Aquaculture and Marine Resources Act
GCF	Green Climate Fund
GEF	Global Environment Facility
GOSKN	Government of St. Kitts and Nevis
IWMC	Integrated Wastewater Management Committee
IWRM	Integrated Water Resources Management
NCEPA	National Conservation and Environmental Protection Act
NGO	Non-Governmental Organizations
NWMCP	National Wastewater Management Coordination Platform
OECS	Organization of Eastern Caribbean States
PHA	Public Health Act
PPP	Public Private Partnership
SIDS	Small Island Developing States
WWM	Wastewater Management

Executive Summary

The **Wastewater Management Strategy and Action Plan for St. Kitts and Nevis** represents a comprehensive and structured approach to addressing the critical challenges of wastewater management in the country. This plan, developed in alignment with national policies and regional commitments, seeks to establish a sustainable, resilient, and efficient wastewater management framework that protects public health, preserves environmental quality, and supports economic development.

The strategy is built upon **seven key priority areas**, each of which outlines specific actions, timelines, and estimated costs necessary to achieve national wastewater management objectives:

1. **Policy, Institutional, and Regulatory Framework** – Strengthening wastewater governance through policy updates, legal reforms, and institutional capacity-building.
2. **Wastewater Reuse and Sustainable Infrastructure Development** – Promoting the adoption of decentralized wastewater treatment, improving existing infrastructure, and expanding the safe reuse of treated wastewater.
3. **Climate Resilience and Adaptation** – Enhancing wastewater management systems to withstand climate-related hazards and integrating disaster risk reduction strategies.
4. **Stakeholder Engagement and Community Participation** – Empowering communities through education, outreach programs, and public-private partnerships.
5. **Data-Driven Planning and Monitoring** – Establishing a national wastewater database, conducting baseline assessments, and improving decision-making through reliable data.
6. **Financing and Resource Mobilization** – Securing sustainable financing through cost-recovery mechanisms, government allocations, and international funding sources.
7. **Regional Collaboration** – Strengthening partnerships with Caribbean nations and aligning wastewater management standards with regional and international frameworks.

The action plan will be executed in three distinct phases over **ten years at an estimated cost of 6,285,000 USD**:

- **Phase 1 (Years 1-3): Establishing the Foundation** – Legal and policy updates, capacity-building, and awareness campaigns.
- **Phase 2 (Years 4-7): Infrastructure Development and Climate Resilience** – Expanding wastewater treatment facilities, implementing pilot projects, and integrating climate adaptation measures.
- **Phase 3 (Years 8-10): Financial Sustainability and Regional Collaboration** – Establishing long-term funding mechanisms, strengthening private sector engagement, and fostering regional knowledge-sharing.

By following this structured roadmap, St. Kitts and Nevis aims to achieve universal access to safe sanitation, reduce pollution, and enhance resilience against climate change while fostering sustainable economic growth.

Overview of the Action Plans

Actions	Timeline (Years)	Costs (USD)
Priority Area 1: Policy, Institutional and Regulatory Framework		
Action 1: Update of Public Health Act (PHA) and National Conservation and Environmental Protection Act (NCEPA) Action 2: Establishment of New Unit or Committee (Federal IWRM Unit / IWMC) Action 3: Specialized Training and Capacity Building for Key Stakeholders Action 4: Update to Building Code and Design Standards Action 5: Development of Guidelines for Agrochemical Runoff and Livestock Waste Management Action 6: Guidelines and Feasibility for Safe Wastewater Reuse Practices Action 7: Strengthening Laboratory Capacity for Wastewater Monitoring	Year 1-3	2,105,000
Priority Area 2: Wastewater Reuse and Sustainable Infrastructure Development		
Action 1: Feasibility and demonstration of small-scale pilot decentralized treatment systems for key sectors Action 2: Feasibility and demonstration of septage treatment and disposal at the local landfills Action 3: Feasibility and demonstration of wastewater reuse in agriculture, aquifer recharge and landscaping	Year 4-7	2,120,000
Priority Area 3: Climate Resilience and Adaptation		
Action 1: Upgrade of national disaster management plans and national adaptation plans to include wastewater management actions Action 2: Integration of climate proofing and renewable energy into wastewater infrastructure development	Year 6-7	835,000
Priority Area 4: Stakeholder Engagement and Community Participation		
Action 1: Outreach to established CSOs / NGOs to empower communities on WWM issues Action 2: Outreach to private sector players to encourage investment in PPPs Action 3: Wide ranging education and awareness campaigns including communications strategy for IWMC	Year 3-5	380,000
Priority Area 5: Data-Driven Planning and Monitoring		
Action 1: Baseline assessment of the sector including identification of key indicators Action 2: Establishment of a database and development of web-based tools for decision-making and enforcement Action 3: Development of wastewater master plan	Year 4-6	425,000
Priority Area 6: Financing and Resource Mobilization		
Action 1: Feasibility Study for Cost Recovery Systems Action 2: Design of Incentive Regime to Promote Private Sector Participation in Wastewater Management (PPPs) Action 3: Securing International and Regional Funding	Year 7-9	300,000
Priority Area 7: Regional Collaboration		
Action 1: Strengthen Knowledge Sharing and Regional Collaboration	Year 9-10	120,000
	Total:	**6,285,000**

Chapter 1 Introduction

1.1 Background

The Federation of St. Kitts and Nevis, like many Small Island Developing States (SIDS), faces significant wastewater management challenges driven by urbanization, population growth, and the expansion of key economic sectors such as tourism and agriculture. Despite ongoing efforts to regulate wastewater discharge, much of the existing infrastructure is outdated, undersized, or improperly maintained. Consequently, untreated or partially treated wastewater is frequently discharged into the environment, leading to critical public health and environmental concerns. Recognizing the urgent need for a coordinated response and the work of the regional GEF CREW+ project, the Government of St. Kitts and Nevis has developed this **Wastewater Management Strategy and Action Plan** as an implementation roadmap for the **National Wastewater Management Policy**. The Action Plan outlines structured actions, institutional responsibilities, financing mechanisms, and monitoring frameworks essential to improving wastewater management while ensuring alignment with national development priorities and international obligations such as the Cartagena Convention's Land-Based Sources (LBS) Protocol**.**

The 10-year Action Plan is structured to address key wastewater management challenges, integrating policy directives, regulatory enhancements, infrastructure modernization, and stakeholder engagement strategies. It serves as a critical tool for decision-makers, regulators, private sector players, and civil society in achieving sustainable wastewater management that enhances public health, environmental protection, and economic resilience.

1.1.1 Situational Analysis Overview

The recent **Situational Analysis on Wastewater Management in St. Kitts and Nevis** identified several gaps and inefficiencies in the country's wastewater management landscape:

Infrastructure Deficiencies:

- The country lacks centralized wastewater treatment facilities, relying heavily on decentralized systems such as septic tanks and soakaway.
- Existing treatment plants, especially in hotels and public facilities, are poorly maintained and operate below capacity.
- Greywater is often discharged directly onto streets or ghauts, exacerbating public health risks and environmental degradation.

Environmental and Public Health Risks:

- Untreated or poorly treated wastewater contaminates coastal waters, threatening marine biodiversity, coral reefs, and tourism revenue.

- Polluted water sources contribute to nutrient overloading, leading to algae blooms and sedimentation that disrupt fisheries and coastal ecosystems.
- Limited wastewater monitoring heightens risks of waterborne diseases, increasing public health vulnerabilities.

Regulatory and Institutional Weaknesses:

- There is no formal national wastewater policy or legislative framework governing wastewater discharge, reuse, and compliance monitoring.
- Outdated laws, such as the Public Health Act and National Conservation and Environmental Protection Act (NCEPA), do not sufficiently address effluent discharge standards or enforcement mechanisms.
- Institutional capacity remains weak due to insufficient staffing, fragmented governance, and poor inter-agency coordination.

Societal and Cultural Barriers:

- Public awareness about the risks of improper wastewater disposal is low, leading to widespread non-compliance.
- There is cultural resistance to the reuse of treated wastewater beyond irrigation, hindering the adoption of sustainable practices.

Climate Vulnerability and Disaster Risk:

- Wastewater infrastructure is highly vulnerable to hurricanes, floods, and rising sea levels, increasing the risk of system failures.
- Coastal erosion threatens septic systems, particularly in low-lying areas.

Financial Constraints:

- Current wastewater financing mechanisms rely heavily on government budgets and private sector investments, lacking sustainable cost-recovery models.
- The absence of tariffs or pollution fees undermines financial sustainability.

Chapter 2 Vision, Goals and Objectives

2.1 Vision

The overarching vision of the Wastewater Management Strategy and Action Plan for St. Kitts and Nevis is to establish a **sustainable, inclusive, and resilient wastewater management system** that enhances public health, protects ecosystems, and supports national economic development. This vision aligns wastewater management with the principles of Integrated Water Resources Management (IWRM), recognizing wastewater as an essential component of the broader water cycle. By integrating wastewater management with water supply, stormwater management, and environmental protection strategies, the Action Plan aims to achieve holistic water resource sustainability and resilience**.**

2.2 Goals

The Action Plan is designed to operationalize the National Wastewater Management Policy and address the country's wastewater management challenges through a phased, structured approach. The primary goals are to:

- **Ensure universal access to sanitation** by expanding and upgrading wastewater treatment facilities, particularly in underserved areas.
- **Safeguard public health** by improving wastewater treatment, reducing contamination of drinking water sources, and enhancing regulatory enforcement.
- **Protect the environment** by reducing pollution from untreated wastewater and strengthening effluent discharge standards.
- **Optimize water resource management** through safe wastewater reuse in agriculture, landscaping, and industrial applications, reducing demand on freshwater resources.
- **Enhance climate resilience** by integrating wastewater management into disaster risk reduction and climate adaptation strategies, ensuring infrastructure withstands hurricanes, flooding, and sea-level rise.
- **Strengthen institutional frameworks** to clarify roles and responsibilities, improve coordination, and enhance regulatory compliance.
- **Develop sustainable financing mechanisms** to ensure the long-term viability of wastewater infrastructure and services.
- **Foster stakeholder engagement and regional collaboration** by involving local communities, private sector actors, and regional partners in wastewater management initiatives.

2.3 Objectives

The Action Plan outlines seven strategic priority areas that will guide its implementation over a 10-year period**.** These priority areas align with the National Wastewater Management Policy and address key infrastructure, governance, financial, and environmental challenges:

1. **Policy, Institutional, and Regulatory Framework**
   - Establish a comprehensive regulatory framework with clear effluent discharge standards and compliance mechanisms.
   - Update and harmonize the Public Health Act (PHA) and National Conservation and Environmental Protection Act (NCEPA) to strengthen wastewater governance.
   - Establish the Integrated Wastewater Management Committee (IWMC) to oversee wastewater policy implementation and coordination.
   - Develop national design standards and guidelines for on-site wastewater treatment and wastewater reuse.
2. **Wastewater Reuse and Sustainable Infrastructure Development**
   - Upgrade existing wastewater treatment facilities to incorporate secondary and tertiary treatment where applicable.
   - Promote nature-based and decentralized wastewater treatment solutions, such as constructed wetlands, in rural and peri-urban areas.
   - Establish dedicated facilities for the safe collection, transport, treatment, and disposal of septage to address gaps in on-site sanitation systems.
   - Expand the reuse of treated wastewater, including greywater, for irrigation, landscaping, and aquifer recharge.
3. **Climate Resilience and Adaptation**
   - Integrate wastewater management into national disaster risk reduction and climate adaptation plans.
   - Retrofit wastewater treatment plants with flood-proof designs and renewable energy solutions to enhance resilience against extreme weather events.
   - Establish early warning systems and emergency response protocols for wastewater treatment failures.
4. **Stakeholder Engagement and Community Participation**
   - Empower local communities through education and awareness campaigns on proper sanitation and wastewater management.
   - Foster public-private partnerships (PPPs) to mobilize investment in wastewater infrastructure.
   - Develop training programs for wastewater professionals, farmers, and local businesses on best practices for wastewater reuse.
5. **Data-Driven Planning and Monitoring**
   - Conduct a comprehensive baseline assessment of wastewater systems, identifying key pollution sources and service gaps.
   - Establish a centralized wastewater monitoring database to track treatment facility performance and compliance.
   - Develop a national wastewater master plan to guide infrastructure investments and policy decisions.
6. **Financing and Resource Mobilization**

- Develop cost-recovery mechanisms, including wastewater tariffs and effluent fees, to support long-term infrastructure maintenance.
- Secure international and regional funding to finance large-scale wastewater management initiatives.
- Promote incentive programs to encourage private sector investment in wastewater treatment and reuse.

7. **Regional Collaboration**
    - Strengthen partnerships with regional and international agencies to facilitate knowledge sharing and capacity-building.
    - Align wastewater management policies with regional agreements, including the Cartagena Convention's LBS Protocol.
    - Participate in joint initiatives addressing marine pollution, climate resilience, and integrated water resource management.

By following this structured vision, goals, and objectives framework**,** the Action Plan will drive sustainable wastewater management that supports public health, economic development, and climate resilience in St. Kitts and Nevis.

Chapter 3 Stakeholder Mapping and Management Planning

3.1 Stakeholder Mapping

The successful implementation of the 10-year wastewater management action plan will rely on the coordinated efforts of multiple stakeholders. Table 3.1 summarizes the core stakeholders and their primary roles as outlined in the National Wastewater Management Policy for St. Kitts and Nevis.

