Evaluation the efficiency of Waste water management in Sri Lanka

Report Number: PER/B/2020/07

National Audit Office

Environment Audit Division

Index

1. Executive summary

Disposed water after consuming which is generated from the industrial, domestic and clinical activities, is known as waste water and it has been identified that the necessity of disposing this wastewater in an environmentally friendly manner, after treatment. The targets 3, 6, 11 and 14 of the Sustainable Development 2030 agenda it has been identified the importance of sustainable wastewater management and the infrastructure development required for this. It has been identified that this has the potential to achieve economic social and environmental benefits and thereby reduce the possible environmental damage by the industry towards the Gross National Product. To this end the audit was conducted in accordance with the present applicable laws regulations and standards and with the aim of examine the performance of the institution responsible for wastewater management.

It was observed that there were circumstances, the marine environmental protection license where necessary and the environmental protection license of the Central Environmental Authority had not been obtained by the hospitals and public waste water treatment plants which were taken under audit, while investigating the activities done before discharging the waste water generated by industrial , domestic and clinical activities and environmental friendliness by the public waste water treatment plants. The capacity of the existing public wastewater treatment plants to treat the wastewater generated by most of the hospitals was not sufficient to compare with the current capacity of the existing wastewater treatment plants and the numbers of deficiencies were also observed in the existing capacity of the treatment plants.

It was observed that due to the risk of pollutants associated with waste water and its potential, it is very important to take steps when disposing the waste water into the open environment, inland water sources and marine environment in a manner that doesn’t exceed the capacity of the waste water and to treat the waste water as a resource, it is important to focus when it focuses on the waste water management. It was observed that the public waste water treatment plants constructed by the National Water Supply and Drainage Board for waste water management have not been

utilized at the maximum capacity and the disposal of sludge has not been conceded out in an environmentally friendly manner.

It was observed that the required contribution could be made to achieve the desired objectives of the Sustainable Development goals by taking necessary steps to dispose of this wastewater in an environmentally friendly manner by all the institutions that contribute to the wastewater management and increasing the quantity of wastewater discharged into the environment, with the growth of the population and the increasing of the amount of water consumed.

2. Background and the nature of the report

2.1. Background

The existence of natural resources in the environment has been severely challenged due to the imbalance in dealing with the environment, when achieving the basic concept of human existence and “development”. Water is one of the major natural resources being challenged. As a result, it is predicted that the majority of the world's population will face a shortage of drinking water in the very near future and it is important to use water sparingly and to protect existing water sources. The quality of water consumed by human beings is under severe threat, due to various human activities and the various wastes discharged disorderly. Waste water should be managed as a resource which is sustainable and affordable rather than the proposal of disposing as “waste”. Accordingly it is expected to emphasis on the importance of developing wastewater management policies in Sri Lanka that go beyond the concept of purification and disposal up to purification, reuse and disposal.

2.1.1. Definition of waste water

Among the various definitions laid forward to waste water, the definition given by the free dictionary was” wastewater is the water which contains washing, disposal and waste”
(Source -free dictionary)

The UN- Habitat United Nations which is primarily responsible for wastewater management for sustainable development has defined waste water broadly by the statement of “sick water” which was published in the 2010. Accordingly ”waste water is defined as the domestic waste water and the water discharged by commercial and non-commercial organizations, including hospitals, industrial, urban, other flows agricultural gardens and aquaculture institutions, consisting of black water(urine ,feces, sediment) and ash water.

The National Environmental Act No 47 of 1987, as amended by Acts No 53 of 2000 and No 56 of 1988 defines waste as follows. “A substance that is discharged excreted or dipped into the environment including liquid, solid, gaseous or radioactive substance of a particular form or form

of a certain density which is assigned as a waste". However the term "wastewater" was not broadly defined in the above definition.

2.1.2. Wastewater generation.

Waste water generation consists of two main types, as domestic and industrial activities

I. Domestic activities

Domestic waste water can be classified into 02 main types as grey water and black water

i.	Ash water	-	Water discharged from the bathrooms, hand washing, laundry work and the kitchen
ii.	Black water	-	Water discharge from toilets and water contaminated by toilet material

II. Industrial activities

All the waste water generated by non-domestic consumption is classified as industrial discharges. This waste water can be discharged of in a variety of ways, including industrial production processes, technical, commercial and institutional activities and this unrefined waste water can cause various adverse conditions for human and aquatic life.

2.1.3. Impacts of waste water

Many countries in the world discharge waste water into the environment without any treatment directly or non-compliant to standards and do not pay attention to the adverse effects on the environment. The materials to be included in the content of the waste water are as follows.

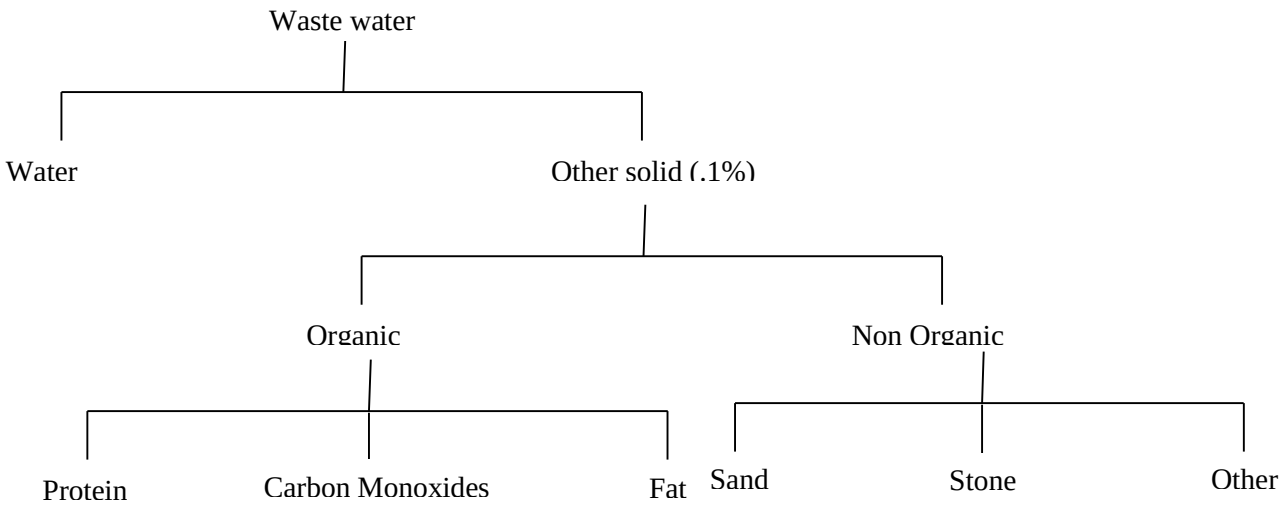
i. Organic matter that can cause bio degradation
ii. Microorganisms(pathogenic and nonpathogenic)
iii. Other contaminants(pigment, pesticides, heavy metals, compounds ,radioactive materials polythene, plastic)

(Source- from the internet)

Thus the discharging of the untreated waste water containing these harmful substances into the environment, can be emerged various environmental problems.

2.1.4. The composition of wastewater.

Waste water contains 99.9% water and 0.1% waste. Although the waste Water represents a very small percentage quantitatively, its overall impact is excessive. The composition of this waste water can be identified as follows.



