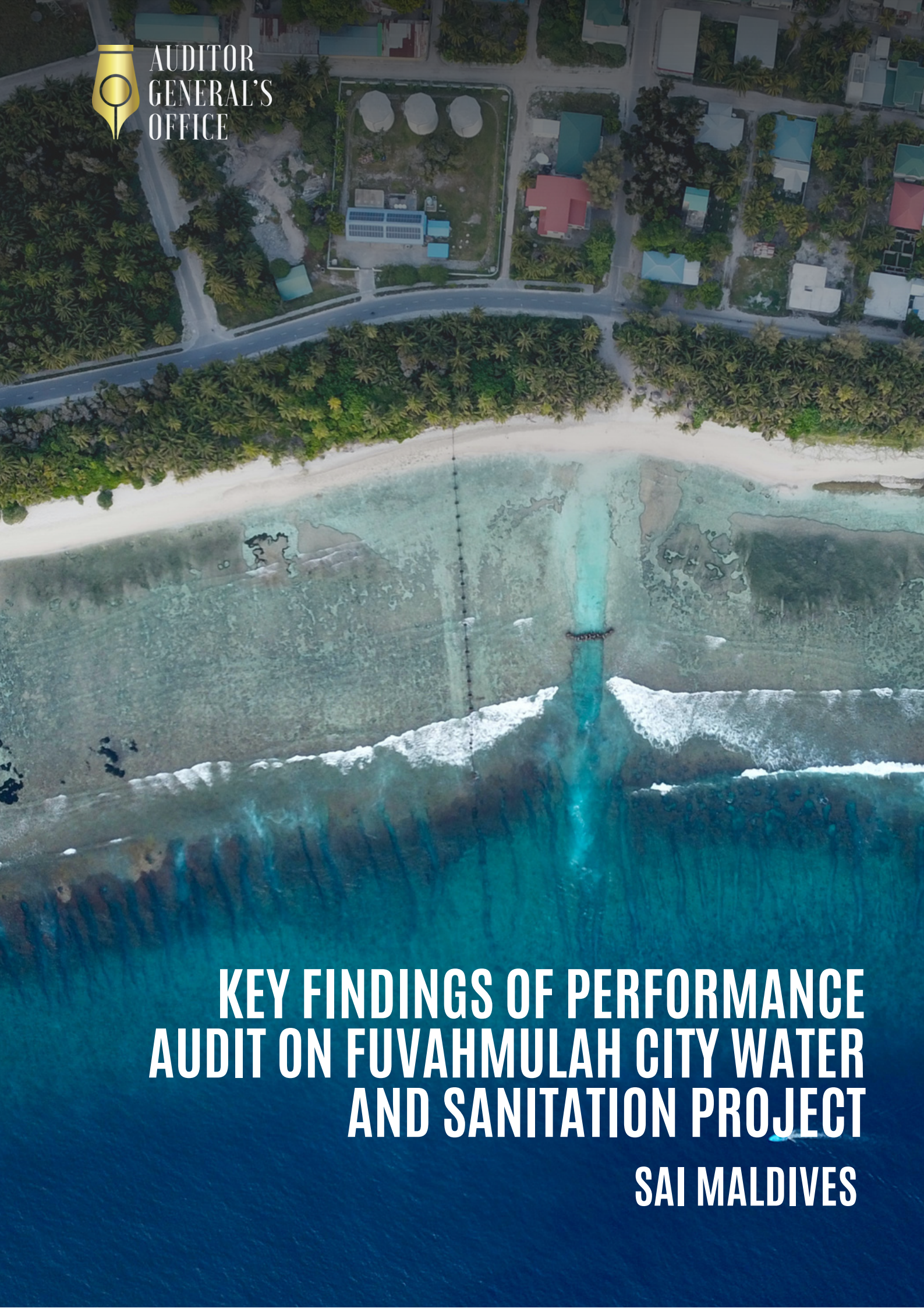


AUDITOR GENERAL'S OFFICE

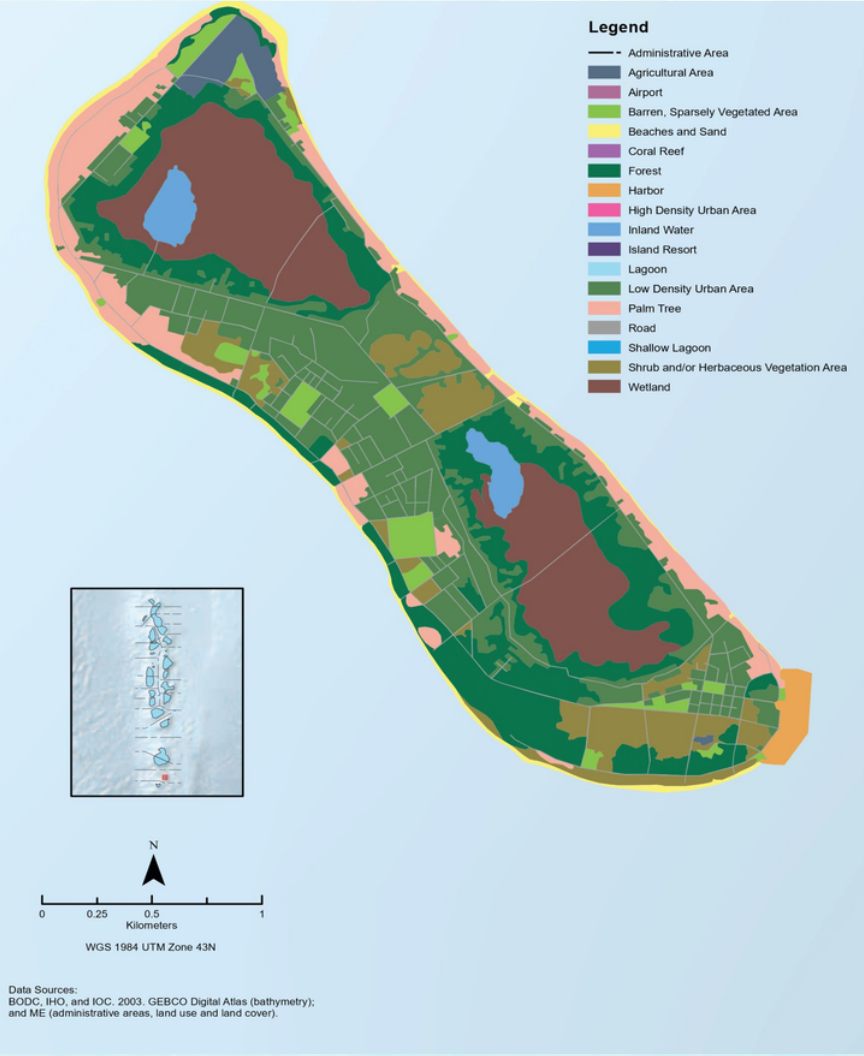
KEY FINDINGS OF PERFORMANCE AUDIT ON FUVAHMULAH CITY WATER AND SANITATION PROJECT

SAI MALDIVES

Introduction

Fuvahmulah Island, situated at coordinates 73°25´40" E, 0°17´53" S, is located in the southern part of the nation. It spans an area of 487 ha, with dimensions of 4.1km in length and 1.1km in width. The island's coastline stretches for a total of 11km. According to the 2014 census, the population of Fuvahmulah stands at 8,579 individuals.

In terms of water supply and sewerage, Fuvahmulah City faced challenges related to both quantity and quality. The existing sewerage infrastructure posed environmental concerns and was also deemed unsafe from a health and hygienic standpoint (MoE, n.d.). Recognizing the impact of the current sewerage system on public health and the environment, a project was initiated in 2015 to establish a safe water and sewerage system in Fuvahmulah City. The project was implemented through Donor and Government funding.



Multi Hazard Risk, Atlas of Maldives (2020)

Audit Objectives

The audit will examine the economy, efficiency and effectiveness of the Fuvahmulah city water and sewerage project. Whether contractual and regulatory obligations were fulfilled by the stakeholders involved in the project from planning to operational phase.

Audit Scope

The audit examined economy, efficiency and effectiveness of the water and sewerage system project of Fuvahmulah city. Detail testing was conducted on sample basis and field visits were conducted at Fuvahmulah city. The audit evaluated whether the contractual and regulatory obligations were fulfilled by the stakeholders, and assessed the effectiveness of the project through information collected from the main stakeholders in this audit, namely Fenaka Corporation, Ministry of Environment Climate Change and Technology, Utility Regulatory Authority, Environmental Protection Agency, Ministry of Planning Housing and Infrastructure, Fuvahmulah city council and the local residents of Fuvahmulah city.