Table 3.1: Key stakeholders for Implementation of Action Plans

Stakeholders	Role
Integrated Wastewater Management Committee (IWMC)	- Serve as the central coordinating body for national wastewater management activities. - Oversee policy implementation, monitor progress, and provide regular reports to the Cabinet. - Ensure inter-agency collaboration and alignment with national and regional development priorities. - Address cross-sectoral issues (land use, agriculture, tourism) intersecting with wastewater management. - Foster collaboration, innovation, and public participation through stakeholder engagement.
Ministry of Environment and Climate Action, Department of Environment	- Secretariat for the IWMC - Ensure wastewater infrastructure is designed for climate resilience. - Oversee the integration of wastewater management into national adaptation and disaster management plans. - Promote the adoption of renewable energy solutions for wastewater treatment facilities.
Environmental Health Department (EHD)	- Act as the lead regulatory authority, enforcing effluent discharge standards and monitoring compliance. - Provide technical guidance, issue permits, and conduct inspections of treatment systems. - Initiate enforcement actions for non-compliance and lead public health protection measures.
Ministry of Finance and Sustainable Development	- Oversee financing mechanisms, cost recovery frameworks, and disbursement of government funds. - Support the mobilization of grants, loans, and private sector investments. - Provide financial monitoring and reporting to ensure long-term sustainability of projects.
Local Water Utilities	- Manage the operation and maintenance of centralized and decentralized wastewater treatment systems. - Integrate wastewater management with broader water resource and stormwater planning. - Collaborate with the EHD on monitoring water quality impacts from wastewater discharges.
Private Sector Operators	- Design, build, operate, and maintain wastewater treatment systems under public-private partnerships (PPPs). - Comply with regulatory standards and adopt innovative, cost-effective technologies. - Participate in co-financing of projects, particularly decentralized and nature-based solutions.

Community Organizations	- Support decentralized wastewater systems through public education, training, and awareness programs. - Facilitate community participation in planning, operation, and monitoring of local systems. - Help foster community ownership and proper maintenance of on-site systems.
Academic and Research Institutions	- Provide research and data to support evidence-based planning and decision-making. - Collaborate on technology testing and pilot projects for wastewater reuse and decentralized systems. - Assist in monitoring and evaluating the environmental impact of wastewater systems.
Regional Partners	- Support knowledge-sharing initiatives and harmonization of wastewater management standards. - Facilitate participation in joint regional projects addressing pollution control and climate resilience. - Provide technical assistance and regional training programs.

These stakeholders will work within the institutional framework outlined in the policy, with the Integrated Wastewater Management Committee (IWMC) playing a central role in overseeing coordination and reporting. This collaborative approach ensures the alignment of efforts across different sectors and agencies while enhancing the country's capacity for sustainable wastewater management.

Immediate requirements to proceed with actions plans:

1. Kick-start capacity building and robust staffing within the key government agencies is critical to ensure effective implementation of projects and coordination with sister government agencies to attract the climate finance required to advance the work.
2. Secure funding (from international grants and / or public-private partnerships) and financial resources (from government budgets) to ensure smooth implementation of project activities.

Critical steps to ensure success:

1. Establish a robust project management framework with clear governance structures, timelines and accountability measures.
2. Foster participatory, early and active stakeholder engagement and coordination to ensure a shared understanding and commitment to the action plan objectives and workplan and clear lines of communication established.
3. Develop detailed workplan focused on phased implementation and flexibility allowing for adjustments based on initial outcomes, stakeholder feedback and changing circumstances.

3.2 Risk Management

Effective risk management is essential to ensure the successful implementation of the 10-year wastewater management strategy. Table 3.2 outlines key risks across strategic actions and defines contingency actions to mitigate or respond to challenges.

Table 3.2: Key risks and contingency actions

Risk category	Description of Risk	Impact Level	Contingency Action
Funding Shortfalls	Insufficient financial resources due to delayed government allocations, lack of private sector investment, or limited international funding.	High	- Establish early financial planning with a diversified funding strategy. - Prioritize initial actions with lower funding needs (pilot projects). - Proactively seek international grants and partnerships. - Develop scalable, modular projects to adapt to funding availability.
Delays in Legal and Regulatory Updates	Prolonged legislative processes, lack of political will, or legal disputes delaying updates to the Public Health Act and environmental laws.	High	- Engage policymakers early through stakeholder consultations. - Set legislative milestones and closely monitor progress. - Consider temporary guidelines until formal laws are passed. - Include legal experts in project planning.
Resistance from Communities and Stakeholders	Public resistance to wastewater projects, particularly around reuse or decentralized systems, due to safety concerns or lack of awareness.	Medium	- Implement targeted education and outreach campaigns. - Involve local leaders and community organizations to build trust. - Pilot projects to demonstrate tangible benefits and ensure transparency. - Collect and address public feedback promptly.
Technical Failures in Infrastructure	Poor performance or failures in decentralized systems, treatment plants, or monitoring equipment due to design flaws or operational inefficiencies.	Medium	- Conduct thorough feasibility studies and testing before large-scale implementation. - Develop maintenance schedules and operator training programs. - Establish contingency funds for quick repair or system upgrades. - Ensure redundancy in critical systems.
Climate-Related Hazards	Extreme weather events such as floods, hurricanes, and sea-level rise damaging infrastructure or disrupting operations.	High	- Design climate-resilient infrastructure with flood-proofing and elevated systems. - Integrate stormwater management into planning. - Establish emergency response protocols and backup power systems. - Monitor climate risk periodically and adapt designs accordingly.

Limited Institutional Capacity	Insufficient technical expertise and limited capacity of government agencies or local utilities to handle expanded roles.	Medium	- Conduct regular capacity-building and technical training programs. - Partner with regional and international organizations to provide expertise. - Hire specialized staff or engage external consultants for complex projects. - Integrate capacity-building into long-term planning.
Weak Monitoring and Enforcement	Poor enforcement of discharge standards and weak monitoring of effluent quality due to lack of resources or coordination.	High	- Develop a centralized monitoring system with real-time data collection. - Ensure proper allocation of human and financial resources for enforcement. - Conduct random inspections and audits. - Train enforcement officers regularly on updated standards and procedures.
Conflicts between Stakeholders	Disputes among government agencies, private sector players, or communities regarding responsibilities, investments, or implementation plans.	Medium	- Clearly define roles and responsibilities in inter-agency agreements. - Establish a dedicated coordination body (IWMC) for conflict resolution. - Schedule regular stakeholder meetings to review progress. - Create a conflict resolution mechanism within project governance structures.
Delays in Securing Private Sector Involvement	Reluctance or delays in private sector investment due to unclear PPP frameworks, high perceived risks, or insufficient financial incentives.	Medium	- Establish clear PPP frameworks and risk-sharing mechanisms. - Provide targeted financial incentives, such as tax credits or subsidies. - Engage the private sector during project design phases. - Implement small-scale PPP pilots to demonstrate feasibility and build confidence.
Data Gaps and Inaccurate Baseline Assessments	Limited or inaccurate data leading to poor planning decisions, misallocation of resources, or delays in implementation.	Medium	- Conduct comprehensive baseline assessments with robust field data. - Establish a centralized data management system. - Include periodic data reviews and updates as part of the M&E framework. - Collaborate with local colleges and research institutions for data collection.
Technological Obsolescence	Obsolete or inadequate technologies being deployed, leading to inefficiencies and high maintenance costs.	Low	- Regularly review emerging technologies and best practices. - Include adaptability in system design to allow upgrades. –

			- Partner with technology providers to ensure ongoing system support and updates. - Conduct cost-benefit analysis before technology selection.
Environmental Risks of Wastewater Reuse	Improperly treated wastewater reuse leading to contamination of crops, groundwater, or public health risks.	Medium	- Set and enforce stringent treatment standards and monitoring protocols. - Pilot reuse projects with close supervision. - Regularly test water quality and ensure compliance with safety standards. - Educate end users (farmers, landscapers) on safe reuse practices.

3.3 Priority Areas

In alignment with the National Policy on Wastewater Management, the strategic priority areas identified are:

1. **Policy, Institutional and Regulatory Framework**
    a. Establish comprehensive regulations, effluent discharge standards, and permitting mechanisms.
    b. Update and harmonize the **Public Health Act** and **National Conservation and Environmental Protection Act**.
    c. Establish Integrated Wastewater Management Committee (IWMC)
2. **Wastewater Reuse and Sustainable Infrastructure Development**
    a. Upgrade existing systems to include secondary and tertiary treatment.
    b. Promote decentralized systems (e.g., constructed wetlands) in rural and peri-urban areas.
    c. Pilot treated wastewater reuse projects for agriculture and landscaping.
3. **Climate Resilience and Adaptation**
    a. Ensure all new and upgraded infrastructure is climate-proof.
    b. Promote renewable energy to power treatment plants.
4. **Stakeholder Engagement and Public Participation**
    a. Develop public education campaigns on wastewater impacts and benefits of reuse.
    b. Involve communities in monitoring and maintenance of decentralized systems.
    c. Foster public-private partnerships (PPPs) with hotels, resorts, and the private sector.
5. **Data-Driven Planning and Monitoring**
    a. Develop a centralized data management system for tracking wastewater treatment performance.
    b. Regularly monitor and publish reports on effluent quality.
    c. Use data to inform policy adjustments and investment priorities.
6. **Financing and Resource Mobilization**
    a. Implement cost-recovery mechanisms (e.g., user fees, tariffs).

b. Explore grants, international funding, and environmental levies.
c. Support innovation through public-private partnerships.

7. **Regional collaboration**
    a. Strengthen regional collaboration to enhance wastewater management through knowledge sharing, alignment with regional standards, and participation in joint initiatives.

Each of the following chapters will outline a plan for the strategic priority areas including setting targets, identification of actions and activities, key performance indicators and cost estimates.

Chapter 4 Priority Area 1: Policy, Institutional and Regulatory Framework

As outlined in the National Policy, upgrading and enhancing the policy, institutional and regulatory framework is the first action area. As such, key legislation, including the Public Health Act and the National Conservation and Environmental Protection Act, should be updated and harmonized to address gaps in wastewater management and emerging challenges. A main coordination body for wastewater management should be established to oversee and streamline efforts (IWMC). Furthermore, it is essential to introduce effluent discharge standards that align with international best practices, such as the Cartagena Convention's LBS Protocol, and enforce compliance through a permitting system. Additionally, wastewater considerations must be integrated into national physical development planning by incorporating them into zoning regulations, building codes, and land-use planning processes. Comprehensive guidelines should be developed to regulate agrochemical runoff, livestock waste, and wastewater reuse, ensuring pollution risks to freshwater and coastal ecosystems are minimized. Furthermore, design standards for onsite wastewater treatment plants should be clearly established, outlining operational requirements for various sectors, including healthcare facilities, hotels, marinas, industries, and commercial establishments, to ensure their efficiency and environmental compliance. Table 4.1 outlines the main targets for this first strategic pillar.

Table 4.1: Key targets for Priority Area 1

Action	Target
Upgrade of PHA and NCEPA	Updated legislation by the mid-Year 2.
Establishment of IWMC	Established and operational IWMC by end of Year 2
Guidelines and design standards issued	Guidelines and design standards for effective wastewater management issued and operational by end of Year 3
Strengthening laboratory facilities	Modern equipment and updated standard operating protocols implemented by the end of Year 4

The situational analysis identified key barriers that have prevented the establishment of a robust policy, institutional and regulatory framework. The stakeholder working group identified key measures to overcome these barriers which are highlighted in Table 4.2.

Table 4.2: Key measures to overcome barriers to Priority Area 1

Barriers	Measures
Outdated Public Health Act and NCEPA lacking effluent discharge regulations	Update and harmonize the Public Health Act and NCEPA to introduce effluent discharge standards
No formal National Wastewater Management Policy or Action Plan	Develop and implement a comprehensive National Wastewater Management Policy and Action Plan
Absence of a wastewater discharge permitting system	Establish a regulatory framework for issuing wastewater discharge permits
Weak enforcement mechanisms due to limited legal authority	Strengthen enforcement mechanisms and expand legal authority for regulatory agencies

Barriers	Measures
Limited inter-agency coordination leading to fragmented governance	Establish an Integrated Wastewater Management Committee (IWMC) for centralized governance
Insufficient technical expertise and enforcement staff	Increase the number of trained Environmental Health Officers and enforcement personnel

4.1 Action and activities for Priority Area 1

Table 4.3 summarizes the key actions and associated activities to be included in the Action Plan further elaborating on the enabling measures identified.

Table 4.3: Key actions and activities for Priority Area 1

Action 1: Update of Public Health Act (PHA) and National Conservation and Environmental Protection Act (NCEPA) 1.1 Conduct a comprehensive gap analysis of existing regulations, standards, and permitting frameworks. 1.2 Benchmark local regulations against international best practices (e.g., Cartagena Convention's LBS Protocol). 1.3 Perform a feasibility study to design and implement an effective permitting system. 1.4 Draft proposed amendments to the PHA and NCEPA, incorporating wastewater-specific provisions, regulations related to effluent discharge standards, detailed guidelines related to enforcement officers and ability to name ex officio officer from sister agencies and establishment of IWMC 1.5 Facilitate stakeholder consultations to refine proposed changes and gather feedback. 1.6 Seek parliamentary approval for legislative amendments. 1.7 Develop implementation guidelines and training materials for enforcement officers. 1.8 Establish a system for issuing permits, monitoring compliance, and imposing penalties for violations.
Action 2: Establishment of Integrated Wastewater Management Committee (IWMC) 2.1 Develop Terms of Reference (TOR) specifying the roles, responsibilities, and scope of the new committee. 2.2 Draft and implement an HR manual detailing staff roles, training, and capacity requirements. 2.3 Create Standard Operating Procedures (SOPs) for coordination, reporting, and stakeholder engagement. 2.4 Establish a data-sharing framework among stakeholders, ensuring consistent access to wastewater-related data and to exchange experiences and best practices 2.5 Hold stakeholder consultations to review and validate the unit's establishment plan.
Action 3: Specialized Training and Capacity Building for Key Stakeholders 3.1 Conduct a training needs assessment to identify gaps across agencies (Environmental Health Department, utilities, planning agencies, etc.). 3.2 Develop customized training modules focused on wastewater treatment technologies, monitoring, enforcement, and regulatory compliance. 3.3 Organize workshops for on-site wastewater system maintenance, permitting processes, enforcement and data management. 3.4 Partner with regional institutions and international organizations to provide technical expertise. 3.5 Establish program to allow master's level training for government engineers to specialize in wastewater management. 3.6 Collaborate with CAWASA to provide ongoing certification programs for wastewater inspectors and operators.