(Source - principle of water quality control in cord-1970)

2.1.5. The importance of wastewater treatment.

It is important to treat this waste water to reduce the risk of diseases caused by pathogens in the waste water and to prevent contamination of groundwater and surface water. Various strategies are used for this purpose and the following methods have been specifically identified.

i. Addition of chemical substances
ii. The septic tank system
iii. By public wastewater treatment plant

Among these, the septic tank method is the most widely used method of treatment before discharging domestic waste water directly into the surface environment. This methodology

can be maintained at minimal cost and with minimal technology. The potential impact of groundwater on the surface discharge of wastewater is determined by soil layer of the particular location. The impact to the ground water is very high, where the soil layers are identically weak. If these septic tanks are not maintained regularly the roots of the trees may absorb the waste water during the rainy season and the waste water may derive to the surface when the groundwater is rising. It is utilized a public wastewater treatment system to disposal of waste water generated by industrial activities, commercial activities and hospitals. The action should be taken to discharge the Waste water collected from this waste water treatment system into the environment in accordance with the parameters mentioned in the Extraordinary Gazette Notification No 1534/18 dated 1st February 2008 issued by the Central Environment Authority.

2.1.6. Waste water related pollutants and its risk.

In many countries of the world, wastewater is discharged into the environment without any treatment or standard treatment. This wastewater contains a large amount of pollutants (Viruses, Bacteria, Protozoa, helminths, Pathogens).According to the United Nations environment program (UNDP), these pollutants were classified under three main categories.

i. Pollutants that have adverse effects on human health.
ii. Pollutants that have negative impact on the environment.
iii. As pollutants with economically detrimental consequences.

The risk posed by these pollutants can be can be described as follows

a) Health risk

Untreated or partially treated waste water can cause diseases such as Cholera and Diarrhea. This risk is not only to the parties directly involved in the waste water but also to the health risk if this water is used for food cultivation in the areas around the waste water is discharged.(source WHO – 2006)

b) Environmental risk

Disposal of untreated or partially treated waste water to inland water sources of irrigation, agriculture and marine activities that can disrupt the biodiversity and ecosystem.

c) Economical risk

The use of polluted waste which contains pollutants, for agricultural purposes has reduced the expected harvest and reduces the market share for purchasing products from safety places. Due to the direct discharge of this waste water into the marine zone, the activities of the tourism industry may be disrupted. (Example: declining of coral reefs, declining diving activities, declining of ornamental fish trade)

2.1.7. Utilizing waste water as a resource.

There are many alternative ways in which waste water can be reused as a resource.

i. Utilizing of waste water for agricultural purposes while maintaining the required standard.

ii. Ensuring that the waste water generated during industrial activities is reused appropriately within those industrial premises after treatment.

iii. The water released by the water supply board can only be used for drinking purposes by using treated waste water for purposes other than drinking. (Example : appropriately use of treated waste water for home gardening and sanitation)

2.1.8. Wastewater management and treatment.

There are many approaches for the waste water management in an environmentally friendly manner and in accordance with the standards, 03 types have been identified which are being mainly considered. Under this centralized, decentralized and integrated waste water management systems have been identified as the major public approaches used in the world. When selecting approaches for waste water management, a number of selection factors should be considered, such as the size of population, nature of the area, level of technological capacity, level of economic development and abandon industry and services, and the quality of waste water discharged should be environmentally friendly and safe for the consumers at the end.

2.2. Authority for Audit

The audit was carried out under my direction in pursuance of provision in Article 154 (1) of the Constitution of the Democratic Socialist Republic of Sri Lanka in conjunction with the provisions of the National Audit Act No. 19 of 2018.

2.3. Access to audit

There are many instances where the wastewater management process in Sri Lanka has become informal at the domestic as well as the institutional level and the main problem is the unsatisfactory public attitude towards it and at the same time the inadequate intervention of the responsible institutions. Accordingly the operational procedures and applicable laws and regulations in this regard and the efficiency and effectiveness of the implementation of those methods are evaluated.

2.4. Audit objectives

The supreme audit institution of Sri Lanka has identified the efficiency of wastewater management as a sub topic to be audited among the environmental audit topics expected to be audited for the years 2017 - 2019 by the Association of Supreme Audit Institutions. Accordingly this topic was selected by the environmental audit division. The following environmental issues were taken into consideration.

a) Examining the institutional non-compliance with applicable legal provisions relating to waste water management.
b) Discussing the adverse environmental impact to surface and groundwater sources and soil by the sludge due to the discharge of waste water into the environment without proper treatment according to the standards.
c) Discussing the adverse environmental impact of improper treatment and disposal of waste water generated by hospitals.
d) Examining the operation of underutilization of waste water treatment plants maintained at the institutional level.
e) Evaluating the performance of various ongoing projects related to waste water management.

f) Examining if action has been taken to compliance with applicable international conventions and commitments regarding the wastewater management process.

2.5. Scope of audit

2.5.1. Compliance with international standards

My audit was conducted in accordance with the international auditing standards and guidelines of Supreme Audit Institute (ISSAI 5110- ISSAI 5140) and ISSAI 5200 – ISSAI 5203)

2.5.2. Government institutions enclosed in the audit.

The sample checking was conducted to examine the effectiveness of the operational methods in relation to waste water management in Sri Lanka.

i. National Water Supply and Drainage Board.
ii. Central Environmental Authority.
iii. Ministry of Health Nutrition and Indigenous Medicine.
iv. Colombo Municipal Council.

2.5.3. Test of sample.

Following were the observations when reaching the conclusions through the observations presented in this report.

The attention was only focused on regarding with the waste water management methodology in the following sectors.

i. Wastewater management of the selected hospital sample.
ii. Physical and documentary inspection of several wastewater treatment centers operated by the National Water Supply and Drainage Board.
iii. Waste water management projects implemented by the Colombo Municipal Council covering up the Colombo district of the Western province.

2.5.4. Scope limitation.

Due to the lack of facilities to carry out laboratory test on the sludge, produced by the waste water treatment and to determine its environmental adverse effects, it has to be based on laboratory test prepared by each of the relevant institutions or the reports that has been used.

Especially the accurate information on the capacity of the treatment plants in hospitals, were not submitted to the audit.

2.6. Audit Methodologies.

2.6.1. Sources of Evidence

Relevant evidence obtained which was considered to be quantitative and as it could be drawn a reasonable conclusion.

i. Discussion notes
ii. Questionnaires
iii. Newspaper articles
iv. Magazines
v. Information from the internet

2.6.2. Confirmation.

i. Examining of laboratory reports.
ii. Field investigation.
iii. Research reports

2.7. Audit Criteria

i. National Environmental Act No 47 of 1980 as amended by Acts No 53 of 2000 and No 56 of 1988.(statement 23(g) of section IV (b))
ii. Marine Pollution Prevention Act No 35 of 2008.
iii. 11.2.4 of chapter ii of the Hospital Infection Control Guidelines issued in the year 2005.
iv. 4.2. D. iii of National Guidelines for Microbiological Studies.
v. Statement 46 of section 04 of the Municipal Council Ordinance 1987.
i. Section 66 (2) and (3) – March 2018 of Colombo District Development plan of the Urban Development Authority under the Ministry of Mega Policies and Western Development of 2018 March.
ii. National Framework for Healthcare Development 2016 to 2025.
iii. Sustainable Development Goals.
iv. WWDR- 2017(World Water Development Report)
v. The Extraordinary Gazette Notification No 1534/18 dated 01st February 2018.

3. Observations

3.1. Background information related to wastewater management.

3.1.1. Legal provisions

a. Obtaining Environmental Protection License.

