

2023

லாரீகை லாரீகால
வருடாந்த அறிகுை
ANNUAL REPORT

புரு கலீபுத் லுநீவருட
நீர் வளச் சபை
WATER RESOURCES BOARD



புரு கலீபாதுத புலாதுகாண்ட
நீர் வழங்கல் அமைச்சு
MINISTRY OF WATER SUPPLY



Annual Report 2023



Water Resources Board
Ministry of Water Supply

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INTRODUCTION

The water resources board was established in 1966 under the Act No. 29 of 1964, as an advisory body to the Minister on all matters concerning the control and utilization of the Water Resources in Sri Lanka.

In 1978, Groundwater Division of the Irrigation Department was transferred to the Water Resources Board and functions of the Board were expanded and commenced the implementation activities.

The Water Resources Board Act was amended and passed by the parliament in 1999 to enable the Water Resources Board to pay more emphasis on matters pertaining to Groundwater Resources in Sri Lanka

As per the Gazette notification No. 2010/23 of 16th March 2017, the use of natural water springs or ground water for certain activities or projects should be done under the supervision & direction of the Water Resources Board.

VISION

Adequate access to clean safe water for all

MISSION

To advise the government and the people on assessing, conserving, harnessing developing and frugally utilizing particularly the finite groundwater resources in the country working in close collaboration with the rural society, relevant central and local government Department/ Divisions/ Authorities/ Institutions, national and international organizations, and scientific communities here and abroad.

OBJECTIVES

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- Carry out research on groundwater resources of the country.
 - Collection of data on groundwater resources and maintain a groundwater data base.
 - Carry out hydrogeological surveys.
 - Awareness creation on the groundwater related issues.
 - Assessment of groundwater resources.
 - Implementation of the activities of the board with the coordination of other institutions.
 - Groundwater development and management.

FUNCTIONS

1. The control, regulation and development (including the conservation and utilization), of the water resources of the country.
2. The prevention of the pollution of rivers, streams and other water resources
3. The formulation of national policies relating to the control and use of the water resources of the country with the following objective's view
 - The multi-purpose development and use of water resources
 - The short-term and long-term provision of water resources for domestic supplies and industrial supplies.
 - The control of salinity
 - Any other like objective
4. The preparation of comprehensive and integrated, control and development of the groundwater resources of the country.
5. The Co-ordination of the activities of government departments, local authorities and public corporations, in regard to surveys of basic data and other investigation, relating to hydrogeology.
6. The analysis of reports based on investigation, statistical surveys plans and proposals relating to the groundwater resources of the country made by government departments, local authorities and public corporations.
7. The co-ordination of projects undertaken by government departments, local authorities and public corporations, relating to the conservation, utilization and development of the subterranean water resources of the country and the assessment of the country, and the assessment of the possibilities, benefits and economic feasibility of such projects.

Corporate Information

Name of the Organization

Water Resources Board

Legal Form

Government owned Statutory Board

Year of Establishment

1966 by Act of Parliament, No.29 of 1964.

1999, the Act was amended Water Resources Board (Amendment) Act No.42 of 1999.

Head Office

488/A, Nawala Road, Koswatta,
Rajagiriya

Tel: +94 11 2694835, +94 11 2697050

Fax: +94 11 2669517 (Admin)

Email: helpdesk@wrb.gov.lk

Web:www.wrb.gov.lk

Line Ministry

Ministry of Water Supply

Tax Identification No.

409018017

Bankers

Bank of Ceylon

National Savings Bank

Income Tax Consultants

ARS Associates

(Chartered Accountants)

Auditors

External : Auditor General -
National Audit Department

Internal : Chief Internal Auditor -
Ministry of Water Supply
Internal Auditor –
Water Resources Board

Board of Directors

Dr. J.D. Samarasinghe - Chairman

Mr.C. Rathnamalala Bandara - Director
(Up to 2023.03.13)

Mr.S.Y.Pillai - Director
(Since 2023.03.14)

Mr. H.R.M. Kiriella - Director

Mr. A.K.D.S..P Mahanama - Director

Ms. L.A.Y.De Silva - Treasury
Representative

Senior Executive Officers

Ms.K.G.D.Priyanka

General Manager (Acting) –[Director
(Development)- Ministry of Water Supply]
(Since 2022.12.01-2023.12.31)

Mr. M.A. Pushpakumara
D.G.M. (HR & Finance)

Mr. A.B.M. Chandrasiri
Assistant General Manager (Finance) 2023.01.04
retirement

Ms. C Abeysooriya
Act. Assistant General Manager (Finance &
Admin)

(Chief Accountant Ministry of Water Supply)
Mr.R.M.S.Rathnayaka

Act. D.G.M (Research & Development)

Mr. K.M.U.C.B. Kulathunga

Assistant General Manager (Operation)

Mr. D.G.S. Wickrama (2023.12.10 retirement)

Assistant General Manager (Project)

Mr. R.R.G.R. Rajapakshe

Assistant General Manager (Research &
Development)

Corporate Governance

Key Players (Board of Directors)

Dr.J.D.Samarasingha

Present Position

Past Positions

- Chairman (Since 2021)

- Chairman – Water Resources Board
- Chairman - Sri Lanka Council for Agricultural Research Policy, Overall Coordinator of the Capacity Building Programme for SLAS officers, Principle Trainer, Senior Consultant - SLIDA, Director, Ministry of Nation Building & Estate Infrastructure, Development, Manager (Finance & Administration) - Tsunami Reconstruction Project Unit (TRPU), Taskforce for Rebuilding the Nation (TAFREN), Attached to the Ministry of Public Administration, Director, National Productivity Secretariat, Ministry of Industrial Development, Ministry of Industrial Development, Assistant Commissioner of Elections, Department of Elections.