Action 4: Update to Building Code and Design Standards 4.1 Review existing building codes to identify gaps related to wastewater treatment. 4.2 Draft updated design standards for on-site wastewater treatment systems for various sectors (e.g., residential, commercial, hotels, healthcare). 4.3 Develop a guidance manual outlining technical specifications and operational requirements for various treatment systems (e.g., septic tanks, package plants). 4.4 Conduct stakeholder consultations to validate proposed updates and guidance manuals. 4.5 Develop training materials for architects, engineers, and construction professionals. 4.6 Enforce updated building codes and standards through permitting, inspection processes and monitoring mechanisms.
Action 5: Development of Guidelines for Agrochemical Runoff and Livestock Waste Management 5.1 Conduct a baseline assessment of current agrochemical runoff and livestock waste management practices. 5.2 Develop technical guidelines for proper containment, treatment, and disposal of livestock waste. 5.3 Establish demonstration sites for best management practices (BMPs) for minimizing nutrient runoff, such as buffer strips, constructed wetlands, and controlled application of fertilizers. 5.4 Design training programs for farmers on BMPs and sustainable waste management. 5.5 Monitor and evaluate the effectiveness of implemented guidelines and refine them as necessary. 5.6 Develop enforcement mechanisms to ensure compliance with runoff and waste guidelines.
Action 6. Guidelines and Feasibility for Safe Wastewater Reuse Practices 6.1 Conduct feasibility studies to assess the potential for greywater and treated wastewater reuse in agriculture, landscaping, and industrial processes. 6.2 Develop guidelines specifying treatment levels required for different reuse applications. 6.3 Develop protocols for monitoring the quality of treated wastewater and ensuring public safety. 6.4 Establish regulatory frameworks to govern wastewater reuse and ensure compliance with quality standards.
Action 7. Strengthening Laboratory Capacity for Wastewater Monitoring 7.1 Conduct a comprehensive assessment of existing laboratory facilities used for water and wastewater testing 7.2 Upgrade laboratory infrastructure and improve sample storage, processing and data management capabilities 7.3 Develop and implement standard operating protocols aligned with best practices 7.4 Conduct specialized training programs for laboratory technicians 7.5 Strengthen quality assurance programs to ensure consistency and reliability in test results.

4.2 Estimation of resources needed for action and activities

To ensure proper implementation of the action plan it is important to build up the capacity of the key government agencies charged with coordination, project management, financial resources planning and allocation, and implementation of the projects.

The DOE and EHD require human resources (at least 2-3 new officers) with key technical skills related to wastewater management systems notably at least one engineer and one project manager (with some thought to additional staffing for communications and public education and awareness). In supporting roles, from the Ministry of Finance or Sustainable Development,

at least one financial analyst or economist with expertise in financial modelling, cost-benefit analysis and design of incentive regimes. From the Ministry of Education, technical instructor to help validate training programmes and to integrate lessons plans on wastewater technologies into the curriculum at various levels. From the Ministry of Legal Affairs, a legal draftsperson with expertise in environmental law, regulatory frameworks and contract law.

Once these capacities are built up and human and financial resources allocated to the key government stakeholders, funding from a variety of sources will need to be secured. The overall cost for implementation of actions and activities for Priority Area 1 is estimated at 2,105,000 USD. Table 4.4 summarizes the approximate costs per activity along with success criteria and risks.

Table 4.4: Action Plan overview table for Priority Area 1

Priority Area	Policy, Institutional and Regulatory Framework							
Ambition	The target for priority area 1 is the upgrading of PHA and NCEPA, establishment of the IWMC and development of guidelines and standards for effective wastewater management by the end of Year 3.							
Benefits	Efficient policy, institutional and regulatory framework allows for the objectives of the National Policy to be realized especially universal access to sanitation, public health safeguards, environmental protection, water resource optimization and climate change adaptation and resilience.							
Action	**Activities to be implemented**	**Sources of funding**	**Responsible body and focal point**	**Time frame**	**Risks**	**Success criteria**	**Indicators for Monitoring of implementation**	**Budget per activity (USD)**
Action 1: Update of Public Health Act (PHA) and National Conservation and Environmental Protection Act (NCEPA)	1.1 Conduct a comprehensive gap analysis of existing regulations, standards, and permitting frameworks.	GOSKN	EHD / DOE	Year 1 Month 1-3	Funding Shortfalls	Completion of gap analysis by mid-Year 1	Delivery of gap analysis report	50,000
	1.2 Benchmark local regulations against international best practices (e.g., Cartagena Convention's LBS Protocol).	GOSKN	EHD / DOE	Year 1 Month 1-3	Funding Shortfalls	Completion of benchmarking by mid-Year 1	Delivery of benchmarking report	50,000
	1.3 Perform a feasibility study to design and implement an effective permitting system.	Grant	EHD / DOE	Year 1 Month 3-6	Funding Shortfalls	Completion of feasibility study by mid-Year 1	Delivery of feasibility and set up of permitting system	50,000
	1.4 Draft proposed amendments to the PHA and NCEPA, incorporating wastewater-specific provisions and establishment of IWMC	Grant	EHD / DOE / Legal	Year 1 Month 3-9	Delays in Legal and Regulatory Updates	Completion of amendments by end of Year 1	Delivery of draft legislation	10,000
	1.5 Facilitate stakeholder consultations to refine proposed changes and gather feedback.	GOSKN	EHD / DOE	Year 1 Month 6-9	Resistance from Stakeholders	Completion of consultations by end of Year 1	Delivery of stakeholder consultation meeting reports	10,000
	1.6 Seek parliamentary approval for legislative amendments.	GOSKN	EHD / DOE / Legal	Year 1 Month 9-12	Limited Institutional Capacity	Approval by first quarter of Year 2	Approval printed in GOSKN gazette	5,000

	1.7 Develop implementation guidelines and training materials for enforcement officers.	Grant	EHD / DOE	Year 2 Month 1-3	Limited Institutional Capacity	Training materials developed by mid-Year 2	Delivery of guidelines and training materials	50,000
	1.8 Establish a system for issuing permits, monitoring compliance, and imposing penalties for violations.	GOSKN	EHD / DOE	Year 2 Month 1-6	Limited Institutional Capacity	Operational permitting system by end of Year 2	Permits being issued	20,000
Action 2: Establishment of New Unit or Committee (Federal IWRM Unit / IWMC)	2.1 Develop Terms of Reference (TOR) specifying the roles, responsibilities, and scope of the new unit.	GOSKN	EHD / DOE	Year 2 Month 1-3	Limited Institutional Capacity	Completion of TOR by mid-Year 2	Delivery of TOR	20,000
	2.2 Draft and implement an HR manual detailing staff roles, training, and capacity requirements.	GOSKN	EHD / DOE	Year 2 Month 1-3	Limited Institutional Capacity	Completion of HR manual by mid-Year 2	Delivery of HR manual	20,000
	2.3 Create Standard Operating Procedures (SOPs) for coordination, reporting, and stakeholder engagement.	GOSKN	EHD / DOE	Year 2 Month 3-6	Limited Institutional Capacity	Completion of SOPs by mid-Year 2	Delivery of SOPs	20,000
	2.4 Establish a data-sharing framework among stakeholders, ensuring consistent access to wastewater-related data and to exchange experiences and best practices	GOSKN	EHD / DOE	Year 2 Month 3-6	Limited Institutional Capacity	Completion of data sharing protocols by end of Year 2	Delivery of data sharing protocol	20,000
	2.5 Hold stakeholder consultations to review and validate the unit's establishment plan.	GOSKN	EHD / DOE	Year 2 Month 6-9	Limited Institutional Capacity	Completion of consultations by end of Year 2	Delivery of consultation reports and establishment of IWMC	20,000
Action 3: Specialized Training and Capacity	3.1 Conduct a training needs assessment to identify gaps across agencies (Environmental Health Department, utilities, planning agencies, etc.).	GOSKN	EHD / DOE	Year 2 Month 1-6	Limited Institutional Capacity	Completion of needs assessment by mid-Year 2	Delivery of needs assessment	20,000

Building for Key Stakeholders	3.2 Develop customized training modules focused on wastewater treatment technologies, monitoring, enforcement, and regulatory compliance.	Grant	EHD / DOE	Year 2 Month 6-9	Funding Shortfalls	Completion of training modules by end of Year 2	Delivery of training modules	75,000
	3.3 Organize workshops for on-site wastewater system maintenance, permitting processes, enforcement and data management.	Grant	EHD / DOE	Year 2-3	Funding Shortfalls	Completion of training exercises by end of Year 3	Training of at least 20 persons by end of Year 3	50,000
	3.4 Partner with regional institutions and international organizations to provide technical expertise.	GOSKN	EHD / DOE	Year 2-3	Limited Institutional Capacity	Establishment of MOUs by end of Year 2	Technical assistance programs established	10,000
	3.5 Establish program to allow master's level training for government engineers to specialize in wastewater management.	GOSKN	EHD / DOE	Year 2-3	Funding Shortfalls	Establishment of programme for master's level training by end of Year 2	At least 2 persons enrolled into master's level programs	100,000
	3.6 Collaborate with CAWASA to provide ongoing certification programs for wastewater inspectors and operators.	GOSKN	EHD / DOE	Year 2 - 3	Limited Institutional Capacity	Operator sitting certification exams by end of Year 3	At least 5 operators certified by end of Year 3	10,000
Action 4: Update to Building Code and Design Standards	4.1 Review existing building codes to identify gaps related to wastewater treatment.	GOSKN	EHD / DOE / DPP	Year 2 Month 9-12	Limited Institutional Capacity	Completion of review report by end of Year 2	Updated building codes by end of Year 3	20,000
	4.2 Draft updated design standards for on-site wastewater treatment systems for various sectors (e.g., residential, commercial, hotels, healthcare).	Grant	EHD / DOE / DPP	Year 3 Month 1-6	Limited Institutional Capacity	Completion of design standards by end of Year 3	Delivery of design standards by end of Year 3	50,000
	4.3 Develop a guidance manual outlining technical specifications and operational requirements for various treatment systems (e.g., septic tanks, package plants).	Grant	EHD / DOE / DPP	Year 3 Month 1-6	Limited Institutional Capacity	Completion of guidance manuals by end of Year 3	Delivery of guidance manuals by end of Year 3	50,000

	4.4 Conduct stakeholder consultations to validate proposed updates and guidance manuals.	GOSKN	EHD / DOE / DPP	Year 3 Month 6	Limited Institutional Capacity	Completion of consultations by end of Year 3	Delivery of stakeholder consultation reports	5,000
	4.5 Develop training materials for architects, engineers, and construction professionals.	Grant	EHD / DOE / DPP	Year 3 Month 6-12	Limited Institutional Capacity	Development of training materials by end of Year 3	Delivery of training by end of Year 4	50,000
	4.6 Enforce updated building codes and standards through permitting, inspection processes and monitoring mechanism	GOSKN	EHD / DOE / DPP	Year 3 ongoing	Weak Monitoring and Enforcement	Completion of compliance reports by start of Year 4 / ongoing	Delivery of compliance checks by end of Year 4 / ongoing	20,000
Action 5: Development of Guidelines for Agrochemical Runoff and Livestock Waste Management	5.1 Conduct a baseline assessment of current agrochemical runoff and livestock waste management practices.	Grant	EHD / DOE / DOA	Year 3 Month 1-3	Data gaps Resistance from farmers	Completion of baseline assessment by mid-Year 3	Delivery of baseline assessment report	50,000
	5.2 Develop technical guidelines for proper containment, treatment, and disposal of livestock waste.	Grant	EHD / DOE / DOA	Year 3 Month 3-9	Limited Institutional Capacity	Completion of technical guidelines by end of Year 3	Delivery of technical guidance manuals	100,000
	5.3 Establish demonstration sites for best management practices (BMPs) for minimizing nutrient runoff.	Grant	EHD / DOE / DOA	Year 3 - 4	Funding shortfalls	Establishment of demonstration sites by end of Year 3	At least 5 demonstration sites established	200,000
	5.4 Design training programs for farmers on BMPs and sustainable waste management.	Grant	EHD / DOE / DOA	Year 4 Month 1-6	Limited Institutional Capacity	Completion of training modules by end of Year 3	At least 50 farmers trained	50,000
	5.5 Monitor and evaluate the effectiveness of implemented guidelines and refine them as necessary.	GOSKN	EHD / DOE / DOA	Year 4 Month 6-12	Weak Monitoring and Enforcement	Completion of M+E protocols by mid-Year 4	Delivery of M+E quarterly reports	20,000
	5.6 Develop enforcement mechanisms to ensure	GOSKN	EHD / DOE / DOA	Year 4 Ongoing	Weak Monitoring	Completion of enforcement	Delivery of compliance checks report	20,000

	compliance with runoff and waste guidelines.				and Enforcement	mechanisms by mid-Year 4		
Action 6: Guidelines and Feasibility for Safe Wastewater Reuse Practices	6.1 Conduct feasibility studies to assess the potential for greywater and treated wastewater reuse.	Grant	EHD / DOE	Year 3 Month 1-6	Data gaps Resistance from stakeholders / communities	Completion of feasibility study by mid-Year 3	Delivery of feasibility study	100,000
	6.2 Develop guidelines specifying treatment levels required for different reuse applications.	Grant	EHD / DOE	Year 3 Month 6-12	Limited Institutional Capacity	Completion of technical guidelines by end of Year 3	Delivery of technical guidelines	100,000
	6.3 Develop protocols for monitoring the quality of treated wastewater and ensuring public safety.	GOSKN	EHD / DOE	Year 4 Month 1-6	Resistance from stakeholders / communities	Completion of M+E protocols by mid-Year 4	Delivery of M+E quarterly reports	50,000
	6.4 Establish regulatory frameworks to govern wastewater reuse and ensure compliance with quality standards.	GOSKN	EHD / DOE	Year 4 Month 6-12	Resistance from stakeholders / communities	Completion of regulatory framework by end of Year 4	Delivery of compliance checks report	20,000
Action 7: Strengthening Laboratory Capacity for Wastewater Monitoring	7.1 Conduct a comprehensive assessment of existing laboratory facilities used for water and wastewater testing	Grant	EHD	Year 3 Month 1-6	Limited Institutional Capacity	Completion of gap analysis study by mid-Year 3	Delivery of feasibility study	20,000
	7.2 Upgrade laboratory infrastructure and improve sample storage, processing and data management capabilities	Grant	EHD	Year 3 Month 6-12	Limited Institutional Capacity	Completion of upgrade of laboratories by end of Year 3	Delivery of laboratory equipment	500,000
	7.3 Develop and implement standard operating protocols aligned with best practices	GOSKN	EHD	Year 4 Month 1-6	Limited Institutional Capacity	Completion of lab protocols by mid-Year 4	Delivery of lab standard operating protocols |	20,000
	7.4 Conduct specialized training programs for laboratory technicians	Grant	EHD	Year 4 Month 6-12	Limited Institutional Capacity	Completion of training modules by end of Year 4	At least 10 laboratory technicians trained	50,000

	7.5 Strengthen quality assurance programs to ensure consistency and reliability in test results.	GOSKN	EHD	Year 4 Month 6-12	Limited Institutional Capacity			

Chapter 5 Priority Area 2: Wastewater Reuse and Sustainable Infrastructure Development

Infrastructure development and the promotion of wastewater reuse are essential for sustainability and resource optimization as outlined in Priority Area 2 in the National Policy. Efforts should focus on modernizing existing treatment plants to incorporate secondary and tertiary treatment where applicable, ensuring that treated wastewater meets the required quality standards for safe reuse. Additionally, nature-based and decentralized solutions, such as constructed wetlands, should be encouraged, particularly in rural and peri-urban areas, where they offer a cost-effective and environmentally friendly alternative while integrating their ecological value into broader planning processes. Addressing gaps in on-site sanitation systems, dedicated facilities and mechanisms for the safe collection, transport, treatment, and disposal of septage should be established to enhance efficiency and minimize environmental risks. Furthermore, promoting wastewater reuse, including greywater, should be prioritized for various applications such as agriculture, landscaping, industrial processes, and aquifer recharge, with the potential for potable reuse where appropriate treatment levels are met. Table 5.1 outlines the key targets.