In general, this audit reviewed the period from 2015 to 2021. However, depending on the subject area audited the time frame was narrowed down for increased reliability in sampling, and also depending on the test performed, the period was traced far back than the aforementioned period of cover.

Stages of Fuvahmulah City Water and Sanitation Project

May 2012 — Planning & Funding

Tendering phase- Consultancy — 21 April 2014 to 28 january 2015

28 Jan 2015 to 06 Oct 2015 — Design Phase

Tendering phase - Civil Construction — 28 Sept 2015 to 24 April 2016

05 May 2016 to 03 Sept 2018 — Civil works & Monitoring

Commissioning

01 Oct 2018 to 01 Feb 2020 — Defect Liability Period

Operation & Maintenance — Starting from 04 Nov 2019

22 Feb 2021 to 30 jan 2022 — Rectification

Key Findings

Cost of Project

The total cost of project contracts is estimated to be MVR 282,671,514, which includes all the expenses related to project contracts. However, there are additional costs expected for approved variation, rectification, and administrative expenses, which have been estimated to be MVR 339,996,269. These additional expenses are not included in the total cost of project contracts and are expected to be incurred separately.

Quality Control

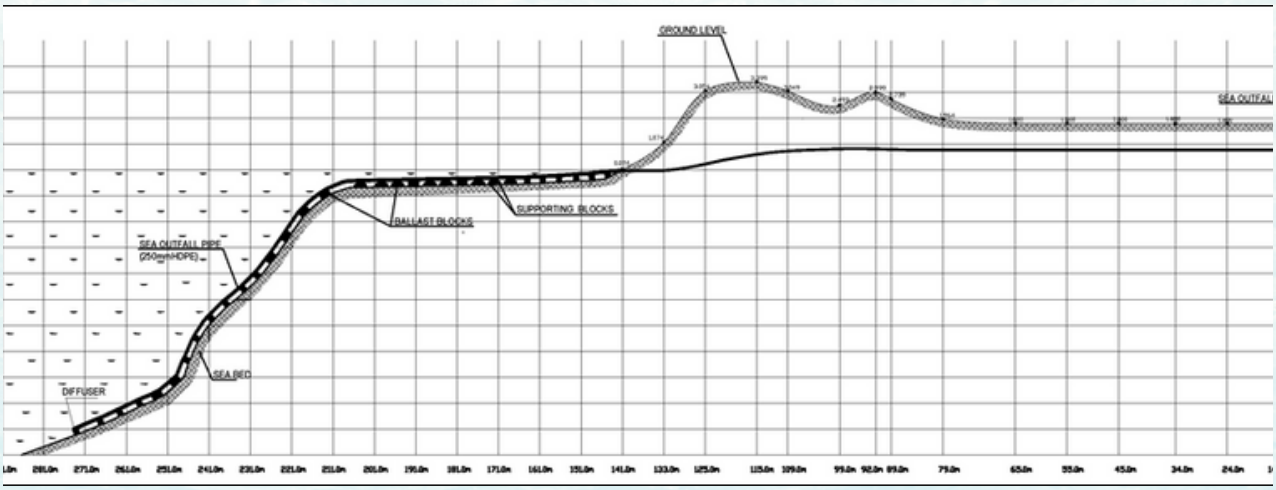
All the quality control measures planned for the Fuvahmulah Water and Sewerage Project was not executed out during the design and implementation phases. This resulted in some project works being inspected and approved by experts who were not approved by the Client (Ministry of Environment Climate Change and Technology). Furthermore, certain works were not inspected or approved at all.

Additionally, a conditional approval was provided by the regulator for the Detailed Design Report of the project, stating that it should include necessary amendments and additional information. However, it was not ensured whether these changes were made and incorporated into the design report.

Environmental Compliance

Works of the project have not been carried out in compliance with the Environmental Impact Assessment (EIA) report. The sewerage discharge pipe was constructed in an ecologically significant marine area, leading to the dispersal of sewer effluents into the aforementioned site. This was not the area designated in the approved EIA for the outfall construction. It should be highlighted that the site has later been declared as an Environmental Protected Area. .

Additionally, the discharge pipe was not installed at the depth specified in the EIA. As stated in EIA report, 15m depth is required for maximum environmental benefit and minimize environmental impacts which may arise due to the discharge which although treated will be a secondary treated waste product.