Mr. S.Y.Pillai

Present Position

Past Positions

- Director (Since 2023.03.14)

- Managing Director / CEO of Woodmaster Holdings (Pvt) Ltd.
- Director HR & Finance of Premier Financial Consultants (Pvt) Ltd. Director Marketing of Cool Power Holdings, General Manager – Sooriyakande Planation (Pvt) Ltd., Senior Manager – Kahawatta Plantations PLC., Superintendent Watawala Plantations PLC.

Mr. H.R.M. Kiriella

Present Position

Past Positions

- Director Water Resources Board

- Coordinating Secretary to the Deputy Government Whip – Sri Lanka Parliament (From 24th August 2020 to 09th May 2022 and Since 01st August 2022), Member of the Board of Directors – Industrial Development Board.
- Assistant Commissioner – Sri Lanka Inventor's Commission, Member of the Board of Directors – Paranthan Chemicals Company Ltd, Member of the Board of Directors – Skills Development Fund Limited, Industrial Relations Advisor – Ceylon Petroleum Corporation., Deputy Marketing Manager (Statistics & Procedures)- Ceylon Petroleum Corporation

Mr. A.K.D.S..P Mahanama

Present Position

Past Positions

- Director Water Resources Board

- Managing Director of scan 3M Holdings (Pvt) Ltd.
- Managing Director of Steapherhead Consumer Associated Network (Pvt) Ltd., A Parliament Secretary of MP in 8th & 9th Parliament Sri Lanka.

Ms. L.A.Y.De Silva

Present Position

Past Positions

- Treasury Representative

- Director / Department of National Planning.
- Director / Department of External Resources., Deputy Director/ District Secretariat Kalutara, Assistant Director / Divisional Secretariat Karadeniya, Assistant Director / Ministry of Industry & Investment Promotion.

Board Meetings

Six (06) Board meetings were held in the year under review.

Audit and Management Committee

- | | |
|--------------------------------|--|
| i. Ms. L.A.Y.De Silva | - Chairman- Treasury Representative |
| ii. Mr.C. Rathnamalala Bandara | - Director (Up to 2023.03.13) |
| Mr.S.Y.Pillai | - Director |
| Since 2023.03.14) | |
| iii. Mr. H.R.M. Kiriella | - Director |
| iv. Mr. A.K.D.S..P Mahanama | - Director |
| (Since 2023.03.14) | |
| v. Mr. E.A.D.P. Prasanna | - Observer - Government Audit |
| vi. Mrs. S.W. Gunawardhana | - Observer - Ministry of water supply- CIA |

Audit and Management Committee Meetings

Three (03) audit and management committee meetings were held during the year 2023.

Senior Executive Officers – Year 2023

- | | |
|------------------------------|---|
| i. Mrs. K.G.D.Priyanka | - General Manager (Acting) – [Director (Development)]
Ministry of Water Supply |
| ii. Mr. M.A. Pushpakumara | - D.G.M. (HR & Finance) |
| iii. Mr. A.B.M. Chandrasiri | - Assistant General Manager (Finance) |
| iv. Mr.R.M.S.Rathnayaka | - Acting D.G.M (Research & Development) |
| v. Mr. K.M.U.C.B. Kulathunga | - Assistant General Manager (Operation) |
| vi. Mr. R.R.G.R. Rajapaksha | - Assistant General Manager (R & D) |
| vii. Mr. D.G.S. Wickrama | - Assistant General Manager (Project) |

Statement of the Chairman and Board of Directors

The responsibilities related to the use of ground water resources in Sri Lanka have been vested in the Water Resources Board by the Water Resources Board Act No. 29 of 1964 and Water Resources Board (Amendment) Act No. 49 of 1999. Accordingly, the Gazette Extra Ordinary No. 2010/23 has been issued on the 16th of March 2017 for the proper management of ground water resources. The primary objectives of the Water Resources Board can be considered as conservation of Sri Lanka's ground water resources for future generations, preparation of management plans for the proper use of ground water resources for sustainable development and conducting research studies on ground water and provide relevant recommendations.

Accordingly, 398 ground water surveys have been conducted on the requests of government and private institutions to find suitable locations to obtain ground water and determine the impact on the groundwater level and the environment due to the excavation of soil, gravel, sand, clay and metal and recommendations have been made in this regard. Further, construction of 53 tube wells for drinking, industrial and agricultural purposes have been completed in the year 2023 based on the ground water surveys, which have been conducted and 190 water capacity tests have been conducted for various institutions under the regulation of institutions for ground water extraction and recommendations have been made. 397 water samples have been analyzed by the laboratory under commercial activities.