Table 5.1: Key targets for Priority Area 2

Action	Target
Pilot demonstration sites for small-scale decentralized wastewater treatment solutions	At least five (5) pilot systems established by the end of Year 5
Pilot demonstration sites for septage treatment and disposal	Two (2) demonstration sites at each landfill by the end of Year 6
Pilot demonstration sites for wastewater reuse	At least three (3) pilot systems established by the end of Year 7

The situational analysis identified key barriers that have prevented the development of sustainable infrastructure for wastewater management in St. Kitts and Nevis. The stakeholder working group identified key measures to overcome these barriers which are highlighted in Table 5.2.

Table 5.2: Key measures to overcome barriers to Priority Area 2

Barriers	Measures
Over-reliance on septic tanks and soakaway systems	Implement routine maintenance and desludging programs for septic systems
No centralized wastewater treatment facility	Invest in centralized and decentralized wastewater treatment facilities

5.1 Action and activities for Priority Area 2

Table 5.3 summarizes the key actions and associated activities to be included in the Action Plan further elaborating on the enabling measures identified.

Table 5.3: Key actions and activities for Priority Area 2

Action 1: Feasibility and demonstration of small-scale pilot decentralized treatment systems for key sectors 1.1 Identify potential locations, including high schools, community centers, healthcare facilities, hotels, breweries, abattoirs, and marinas, while assessing wastewater generation, treatment needs, and pollutants. 1.2 Conduct environmental, technical, and financial feasibility assessments for each site and evaluate the sustainability of proposed solutions. 1.3 Develop climate-resilient treatment systems incorporating low-carbon technologies such as solar-powered aeration, constructed wetlands, or package treatment plants. 1.4 Engage local authorities, facility operators, school administrators, and private sector players to secure co-funding and technical support. 1.5 Secure all necessary regulatory permits for construction and operation. 1.6 Prepare tender documents, procure contractors, and construction of pilot systems. 1.7 Provide technical training for local operators, maintenance staff, and facility managers on system operations, maintenance, and troubleshooting. 1.8 Establish a performance monitoring plan to track system efficiency, effluent quality, and regulatory compliance, including real-time monitoring where feasible. 1.9 Document project outcomes, challenges, and lessons learned, share best practices regionally, and integrate findings into wastewater design standards and guidance manuals.
Action 2: Feasibility and demonstration of septage treatment and disposal at the local landfills 2.1 Assess current practices in septage collection, transport, and disposal. 2.2 Evaluate the suitability of existing landfill sites for septage treatment and disposal and identify appropriate treatment options (e.g., settling tanks, sludge drying beds, anaerobic digesters). 2.3 Conduct an EIA to evaluate potential risks and mitigation measures and evaluate the financial feasibility of establishing dedicated septage treatment facilities. 2.4 Engage landfill operators, local governments, and private service providers. 2.5 Develop designs for the chosen treatment technology. 2.6 Obtain necessary permits for construction and operation. 2.7 Implement a pilot system to test operational viability. 2.8 Train operators on collection, transport, and treatment processes. 2.9 Track septage treatment efficiency and environmental impact and plans for scale-up.
Action 3: Feasibility and demonstration of wastewater reuse in agriculture, aquifer recharge and landscaping 3.1 Assess water demand for agriculture, landscaping, and aquifer recharge and evaluate the technical, financial, and environmental feasibility of reuse options. 3.2 Identify potential sites for pilot projects, such as farms, parks, or golf courses. 3.3 Design or upgrade existing treatment systems to meet reuse standards. 3.4 Engage stakeholders, including farmers, municipal authorities, and tourism operators. 3.5 Secure permits for wastewater reuse, ensuring compliance with public health standards. 3.6 Implement pilot reuse projects, including irrigation systems and aquifer recharge infrastructure. 3.7 Conduct regular testing of treated water quality and soil or aquifer conditions. 3.8 Provide training for farmers, landscapers, and other end-users on proper reuse practices. 3.9 Monitor project outcomes and gather lessons learned and incorporate into updated guidelines for wastewater reuse.

5.2 Estimation of resources needed for action and activities

To ensure proper implementation of the action plan it is important to build up the capacity of the key government agencies charged with coordination, project management, financial resources planning and allocation, and implementation of the projects.

The DOE and EHD require human resources (at least 2-3 new officers) with key technical skills related to wastewater management systems notably at least one engineer and one project manager (with some thought to additional staffing for communications and public education and awareness). In supporting roles, from the Ministry of Finance or Sustainable Development, at least one financial analyst or economist with expertise in financial modelling, cost-benefit analysis and design of incentive regimes.

Once these capacities are built up and human and financial resources allocated to the key government stakeholders, funding from a variety of sources will need to be secured. The overall cost for implementation of actions and activities for Priority Area 2 is estimated at 2,120,000 USD. Table 5.4 summarizes the approximate costs per activity along with success criteria and risks. Cost estimates (adjusted for inflation) were retrieved from historical reports, online literature and senior staff from key government agencies provided estimates based on their expert opinion and recent procurement exercises in their respective agencies.

Table 5.4: Action Plan overview table for Priority Area 2

Priority Area	Wastewater Reuse and Sustainable Infrastructure Development							
Ambition	The target for priority area 2 is design and implementation of pilot projects in three key areas: decentralized wastewater treatment solutions, septage collection, treatment and disposal and wastewater reuse.							
Benefits	Efficient wastewater reuse and sustainable infrastructure development allows for the objectives of the National Policy to be realized especially universal access to sanitation, public health safeguards, environmental protection, water resource optimization and climate change adaptation and resilience.							
Action	**Activities to be implemented**	**Sources of funding**	**Responsible body and focal point**	**Time frame**	**Risks**	**Success criteria**	**Indicators for Monitoring of implementation**	**Budget per activity (USD)**
Action 1: Feasibility and demonstration of small-scale pilot decentralized treatment systems for key sectors	1.1 Identify potential locations while assessing wastewater generation, treatment needs, and pollutants.	GOSKN	IWMC / EHD / DOE	Year 4 Month 6-9	Limited Institutional Capacity	Completion of assessment reports by end of Year 4	Delivery of reports and identification of sites	10,000
	1.2 Conduct environmental, technical, and financial feasibility assessments for each site.	Grant	IWMC / EHD / DOE	Year 4 Month 9-12	Limited Institutional Capacity	Completion of feasibility studies by end of Year 4	Delivery of feasibility studies	50,000
	1.3 Design climate-resilient treatment systems	Grant	IWMC / EHD / DOE	Year 5 Month 1-3	Funding shortfalls	Completion of designs for pilot projects	Design of at least 5 pilot projects	50,000
	1.4 Engage local authorities, facility operators, school administrators, and private sector	GOSKN	IWMC / EHD / DOE	Year 5 Month 1-3	Resistance from stakeholders / communities	Completion of consultations by mid-Year 5	Delivery of stakeholder consultation reports	5,000
	1.5 Secure all necessary regulatory permits for construction and operation.	GOSKN	IWMC / EHD / DOE	Year 5 Month 1-3	Limited Institutional Capacity	Completion of submission to DPP	Valid permits for all pilot sites	5,000
	1.6 Prepare tender documents, procure contractors, and construction of pilot systems.	Grant	IWMC / EHD / DOE	Year 5 Month 9-12 + Year 6	Funding shortfalls	Completion of tender documents by mid- Year 5	5 operational pilot systems by end of Year 6	750,000
	1.7 Provide technical training for local operators, maintenance staff, and facility managers	Grant	IWMC / EHD / DOE	Year 6 Month 1-6	Limited Institutional Capacity	Completion of training modules by end of Year 5	Training of at least 10 operators by mid-Year 6	20,000

	1.8 Establish a performance monitoring plan to track system efficiency, effluent quality, and regulatory compliance	Grant	IWMC / EHD / DOE	Year 5 Month 9-12	Weak Monitoring and Enforcement	Completion of M+E framework by end of Year 5	Quarterly M+E reports in Year 6 and onwards	10,000
	1.9 Document project outcomes, challenges, and lessons learned, share best practices regionally, and integrate findings into wastewater design standards and guidance manuals.	GOSKN	IWMC / EHD / DOE	Year 6 Ongoing	Limited Institutional Capacity	Completion of project outcomes report by mid-Year 7	Updated wastewater design standards and guidance by end of Year 7	10,000
Action 2: Feasibility and demonstration of septage treatment and disposal at the local landfills	2.1 Assess current practices in septage collection, transport, and disposal.	Grant	IWMC / EHD / DOE	Year 5 Month 1-3	Limited Institutional Capacity	Completion of assessment reports by mid-Year 5	Delivery of situational analysis report	10,000
	2.2 Evaluate the suitability of existing landfill sites for septage treatment and disposal and identify appropriate treatment options	Grant	IWMC / Solid Waste	Year 5 Month 6-9	Limited Institutional Capacity	Completion of feasibility studies by end of Year 5	Delivery of feasibility studies	10,000
	2.3 Conduct an EIA and cost benefit analysis	Grant	IWMC / Solid Waste	Year 5 Month 9-12	Limited Institutional Capacity	Completion of EIA and CBA by end of Year 5	Delivery of EIA and CBA reports	20,000
	2.4 Engage landfill operators, local governments, and private service providers.	GOSKN	IWMC / Solid Waste	Year 5 Month 9-12	Resistance from stakeholders / communities	Completion of consultations by end of Year 5	Delivery of stakeholder consultation reports	5,000
	2.5 Develop designs for the chosen treatment technology.	Grant	IWMC / Solid Waste	Year 6 Month 1-3	Funding shortfalls	Completion of designs by mid-Year 6	Delivery of design report for two pilot systems	20,000
	2.6 Obtain necessary permits for construction and operation and procure contractor	GOSKN	IWMC / Solid Waste	Year 6 Month 1-3	Limited Institutional Capacity	Completion of tender / permit documents by mid- Year 6	Procurement of contractors and construction reports	5,000

	2.7 Implement a pilot system to test operational viability.	Grant	IWMC / Solid Waste	Year 6 Month 3-12	Funding shortfalls	Completion of pilot systems by end of Year 6	Two operational pilot systems by end of Year 6	500,000
	2.8 Train operators on collection, transport, and treatment processes.	Grant	IWMC / Solid Waste	Year 7 Month 1-3	Limited Institutional Capacity	Completion of training modules by end of Year 6	Training of at least 10 operators by mid-Year 7	20,000
	2.9 Track septage treatment efficiency and environmental impact and plans for scale-up.	GOSKN	IWMC / Solid Waste	Year 7 Ongoing	Weak Monitoring and Enforcement	Completion of M+E framework by end of Year 6	Quarterly M+E reports in Year 7 and onwards	10,000
Action 3: Feasibility and demonstration of wastewater reuse in agriculture, aquifer recharge and landscaping	3.1 Assess water demand for agriculture, landscaping, and aquifer recharge and evaluate the technical, financial, and environmental feasibility of reuse options.	Grant	IWMC / EHD / DOE	Year 6 Month 1-6	Limited Institutional Capacity	Completion of assessment reports by mid-Year 6	Delivery of reports and identification of sites	10,000
	3.2 Identify potential sites for pilot projects	GOSKN	IWMC / EHD / DOE	Year 6 Month 1-6	Limited Institutional Capacity	Completion of site suitability report by end of mid-Year 6	Identification of sites	10,000
	3.3 Design or upgrade existing treatment systems to meet reuse standards.	Grant	IWMC / EHD / DOE	Year 6 Month 6-12	Funding shortfalls	Completion of designs for pilot projects	Design of at least 3 pilot projects	30,000
	3.4 Engage stakeholders, including farmers, municipal authorities, and tourism operators.	GOSKN	IWMC / EHD / DOE	Year 6 Month 6-12	Resistance from stakeholders / communities	Completion of consultations by end of Year 6	Delivery of stakeholder consultation reports	5,000
	3.5 Secure permits for wastewater reuse, ensuring compliance with public health standards.	GOSKN	IWMC / EHD / DOE	Year 6 Month 9-12	Limited Institutional Capacity	Completion of submission to DPP	Valid permits for all pilot sites	5,000
	3.6 Implement pilot reuse projects	Grant	IWMC / EHD / DOE	Year 7 Month 1-6	Funding shortfalls	Completion of tender documents by early Year 7	Completion of pilot systems by end of Year 7	500,000

	3.7 Conduct regular testing of treated water quality and soil or aquifer conditions.	GOSKN	IWMC / EHD / DOE	Year 7 Month 6-12	Weak Monitoring and Enforcement	Completion of training modules by end of Year 7	Training of at least 10 operators by mid-Year 7	20,000
	3.8 Provide training for farmers, landscapers, and other end-users on proper reuse practices.	Grant	IWMC / EHD / DOE	Year 7 Month 6-12	Limited Institutional Capacity	Completion of M+E framework by end of Year 7	Quarterly M+E reports in Year 7 and onwards	20,000
	3.9 Monitor project outcomes and gather lessons learned and incorporate into updated guidelines for wastewater reuse.	GOSKN	IWMC / EHD / DOE	Year 7 Ongoing	Weak Monitoring and Enforcement	Completion of project outcomes report by mid-Year 8	Updated wastewater design standards and guidance by mid-Year 8	10,000

Chapter 6 Priority Area 3: Climate Resilience and Adaptation

Building climate resilience into wastewater systems is essential to ensuring their sustainability and functionality in the face of climate challenges. This involves retrofitting and constructing wastewater treatment facilities with flood-proof designs and other resilience measures to withstand extreme weather events. Additionally, wastewater management should be integrated into national disaster risk reduction and climate adaptation plans, linking stormwater and wastewater systems to enhance overall resilience. Furthermore, the adoption of renewable energy sources, such as solar and wind, should be promoted to power wastewater treatment plants, reducing operational costs and minimizing carbon emissions. Table 6.1 outlines the targets for Priority Area 3.