According to the project completion report, the Sewerage Discharge pipe was found to be damaged during the Defect Liability period. This damage resulted from underestimating the environmental conditions during the design phase. To prevent a re-occurrence, the design was modified. However, in February 2023, the same issue resurfaced and caused damage to the sewer outfall, resulting in sewer leakage onto the reef and its surroundings. This could be due to the fact that a permanent solution was not provided to rectify the design issue.

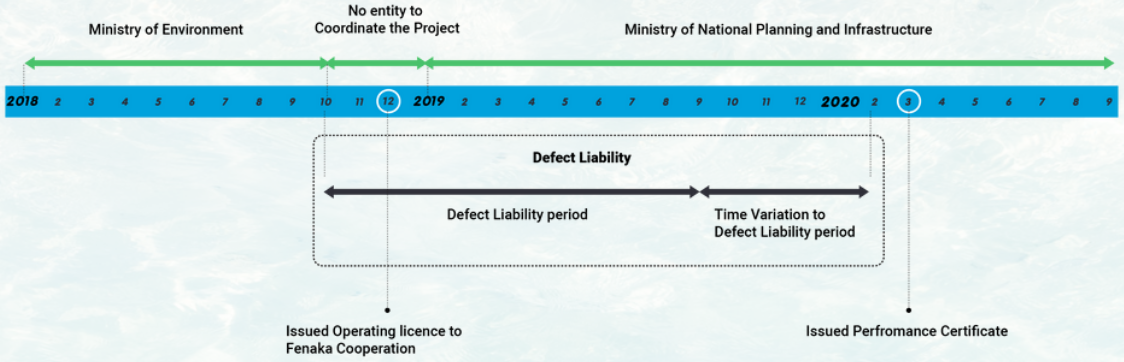
In addition, the establishment of some of the sewerage Infrastructure (STP, Vacuum station 1) were in an area other than which was specified in the approved EIA. Further, the approval for the revised areas was not provided to the Audit.

Due to the change of these sites, a significant increase in vegetation removal has occurred through the project. While in the EIA the impact for the initial vegetation clearance was classified as a medium to long term impact, the impact on the environment from clearing the vegetation is likely to be more than anticipated in EIA.

Continuous Environmental monitoring throughout the project is essential to note the actual impact of the project on the environment. However, Client has not submitted the required Environmental monitoring reports under the EIA regulation. Furthermore, the project lacked adequate mechanisms to ensure the implementation of mitigation measures prescribed in the EIA to minimize the impact on the environment.

Coordination, stakeholder engagement and defect liability period

Projects like this require close coordination and monitoring. However, for a period of four months, no institution was coordinating the work of the project. This includes three months of the Defect Liability Period, which is the time to identify and resolve any issues with the water supply and sewerage system established by the project. During this three-month period, there was no agency to coordinate the project and address any issues that were identified and reported by the Supervision Consultant and the monitoring and evaluation of the project were not carried out effectively due to the lack of coordination.



Additionally, during the Defect Liability Period, both the contractor and the Operator were obliged for operating the system. This resulted in hindering the opportunity for the Operator to operate and identify the issues in the system during the Defect Liability Period. Although the operator themselves have not done enough to overcome this challenge and continue with the operations of the system, there were no regulatory actions taken against them. The Ministry of Planning and Infrastructure also issued performance certificate to the contractor without fully resolving the issues identified during the Defect Liability Period, stating that the project was completed.

Furthermore, important information and documents related to the project were not properly maintained, and hand-over documents were not prepared when the project was shifted between the Ministries. Furthermore, the lack of involvement from relevant stakeholders during the project's work added to the issues faced in the project.