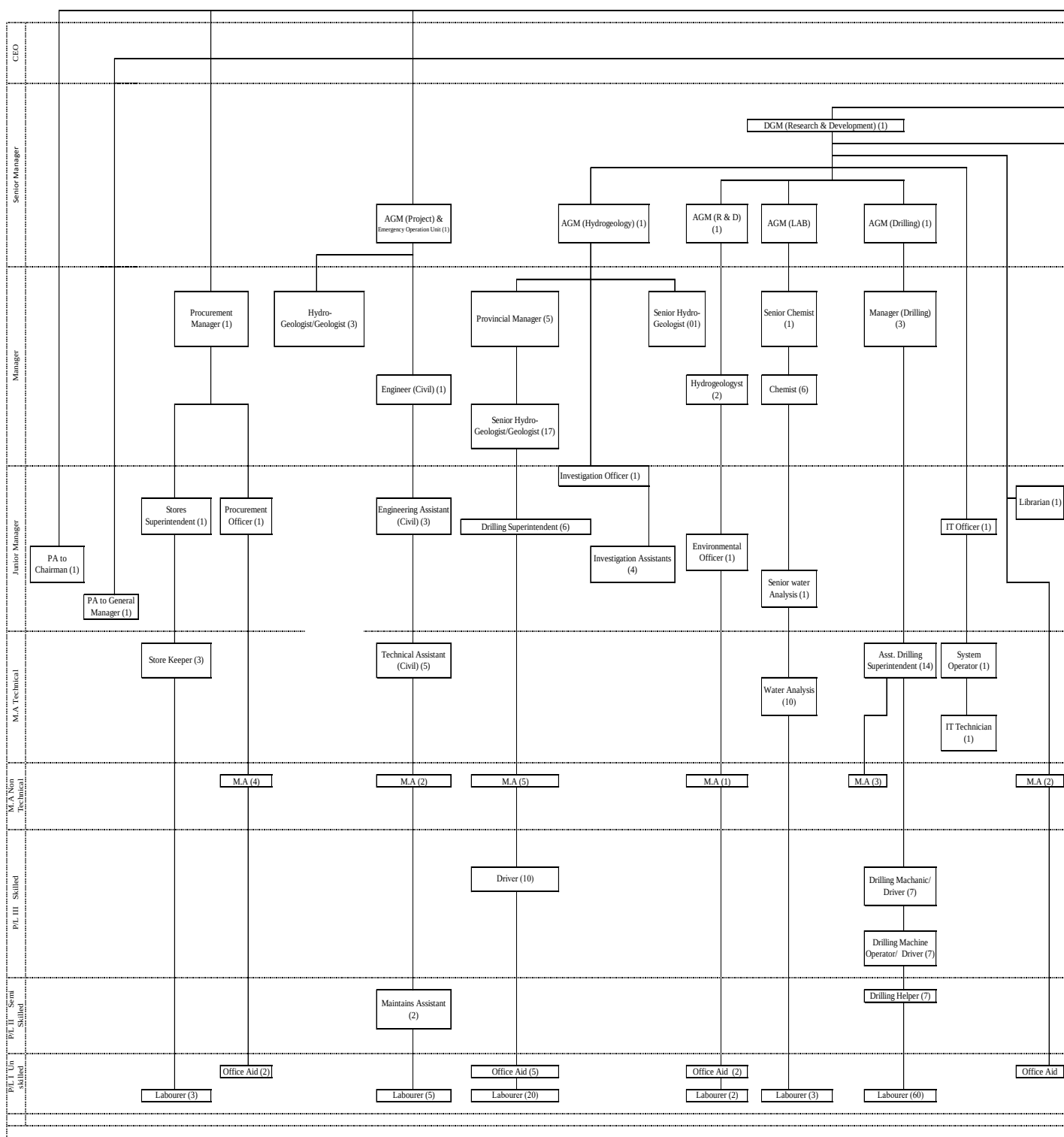
Under research studies, the Water Resources Board conducts studies on the changes in groundwater levels and its quality in the sensitive zones of 18 districts as a long-term process and uses the results for the regulation and management strategies of groundwater resources. The Water Resources Board is constantly updating a database of groundwater resources and carry out operations accordingly through the automatic measurement data systems installed on the quantitative and qualitative behavior of groundwater resources and all the information related to groundwater in other research studies. Further, artificial groundwater recharge methods are currently being implemented at several locations as pilot studies for the regions that have been identified with excessive groundwater extraction and minimum natural recharge of groundwater. It is planned to use this recharge method in other parts of the country based on its results and effectiveness.

Arrangements have been made to regulate the institutions of extracting groundwater and external institutions of drilling tubewell to manage and utilize groundwater and the Water Resources Board Act has been amended and forwarded to the Ministry for further regularization. Plans have been prepared for sustainable use of groundwater resources in the country.

Processes of collecting basic information on the use of groundwater resources and its extraction at the level of Divisional Secretary's Divisions covering the entire country is being implemented as a major step under this programme.

Thus, it should be mentioned that the responsibility of protecting water for the future generations through the protection and proper utilization of groundwater resources is carried out with the above commitment.

ORGANIZATIONAL STRUCTURE





Cadre Information as at 31st December 2023

Salary Scale	Approved Cadre Permanent	Existing Cadre Permanent
HM	12	04
MM	47	31
JM	27	10
MA	92	50
PL	236	143
Total	414	238