According to the statement 23(a) of the National Environmental Act No 47 of 1980 amended by the Act No 53 of 2000 No 56 of 1988, the authority of a license issued by the Central Environmental Authority and certain other standards and other criteria that may be prescribed under this Act, the disposal of potential contaminants into the environment shall not be discharged, deposited or disposed into the environment and a permit shall be obtained under section 23 (b)(i). Also the Environmental Protection license must be obtained for the registered industries and industrial affairs which were identified as the most environmentally hazardous. Industries for industrial or public waste water treatment centers for sewage drainage by the section 57 according to the Extraordinary Gazette No 1533/16 dated 25th July 2008.

Out of the 17 hospitals which were physically inspected during the audit, 09 hospitals namely Peradeniya, Kandy Teaching Hospitals, Kanthale Base Hospital, Nuwara Eliya, Hospitals in Trincomalee District, Matara, Badulla General Hospitals, Pollonnaruwa and Tissamaharama Hospitals had not been taken any action to obtain theEnvironment Protection Licence. At the same time no action has been taken to obtain an Environmental Protection License for the wastewater treatment plant at Kataragama and the wastewater treatment system associated with the Mattegoda Housing scheme.

The Central Environment Authority (CEA) had not conducted adequate follow up on not obtaining of Environment Protection License for waste wastewater treatment plants and the impact on the environment due to discharging waste water into the environment by such places. It was observed that a significant attention of the central Environmental Authority and the hospital authorities are not sufficient to direct the necessary procedures to bring the hospital system of Sri Lanka to the level of international standards which has the highest contribution to the health and well-being of its citizens through its contribution to the protection of the environment.

b. Obtaining a Marine Environmental Protection License.

According to the Coast Conservation Act No 57 of 1981 the coastal zone is the area lying within a limit of three hundred meters (300 meters) landwards of the mean high water line and a limit of two kilometers (2 km) seawards of the mean low water line

.Pursuant to section 27 of the Marine Pollution Prevention Act No 35 of 2008, a person who disposes oil contaminants or other pollutants in Sri Lanka water line or any other marine region off the coast and cost of Sri Lanka, must be convicted of an offence under this Act subjected to a fine of not less than four million rupees and not exceeding fifteen million rupees at the time of conviction.

Following were observed

i. Although the Marine Environment Protection Authority has identified 315 institutions as discharging the wastewater into the sea as at 31st December 2019, it was observed that 115 of these institutions discharge waste water into the sea without obtaining the relevant permits. Although the main objective of marine zone management is to manage marine resources in a sustainable manner and thereby bring economic and social benefits to the people, it was observed that it had not been acquired the expected sustainability due to non-complying with the above legal provisions to prevent pollution since more than 50 percent of the total number of institutions identified for discharging wastewater for the into the ocean.

ii. Although its primary vision is to create a pollution free marine environment around Sri Lanka for the well-being and sustainable development of the people of Sri Lanka and the Sri Lankan economy by the year 2020, it was observed that the quality of the marine water had not met the required standards and hence there was an environmental and health risk due to taking actions without complying the section 27 of the Marine Pollution Prevention Act No 35 of 2008, towards the parties who were not adhering the provisions of the Act by the Marine Environment Protection Authority (MEPA) which has a major role to play in ensuring that the provisions of the Marine Environment Protection Act and the orders and the regulations enacted under that Act effectively and efficiently.

iii. As the population of the western province is nearly 6 million, it could be considered that the wastewater generated per day is at least 200 liters by a single citizen, the western province alone generates approximately 1200 million liters of wastewater per day. Wellawatta and Madampitiya pumping stations are the two major places where wastewater is finally disposed into the ocean zone, both of which had not been obtained the Marine Environment Protection License. It is observed the severity of Marine Environmental Pollution as it can be estimated that about 438,000 million liters of untreated wastewater is added to the ocean, annually through the Western province alone.

c. Testing of Wastewater Parameters.

Regulations in terms of section 32 of the National Environment Act No 47 of 1980, which should be read in conjunction with section 23 (a) and (b) of the National Environment Act No 1534/18 of 1st February 2008, were published. Lists i to vii of the first schedule to this Gazette had published the capacity limits for wastewater discharge in 07 instances. These instances where it had not acted according to that limits were observed as follows, while the sample investigation.

i. Approximately two hundred thousand cubic meters of wastewater is generated daily from the Badulla General Hospital which functions as the main General Hospital in the Uva province, facilitating to 1513 patients, is discharged into the Badulupitiya canal after treatment. The up to date laboratory records had not been maintained regarding the quality of the wastewater discharged. It was also observed that the capacity of the wastewater collection center was not adequate and evidence of discharging this wastewater into the inland water sources hygienic and environmentally friendly, was not presented for the audit.

ii. The wastewater treatment plant built for the treatment of the waste generated by the Polonnaruwa District General Hospital which facilitates more than 916 patients, treats 500 cubic meters of waste water per day. It was observed that the prevailing capacity here was not sufficient. Although it was planned to increase the capacity of the waste water treatment plant of the hospital in 2019, the capacity of the waste water treatment plant had not been increased until 14th

September 2020. Therefore the observations of the quality of the treated waste water can't be provided. According to the laboratory reports obtained on the 14th February 2018, regarding the waste water discharged by the waste water treatment plant of Polonnaruwa Hospital, parameters such as, the Total Solid Content (TSS), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD) and total Coli type Bacteria (T Coli), The Dead Waste Bacterial Coli Form(E. Coli) had been exceeded holding limit. Thus it was observed that the environmental and health damage is high due to the by waste water discharged into the environment in a manner does not conform to the prescribed standards.

iii. It cannot be satisfied with the amount of Chlorine (TCL) used in the final disposal as there is no laboratory test for the wastewater discharged from the wastewater treatment system of Mulleriyawa Hospital.

Diagram No 01

Waste water treatment system of Mulleriyawa Hospital.

iv. It was observed that the laboratory tests on the waste water discharged by the waste water treatment plant of the Trincomalee Hospital were not carried out properly and Chlorine (TCL) was added without calculating the amount of waste water discharged and the expected treatment had not been taken place. The data on the amount of waste water discharged by this waste water system and the capacity of the waste water treatment system was not presented for the Audit. And it was observed that the capacity of the existing wastewater treatment plant was insufficient. This waste water would eventually join the shore line and it had not even been obtained the marine environment protection license. It was observed that the responsibility of the management to ensure the health of the people and environmental friendliness, was insufficient while it was confirmed that waste water is discharged into the Trincomalee costaline,which has become a tourist destination, filled with natural beauty in the Eastern province, when discharging the wastewater in accordance with the standards.

v. According to the laboratory test reports of the Nuwara Eliya District Hospital dated 20th June 2018, the total amount of such as Coli bacteria (T. Coli) in the water discharged after treatment system, had exceeded the holding limit. It was observed that this wastewater was finally flowing through the drainage system of Nuwaraeliya town. Accordingly it was observed that there is a risk of Pathogens contained in the sewage waste entering the agricultural lands.

3.1.2. Corporate Building Policy

There was a risk of occurring environmental and health problems due to the discharge of untreated waste water into the environment due to non-considering on proper methodology of disposing waste water though it is considered as a mandatory fact of designing buildings related to industry or other special projects and without any proper assessment on future needs of these buildings and the basic needs of the wastewater generated by that building when planning the construction of the building under the building policy. It was observed that this problem has a more profound effect on the industries established in the investment promotional zones and non-implementation of building policy in constructing the hospitals.