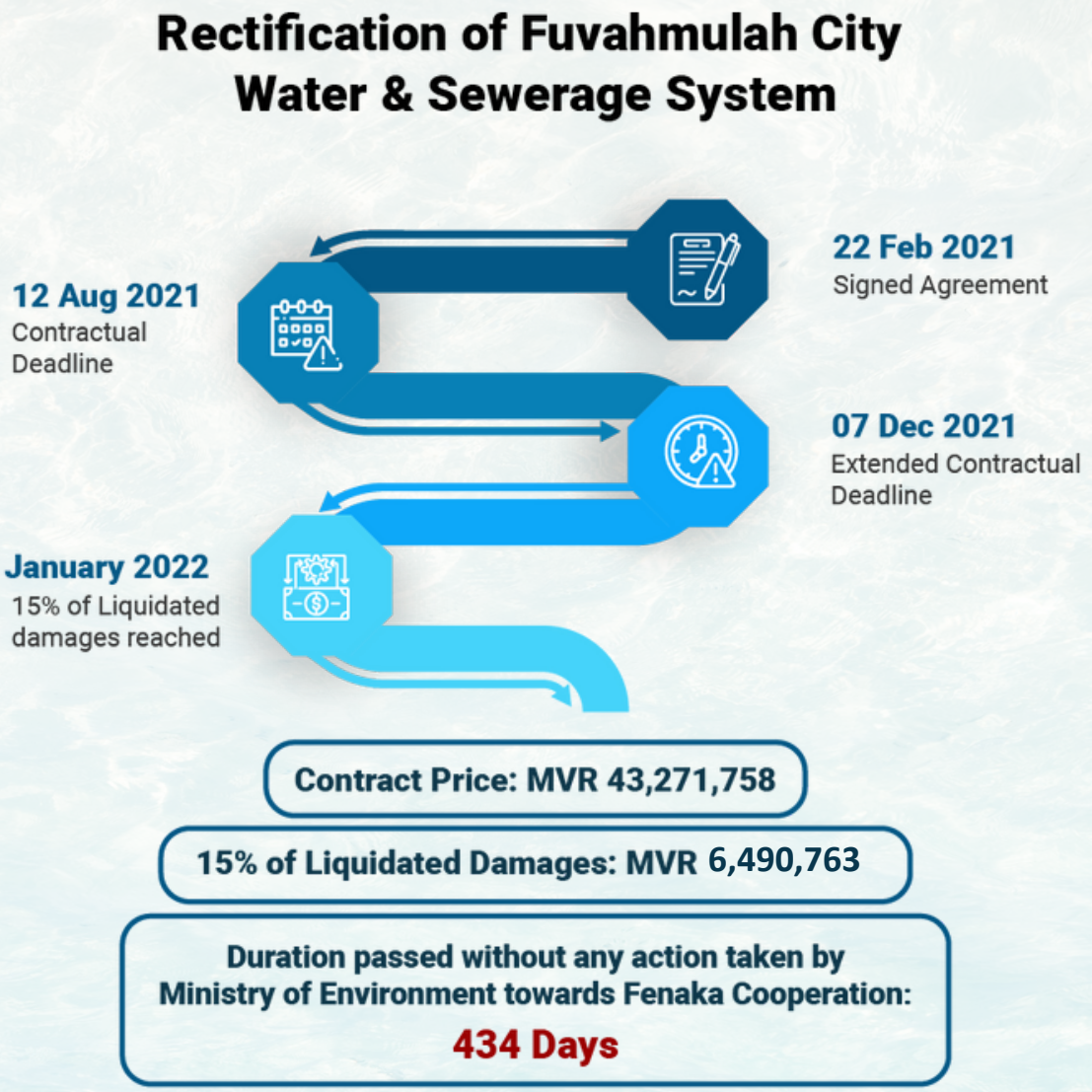
Resources and Training

The service provider will require human and other resources in order to sustainably deliver services and achieve the objectives of the project. However, the service provider lacks the necessary resources, including qualified staff and spare resources, to effectively operate and maintain the system. The root causes for these were; inadequate planning at the proposal stage (details of training), contractor's
failure to fulfill the training requirement stipulated in the contract and service provider not making efforts to secure these resources on their own even after the construction phase of the project.

Process of Manually Carrying Raw Sewage

Although projects conducted by the Government should follow the principles of sustainable development (economic, social, and environmental), the actual cost of the project has exceeded the initial anticipated amount. This includes the costs of temporary solutions brought after the project's completion to cater for the overflow of sewerage effluents unto the island. As a such, the service provider assigned the task of manually collecting and disposing of sewer from manholes and vacuum chambers to private parties without going through the bidding process. Furthermore, the total cost for this work was not fixed and instead charged for each manhole cleared and the rate at which this work was awarded was higher compared to previous rates. Over a period of 21 months, a total of MVR 8,673,370 was spent on collecting the sewer from manholes and transporting in to the Sewerage Treatment Plant on tanks mounted in pickups. The procurement process during this phase been deemed to be not in the best interest of the state.

Rectification



The Rectification Contract worth MVR. 43,271,758 was granted in order to address the ongoing issues within the system and implement a permanent solution. According to the most recent progress report submitted to the Ministry of Environment, it was revealed that only 87% of the contracted work for rectifying Fuvahmulah city's sewerage system was accomplished within the agreed contract period. And at the date of report being issued not all tasks outlined in the rectification project were completed as per the terms and conditions of the contract.