Cadre Information as at 31st December 2023

Designation	Salary Scale	Approved cadre	Existing cadre	Vacancies to be filled
General Manager	HM	1	0	1
Dy. General Manager	HM	3	1	2
Asst. General Manager	HM	8	3	5
Provincial Manager	MM	5	0	5
Hydro Geologist/Snr Hydro Geologist	MM	24	23	1
Engineer (Mechanical)	MM	1	0	1
Engineer (Civil)	MM	2	1	1
Chemist	MM	7	5	2
Manager (Drilling)	MM	3	0	3
Internal Auditor	MM	1	1	0
Accountant	MM	1	0	1
Manager (Administration)	MM	1	1	0
Manager (Procurement)	MM	1	0	1
Legal Officer	MM	1	0	1
Senior Water Analyst	JM 1-1	1	0	1
PA to Chairman	JM 1-1	1	1	0
PA to General Manager	JM 1-1	1	1	0
Administrative officer	JM 1-1	2	2	0
Accounts officer	JM 1-1	1	1	0
Transport/Logistic Officer	JM 1-1	1	0	1
Environmental Officer	JM 1-1	1	1	0
Audit Officer	JM 1-1	1	1	0
Librarian	JM 1-1	1	0	1
IT Officer	JM 1-1	1	1	0
Engineering Asst (Civil)	JM 1-1	4	0	4
Engineering Asst (Mechanical)	JM 1-1	2	0	2
Stores Superintendent	JM 1-1	1	0	1
Procurement Officer	JM 1-1	1	1	0
Drilling Superintendent	JM 1-1	6	1	5
Progress Monitoring Officer	JM 1-1	1	0	1
Investigation Officer	JM 1-1	1	0	1
Technical Asst (Civil)	MA 2-2	7	1	6
Technical Asst (Mechanical)	MA 2-2	6	4	2
Asst. Drilling Superintendent	MA 2-2	14	10	4
Investigation Asst.	MA 2-2	4	0	4
Water Analyst	MA 2-2	10	10	0
Work Supervisor	MA 2-2	2	1	1
Workshop Supervisor	MA 2-2	2	0	2
System Operator	MA 2-2	1	1	0
Accounts Asst.	MA 2-2	2	0	2
Store Keeper	MA 2-2	3	2	1
IT Technician	MA 2-2	1	1	0
Management Asst.	MA 2-1	2	2	0
Management Asst.	MA 1-2	37	18	19
Security Officer/Asst.	MA 1-2	1	0	1
Drilling Mechanic cum Driver	PL 3	7	0	7
Mason	PL 3	3	2	1
Plumber	PL 3	4	0	4
Driver	PL 3	50	32	18
Welder / Fitter	PL 3	3	2	1
Motor Mechanic	PL 3	2	1	1
Latheman/Fitter	PL 3	1	1	0
Electrician	PL 3	1	0	1
Auto Electrician	PL 3	1	0	1
Tinker / Painter	PL 3	2	0	2
Heavy Machinery Mechanic	PL 3	2	0	2
Drilling Machine Operator cum Driver	PL 3	7	2	5
Drilling Helper	PL 2	7	0	7
Maintenance Helper	PL 2	3	2	1
CB Keeper	PL 2	1	0	1
Laboure	PL 1	105	78	27
Office Aide	PL 1	23	14	09
Security Guard	PL 1	14	09	05
Total		414	238	176

Major Activities

Construction of Tube Wells



Conducting pumping tests



Conducting geophysical investigations



Analyzing of water samples



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OPERATIONAL ACTIVITIES PERFORMED DURING THE YEAR 2023

Scope & Role of Water Resources Board

The Water Resources Board was established by the Act No. 29 of 1964 in 1965. The main scope of the WRB was to advise the Minister as per clause 12.1 in Act No. 29. From 1979, adjoining the Groundwater Division of the Department of Irrigation, Water Resources Board facilitates to carry out the mandatory activities under clause 12.1 of the Act whilst attending the groundwater explorations and development works as well. Accordingly, WRB has given priority for implementation of groundwater explorations, tube well constructions, hand pump installations in Mahaweli Development Areas and other dry zone areas implemented by Government funded rural water supply schemes such as integrated rural development projects in Monaragala, Hambantota, Puttalam, Kurunegala and Northern & Eastern provinces during this period.

With the increased demand for the groundwater for multiple purposes, the further responsibility was vested on Water Resources Board through the amendment of Act 29, 1964 in 1999 enabling expansion of its scope on groundwater development activities. At this juncture, further to tube well constructions & Hand Pump installations, WRB conducted research projects, studies, groundwater exploration programs and identification of productive aquifers contributing to national economic development and well-being of the community enhancing living standards of the people.

During the first decade of the millennium, there were marked increase of tube well construction within the country for numerous purposes by the private parties as well as stake holder agencies to tap limited water resources without following any scientific guidelines. This trend resulted in increased salinization by sea water intrusion, groundwater depletion by over abstractions, quality deterioration by contamination through anthropogenic processes at different areas of the country which had been identified by the groundwater studies carried out by WRB in these sensitive groundwater terrains at that time.

Groundwater quality and quantity deterioration encountered and experienced in the highly sensitive areas and the resultant public complaints had brought in pressure seeking a solution through a management plan by WRB to mitigate the possible impacts. In view of developments, WRB managed to convince the cabinet for publishing of an extraordinary Gazette No. 2010/23 in 2017 which has given WRB, the responsibility to regulate, control and manage the groundwater resources.

At present, WRB focuses basically towards the research, studies, monitoring and exploration of productive aquifers for use in strategically and economically important development projects in future plans. Further upon request WRB carry out necessary recommendations and impacts assessment on groundwater resources due to all sort of mining activities, tunnel constructions and any of nationally important development projects during the EIA, IEE, SEA levels. Such information and recommendations on assessment studies provide foundation for sustained management of groundwater resources of the country through systematic planning and implementation which included control and regulation components as well.

In addition, the future plans of WRB are directed towards the regulation and management practices on Groundwater resources of the country. Specially the ongoing Pilot project covering the three river basins (Malwathgu Oya, Daduru Oya & Kumbukkan Oya) will facilitate a systematic long-term groundwater monitoring network which is the fundamental platform providing the information for all aspect of future regulation and management plans. This will be expanded to all river basins of the country in the long-term plan. Meanwhile, Groundwater management study in eight Pilot river basins as a component of a pipeline Project which is presently at the initial phase for its commencement of operation. The amendment of the act also in operation which facilitates to strengthen the regulation and management of groundwater resources of the country.

WRB is the mandated Institution of the country responsible in all matters related to the groundwater resources. Considering this, the Board has given priority to the areas of research, monitoring, regulation and developing sustained groundwater management plans at river basin levels. Presently the Board has focused mainly on regulatory and management aspect of groundwater resources adhering to the National Water Resources Policy of the country.

Activities planned for year 2023

During the year 2023, the following projects & activities were scheduled to carry out as per the workplan. Basically, the projects and operations of activities are categorized into three areas.