Table 6.1: Key targets for Priority Area 3

Action	Target
Upgrade national disaster and adaptation plans to include wastewater management actions	Updated plans by end of Year 3
Retrofitting of wastewater treatment plants	At least four (4) systems retrofitted by the end of Year 7
Pilot demonstration sites for use of RE for wastewater treatment	At least two (2) pilot systems by the end of Year 6

The situational analysis identified key barriers that have prevented the development of sustainable infrastructure for wastewater management in St. Kitts and Nevis. The stakeholder working group identified key measures to overcome these barriers which are highlighted in Table 6.2.

Table 6.2: Key measures to overcome barriers to Priority Area 3

Barriers	Measures
Wastewater management issues not considered in national disaster plans	Integrate wastewater management actions into national disaster and adaptation plans
Vulnerability to hurricanes, flooding, and sea-level rise	Integrate climate resilience measures into wastewater infrastructure planning
Lack of climate-resilient wastewater infrastructure	Retrofit and design wastewater treatment systems to withstand extreme weather

6.1 Action and activities for Priority Area 3

Table 6.3 summarizes the key actions and associated activities to be included in the Action Plan further elaborating on the enabling measures identified.

Table 6.3: Key actions and activities for Priority Area 3

Action 1: Upgrade of national disaster management plans and national adaptation plans to include wastewater management actions 1.1 Conduct a comprehensive assessment of national disaster management plans (NDMP) and national adaptation plans (NAP) to identify gaps in wastewater management. 1.2 Evaluate wastewater infrastructure vulnerability to climate hazards, such as flooding, hurricanes, and sea-level rise. 1.3 Engage key stakeholders, including environmental health agencies, disaster management authorities, and local utilities, to discuss integration needs. 1.4 Draft targeted actions for wastewater management in NDMP and NAP to address resilience and emergency preparedness. 1.5 Develop clear procedures for responding to wastewater treatment system failures. 1.6 Define early warning systems and monitoring protocols to protect wastewater infrastructure during extreme weather events. 1.7 Train local authorities and emergency response teams on wastewater-related disaster management.
Action 2: Integration of climate proofing and renewable energy into wastewater infrastructure development 2.1 Establish climate proofing design standards for infrastructure resilience, including elevated structures in flood-prone areas, flood barriers, waterproofing measures, and stormwater management systems. 2.2 Assess the potential for integrating solar, wind, or biogas energy into wastewater treatment facilities. 2.3 Launch demonstration projects to showcase the use of renewable energy in wastewater treatment plants. 2.4 Apply climate-resilient designs in all new wastewater infrastructure projects and retrofit existing facilities to withstand extreme weather events. 2.5 Organize workshops for engineers, contractors, and wastewater utility staff on designing and maintaining climate-adapted wastewater systems. 2.6 Implement regular assessments to track the effectiveness of retrofitted infrastructure and renewable energy solutions. 2.7 Document lessons learned and best practices from pilot projects and disseminate findings to guide future wastewater management improvements.

6.2 Estimation of resources needed for action and activities

To ensure proper implementation of the action plan it is important to build up the capacity of the key government agencies charged with coordination, project management, financial resources planning and allocation, and implementation of the projects.

The DOE and EHD require human resources (at least 2-3 new officers) with key technical skills related to wastewater management systems notably at least one engineer and one project manager (with some thought to additional staffing for communications and public education and awareness). In supporting roles, from the Ministry of Finance or Sustainable Development, at least one financial analyst or economist with expertise in financial modelling, cost-benefit analysis and design of incentive regimes.

Once these capacities are built up and human and financial resources allocated to the key government stakeholders, funding from a variety of sources will need to be secured. The overall cost for implementation of actions and activities for Priority Area 3 is estimated at 835,000 USD. Table 6.4 summarizes the approximate costs per activity along with success criteria and risks.

Table 6.4: Action Plan overview table for Priority Area 3

Priority Area	Climate Resilience and Adaptation							
Ambition	The target for priority area 3 is to update national disaster and climate adaptation plans with consideration for wastewater management and to implement pilot projects integrating RE into wastewater treatment systems and to climate-proof and retrofit existing systems.							
Benefits	Integrating climate resilience and adaptation actions allows for the objectives of the National Policy to be realized especially universal access to sanitation, public health safeguards, environmental protection and water resource optimization.							
Action	**Activities to be implemented**	**Sources of funding**	**Responsible body and focal point**	**Time frame**	**Risks**	**Success criteria**	**Indicators for Monitoring of implementation**	**Budget per activity (USD)**
Action 1: Upgrade of national disaster management plans and national adaptation plans to include wastewater management actions	1.1 Conduct a comprehensive assessment of national disaster management plans (NDMP) and national adaptation plans (NAP) to identify gaps in wastewater management.	GOSKN	IWMC / EHD / DOE	Year 3 Month 1-6	Limited Institutional Capacity	Completion of assessment reports by end of Year 3	Delivery of reports	10,000
	1.2 Evaluate wastewater infrastructure vulnerability to climate hazards, such as flooding, hurricanes, and sea-level rise.	Grant	IWMC / EHD / DOE	Year 3 Month 3-9	Limited Institutional Capacity	Completion of vulnerability assessment by end of Year 3	Delivery of vulnerability assessment	50,000
	1.3 Engage key stakeholders, including environmental health agencies, disaster management authorities, and local utilities, to discuss integration needs.	GOSKN	IWMC / EHD / DOE	Year 3 Month 3-6	Resistance from stakeholders / communities	Completion of consultations by mid-Year 5	Delivery of stakeholder consultation reports	10,000
	1.4 Draft targeted actions for wastewater management in NDMP and NAP to address resilience and emergency preparedness.	Grant	IWMC / EHD / DOE	Year 3 Month 3-9	Limited Institutional Capacity	Completion of updated NDMP and NAP	Updated NDMP and NAP	10,000
	1.5 Develop clear procedures for responding to wastewater treatment system failures.	Grant	IWMC / EHD / DOE	Year 3 Month 9-12	Funding shortfalls	Completion of SOPs by end of Year 3	SOPs distributed and utilized	20,000

	1.6 Define early warning systems and monitoring protocols to protect wastewater infrastructure during extreme weather events.	Grant	IWMC / EHD / DOE	Year 3 Month 9-12	Funding shortfalls	Completion of EWS framework by end of Year 3	EWS framework in use	50,000
	1.7 Train local authorities and emergency response teams on wastewater-related disaster management.	GOSKN	IWMC / EHD / DOE	Year 4 Month 1-3	Limited Institutional Capacity	Completion of training modules by end of Year 3	Training of at least 20 individuals	10,000
Action 2: Integration of climate proofing and renewable energy into wastewater infrastructure development	2.1 Establish climate proofing design standards for infrastructure resilience.	Grant	IWMC / EHD / DOE	Year 6 Month 1-6	Limited Institutional Capacity	Completion of design standards reports by mid-Year 6	Delivery of design standards	20,000
	2.2 Assess the potential for integrating solar, wind, or biogas energy into wastewater treatment facilities.	Grant	IWMC / EHD / DOE	Year 6 Month 1-6	Limited Institutional Capacity	Completion of feasibility studies by mid-Year 6	Delivery of feasibility studies	20,000
	2.3 Launch demonstration projects to showcase the use of renewable energy in wastewater treatment plants.	Grant	IWMC / EHD / DOE	Year 6 Month 6-12	Funding Shortfalls	Completion of designs by mid-Year 6	Delivery of design report for at least two pilot systems	200,000
	2.4 Apply climate-resilient designs in all new wastewater infrastructure projects and retrofit existing facilities to withstand extreme weather events.	Grant	IWMC / EHD / DOE	Year 7	Funding Shortfalls	Completion of retrofitting pilot systems by end of Year 7	Four retrofitting systems operational by end of Year 7	400,000
	2.5 Organize workshops for engineers, contractors, and wastewater utility staff on designing and maintaining climate-adapted wastewater systems.	GOSKN	IWMC / EHD / DOE	Year 7 Month 1-3	Limited Institutional Capacity	Completion of consultations by mid-Year 7	Delivery of stakeholder consultation reports	20,000
	2.6 Implement regular assessments to track the effectiveness of retrofitted infrastructure and renewable energy solutions.	GOSKN	IWMC / EHD / DOE	Year 7 Month 1-3	Limited Institutional Capacity	Completion of M+E framework by end of Year 7	Quarterly M+E reports in Year 7 and onwards	5,000

	2.7 Document lessons learned and best practices from pilot projects and disseminate findings to guide future wastewater management improvements.	GOSKN	IWMC / EHD / DOE	Year 7 Month 9-12	Limited Institutional Capacity	Completion of project outcomes report by mid-Year 8	Updated wastewater design standards and guidance by mid-Year 8	10,000

Chapter 7 Priority Area 4: Stakeholder Engagement and Community Participation

Meaningful engagement is essential for the success and inclusivity of wastewater management initiatives. Community involvement should be prioritized by empowering local communities, including women and marginalized groups, to actively participate in the design, monitoring, and decision-making processes of wastewater projects through capacity-building programs. Public-private partnerships (PPPs) should also be facilitated to mobilize investment and encourage private sector participation in wastewater infrastructure and services. Additionally, comprehensive education and awareness campaigns should be developed to address the full range of wastewater management issues. These campaigns should aim to increase public understanding of the environmental and public health risks associated with untreated or poorly managed wastewater, promote proper sanitation practices, and discourage activities that contribute to pollution, such as the improper disposal of household chemicals and agrochemical runoff. Addressing cultural and social resistance to treated wastewater reuse is also crucial, and efforts should highlight its safety and benefits for agriculture, industry, and environmental conservation. Furthermore, raising awareness about the importance of maintaining on-site sanitation systems, such as septic tanks, and the necessity of regular desludging and proper septage disposal will contribute to long-term sustainability. Encouraging community ownership of wastewater infrastructure through education on its value and long-term benefits for health, ecosystems, and economic development will further support the successful implementation of wastewater management programs. Table 7.1 outlines the targets for Priority Area 4.

Table 7.1: Key targets for Priority Area 4

Action	Target
Targeted outreach program to NGOs/ CSOs	Programs launched by end of Year 3
Targeted outreach program to private sector	Programs launched by end of Year 3
Established communications strategy and public awareness campaigns	Strategy completed and campaigns launched by end of Year 4

The situational analysis identified key barriers that have prevented the development of sustainable infrastructure for wastewater management in St. Kitts and Nevis. The stakeholder working group identified key measures to overcome these barriers which are highlighted in Table 7.2.

Table 7.2: Key measures to overcome barriers to Priority Area 4

Barriers	Measures
Low public awareness on wastewater risks and management	Launch national public awareness campaigns on wastewater risks and proper management
Cultural resistance to wastewater reuse for non-potable purposes	Promote wastewater reuse programs with public engagement and incentives

7.1 Action and activities for Priority Area 4

Table 7.3 summarizes the key actions and associated activities to be included in the Action Plan further elaborating on the enabling measures identified.

Table 7.3: Key actions and activities for Priority Area 4

Action 1: Outreach to established CSOs / NGOs to empower communities on WWM issues
1.1 Identify and list organizations that can partner on wastewater-related community initiatives (e.g., environmental, women, and youth groups). 1.2 Organize an initial workshop with selected CSOs/NGOs to explain wastewater management goals and opportunities for collaboration. 1.3 Develop training modules on topics such as wastewater monitoring, maintenance of on-site systems, and community-based solutions. 1.4 Establish formal agreements with CSOs/NGOs outlining their roles in community outreach and project monitoring. 1.5 Collaborate with NGOs to train community members to monitor wastewater infrastructure and report issues. 1.6 Design targeted programs to engage women, youth, and marginalized communities. 1.7 Set up mechanisms for communities to provide feedback on wastewater projects through local CSOs/NGOs. 1.8 Track progress, document success stories, and share best practices within communities.
Action 2: Outreach to private sector players to encourage investment in PPPs
2.1 Identify key players in sectors such as construction, hospitality, and manufacturing that could invest in wastewater solutions. 2.2 Hold roundtable discussions to present potential wastewater investment opportunities and benefits of PPPs. 2.3 Work with legal and financial advisors to establish a clear framework outlining investment models, risk-sharing mechanisms, and incentives. 2.4 Organize sector-specific consultations with hotels, breweries, and agricultural businesses to explore tailored investment models. 2.5 Develop concept notes for priority projects to present to potential private investors. 2.6 Launch pilot projects under the PPP model to demonstrate feasibility and build private sector confidence. 2.7 Set up performance tracking systems to evaluate private sector contributions and outcomes.
Action 3: Wide ranging education and awareness campaigns including communications strategy for IWMC
3.1 Design a comprehensive communications strategy that includes target audiences, key messages, media channels, and outreach approaches. 3.2 Create brochures, posters, videos, and social media content explaining the importance of proper wastewater management and ongoing demonstration projects. 3.3 Organize community events to raise awareness about wastewater impacts on public health and the environment. 3.4 Develop educational programs and activities for schools, including field trips to wastewater facilities. 3.5 Create interactive online platforms for sharing knowledge, collecting feedback, and answering public questions on wastewater management. 3.6 Partner with radio, TV, and newspapers to run public service announcements and feature stories on wastewater management. 3.7 Conduct door-to-door campaigns or distribute information to promote proper maintenance of on-site sanitation systems. 3.8 Establish mechanisms to gauge public awareness levels and adjust campaign strategies accordingly.