Operation and Sustainable Service Provision

The operator has not properly maintained the costs of operating the system. They have only recorded Salary and electrical costs as a major operating expense meanwhile several other expenses such as water Maintenance, spares, travel, water quality testing etc. which would be incurred during operations. Moreover, they have not submitted reports on the financial costs which is to be prepared and submitted under the water and sanitation operating license. Therefor the cost of managing these systems has not been ascertained and the revenue dues have not been received.

Additionally, the service provider relies on revenue generated from providing water supply service to cover operational costs as sewerage services is provided free of charge. However, citizens are not utilizing as much water as initially anticipated when designing the service. Moreover, the Reverse Osmosis (RO) plant is also producing less water than its designed capacity.

The contract stipulated that the RO plants would produce 1,500 cubic metres of water per day, but in reality, the plant only managed to produce 532 cubic metres of water.

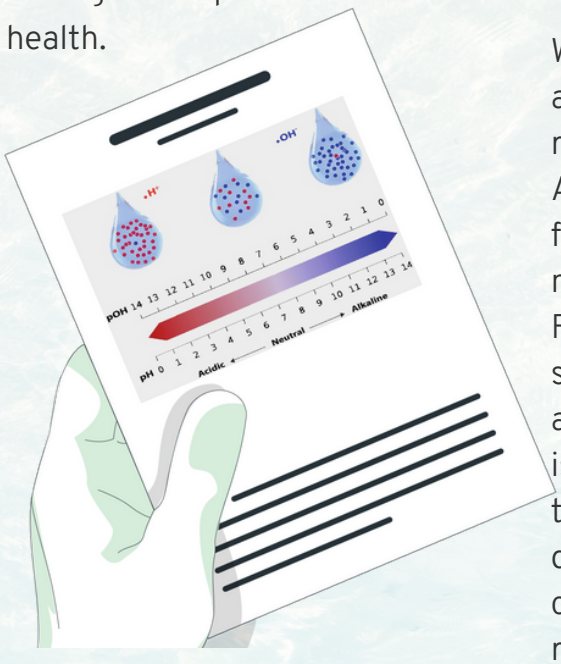
The issue of generating water capacity from the RO plant was identified as a design problem during the Defect Liability Period (DLP) stage. The project completion report mentioned that it would be resolved by deducting from the retention money.

The report from the Ministry of Environment on December 3, 2022, also concluded that the plant was not functioning at its maximum capacity and a permanent solution was not provided to address the issues.

The service provider may have incurred significant financial losses due to leaks from the water supply network, resulting in a significant amount of water being lost to the ground. However, this issue remains unresolved. Between January 2021 and February 2022, Operator lost approximately 79,856,961 litres of water, leading to an estimated loss of MVR 4,132,146 (four million one hundred thirty-two thousand one hundred and forty-six).

Socio-economic Impact

In terms of societal and environmental perspectives, numerous challenges arose as a result of deficiencies in the sewerage system. Furthermore, it was determined that the transportation and disposal of sewerage was conducted without an environmental management plan to minimize the negative impact on the environment and public health.



Water quality reports that need to be prepared and presented as part of Operator's license requirements have not been submitted. Additionally, the allocation of sampling points for monitoring the quality of supply water does not adequately cover the entire island. Furthermore, the level of residual chlorine in the supply water falls below the required standards, and no action has been taken to address this issue. Moreover, during the audit, it was found that the water produced by the RO plant and distributed through the network contained coliform. However, this problem has since been rectified by the operator during the audit process upon notification.

Further, issues identified through the audit includes the preference of the public towards single use plastic PET bottles in place of the supply water, a lack of trust from the community towards the safety of supply water, inadequate public knowledge regarding measures taken to ensure supply water quality, and shortcomings in efforts to raise awareness about the water supply.

In addition, it is crucial to note that the prevalent contamination in the island's groundwater lens and the overall poor water quality in numerous regions pose a significant hazard to both household appliances and individuals' health as the use of groundwater is preferred for non-potable water uses. Furthermore, the continuous use of groundwater would result a considerable loss of water from the water table to the ocean through the sewer outfall. This water prior to the establishment would be recharged through the sceptic tanks. If the practice continues, there is risk of groundwater salinization occurring within the island in the future.

Performance Audit Department
Auditor General's Office of Maldives