- 1.) Treasury Grant Projects – Groundwater Resources Monitoring and feasibility studies on managed aquifer recharge and introducing management plans for CBO & RWSS areas have scheduled including skill & institutional infrastructure Development activities for the year 2023.
- 2.) Generated Activities – Activities of the groundwater users in the country as commercial activities (Hydrogeological investigations, tube well constructions, well cleaning, aquifer testing, water quality analysis) and regulations of the groundwater resources through necessary guidelines for the specific activities.

i.) Foreign Funded Projects

ii.) Implementation of Manage Aquifer Recharge Systems on Groundwater Resources within Community Base Organizations (CBO) & Rural Water Supply Schemes (RWSS)

The preliminary assessment on the feasibility for groundwater recharge in CBOs, RWSS is scheduled and subsequent implementation of Manage aquifer recharge (MAR) at two feasible sites have been scheduled based on the initial assessment studies during the year 2023. This is funded by UNICEF through the National Community Water Supply Department.

iii.) Subcomponent 1.3.2 “Strengthening of Groundwater Resources Management in Sri Lanka” under Integrated Water Resources & Watershed Management Project (IWWRMP)

Under the project of “Integrated Watershed & Water Resources Management” which is in operation presently by the Ministry of Irrigation, the subcomponent of Strengthening Groundwater Resources Management is scheduled to carry out its activities by Water Resources Board and the program will be continued from 2023 up to 2025.

The physical progress & financial achievement during this period is shown below under the aforesaid three main categories.

1.) Treasury Grant Projects (2023)- Rs. 20.0 Mn

Table 1: Treasury grant projects and allocations for 2023

#	Sub Projects/ Sub Activities	TEC (Rs. Mn)	Expected Benefits/ Results
1	Long-term Groundwater Monitoring Project (LTGM): Colombo-Negombo, Ampara, Mannar, Vavuniya, Kilinochchi, Jaffna, Anuradhapura, Polonnaruwa, Matale, Puttalam.	4.00	Assessment of water quality and GW level variations in highly sensitive GW aquifers of the country for long term management and planning
2	Study on Direct and Indirect Impact of Climate Changes on Groundwater Resources (SICC)	1.50	Assessment and evaluation of changes on GW resources due to climatic changes in Coastal areas of the country
3	Management of high groundwater abstraction zones within Maoya river basin (Ma-oaya)	1.40	Hydrogeological assessment and aquifer mapping for managing the GW resources within the Ma-Oya river basin
4	Combine Inspections on Groundwater Relating Environmental Issues (INSP)	1.50	Addressing for remediation and conflict resolution on issues of GW use for sustained management and make equality of water rights within the society
5	Development of Groundwater Atlas for Sri Lanka (GW-ATLAS)	0.60	Utilize the information for management of GWR, apply on IWRM and other development activities of the country
6	Emergency use for disaster events related to water sector (drought, floods, catastrophic event of contamination on GWR) (E-USE)	3.00	Addressing & remediation measures implementation on national level water related disaster events
7	Rehabilitation and improvements of WRB infrastructure (REIMP)	4.00	Infrastructure development of the institution
8	Development and management of groundwater resources in water supply schemes (DMWSS)	4.00	Enhance & manage of groundwater aquifers qualitatively & quantitatively within the identified highly vulnerable water supply schemes which is operated entirely by groundwater sources.
	Total	20.0	

1. Treasury Funded Groundwater Studies

1.1 Long term groundwater monitoring project in hydrogeologically sensitive terrains (LTGM)

Long term groundwater monitoring project is a combined program where the continuous groundwater level & quality monitoring is carried out at 14 areas in which WRB initially have performed groundwater studies & completed initial assessment.

At the beginning of this groundwater studies, test boreholes were constructed considering different groundwater issues that have identified in each project areas to establish long term monitoring network system of the respective areas. The number of constructed test boreholes and monitoring shallow wells are given in following table.

Table 2: Long term groundwater monitoring projects 2023

No.	Project Name	Area	Dedicated monitoring wells - constructed
1.	Detailed hydrogeological study on coastal sandy aquifer extended from Colombo to Negombo	Coastal sand belt from Colombo to Negombo	78
2.	Identification Suitable Areas for Groundwater Recharge in Puttalam District	Puttalam, Kalpitiya area	14
3.	Identification of hazardous minerals in Anuradhapura district	Anuradhapura District	32
4.	Hydrogeological studies in Vavuniya and Kilinochchi areas	Vavuniya, Kilinochchi	35
5.	Long term groundwater monitoring in Monaragala district	Monaragala district	29
6.	Hydrogeological study in limestone aquifer system in Mannar district	Mannar	40
7	Detailed hydrogeological study in Kirindi Oya River Basin	Kirindi Oya basin	25
8	Jaffna Well monitoring program	Jaffna Peninsula	43
9	Jaffna groundwater resources assessment under DSWRPP	Jaffna Peninsula	35
10	Polonnaruwa groundwater monitoring study	Polonnaruwa district	75
11	Mathale groundwater monitoring study	Mathale district	35
12	Malwathu oya – GWMNP	Malwathuoya basin	85
13	Maduru oya – GWMNP	Maduruoya basin	20
14	Kumukkanoya – GWMNP	Kumbukkanoya basin	20
15	Jaffna – GWMNP	Jaffna Peninsula	38
16	Puttalam – GWMNP	Puttalam	27
17	Trincomalee district	Trincomalee district	40

In addition to the above dedicated monitoring wells, the existing wells depending the fulfilling the objectives were also included into the long-term monitoring network systems of the respective areas. Water sampling, Water quality analysis, water level monitoring and update of monitoring information to identify the long-term variation of quality and quantity of the respective regions for managing of groundwater resources are the main activities and objective of the project.

Under these activities, progress is as follows.