It was observed that it is very important to follow the guidelines required to apply for the Environmental Protection License, when constructing a new wastewater treatment plant and in the expansion of existing treatment plants and to pay attention to the recommendations of the officials of the Central Environment Authority.

3.1.3. Activity of Local Government Institutions

There was a risk of environmental problems in discharging wastewater into the environment due to the failure of not paying proper attention on the following matters by the Local Authorities.

a) Approving the relevant building plans without paying proper attention to the relevant wastewater treatment and disposal methodology in approving the housing and building plans.
b) Improper maintenance of drainage system canal maintained by many Local Government Institutions.
c) Failure to enforce the relevant laws by the Local Authorities regarding disorder and illegal discharge of wastewater.
d) Failure to acquire lands in such a manner as to include adequate coverage zones for wastewater management facilities in urban development.
e) Constraints on financial and physical resources arising out of the maintenance and capacity development of large-scale wastewater treatment plants operating individually in the province.
f) Failure to make an active contribution to minimize public protests while constructing the wastewater treatment plants
g) Lack of adequate trained human resources to operate wastewater treatment system.

3.2. Waste water Treatment System of Hospitals

3.2.1. The nature of the activity of waste water treatment plants and the adding of waste water to the external environment.

Following are the observations of the audit regarding the performance and capacity of the public waste water treatment plants in the under mentioned hospitals.

a. Clinical substances and fluids discharged by the laboratory of the Badulla General Hospital were directly connected to the septic system without prior treatment. Accordingly it was observed that the waste water discharge into the environment by this system is also non-compliance, as the pathogen discharged from the laboratories are also added to the system without any prior treatment.

Diagram N0. 2

Connecting waste water directly without basic treatment.

b. Sewage waste water would also be connected to the newly constructed natural waste water system at Kanthale Hospital. However no specific methodology was used to m maintain the level of Coliform Bacteria with in the holding limits after refining. Although all the toilets were diverted to the sewage pits which absorbs sewage waste, the pits had been over flown due to insufficient capacity. It was also observed that the waste water from the 02 wards of the hospital is discharged through canals without any treatment.

Diagram- 03

Wastewater treatment system-Kanthale Base Hospital

c. It was observed that the capacity of the wastewater treatment system at Tissamaharama Hospital is not sufficient with compared to the waste generated at present and the wastewater treatment system was not functioning efficiently and to the required standard. It was also observed that the blood discharged after sample investigation from the laboratory at the Tissamaharama Hospital were accumulated in these gullies and they were overflown and the blood has been mixed up with the wastewater.

Diagram No- 04

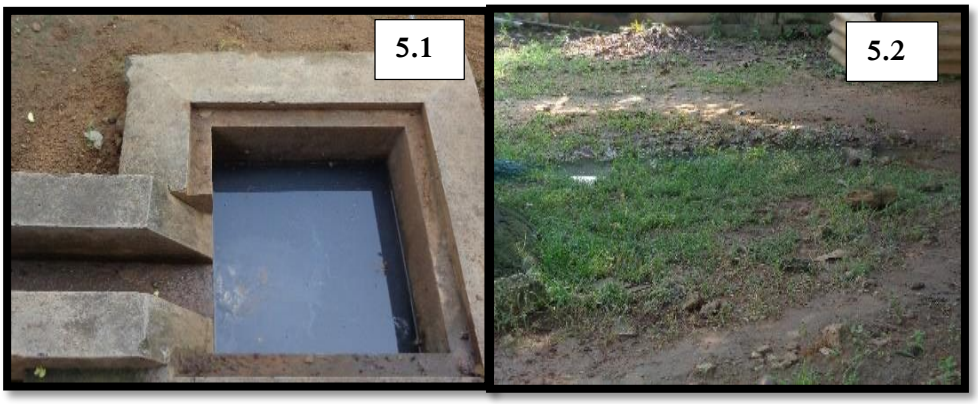
d. The present capacity the Trincomalee Hospital waste water treatment plant is not sufficient for the needs of the hospital and the hospital did not have a design designed plan for the wastewater treatment plant.

e. Out of the 04 blowers, used to obtain the oxygen required for the wastewater treatment system of the Gampaha Hospital waste water treatment system,03 blowers were inactive and 02 submersible pumps in the spray tank and 02 submersible pumps in the insulation tank inactive. Also the engine of the Bar Screening machine was inactive. It was observed that treatment process did not take place due to the malfunction of the equipment of the wastewater treatment system and the hospital didn't have a design plan of the wastewater treatment system of the hospital. There was a strong odor at the time of the audit associated with the drainage system that was released into the external environment after the waste water was treated.

f. The wastewater treatment system of the Nuwara Eliya District General Hospital was started 25 years ago and the hospital didn't have specific information about the capacity or design of this treatment system. The refinery system was contracted out to a private company to operate and maintain. A pipe leading to the sedimentation tank of the public wastewater treatment plant was broken and the waste water was added to the ground.

g. It was observed that a wastewater treatment plant is not operational for the treatment of wastewater discharged by the Katargama Hospital. Although it has been planned to connect the wastewater of the hospital to the public wastewater treatment plant, which operates under the Water Supply and Drainage Board, it had been completed by the 26th June 2020. Over flowing of waste water was observed at various places in Katargama Hospital premises and non-eco-friendly discharge of wastewater generated by the hospital had increased the risk to the groundwater and surface environment

Diagram No- 05



Wastewater discharge by Katargama Hospital

h. It has been observed that the wastewater treatment methods in accordance with the standards and the quality of the wastewater discharged into the external environment are not carried out in an environment friendly manner as observed, with regard to waste water management in the sample tested hospitals. The major situations which are identified regarding to the non-hygienic and non-environmentally friendly disposing of wastewater can be identified as follows.

i. There is a risk of being able to admit the infectious agents including Mercury, Antibiotics, Radioactive waste and Bacteria Virus and Parasites from disinfectants of the chemicals used for laboratory activities, x-ray antimicrobial compounds containing absorbable organic matter, dental amalgam or laboratory chemicals in the laboratory wastewater of the Hospitals. Therefore the pretreatment of the waste water generated by the laboratories should be identified as recommended conditions although it is not acted accordingly.

ii. It is important to pay specific attention to wastewater management and to maintain accurate data on capacity development of wastewater treatment plants should be established in parallel with hospital development. Accordingly the responsible parties should pay attention to the inadequacies of the existing capacity of the wastewater treatment plants and take necessary steps to prepare the necessary financial and physical plans and implement them, but they have not been acted accordingly.

iii. It was unable to build up reliability with regard to the quality of the wastewater disposed after treatment due to absence of taking action on preparing the necessary institutional framework regarding the further procedure to be followed by further analysis of those reports and obtaining timely reports in that regard and taking action to maintain the holding limits to be followed and maintained before discharging waste water into inland water sources.

3.2.2. Disposal of sludge

As shown in table 2.3 of the National Environment (safety and quality) Regulations No 01 of 2008 the sludge remains in the wastewater treatment plants are toxic when they are presented in the wet nature and there is a need for eco-friendly disposal. It was observed that the sludge had not been disposed in an environmentally friendly and healthy manner.

a) It was observed that the sources of water can be polluted by mixing the sludge with the rainwater and adding it to the canal through drainage systems and the drying beds constructed for the sludge remaining after the wastewater treatment process of the Polonnaruwa Hospital will be completely submerged due to floods during the rainy season.
b) The sludge remaining after the treatment of the wastewater of the Matara General Hospital has been discharged in the open ground.
c) It was observed that the solid waste collected by the filters of the general waste water treatment plant of the Nuwara Eliyal Hospital is dumped in an open area and set on fire near the waste water treatment plant.