7.2 Estimation of resources needed for action and activities

To ensure proper implementation of the action plan it is important to build up the capacity of the key government agencies charged with coordination, project management, financial resources planning and allocation, and implementation of the projects.

The IWMC will require human resources (at least 2-3 new officers) with key technical skills related to wastewater management systems notably at least one engineer, one project manager and one communications specialist. In supporting roles, from the Ministry of Finance or Sustainable Development, at least one financial analyst or economist with expertise in financial modelling, cost-benefit analysis and design of incentive regimes.

Once these capacities are built up and human and financial resources allocated to the key government stakeholders, funding from a variety of sources will need to be secured. The overall cost for implementation of actions and activities for Priority Area 4 is estimated at 380,000 USD. Table 7.4 summarizes the approximate costs per activity along with success criteria and risks. Cost estimates (adjusted for inflation) were retrieved from historical reports, online literature and senior staff from key government agencies provided estimates based on their expert opinion and recent procurement exercises in their respective agencies.

Table 7.4: Action Plan overview table for Priority Area 4

Priority Area	Stakeholder Engagement and Community Participation							
Ambition	The target for priority area 4 is to fully engage key stakeholders and communities.							
Benefits	Full participatory engagement of stakeholders allows for the objectives of the National Policy to be realized especially universal access to sanitation, public health safeguards, environmental protection and water resource optimization.							
Action	**Activities to be implemented**	**Sources of funding**	**Responsible body and focal point**	**Time frame**	**Risks**	**Success criteria**	**Indicators for Monitoring of implementation**	**Budget per activity (USD)**
Action 1: Outreach to established CSOs / NGOs to empower communities on WWM issues	1.1 Identify and list organizations that can partner on wastewater-related community initiatives.	GOSKN	IWMC	Year 3 Month 1-3	Limited Institutional Capacity	Completion of scoping report by mid-Year 3	Delivery of report	5,000
	1.2 Organize an initial workshop with selected CSOs/NGOs to explain wastewater management goals and opportunities for collaboration.	GOSKN	IWMC	Year 3 Month 3	Resistance from stakeholders / communities	Completion of workshop report by mid-Year 3	Delivery of workshop report Workshop held with at least 50 stakeholders	10,000
	1.3 Develop training modules on topics such as wastewater monitoring, maintenance of on-site systems, and community-based solutions.	Grant	IWMC	Year 3 Month 6-12	Resistance from stakeholders / communities	Completion of training modules by end of Year 3	Delivery of training program	20,000
	1.4 Establish formal agreements with CSOs/NGOs outlining their roles in community outreach and project monitoring.	GOSKN	IWMC	Year 3 Month 6-12	Resistance from stakeholders / communities	Completion of MOUs by end of Year 3	At least 5 MOUs signed	10,000
	1.5 Collaborate with NGOs to train community members to monitor wastewater infrastructure and report issues.	Grant	IWMC	Year 4 Month 1-6	Funding shortfalls	Completion of training reports by mid-Year 4	Delivery of training to at least 100 stakeholders	20,000
	1.6 Design targeted programs to engage women, youth, and marginalized communities.	Grant	IWMC	Year 4 Month 1-6	Funding shortfalls	Completion of targeted programs by mid-Year 4	Engagement with at least 100 stakeholders from women, youth or	50,000

							marginalized communities.	
	1.7 Set up mechanisms for communities to provide feedback on wastewater projects through local CSOs/NGOs.	GOSKN	IWMC	Year 4 Month 6-12	Limited Institutional Capacity	Completion of feedback mechanism by end of Year 4	Engagement / survey and feedback assessed from at least 50 stakeholders.	10,000
	1.8 Track progress, document success stories, and share best practices within communities.	GOSKN	IWMC	Year 4 Ongoing	Limited Institutional Capacity	Completion of M+E framework by end of Year 4	Quarterly M+E reports in Year 4 and onwards	10,000
Action 2: Outreach to private sector players to encourage investment in PPPs	2.1 Identify key players in sectors such as construction, hospitality, and manufacturing that could invest in wastewater solutions.	GOSKN	IWMC	Year 3 Month 1-3	Limited Institutional Capacity	Completion of scoping report by mid-Year 3	Delivery of report	5,000
	2.2 Hold roundtable discussions to present potential wastewater investment opportunities and benefits of PPPs.	GOSKN	IWMC	Year 3 Month 3	Resistance from stakeholders / communities	Completion of roundtable report by mid-Year 3	Delivery of workshop report Workshop held with at least 50 stakeholders	10,000
	2.3 Work with legal and financial advisors to establish a clear framework outlining investment models, risk-sharing mechanisms, and incentives.	Grant	IWMC	Year 3 Month 6-12	Limited Institutional Capacity	Completion of investment framework by end of Year 3	Delivery of investment framework	20,000
	2.4 Organize sector-specific consultations with hotels, breweries, and agricultural businesses to explore tailored investment models.	GOSKN	IWMC	Year 3 Month 6-12	Resistance from stakeholders / communities	Completion of private sector consultations by end of Year 3	Delivery of consultations report with at least 50 stakeholders	10,000
	2.5 Develop concept notes for priority projects to present to potential private investors.	Grant	IWMC	Year 4 Month 1-6	Funding shortfalls	Completion of concept notes by mid-Year 4	Delivery of at least 5 concept notes	20,000

	2.6 Launch pilot projects under the PPP model to demonstrate feasibility and build private sector confidence.	Grant	IWMC	Year 4 Month 6-12	Funding shortfalls	Completion of pilot project launch by end of Year 4	At least 1 pilot project using the PPP model by end of Year 4.	50,000
	2.7 Set up performance tracking systems to evaluate private sector contributions and outcomes.	GOSKN	IWMC	Year 4 Ongoing	Limited Institutional Capacity	Completion of M+E framework by end of Year 4	Quarterly M+E reports in Year 5 and onwards	10,000
Action 3: Wide ranging education and awareness campaigns including communications strategy for IWMC	3.1 Design a comprehensive communications strategy that includes target audiences, key messages, media channels, and outreach approaches.	Grant	IWMC	Year 4 Month 1-3	Limited Institutional Capacity	Completion of communications strategy by mid-Year 4	Delivery of communications strategy	20,000
	3.2 Create brochures, posters, videos, and social media content explaining the importance of proper wastewater management and ongoing demonstration projects.	Grant	IWMC	Year 4 Month 1-3	Limited Institutional Capacity	Completion of awareness materials by mid-Year 4	Delivery of awareness materials	20,000
	3.3 Organize community events to raise awareness about wastewater impacts on public health and the environment.	GOSKN	IWMC	Year 4 Month 6-12	Resistance from stakeholders / communities	Completion of community event reports by end of Year 4	At least 10 community events held in Year 4 and onwards	10,000
	3.4 Develop educational programs and activities for schools, including field trips to wastewater facilities.	GOSKN	IWMC	Year 4 Month 6-12	Resistance from stakeholders / communities	Completion of school outreach program by end of Year 4	At least 40 school visits in Year 4 and onwards	20,000
	3.5 Create interactive online platforms for sharing knowledge, collecting feedback, and answering public questions on wastewater management.	Grant	IWMC	Year 5 Month 1-6	Funding shortfalls	Completion of online knowledge sharing platform by mid-Year 5	Number of visits and downloads	20,000
	3.6 Partner with radio, TV, and newspapers to run public service announcements and	GOSKN	IWMC	Year 4 Ongoing	Funding shortfalls	Completion of MOUs with media partners	At least 5 MOUs signed	10,000

	feature stories on wastewater management.					by end of Year 4		
	3.7 Conduct door-to-door campaigns or distribute information to promote proper maintenance of on-site sanitation systems.	GOSKN	IWMC	Year 4 Ongoing	Resistance from stakeholders / communities	Completion of door-to-door campaign design by end of Year 4	At least 1000 households reached	10,000
	3.8 Establish mechanisms to gauge public awareness levels and adjust campaign strategies accordingly.	GOSKN	IWMC	Year 5 Ongoing	Limited Institutional Capacity	Completion of M+E framework by end of Year 4	Quarterly M+E reports in Year 5 and onwards	10,000

Chapter 8 Priority Area 5: Data-Driven Planning and Monitoring

Accurate data collection and analysis are essential for the effective planning, implementation, and evaluation of wastewater systems. A comprehensive national wastewater master plan should be developed to guide infrastructure investments, policy actions, and resource allocation. Conducting a baseline assessment is crucial to quantifying key indicators such as the volume of untreated wastewater, population coverage by treatment facilities, and pollution hotspots, providing a benchmark against which progress can be measured. Additionally, a centralized database should be established to monitor wastewater system performance, track effluent quality, and ensure regulatory compliance, with regular progress reports published to maintain transparency. Utilizing this data for evidence-based decision-making will help prioritize investments, identify high-risk areas, and evaluate the environmental and public health impacts of wastewater management initiatives, ultimately improving system efficiency and sustainability. Table 8.1 outlines the targets for Priority Area 5.

Table 8.1: Key targets for Priority Area 5

Action	Target
Establishment of database and GIS tools for decision-making	Tools developed by end of Year 5
Development of wastewater master plan	Plan developed by end of Year 6

The situational analysis identified key barriers that have prevented the development of sustainable infrastructure for wastewater management in St. Kitts and Nevis. The stakeholder working group identified key measures to overcome these barriers which are highlighted in Table 8.2.

Table 8.2: Key measures to overcome barriers to Priority Area 5

Barriers	Measures
Major data gaps related to wastewater management	Development of a database and GIS tools to enhance decision-making
Lack of infrastructure development plan for wastewater	Development of a wastewater master plan to promote a phased approach to infrastructure development and improvement

8.1 Action and activities for Priority Area 5

Table 8.3 summarizes the key actions and associated activities to be included in the Action Plan further elaborating on the enabling measures identified.

Table 8.3: Key actions and activities for Priority Area 5

Action 1: Baseline assessment of the sector including identification of key indicators
1.1 Collect and review existing reports, maps, and statistics on wastewater systems and effluent quality. 1.2 Identify key indicators such as volume of untreated wastewater, population served by treatment facilities, effluent discharge quality (BOD, nitrogen, phosphates) and pollution hotspots

1.3 Conduct surveys of treatment plants, septic systems, and wastewater discharge locations to gather missing data. 1.4 Initiate baseline testing of coastal waters, rivers, and groundwater for microbial and nutrient pollution. 1.5 Collaborate with local utilities, environmental health departments, and communities to validate findings. 1.6 Develop and publish a baseline report as a reference for planning and progress monitoring.
Action 2: Establishment of a database and development of web-based tools for decision-making and enforcement 2.1 Identify user needs, data types, and key performance indicators (KPIs) for wastewater management. 2.2 Design database to include fields for infrastructure, effluent quality, compliance records, and financial metrics, select software, define user access and roles and establish protocols for system updates, troubleshooting, and data backups. 2.3 Migrate baseline data, historical records, and real-time monitoring results into the database. 2.4 Incorporate Geographic Information System (GIS) features to map pollution hotspots and wastewater infrastructure. 2.5 Develop a user-friendly interface with dashboards, data visualization tools, and real-time alerts. 2.6 Install remote monitoring sensors at key sites (treatment plants, discharge points) for automated data collection. 2.7 Provide training for regulatory agencies and wastewater operators on data input, retrieval, and analysis.
Action 3: Development of wastewater master plan 3.1 Use baseline assessment and database insights to identify infrastructure gaps and investment needs. 3.2 Conduct scenario-based analysis to evaluate future wastewater demand based on population growth, tourism, and climate change. 3.3 Prioritize infrastructure upgrades, decentralized system deployments, and capacity-building programs. 3.4 Identify funding requirements, potential revenue streams, and financing mechanisms. 3.5 Compile technical, policy, and investment recommendations into the master plan document. 3.6 Organize public consultations and workshops to review and refine the plan. 3.7 Seek approval from relevant government bodies and publish the final WWMP.

8.2 Estimation of resources needed for action and activities

To ensure proper implementation of the action plan it is important to build up the capacity of the key government agencies charged with coordination, project management, financial resources planning and allocation, and implementation of the projects.

The IWMC will require human resources (at least 2-3 officers) with key technical skills related to wastewater management systems notably at least one engineer, one project manager and one communications specialist. In supporting roles, from the Ministry of Finance or Sustainable Development, at least one financial analyst or economist with expertise in financial modelling, cost-benefit analysis and design of incentive regimes. Once these capacities are built up and human and financial resources allocated to the key government stakeholders, funding from a variety of sources will need to be secured. The overall cost for implementation of actions and activities for Priority Area 5 is estimated at 425,000 USD. Table 8.4 summarizes the approximate costs per activity along with success criteria and risks.