Table 03: Progress of LTGM – 2023

	Activity	Target of the year 2023	Target of the year 2023 (%)	Progress of the year 2023
1	Water sampling	2491	100%	100%
2	Water quality analysis	2095	100%	62%

1.1.1 Coastal sand belt from Colombo to Negombo

The overall objective of the project is to identify, develop, manage, allocate and conserve the shallow sandy aquifer to achieve the maximum benefits without harming the environment.

Owing to industrialization and urbanization, this area has a higher growth rate and a higher population rate compared to other regions in Sri Lanka. Thus, the freshwater supply becomes insufficient. Although, groundwater one of the main shallow aquifers in Colombo and Negombo is substantially developed along the western shore and is bearing unconsolidated sandy deposits. Even though surface waters do not completely meet the demand, over 50% of the community relies on shallow drilled wells and tube wells that are already available as groundwater resources.

This aquifer is used to extract a sizable amount of water by numerous public and private entities, including the airport, BOI Katunayake, other industries, and hotels. With the water well sector expanding quickly, excessive groundwater extraction has a negative influence on the environment since it should be limited by aquifer features. The area would get salinized, lose portable water, and experience land subsidence as a result.

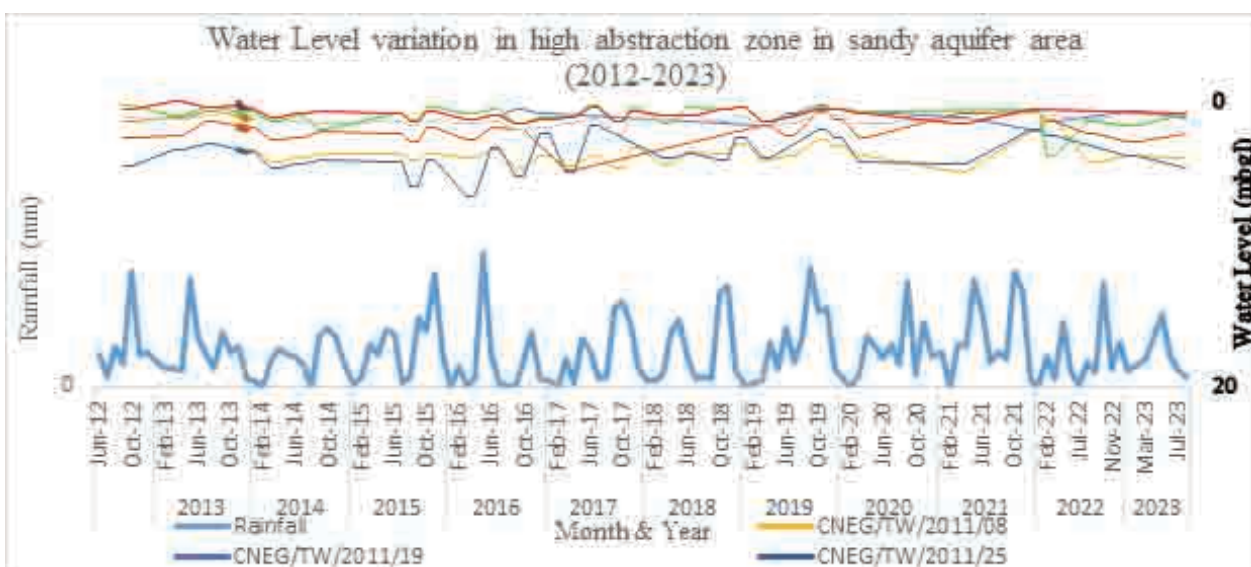


Figure 1: Water level fluctuation of the area from 2012 - 2023

To identify, develop, manage, allocate, and conserve the sandy aquifer to achieve the maximum benefits without harming the environment Water Resources Board Sri Lanka initiated a Long Term Monitoring Network that assessed the impact of anthropogenic and natural activities on coastal sand aquifer extending from Colombo Negombo region.

Wells located in a high-abstraction area follow the rainfall pattern for the last 11 years. There has been no significant variation in water level changes for the past 11 years in high abstractions.

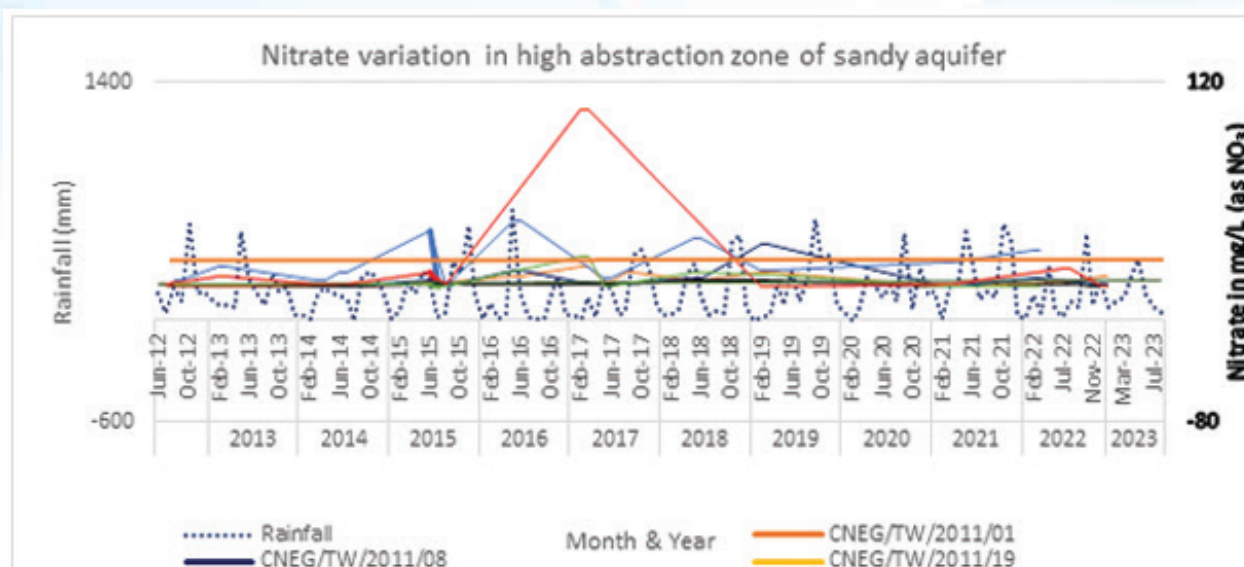


Figure 2: Nitrate variation of the area from 2012 - 2023

Nitrate variation over the past 11 years is under the permissible level of 50 Nitrate in mg/L (as NO₃) except for CNEG/TW/2012/34 in February 2017.