3.3. Waste water Treatment Plants

The guidelines have been voted by the International quality standards (ISO)number 24516-3, 24516-4 (2019) regarding the capacity of waste water refine plants, sludge treatment facilities, nature of pumping stations , waste water retention facilities and existing asset management in a wastewater treatment plant , the good management practices the instruments used and the technical standards which should be in the waste water refine plant .

There are 13 waste water treatment plants operating under the control of the National Water Resources And Drainage Board which are classified as five major cities of katargam, kurunegala ,Hikkaduwa, Rathmalana ja-elais,and three housing schemes of Maththegoda,Raddalugama,Hanthana and foure free trade zones at the Biyagama,SithawakaKOKgala and Modarawela . The proposed waste water treatment system in the Kandy city is being constructed at the date of audit.

Following are the details of the refinery centers selected for audit from the above projects.

3.3.1. Wastewater Treatment Plants Kataragama

This center launched in October 2017 is expected to cover a population of approximately 20,935 Kataragama sacred area and the Sellakatharagama area are also included to this. The treatment system consists of 02 aerated lagoons and a maturation pond, which finally releases the treated wastewater into the Menic River after Chlorination. This wastewater treatment plant has a capacity of 3000 liters and currently refining is done for 3600-1000 liters of wastewater per day from 7 pumping stations.

3.3.1.1. Non- compliance

a. The Environmental Protection License had not been obtained for the center.

b. It was observed that the Mercury was being stored in the laboratory without approval.

3.3.1.2 Waste water Related Parameters.

a) Only five basic parameters were tested and the parameters such as sewage waste bacteria (E-Coli) were not being tested daily, prior to discharge the treated waste water in to the external environment.

b) Though there are 02 gully bowsers visiting once a day while 06 gully bowsers visiting per day during the festival season the amount of in flow to the center is not measured and the chemical testing is also not been conducted.

3.3.1.3 Capacity Utilization

It was observed that the proposed capacity of the treatment center was 3000m^3 cubic meters but the maximum capacity is not being utilized as the current collection volume is around 600-1000m^3 per day.

3.3.1.4. Operational inefficiency.

a) Although Water Supply and Drainage Board had planned to provide pipe connections to 4560 meters of 15 locations to connect to this wastewater treatment plant, the work had not been completed by the date of the audit. Although the government institutions such as Ayurveda Hospital, Ayurveda Circuit Bangalore, Katharagama primary school, President's College, Circuit Bangalore of Valuation Department and post office had been provided with wastewater connections, no action had been taken to complete the relevant internal connections.

b) The 04 drying beds designed for the removal of sludge accumulated after refining had not been constructed until the 26th June 2020.

c) Though there were 04 sensors in the center for activation one, of them was not operational.

d) Although the spare parts required for the maintenance of the wastewater treatment plant have been provided for a period of 5 years from the year 2017, no methodology has been adapted regarding the procedure for obtaining the required spare parts for the period after that

e) The officers, who have been recruited as plant technicians at the center on the 17th October 2017, had not been given the necessary.

3.3.2. Waste water treatment plant-Kurunegala

The Kurunegala wastewater treatment plant which commenced operations on the 6$^{th\ August}$ 2018, is expected to cover about 43,000 beneficiaries. The expected treat capacity is around 4500 m^3 per day and this is the largest sewerage project constructed outside Colombo. Here a biological method is used to treat the wastewater and it is purified by microbial activity through aeration. Although the volume of water expected to be treated by this treatment plant is 4500m^3 per day, as of 26th June 2020, the actual volume to be treated was around 2600m^3. It was observed that the management of these wastewater treatment plants costs Rs.5 million per month and its capacity is underutilized.

3.3.3. Waste water treatment plant-Rathmalana

This wastewater treatment plant was launched in 2013 which covers 408 industries and a population of 20,000 and has a capacity of 17,000 cubic meters. The treated wastewater is discharged into the sea away from 600 meters. The wastewater treatment system collects about 04 cubes of sludge per day and directs the sludge to compost yard.

The observations are as follows.

a) There have been public complaints that there is an odor associated with the wastewater treatment plant
b) Although it was stated in the Marine Pollution Prevention Act that the wastewater discharge into the sea after treatment should be discharged at a distance of 2 km, it was revealed that the wastewater discharged from the Rathmalana refinery is discharged into the sea at a distance of 600 meters.

It was observed that the attention have not paid continuously on the following reasons by the responsible parties and institutions on the operation of wastewater refining centers, the final disposal methods and the capacity utilization.

i. It was observed that the continuously increasing of the cost of refining spent for the refining of drinking water by the National Water Supply and Drainage board due to the high level

of contaminants in the “Raw Water” obtained for treatment. There is a lack of attention paid to the standards to be maintained in the discharging of waste water for the inland water sources.

ii. The economic and environmental adverse effects can be occurred accordingly with resulting in underutilized investment costs due to not identifying the existing barriers by a periodic review of the capacity utilization of the treatment plants the failure to take the necessary action after investing in wastewater treatment plants

iii. The nature of wastewater pathogens has become an obstacle in future development plans and investment policy formation due to the failure of maintain data on the quantity, quality and classification of waste water, treated by wastewater treatment plants.

iv. There is a shortage of skilled employers for continuous operational activities in wastewater treatment plants.

v. There were no plans for the maintenance and providing equipment to maintain the continuous future operation of public wastewater treatment plants initiated by very high Investments.

vi. The wastewater management has not been identified as an opportunity to be given priority in identifying the development of objectives of a country.

3.3.4. Wastewater treatment systems associated to housing schemes.

Mattegodada Raddolugama and Hanthana housing schemes cover the wastewater generated by the population of 4846, 8589 and 1654 respectively and maintain the existing capacity of 600, 6000 and 650 cubic meters respectively. The parameters such as Biochemical Demand (BOD), Chemical Oxygen Demand (TOD) and Suspended Solid Waste (TSS) of the wastewater discharged by this wastewater treatment plant are only being tested. Monitoring the quality of wastewater over a period of time can help to plan and develop the strategies related to wastewater management focusing on only a limited number of waste water related standards issued by the Central Environmental Authority, it was finally impossible to provide observations on the health and environmental friendliness of the waste water discharged by those housing schemes.

3.3.5. Public wastewater treatment plant at Seethawaka Export Processing Zone

The details were are as follows

a) Seethawaka Export Processing Zone which was established in the year 1999 has been transferred to the Board of investment of Sri Lanka in the year 2001. This consists of 28 industrial enterprises which have created about 23,300 jobs opportunities. Although the existing public waste water treatment plant in this zone has a capacity of 9500 cubic meters per day, the factories in it discharge approximately 12400 cubic meters of waste water per day. It has been identified that the capacity of the public wastewater treatment plants should be increased without delay as existing public waste water treatment plant is not sufficient to treat the waste water discharged from that.

b) According to the proposal made by the Honorable Minister of Industrial and Export Investment Processing, to activate the project on enhancing the capacity of the public waste water treatment center of the Seethawaka Export Processing Zone up to 15,000 cubic meters per day, has been approved by the Cabinet on the 14th January 2020, those activities haven't been completed up to then.