Table 8.4: Action Plan overview table for Priority Area 5

Priority Area	Data-driven planning and monitoring							
Ambition	The target for priority area 5 is to use evidence-based decision-making for the long-term planning and monitoring of wastewater management actions.							
Benefits	Fully developing data-driven planning and monitoring allows for the objectives of the National Policy to be realized especially universal access to sanitation, public health safeguards, environmental protection and water resource optimization.							
Action	**Activities to be implemented**	**Sources of funding**	**Responsible body and focal point**	**Time frame**	**Risks**	**Success criteria**	**Indicators for Monitoring of implementation**	**Budget per activity (USD)**
Action 1: Baseline assessment of the sector including identification of key indicators	1.1 Collect and review existing reports, maps, and statistics on wastewater systems and effluent quality.	GOSKN	IWMC	Year 4 Month 1-3	Limited Institutional Capacity	Completion of desk review report by mid-Year 4	Delivery of report	5,000
	1.2 Identify key indicators	GOSKN	IWMC	Year 4 Month 1-3	Limited Institutional Capacity	Completion of list of key indicators by mid-Year 4	Delivery of listing	5,000
	1.3 Conduct surveys of treatment plants, septic systems, and wastewater discharge locations to gather missing data.	GOSKN	IWMC	Year 4 Month 3-9	Limited Institutional Capacity	Completion of surveys by end of Year 4	Delivery of survey report	10,000
	1.4 Initiate baseline testing of coastal waters, rivers, and groundwater for microbial and nutrient pollution.	GOSKN	IWMC	Year 4 Month 6-12	Funding shortfalls	Completion of testing reports by end of Year 4	Delivery of testing reports	50,000
	1.5 Collaborate with local utilities, environmental health departments, and communities to validate findings.	GOSKN	IWMC	Year 4 Month 9-12	Resistance from stakeholders	Completion of validation report by end of Year 4	Delivery of validation report	5,000
	1.6 Develop and publish a baseline report as a reference for planning and progress monitoring.	GOSKN	IWMC	Year 5 Month 1-3	Limited Institutional Capacity	Completion of baseline report by end of Year 4	Delivery of baseline reports	10,000

Action 2: Establishment of a database and development of web-based tools for decision-making and enforcement	2.1 Identify user needs, data types, and key performance indicators (KPIs) for wastewater management.	GOSKN	IWMC	Year 5 Month 1-3	Limited Institutional Capacity	Completion of scoping report by mid-Year 5	Delivery of report	5,000
	2.2 Design database and web-based tools	Grant	IWMC	Year 5 Month 1-6	Funding shortfalls	Completion of design report by mid-Year 5	Delivery of design report	20,000
	2.3 Migrate baseline data, historical records, and real-time monitoring results into the database.	Grant	IWMC	Year 5 Month 6-12	Funding shortfalls	Completion of database by end of Year 5	Delivery of functional database	50,000
	2.4 Incorporate Geographic Information System (GIS) features to map pollution hotspots and wastewater infrastructure.	Grant	IWMC	Year 5 Month 6-12	Funding shortfalls	Completion of GIS tools by end of Year 5	Delivery of web-based GIS tools	50,000
	2.5 Develop a user-friendly interface with dashboards, data visualization tools, and real-time alerts.	Grant	IWMC	Year 5 Month 9-12	Funding shortfalls	Completion of integrated database on GIS tool by end of Year 5	Delivery of fully functional decision-making tool	50,000
	2.6 Install remote monitoring sensors at key sites (treatment plants, discharge points) for automated data collection.	Grant	IWMC	Year 6 Month 1-6	Funding shortfalls	Completion of installation of remote sensors by mid-Year 6	Remote sensors installed at least 50% of medium sized WW treatment systems.	50,000
	2.7 Provide training for regulatory agencies and wastewater operators on data input, retrieval, and analysis.	GOSKN	IWMC	Year 6 Ongoing	Limited Institutional Capacity	Completion of training by mid-Year 6	At least 50 stakeholders trained	10,000
Action 3: Development	3.1 Use baseline assessment and database insights to identify infrastructure gaps and investment needs.	Grant	IWMC	Year 6 Month 1-3	Limited Institutional Capacity	Completion of gap analysis by mid-Year 6	Delivery of gap analysis and investment needs report	10,000

of wastewater master plan	3.2 Conduct scenario-based analysis to evaluate future wastewater demand based on population growth, tourism, and climate change.	Grant	IWMC	Year 6 Month 3-6	Limited Institutional Capacity	Completion of scenario analysis by mid-Year 6	Delivery of projection reports	20,000
	3.3 Prioritize infrastructure upgrades, decentralized system deployments, and capacity-building programs.	GOSKN	IWMC	Year 6 Month 6-9	Limited Institutional Capacity	Completion of prioritization reports by end of Year 6	Delivery of prioritization reports	20,000
	3.4 Identify funding requirements, potential revenue streams, and financing mechanisms.	GOSKN	IWMC	Year 6 Month 9-12	Limited Institutional Capacity	Completion of financial analysis report by end of Year 6	Delivery of financial analysis report	20,000
	3.5 Compile technical, policy, and investment recommendations into the master plan document.	Grant	IWMC	Year 6 Month 9-12	Funding shortfalls	Completion of entire plan by end of Year 6	Delivery of WWMP	20,000
	3.6 Organize public consultations and workshops to review and refine the plan.	GOSKN	IWMC	Year 6 Month 9-12	Resistance from stakeholders	Completion of stakeholder validation report by end of Year 6	Delivery of validation and workshop report	10,000
	3.7 Seek approval from relevant government bodies and publish the final WWMP.	GOSKN	IWMC	Year 7 Month 1-3	Delays in Legal and Regulatory Updates	Completion of final plan by mid-Year 7	Published in the GOSKN gazette	5,000

Chapter 9 Priority Area 6: Financing and Resource Mobilization

Sustainable financing mechanisms are essential for supporting long-term infrastructure development and ensuring operational efficiency in wastewater management. Implementing cost recovery systems through wastewater tariffs and effluent fees, based on the "Polluter Pays Principle," will help generate revenue while ensuring affordability for low-income households through targeted subsidies. Additionally, securing international and regional funding, including grants and loans, will provide financial support for large-scale infrastructure investments. Incorporating ecosystem services valuation into cost-benefit analyses will further enhance resource efficiency by recognizing the economic value of natural ecosystems, such as wetlands, and promoting their conservation as part of sustainable wastewater management strategies. Table 9.1 outlines the strategic targets for Priority Area 6.

Table 9.1: Key targets for Priority Area 6

Action	Target
Design of cost recovery systems for WWT systems	Framework developed by end of Year 7
Design of incentives regime to promote PPPs	Incentive regime in place by end of Year 8

The situational analysis identified key barriers that have prevented the development of sustainable infrastructure for wastewater management in St. Kitts and Nevis. The stakeholder working group identified key measures to overcome these barriers which are highlighted in Table 9.2.

Table 9.2: Key measures to overcome barriers to Priority Area 6

Barriers	Measures
Inadequate funding for wastewater infrastructure and management	Introduce wastewater tariffs and effluent fees for sustainable financing
Lack of cost-recovery mechanisms for wastewater services	Implement a cost-recovery mechanism based on the 'polluter pays' principle
Limited access to international financing and grants	Seek international funding from environmental and climate finance institutions

9.1 Action and activities for Priority Area 6

Table 9.3 summarizes the key actions and associated activities to be included in the Action Plan further elaborating on the enabling measures identified.

Table 9.3: Key actions and activities for Priority Area 6

Action 1: Feasibility Study for Cost Recovery Systems 1.1 Assess current wastewater service costs, revenue streams, and gaps in financing. 1.2 Study successful cost recovery models implemented in small island developing states (SIDS) and other similar regions. 1.3 Conduct affordability assessments to determine appropriate tariff levels that ensure access for low-income households. 1.4 Organize meetings with government agencies, private sector players, and community representatives to gather input on proposed tariffs and cost recovery mechanisms. 1.5 Develop a tiered tariff structure based on the "Polluter Pays Principle" that varies by sector and wastewater discharge volumes. 1.6 Design subsidies or social safety nets to protect vulnerable and low-income groups from unaffordable charges. 1.7 Ensure the proposed cost recovery system aligns with existing national regulations and update them if necessary.
Action 2: Design of Incentive Regime to Promote Private Sector Participation in Wastewater Management (PPPs) 2.1 Explore financial incentives such as tax credits, land-use concessions, performance-based grants, or tariff reductions. 2.2 Evaluate the impact of different incentives on private sector willingness to invest and overall project sustainability. 2.3 Design tailored incentive packages for different types of projects, such as decentralized systems, wastewater reuse, and renewable energy integration. 2.4 Ensure that incentives are reflected in the broader PPP framework under the institutional structure for wastewater management. 2.5 Set up monitoring and compliance mechanisms to ensure that private partners meet performance targets in return for incentives.
Action 3: Securing International and Regional Funding 3.1 Map available regional and international funding sources (e.g., GEF, Green Climate Fund, Caribbean Development Bank). 3.2 Develop proposals targeting priority wastewater projects, particularly those involving infrastructure upgrades and wastewater reuse. 3.3 Collaborate with regional entities to jointly apply for grants or funding for regional projects. 3.4 Train national agencies in proposal development and grant management. 3.5 Engage with international development banks to secure low-interest loans for long-term wastewater investments.

9.2 Estimation of resources needed for action and activities

To ensure proper implementation of the action plan it is important to build up the capacity of the key government agencies charged with coordination, project management, financial resources planning and allocation, and implementation of the projects.

The IWMC will require human resources (at least 2-3 officers) with key technical skills related to wastewater management systems notably at least one engineer, one project manager and one communications specialist. In supporting roles, from the Ministry of Finance or Sustainable Development, at least one financial analyst or economist with expertise in financial modelling, cost-benefit analysis and design of incentive regimes. The overall cost for implementation of

actions and activities for Priority Area 6 is estimated at 300,000 USD. Table 9.4 summarizes the approximate costs per activity along with success criteria and risks.

Table 9.4: Action Plan overview table for Priority Area 6

Priority Area	Financing and Resource Mobilization							
Ambition	The target for priority area 6 is develop sustainable financing mechanisms to support long-term infrastructure development and operational efficiency.							
Benefits	Sustainable financing and efficient resource mobilization allow for the objectives of the National Policy to be realized especially universal access to sanitation, public health safeguards, environmental protection and water resource optimization.							
Action	**Activities to be implemented**	**Sources of funding**	**Responsible body and focal point**	**Time frame**	**Risks**	**Success criteria**	**Indicators for Monitoring of implementation**	**Budget per activity (USD)**
Action 1: Feasibility Study for Cost Recovery Systems	1.1 Assess current wastewater service costs, revenue streams, and gaps in financing.	GOSKN	IWMC	Year 7 Month 1-3	Limited Institutional Capacity	Completion of gap analysis report by mid-Year 7	Delivery of gap analysis report	10,000
	1.2 Study successful cost recovery models implemented in small island developing states (SIDS) and other similar regions.	Grant	IWMC	Year 7 Month 1-3	Limited Institutional Capacity	Completion of review of regional models by mid-Year 7	Delivery of review report	10,000
	1.3 Conduct affordability assessments to determine appropriate tariff levels that ensure access for low-income households.	Grant	IWMC	Year 7 Month 1-6	Limited Institutional Capacity	Completion of assessment by mid- Year 7	Delivery of assessment report	20,000
	1.4 Organize meetings with government agencies, private sector players, and community representatives to gather input on proposed tariffs and cost recovery mechanisms.	GOSKN	IWMC	Year 7 Month 6-9	Resistance from stakeholders	Completion of consultation reports by end of Year 7	Delivery of consultation reports At least 100 stakeholders engaged	10,000
	1.5 Develop a tiered tariff structure based on the “Polluter Pays Principle” that varies by sector and wastewater discharge volumes.	Grant	IWMC	Year 7 Month 9-12	Limited Institutional Capacity	Completion of tariff design report by end of Year 7	Delivery of tariff design report	20,000

	1.6 Design subsidies or social safety nets to protect vulnerable and low-income groups from unaffordable charges.	Grant	IWMC	Year 7 Month 9-12	Limited Institutional Capacity	Completion of tariff design report by end of Year 7	Delivery of tariff design report	10,000
	1.7 Ensure the proposed cost recovery system aligns with existing national regulations and update them if necessary.	GOSKN	IWMC	Year 7 Month 9-12	Delays in Legal and Regulatory Updates	Completion of regulatory upgrades to enact tariffs by end of Year 7	New tariffs published in the gazette and operationalized	10,000
Action 2: Design of Incentive Regime to Promote Private Sector Participation in Wastewater Management (PPPs)	2.1 Explore financial incentives such as tax credits, land-use concessions, performance-based grants, or tariff reductions.	Grant	IWMC	Year 8 Month 1-3	Limited Institutional Capacity	Completion of review report by mid-Year 8	Delivery of incentive review report	10,000
	2.2 Evaluate the impact of different incentives on private sector willingness to invest and overall project sustainability.	Grant	IWMC	Year 8 Month 3-6	Funding shortfalls	Completion of survey report by mid-Year 8	Delivery of survey report	20,000
	2.3 Design tailored incentive packages for different types of projects, such as decentralized systems, wastewater reuse, and renewable energy integration.	Grant	IWMC	Year 8 Month 6-12	Funding shortfalls	Completion of incentives design report by mid-Year 8	Delivery of design report	50,000
	2.4 Ensure that incentives are reflected in the broader PPP framework under the institutional structure for wastewater management.	Grant	IWMC	Year 8 Month 6-12	Funding shortfalls	Completion of incentives design report by mid-Year 8	Delivery of design report	10,000
	2.5 Set up monitoring and compliance mechanisms to ensure that private partners meet performance targets in return for incentives.	Grant	IWMC	Year 9 Month 1-3	Funding shortfalls	Completion of M+E framework by end of Year 8	Delivery of M+E framework report	10,000
Action 3: Securing International	3.1 Map available regional and international funding sources (e.g., GEF, Green Climate	GOSKN	IWMC	Year 3 Ongoing	Limited Institutional Capacity	Completion of mapping report by mid-Year 3	Delivery of mapping report	10,000

and Regional Funding	Fund, Caribbean Development Bank).							
	3.2 Develop proposals targeting priority wastewater projects, particularly those involving infrastructure upgrades and wastewater reuse.	GOSKN	IWMC	Year 3 Ongoing	Limited Institutional Capacity	Completion of proposals by end of Year 3	Delivery of concept notes and proposals	50,000
	3.3 Collaborate with regional entities to jointly apply for grants or funding for regional projects.	GOSKN	IWMC	Year 3 Ongoing	Limited Institutional Capacity	Completion of joint proposals by end of Year 3	Delivery of joint proposal for regional projects	20,000
	3.4 Train national agencies in proposal development and grant management.	Grant	IWMC	Year 3 Ongoing	Limited Institutional Capacity	Completion of training report by end of Year 3	At least 20 individuals trained in proposal writing	20,000
	3.5 Engage with international development banks to secure low-interest loans for long-term wastewater investments.	GOSKN	IWMC	Year 3 Ongoing	Funding shortfalls	Completion of engagement reports by end of Year 3	Delivery of engagement reports and signed MOUs	10,000

Chapter 10 Priority Area 7: Regional Collaboration

Collaborating with regional partners is crucial for strengthening capacity and ensuring alignment with shared goals and commitments in wastewater management. Partnering with CARICOM and OECS member states will facilitate knowledge sharing by enabling the exchange of best practices, lessons learned, and innovative wastewater solutions. Aligning national wastewater management frameworks with regional agreements, such as the OECS St. George's Declaration and the Cartagena Convention's LBS Protocol, will help establish standardized approaches to wastewater governance and environmental protection. Additionally, active participation in regional projects focused on marine pollution control, climate resilience, and integrated water resource management will enhance coordination and foster sustainable wastewater management practices across the region. Table 10.1 outlines the targets for priority area 7.