1.1.2 Puttalam District

The study was commenced under treasury grant in year 2011 and completed in 2015. After completion of the project, the monitoring network was selected for long term monitoring under LTGM project.

Objectives of the project are to identify impact on groundwater due to over extraction, understand about the sea water intrusions, understand about the groundwater usage pattern of the area, the availability of agrochemical and pesticides in groundwater resources, in order to establish suitable and sustainable groundwater resources management policies for the area. To achieve the objectives, temporal distribution of the water quality and water levels in Vanathavilluwa, Puttalam, Karuwalagaswewa, Mundalama and Kalpitiya Divisional Secretary Divisions were studied in a long-term manner. The summary of progress from January to December, 2023 is as follows.

Table 4: Summary of progress of the project activities -2023

Description of the activity	Program for 2023	Progress of 2023
Quarterly ground water level monitoring & insitu analysis	214	214
Water Sample Collection	214	214
Full Chemical Analysis	60	60
Heavy Metals		
Analysis of Water Samples	214	214
Full Chemical Analysis	60	60
Heavy Metals		

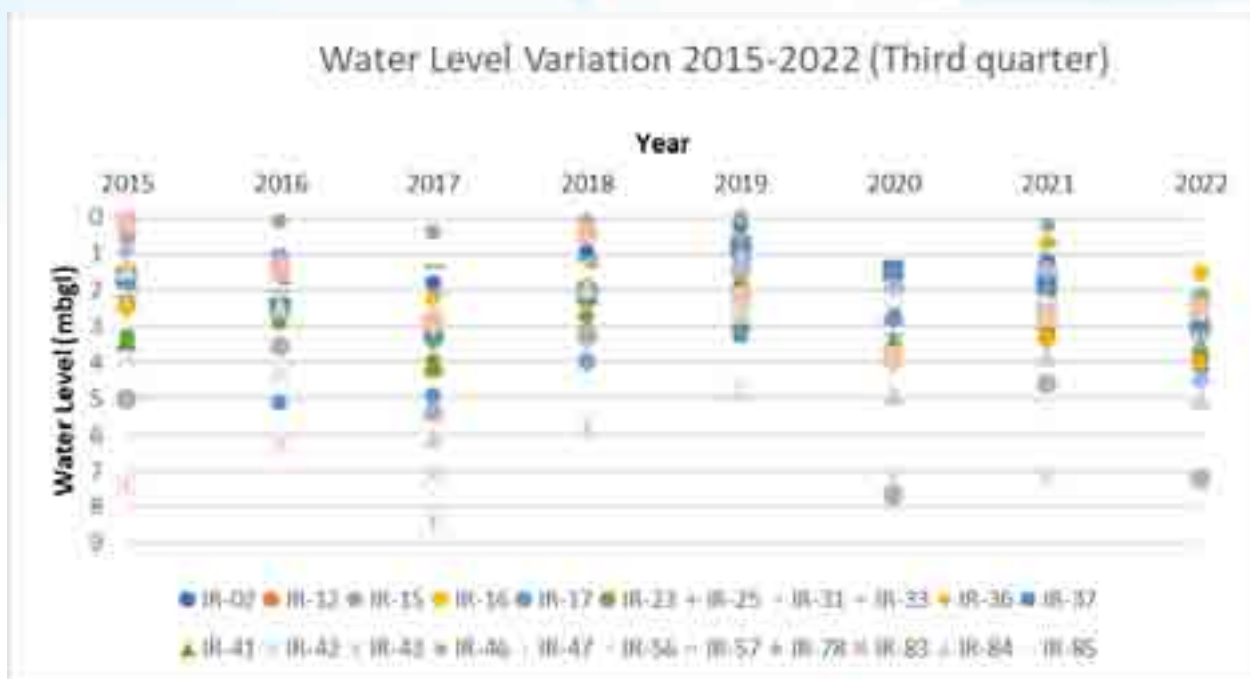


Figure 3: Water level fluctuation of the study area.

According to the above water level variation graph, water level of many wells in 2023, are deeper than water level of 2022. In 2019, Water levels have increased up to 2 m height in the rainy season in many areas by means these areas are adequate for the groundwater recharge.

1.1.3. Anuradhapura District

In an effort to mitigate the prevalence of Chronic Kidney Disease (CKDu) and other waterborne illnesses rampant in the Anuradhapura district, the Water Resources Research & Training Center organized water clinics. The primary objective was to raise awareness among rural communities regarding water quality and associated issues. Concurrently, since 2015, the monitoring of the established network has been consistently upheld. Initially initiated in 2011 through a treasury grant, the study aimed to identify water quality distribution in surface water, shallow and deep aquifers across diverse drainage basins in the Anuradhapura district. Specific recommendations for subsequent studies on water quality distribution, encompassing long-term monitoring, were also part of the project's scope.