3.4. Wastewater management methodology in Colombo Municipal Council area.

3.4.1. Conducting of waste water pumping stations.

The design of the wastewater management system covering the northern part of the Colombo district was started in 1896 and its construction was commenced by 1906.Waste water was collected by 7 pumping stations and discharged into the Kalani river after being treated by the Madampitiya treatment plant by the year 1910. During the period from 1911 to 1925 the system was improved and 2 pumping stations were constructed in the southern part of the Colombo district and waste water discharge it into the sea after treated by the waste water treatment system which was constructed in the Wellawatha area. It was forecasted that the daily water consumption per person was 220 liters and the population of the Colombo district to be 350,000 when the system was designed by the year of 1950.

In 1972 master plan was drown up for further expansion of waste water management system in Colombo district. That system consisted of approximately to 254 kilometers of pipe line, 38 kilometers of pressure pipes and19 pumping stations. The sewage system of the city of Colombo consists of 19 pumping stations including 14 main pumping stations. Areas belonging to the city of Colombo are divided into 2 main parts as north and south and the details of the pumping stations belonging to each area as follows.

Table number 01

Area	Nature of the pumping station	location
Northern province	Main pumping station	i. Madampitiya ii. Wanathamulla iii. Maligawatta iv. Vystwike v. Port vi. Cs3 fish market
	Other pumping station	i. Vauxhall Street ii. Stace Road iii. Crow Inland housing scheme iv. Achilon square v. D block vi. Helama watta
Southern province	Main pumping stations	i. Borrela ii. Polwatta iii. Slave Inland iv. Thibirigasyaya v. Wellawatha vi. 58peters lane vii. Bambalapitiya

The treated wastewater is discharged into the sea through a 1243 meters long pipeline at Wellawatta and 1847 meters long pipeline at Muthuwella. In addition wastewater discharged from the territories such as Dehiwala, Mount-Lavinia, Kolonnawa and 11 institutions which are not belong to the territory of Colombo is connected to the wastewater management system of Colombo municipal council

At the date of audit the following observations were made regarding the Wellawatte and Madampitiya wastewater treatment plants.

a. Malfunctioning of the system

It was observed that both the Wellawatte and Madampitiya wastewater treatment systems are inactive and discharged waste water into the sea without any treatment. It was observed that the direct discharge of sewage into the sea causes marine pollution deviate from the qualitative conditions of the marine water may adversely affect the marine environment and health as well as directly affect to the tourism industry.

b. Disposal without refining

Absolutely violating the provisions of the National Environmental Act 47 of 1980 and prevention of Marine Pollution Act no 35 of 2008 has resulted in a large amount of sewage generated in the city of Colombo being discharged into the environment, although these untreated wastes are discharged more than one kilometer away from the beach, there is a risk of the above pathogens entering the beach, because of the natural process of the sea. However the responsible institutions have not taken the necessary measures to remove adverse effects on environment, health and the lives of the people due to the failure of checking the purity of the marine water and the composite of the sea water and not taking necessary actions.

c. Dilapidation of Pipelines

The audit revealed that due to the interconnection of rain water and wastewater pipelines wastewater enters the canals through rainwater pipelines. It was observed that this was due to the deterioration of the pipelines and the illegal connection to the drain pipelines.

d. Lack of Laboratory facilities

It was revealed that due to the inadequate laboratory facilities and staff of the operational laboratory under the Madampitiya pumping station, all the waste water(gully bowsers) brought from outside is not treated for compliance with the relevant parameters before being discharged into the sea after treatment. As a result, it was possible to discharge sewage waste directly into the sea.

e. Laboratory reports

The continuous laboratory tests had not been carried out by the Columbia municipal council on the quality of the beach, of areas such as Wellawatte and Muthuwella where the sewage waste is disposed and boundary of the Colombo city. The beach of wellawatte,Muthuwella and specially the Galle Face area are used by the general public for entertainment and bathing. The Colombo Municipal Council had not given a confirmation that the pathogens were not on the marine water and the beaches of this area due to discharging the untreated sewage waste into the sea.

f. Wastewater management in the city of Colombo

According to the observations regarding the pumping stations Maligawatte and Borella pumping stations were inactive at the time of audit. Further the pumps belong to the pumping stations such as Polwatta, Wellawatte, S8 peters lane, Madampe, Hettiyawatte,Stace road, Crow Island,Achillies square,Vauxhall Street and Maligawatte were observed to be non functioning as per schedule 01.It was revealed that the solid waste is also discharged directly into the sea as the wastewater pumping stations are not functioning properly.

3.4.2. Other water management projects related to Colombo city.

The details were as follows

a) during the last 50 years in the city of Colombo has become more densely populated developed as a commercial city and the need of increasing mint of the people living outside Colombo to come to Colombo because of that the waste water generated inside the city has been increased. During the period the 2006 to 2019 the population obtaining in accommodation facilities in the places where there are accommodations available had been increased and the number of foreigners arriving into the country had also been increased
b) City of Colombo is rapidly developing commercial city and the port city is one of the largest new development project to be added to the city. The amount of waste water generated daily in the port city is projected to be 29000 m^3 however a sustainable waste water treatment plant has not yet been identified for the sewage waste disposal from the port city.

3.4.2.1. Greater Colombo Wastewater Management Development Investment Program

Following are the details of the wastewater management development investment programs implemented by the Colombo Municipal Council in relation to wastewater Generation Management as above mentioned.

Project 02 and project 03.

The cost of this project which is being implemented in the Colombo city limits area under the Asian development loan No 3030/3348/3349 project, is as follows.

- Project 2- It is18 million us dollars, out of this estimated cost US Dollars 9.44 million, has been allocated for the Colombo Municipal Council Protect period from 3rd June 2014 to 30th June 2019.
- Project 3- The project cost of this agreement has been signed on the 11th August 2016 is 112.83 million of USD. The period of the project is from 11th August 2016 to 31st December 2020. The estimated cost for internal waste water management under this project is as follows.

	US dollar million
➢ Development of the wastewater System of Colombo city	47.11
➢ Waste water refining center	44.37
➢ Functional collaboration	5.48

The following observations were made regarding the above project.

a) When it was observed the progress of preparing and design plans for the wastewater investment, the estimated cost for the particular task is 3.8 million of USD. As at 31st December 2018, only 28.5 percent of the planned target financial progress had been achieved and physical progress was observed as 23.8 percent.
b) The contract for the repairing 0f pipelines discharging waste water into the sea has been completed and according to the wastewater management project performance report of the Colombo Municipal Council as at 31st December 2019, the average physical progress of the design construction installation and repair of pumping stations is about 79 percent.
c) The physical progress of the Wanathamulla sewage system was 68 present as at 31st December 2019.
d) The performance of the DSIDC counseling problem was 31 percent as at 31st December 2019.
e) Although the procurement work for the inspection of 97.2km of sewage waste lines had been commenced in the year 2016, the contract had not been awarded till 31st December 2019.
f) Contract work on the Kirulapone sewerage pipeline had been completed by 39 percent as at 31st December 2019.
g) The process of awarding the contract for the construction of the Wellawatte water wastewater treatment plant had not been completed by December 31st 2019.
h) The awarding of contracts for the construction of the Kirulapone,Narahenpita sewage network and the expansion of the sewerage system in the Southern Province had not been completed by 31st December 2019.

i) It had not been considered about the Berae Lake when preparing the design plan of waste water treatment plants by the southern catchment gravity sewer.
j) It was observed that the method of disposal of waste water generated under the Port City Development Project was not primarily included in the above plans but the attention had been paid on that later. Here it had been proposed as 02 permanent and temporary solutions.

- Addition of wastewater from Madampitiya to the sea by the end of 2019 as a temporary solution.

- Discharging to the sea from the South disposal station of slave Island by the year of 2022 as a permanent solution.