Table 10.1: Key targets for Priority Area 7

Action	Target
Increased knowledge sharing and networks established	Development of shared knowledge hub by end of Year 10

The situational analysis identified key barriers that have prevented the development of sustainable infrastructure for wastewater management in St. Kitts and Nevis. The stakeholder working group identified key measures to overcome these barriers which are highlighted in Table 10.2.

Table 10.2: Key measures to overcome barriers to Priority Area 7

Barriers	Measures
Insufficient data sharing and lessons learnt	Develop a shared knowledge hub for sharing of lessons learned, best practices and findings to encourage replication of successful models from across the Caribbean region.

10.1Action and activities for Priority Area 7

Table 10.3 summarizes the key actions and associated activities to be included in the Action Plan further elaborating on the enabling measures identified.

Table 10.3: Key actions and activities for Priority Area 7

Action 1: Strengthen Knowledge Sharing and Regional Collaboration
1.1 Join established regional knowledge networks such as the Caribbean Water and Wastewater Association (CWWA) conference and activities and other platforms to facilitate knowledge exchange. 1.2 Organize knowledge exchange workshops to share case studies, best practices, and innovative wastewater management solutions through regular training sessions and webinars. 1.3 Develop a shared knowledge repository as a digital platform to store technical guidelines, reports, and policy recommendations for easy regional access.

1.4 Conduct policy and standards alignment reviews by evaluating national wastewater policies and identifying areas requiring harmonization with regional agreements, such as the Cartagena Convention's LBS Protocol. 1.5 Develop and integrate harmonized standards for wastewater discharge, treatment guidelines, and pollution control in collaboration with regional bodies. 1.6 Participate in regional policy dialogues with regional bodies to discuss policy harmonization efforts and secure technical assistance for implementation.

10.2 Estimation of resources needed for action and activities

To ensure proper implementation of the action plan it is important to build up the capacity of the key government agencies charged with coordination, project management, financial resources planning and allocation, and implementation of the projects.

The IWMC will require human resources (at least 2-3 officers) with key technical skills related to wastewater management systems notably at least one engineer, one project manager and one communications specialist. In supporting roles, from the Ministry of Finance or Sustainable Development, at least one financial analyst or economist with expertise in financial modelling, cost-benefit analysis and design of incentive regimes. The overall cost for implementation of actions and activities for Priority Area 7 is estimated at 120,000 USD. Table 10.4 summarizes the approximate costs per activity along with success criteria and risks.

Table 10.4: Action Plan overview table for Priority Area 7

Priority Area	Regional Collaboration							
Ambition	The target for priority area 7 is to enhance collaboration with other Caribbean states to exchange best practices, align policies, and integrate wastewater management strategies.							
Benefits	Regional collaboration allows for the objectives of the National Policy to be realized especially universal access to sanitation, public health safeguards, environmental protection and water resource optimization by learning from regional best practices.							
Action	**Activities to be implemented**	**Sources of funding**	**Responsible body and focal point**	**Time frame**	**Risks**	**Success criteria**	**Indicators for Monitoring of implementation**	**Budget per activity (USD)**
Action 1: Strengthen Knowledge Sharing and Regional Collaboration	1.1 Join established regional knowledge networks such as the Caribbean Water and Wastewater Association (CWWA) conference and activities and other platforms to facilitate knowledge exchange.	GOSKN	IWMC	Year 8 Ongoing	Limited Institutional Capacity	Completion of participation reports by mid-Year 9	Participation at regional workshops and conferences	10,000
	1.2 Organize knowledge exchange workshops to share case studies, best practices, and innovative wastewater management solutions through regular training sessions and webinars.	Grant	IWMC	Year 8 Ongoing	Funding shortfalls	Completion of workshop reports by end of Year 10	Participation / hosting at regional workshops and conferences	20,000
	1.3 Develop a shared knowledge repository as a digital platform to store technical guidelines, reports, and policy recommendations for easy regional access.	Grant	IWMC	Year 9 Month 1-6	Funding shortfalls	Completion of hub by end of Year 9	Development and hosting of regional knowledge hub	20,000
	1.4 Conduct policy and standards alignment reviews by evaluating national wastewater policies and identifying areas requiring harmonization with	GOSKN	IWMC	Year 9 Month 6-12	Limited Institutional Capacity	Completion of alignment report by end of Year 9	Delivery of alignment report	10,000

	regional agreements, such as the Cartagena Convention's LBS Protocol.							
	1.5 Develop and integrate harmonized standards for wastewater discharge, treatment guidelines, and pollution control in collaboration with regional bodies.	Grant	IWMC	Year 10 Month 1-6	Limited Institutional Capacity	Completion of harmonized standards by end of Year 10	Updating of local standards to be aligned with regional guidelines	50,000
	1.6 Participate in regional policy dialogues with regional bodies to discuss policy harmonization efforts and secure technical assistance for implementation.	GOSKN	IWMC	Year 9 Ongoing	Limited Institutional Capacity	Completion of dialogue reports by end of Year 10	Participation in at least 2 dialogues / sessions regionally annually	10,000

Chapter 11 Implementation Timeline

The action plan is structured into three distinct phases to ensure gradual implementation, capacity-building, and long-term sustainability. Each phase has a specific focus to guide the successful execution of wastewater management initiatives.

Phase 1 (Years 1-3): Establishing the Foundation

Laying the Legal, Institutional, and Policy Framework

This phase focuses on strengthening policies, institutional capacity, and stakeholder engagement to create a robust foundation for wastewater management.

- Update and harmonize wastewater-related regulations (Public Health Act, NCEPA).
- Establish the Integrated Wastewater Management Committee (IWMC) to oversee national wastewater initiatives.
- Develop effluent discharge standards, permitting systems, and regulatory frameworks.
- Provide specialized training and capacity-building programs for government agencies and key stakeholders.
- Update building codes and design standards to incorporate modern wastewater treatment requirements.
- Develop guidelines for agrochemical runoff and livestock waste management.
- Conduct feasibility assessments for safe wastewater reuse practices.
- Initiate public awareness campaigns through CSOs, NGOs, and media to educate communities on wastewater risks and solutions.

Phase 2 (Years 4-7): Infrastructure Development and Climate Resilience

Scaling Up Wastewater Treatment, Reuse, and Climate Adaptation

This phase focuses on developing wastewater treatment infrastructure, expanding reuse initiatives, and integrating climate resilience measures.

- Implement pilot projects for decentralized wastewater treatment systems in key sectors (schools, hotels, marinas, etc.).
- Conduct feasibility studies and establish pilot sites for septage treatment and disposal at local landfills.
- Demonstrate wastewater reuse applications in agriculture, landscaping, and aquifer recharge.
- Integrate wastewater management strategies into disaster risk reduction and climate adaptation plans.
- Develop climate-proofing design standards for wastewater treatment plants.

- Pilot renewable energy (solar, wind, biogas) integration in wastewater treatment facilities.
- Develop a centralized database and GIS tools to support wastewater decision-making.
- Formulate a National Wastewater Master Plan to guide infrastructure development and investment.

Phase 3 (Years 8-10): Financial Sustainability and Regional Collaboration

Securing Long-Term Financing and Strengthening Regional Integration

The final phase ensures financial sustainability, private sector participation, and regional alignment in wastewater policies.

- Conduct a feasibility study on cost-recovery systems for wastewater infrastructure.
- Design incentive frameworks to encourage private sector investment in wastewater management.
- Secure international and regional funding sources for infrastructure expansion and maintenance.
- Strengthen knowledge-sharing and regional collaboration through partnerships with international organizations.
- Develop a wastewater knowledge hub to facilitate best practices and policy alignment.
- Align wastewater discharge and treatment standards with regional agreements (e.g., Cartagena Convention).
- Establish long-term monitoring and evaluation systems to assess progress and ensure continuous improvement.

This structured three-phase approach ensures gradual implementation, scalability, and long-term sustainability of the Wastewater Management Action Plan in St. Kitts and Nevis as outlined in Figures 11.1 and 11.2.

Figure 11.1: Phased Implementation Approach for the Action Plan

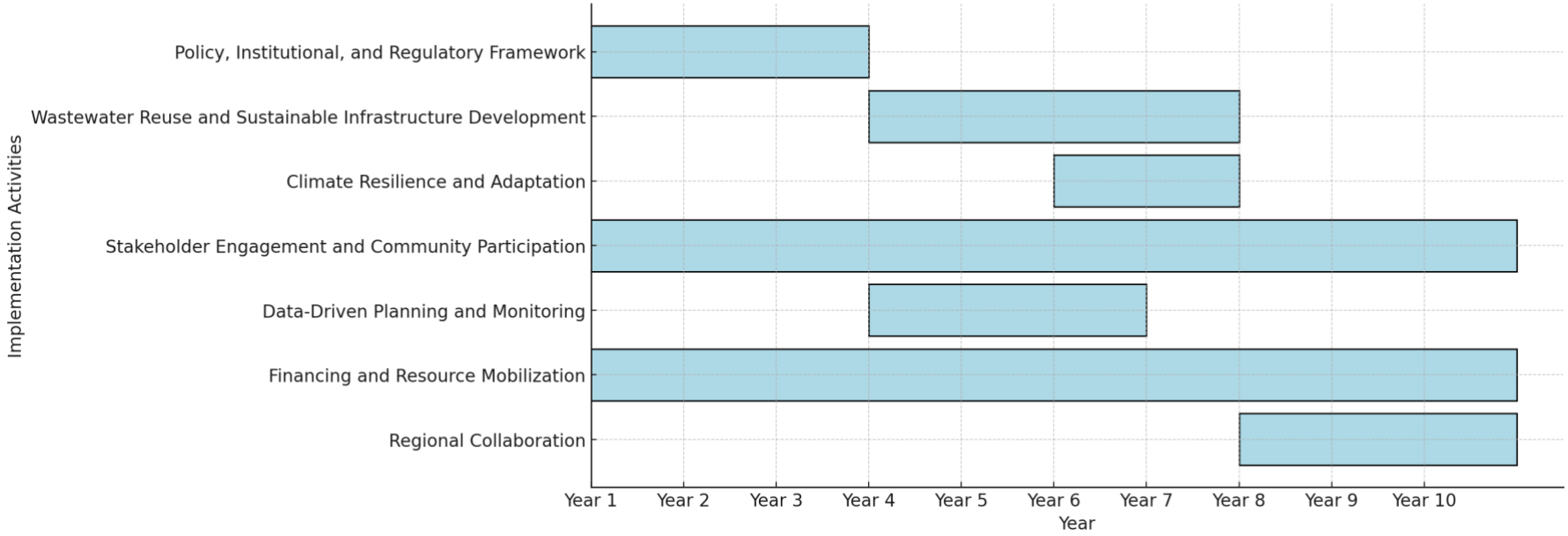

Figure 11.2: Phased Implementation Timeline for the Action Plan

Chapter 12 Summary and Conclusions

The National Wastewater Management Strategy and Action Plan for St. Kitts and Nevis provides a **comprehensive roadmap** for achieving sustainable and climate-resilient wastewater management over the next decade. The plan highlights the importance of **institutional reforms, infrastructure development, stakeholder engagement, data-driven decision-making, and financial sustainability** in ensuring the long-term success of wastewater management initiatives.

Key Findings and Achievements

Through extensive stakeholder consultations and situational analysis, the strategy identifies major **barriers** to wastewater management, including:

- Outdated regulatory frameworks,
- Insufficient infrastructure for wastewater treatment and reuse,
- Climate-related vulnerabilities,
- Limited public awareness, and
- Gaps in financing and private sector investment.

To overcome these barriers, the action plan proposes a **phased implementation strategy** that prioritizes policy reforms and foundational capacity-building before transitioning to large-scale infrastructure investments and long-term sustainability measures.

Strategic Outcomes and Long-Term Vision

The successful implementation of this plan will yield significant benefits for public health, the environment, and economic development, including:

- **Improved water quality** through reduced pollution from untreated wastewater,
- **Enhanced climate resilience** by integrating wastewater management into disaster risk reduction plans,
- **Increased stakeholder participation** through education, awareness, and partnerships with the private sector, and
- **Sustainable financing mechanisms** to ensure the continued operation and maintenance of wastewater infrastructure.

Moving Forward

To ensure **effective execution**, the Government of St. Kitts and Nevis, in collaboration with local stakeholders and regional partners, must prioritize:

1. **Timely legislative updates** to strengthen enforcement mechanisms,
2. **Capacity-building initiatives** to equip government agencies and utilities with technical expertise,
3. **Investment in wastewater infrastructure** to expand access to safe sanitation services,
4. **Innovative financing solutions** to attract international and private sector funding, and
5. **Regular monitoring and evaluation** to track progress and make necessary adjustments.

With sustained political commitment, regional collaboration, and public-private engagement**,** St. Kitts and Nevis is well-positioned to achieve its wastewater management goals—enhancing public health, preserving environmental integrity, and ensuring sustainable economic growth for future generations.

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