3.4.2.2. Proposed Wastewater Management Projects - Sri Jayawardenepura Kotte

The details were as follows.

a) A waste water management project with the assistance of JICA institute has been proposed based on the area of Sri Jayawaredanapura, the administrative capital of Sri Lanka in the Colombo district, with the objective of benefiting approximately 250,000 amount of people. This project is expected to implement the waste water management in the areas such as Baththaramulla, Rajagiriya,Ethul kotte ,Nugegoda,Delkada ,Kiwulawela and Kaduwella. and the places as well as the parliament complex and Sethsiripaya. It is proposed to cover 235 government agencies including CIDA and the proposed apartment complex. The total area of land covered by this project which is being implemented under the Ministry of Urban Planning and Water Supply is 3000 hectares. The project also aims to collect waste water from 8 railway stations. Under the light railway project (LRT).It can collect, treat and discharge about 40,000 cubic meters of wastewater per day. Further it is estimated to provide 45 000 sewer connections through this project.
b) Only the feasibility studies of this project had been carried out as at 31st March 2019 and the implementation of the project had not been commenced. It was observed that the sewage waste and wastewater generated in this area is discharged into the water sources without any treatment and the environmental damage caused by it, can be greatly increased.

3.5. Organizational role.

3.5.1. Allotting the charges for environmental protection

Section ii of the National Environmental Act No 47 of 1980, have been set out the task, powers and functions of the authority and through the paragraph 10(c) it has been mentioned regarding "pollution". Also section iv(b) of the National Environmental Amendment Act No 56 of 1988, has set out the provisions under the environmental conditions. According to the provisions, a person who would become a convict for polluting the local water line of Sri Lanka will liable to a fine of not less than Rs.10000 or a fine of Rs.100,000 and if that offence would be done continuously, it would liable to a fine of Rs.500 per day.

The following were the observations.

a) The charge to be levied on pollutant for discharging waste water without standards was not determined by the nature of the waste water generation and the quantity of wastewater generated through the Gazette Notification No 1533/16 of 25 January 2008, identified on the adverse condition of the documented industries and industrial activities, which were identified the nature of the adverse effects were not taken into consideration when allocating the above charges. It was observed that it has been deviated from the concept of "pollutant mast pay."

b) It was not covered that the wastewater was generated by industrial activities to encourage industrialists to reuse their waste water in a suitable manner after treatment by wastewater treatment plants by the incentive plans and strategies through the Act.

3.5.2. Basic Functions under Wastewater Management

According to the paragraph 5201(39) of the Environmental Audit Guidelines of the Superior Audit Institutions, the following environmental conditions may be considered for the financial statements prepared by an institution, including revenue and expenditure.

a) When it is failed to comply with the environmental regulations, as an example disclosing the penalty payments or legal expenses which may incur the future through the note to accounts at the events of discharging wastewater of non-compliance manner, to the relevant standards.

b) Continual analysis of the performance targets of environmental expenditure included in the annual capital and recurrent expenditure incurred by the institution.

c) It was unable to reveal truthfully and fairly that the financial statements issued by particular institution, is not liable for environmental damage.

3.6. International Conventions and its Conformities

3.6.1. Blue Flag Program

The blue flag program was launched in Europe in 1987.The main purpose of this is to encourage European Nations to protect the beach in accordance with the bathing water directive. As at June 2018, there are 4554 Blue Flag locations are located in 45 countries. The Foundation of Environmental Education Program (FEE) in Belgium has introduced 33 criteria. These 33 criteria are mainly divided into 04 parts.

They are

- Environmental education and information
- Quality of water
- Environmental management
- Safety services

It has been introduced under the criteria 09 that coastal areas should not be affected by the discharge of waste water and sewage waste discharge from industries under the quality of water. Currently the Marine Environment Protection Authority (MEPA) has identified 05 locations to implement this Blue Flag Beach Program in Sri Lanka. Those places are Moragalla, Unawatuna, Nilaweli, Marble Beach and Pasikudah. The authority has estimated that around Rs.90,000,000 will be required for the development of these areas and steps are being taken to obtain loans from the Spanish Government. The observations in this regard as follows.

a) Unclean Coastal Areas

   The coastal areas of Wellawatta, Muthuwella and Galle Face, which were currently in a state of high pollution, have not been included in this Costal Restoration Program although they attract a large number of local and foreign tourists.

b) Failure to implement program

   It was revealed that the Blue Flag Program is not currently operational due to insufficient funding.

3.6.2. Sustainable Development Goals 2030 Agenda and Wastewater Management.

3.6.2.1. The adverse effects on the environment by the waste water have been identified by the Sustainable Development Goals 2015- 2030 Agenda 2015, with the participation of 193 member countries at date of 25th September 2015. Global goals and indicators are expected to be achieved under 06 Sustainable Development Goals.

Following were the observations.

a. It has been identified the facts that reducing water pollution at 2030 by improving the quality of water, eliminating the disposal and discharging harmful toxins and other substances, eliminating the discharging of untreated waste and reducing untreated waste water discharging, recycling the water at significant level and protecting , reusing of water .Although the cabinet Memorandum approved Rs. 22.39 billion for wastewater management for the hospital system, the operations had not been proceeded until the date of audit as at 10th of September 2020.

b. Identifying the sustainable development goals for economic development and recognizing the importance of waste water management in achieving those goals should be considered in depth as follows

   I. As the investments in wastewater management make a significant contribution to the protection of unsafe water and the resulting diseases, it is observed economically socially and environmentally.

   II. It was observed that the capacity of the treatment plants, was not adequate, the wastewater is not refined according to the standard, when there is a rainy weather, the wastewater would mix with the rain water and flows directly to the surface of the earth in most of the hospitals which were taken under the audit.

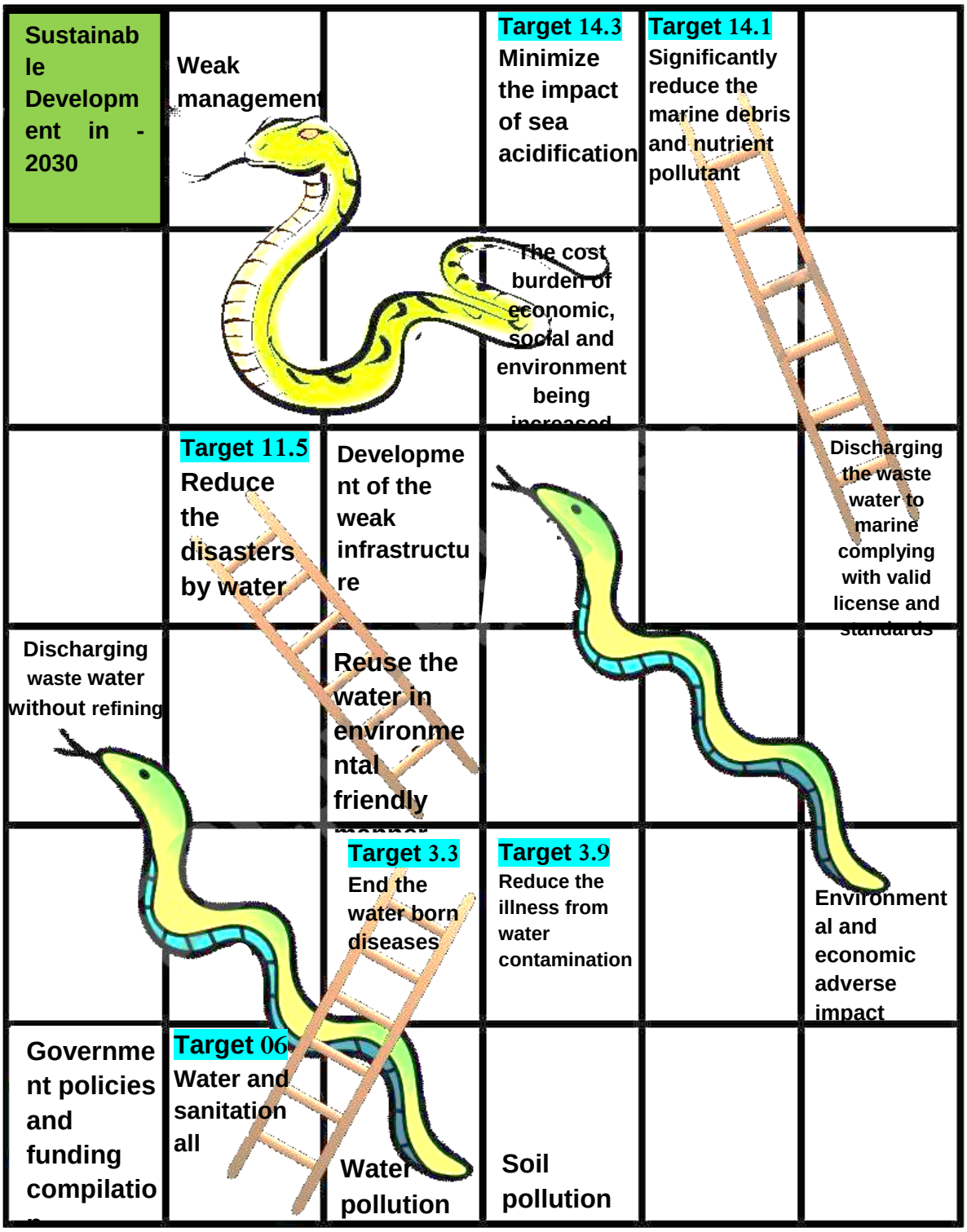
   III. It was observed that wastewater discharged by the Colombo Municipal Council which was taken under audit is finally discharged into the sea without proper treatment.

c. By the Sustainable Development target 3.3, it is aimed to the eradicate neglected tropical epidemics including AIDS, Tuberculosis and Malaria, Hepatitis water borne diseases and other infectious diseases by 2030.Further the target 3.9 aims to, reduce the number of deaths and illnesses caused by chemical, air, water and soil pollution significantly by 2030.

d. By the Sustainable Development target 11.5 it is expected to focus on the poorest and the most vulnerable people by 2030 and significantly reduce the direct economic damage to the world's GDP, caused by disasters, including water borne disasters and thereby impact and death and It is expected to reduce the number of people significantly. It aims to develop wastewater infrastructure networks to withstand the climate changes.

e. By Sustainable Development target 14.1, it is hope to will significantly reduce the prevention of all types of marine pollution significantly by 2030, including marine pollution, especially by land based activities and through the target 14.3 it is going to the impact through the effect, due to the marine acidification and finally discovering the solutions. The activities should be done with the aim of gaining economic, environmental and social benefits through waste water management expected by this.

3.6.2.2. The Approach to Sustainable Development by government policies can be identified as follows.


Sustainable Development in - 2030
Weak management
Target 14.3 Minimize the impact of sea acidification
Target 14.1 Significantly reduce the marine debris and nutrient pollutant
The cost burden of economic, social and environment being increased
Target 11.5 Reduce the disasters by water
Development of the weak infrastructure
Discharging the waste water to marine complying with valid license and standards
Discharging waste water without refining
Reuse the water in environmental friendly
Target 3.3 End the water born diseases
Target 3.9 Reduce the illness from water contamination
Environmental and economic adverse impact
Government policies and funding compilation
Target 06 Water and sanitation all
Water pollution
Soil pollution

4. Recommendations

4.1. Taking necessary action to check whether the wastewater is within the capacity of the specified parameters, during the discharge of waste water by the Gully bowsers to treatment system and taking action to measure amount of waste water adding to the system by the gully bowsers quantitatively.

4.2. Taking necessary action to repair the pumping station to operate efficiently which are inactive and the pumping station which are not functioning properly.

4.3. Expediting the completion of construction activities and the Greater Colombo wastewater management investment program and recruiting the required number of staff and skilled workers to operate those projects.

4.4. Taking action to identify the current polluted condition of the coastal areas which are attracting local and foreign tourists and implementing necessary programs to reduce such polluted conditions.

4.5. Focusing attention in obtaining the necessary financial assistance for the implementation of important coastal protection programs.

4.6. Identifying the underlying data under the Sustainable Development Goals and directing for remedial actions.

4.7. Adequate investment in wastewater management to achieve the Sustainable Development Goals by 2030.

4.8. Taking actions under the prevention of Marine Pollution Act against industries discharging waste water into the sea without a permit.

4.9. Enforcing of new laws regarding the reuse of treated wastewater.

4.10. Introducing new technologies along with waste water management training the human resources, human resource, and training, maximizing capacity and continuing maintenance.

4.11. Properly fulfilling the role of the institutions responsible for the implementation of wastewater treatment in improving and implementing projects, enforcing regulations of local importance and making necessary updates of them and taking actions complying with the international conventions and regulation.

4.12. Caring should be taken in directing wastewater primarily, internally to rivers and other canals, especially in the cities near costal including Colombo, and to ensure a proper disposal of wastewater in a proper manner.

4.13. Focusing on sustainable eco-friendly waste water treatment when planning large projects including especially the city of Colombo.

4.14. Drawing the attention of the public, to the economic, social and environmental benefits and the adverse effects of untreated and the waste water discharged without the standards of implementing large scale waste water project.

Sgd./W.P.C. Wickramaratne
Auditor General

W.P.C. Wickramaratne
Auditor General
12 May 2021

Schedule 01

I.	Pumping station	Number of pumps	Designed Capacity	Present Situation
II.	Vystwyke PS	03	08 liters per second	Contractor is adopting another pump
III.	Wanathamulla	02	180 liters per second	Contractor is adopting another pump
IV.	Kirula-Thimbirisgasyaya	03	180 liters per second	Only 02 machines are operating
V.	Bambalapitiya	03	43 liters per second	Contractor is adopting another pump
VI.	Maligawatta	04	02-360 01-180 01-540 liters per second	Only 02 pumps which are with the capacity of 360 liters per second are operating
VII.	Borella	04	02-320 01-160 01-280	Only 02 pumps which are with the capacity of 160 and 280 liters per second are operating
VIII.	CS3fish market	04	04-224	Contractor is adopting another pump
IX.	Slave Island	03	03-224	Contractor is adopting another pump
X.	Polwatta	04	04-220	
XI.	Wellawatta	03	03-115	Only one pump is operating
XII.	58-Peterson Lane	03	03-490	Only one pump is operating
XIII.	Madampitiya	05	03-722	Two pumps are operating
XIV.	Hettiyawata-port	04	02-320 01-160 01-280	Only one pump is operating
XV.	Stace Road	02	02-50	Only one pump is operating

XVI.	Crow Island	02	02-40	Only one pump is operating
XVII.	Achilon square	03	02-35	Only one pump is operating
VIII.	Vauxhall street	02	02-20	Only one pump is operating
XIX.	Maligawatta	02	02-35	Only one pump is operating
XX.	Maligawatta	02	02-44	Only one pump is operating