Throughout the year 2023, activities were diligently executed, with a focus on 90 selected sampling locations for comprehensive monitoring. The project encompassed in-situ data collection and laboratory analysis of water quality. Table 5 provides a breakdown of the numerical representation of each activity. This comprehensive approach ensures a holistic understanding of the water quality landscape and lays the foundation for evidence-based recommendations to address the waterborne health challenges in the Anuradhapura district.

Table 5: Activities carried out during the year 2023 under LTGM Project-Anuradhapura.

No.	Activity/Description	No. of items
1	Collection of Water Samples and groundwater level monitoring	167
2	Insitu Analysis of Water Samples	167
3	Chemical Analysis of water samples	
	Full chemical analysis	167
	Heavy Metal analysis	Not proceeded

**Figure 5:** Conducting Well monitoring and water sampling at Anuradhapura area.

1.1.4 Kilinochchi District

In the beginning of the project, following objectives were concerned to fulfill and after achieving all tasks of first stage, Long Term Groundwater Monitoring (LTGM) was conducted since year 2015.

- To identify Groundwater potential areas
- To identify Aquifer Parameters
- To identify the groundwater sources for small scale irrigated agriculture and drinking purpose

The main objective of the project was to identify groundwater potential areas and to see the possibility of developing groundwater sources for future drinking water and small scale irrigated agricultural projects. A specific objective of the study was to identify the aquifer parameters; it is extensions and demarcates the groundwater potential areas within the Kilinochchi district. It was expected to identify the groundwater sources for small scale irrigated agriculture and for drinking purposes of the people in district with the intention of upgrading the living standards of the people.

This project was started on year 2013 and prominent scopes were completed during 2013-2014 time period. Then after scope of the project was narrowed to monitoring of groundwater in established groundwater monitoring network. In this setup, during years 2019,2020,2021,2022 and 2023 it was focused to monitor groundwater quality and quantity variation of the district.

In the year 2023 1st and 3rd quarter, selected 20 sample locations were monitored and samples were collected for chemical analysis in the laboratory.

Table 06: Activities carried out during the year 2023 under LTGM Project - Kilinochchi

Activity/Description	No of items
Collection of water samples	39
In-situ Analysis	19
Water Level monitoring	34
Full Chemical analysis	39
Heavy Metal analysis	10

1.1.5 Vavuniya District

The main objective of the project is to identify groundwater potential areas and to see the possibility of developing groundwater sources for future drinking water and small scale irrigated agricultural projects.

A specific objective of the study is to identify the aquifer parameters; it is extensions and demarcates the groundwater potential areas within the Vavuniya district. It is expected to identify the groundwater sources for small scale irrigated agriculture and for drinking purposes of the people in the district with the intention of up grading the living standards of the people.

This project was started on year 2013 and prominent scopes were completed during 2013-2014 time periods. Then after scope of the project was narrowed to monitoring of groundwater in established groundwater monitoring network. In this setup, during years 2019, 2020, 2021, 2022 and 2023 it was focused to monitor groundwater quality and quantity variation of the district.

Table 07: Activities carried out during the year 2023 under LTGM Project - Vavuniya

Activity/Description	No of items
Collection of water samples	34
In-situ Analysis	17
Water Level monitoring	33
Full Chemical analysis	34
Heavy Metal analysis	10

1.1.6 Monaragala district

This project was implemented to understand about the groundwater chemistry and the water level fluctuations of Monaragala district. The objective of this project was to aware the community regarding the water quality in different areas and aware about the necessary treatment methods and systems to enhance the drinking water standards.



Figure 6 : selected well monitoring network



Figure 7: Water sample collection in Monaragala area

The following graph shows the water level fluctuation over the monitoring period. Most of the wells have it's deepest water level in the 3rd quarter of year 2022. The second most deepest water level record in 2nd quarter of the year 2020. Those wells are distributed in different area and the water level fluctuation is mainly controlled by the local rainfall.

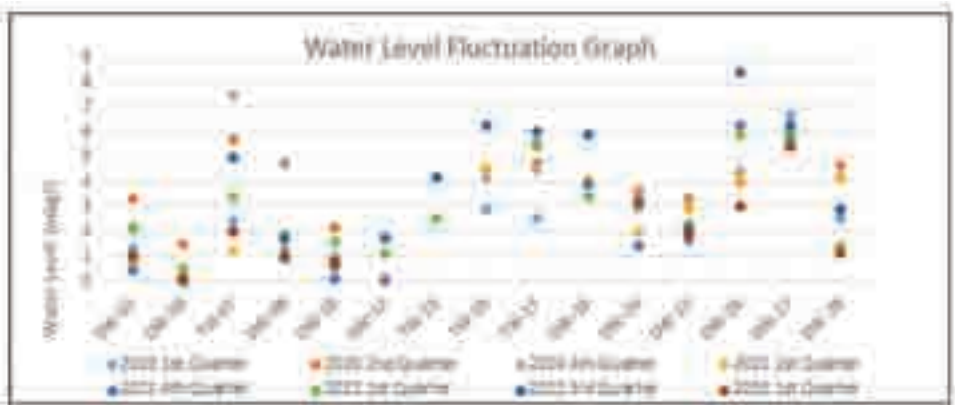


Figure 8: Water level fluctuations of Monaragala district

1.1.7 Kirindi Oya

Kirindi oya river basin is situated in the southeastern part of Sri Lanka and is located between latitudes of 6.904° and 6.187° N and longitudes of 80.987° and 81.331° E. The Kirindi Oya river is 118 km long and is fed by a catchment area of 1,203 km² (Abeysingha et al., 2016). The Kirindi Oya basin spreads over Badulla, Monaragala and Hambanthota districts of the Provinces of Uva and Southern. The study area is bounded by Mahawali Ganga basin in the north, Walawe Ganga and Malala Oya basins in the west, Manik Ganga basin in the east and Indian Ocean in the south.

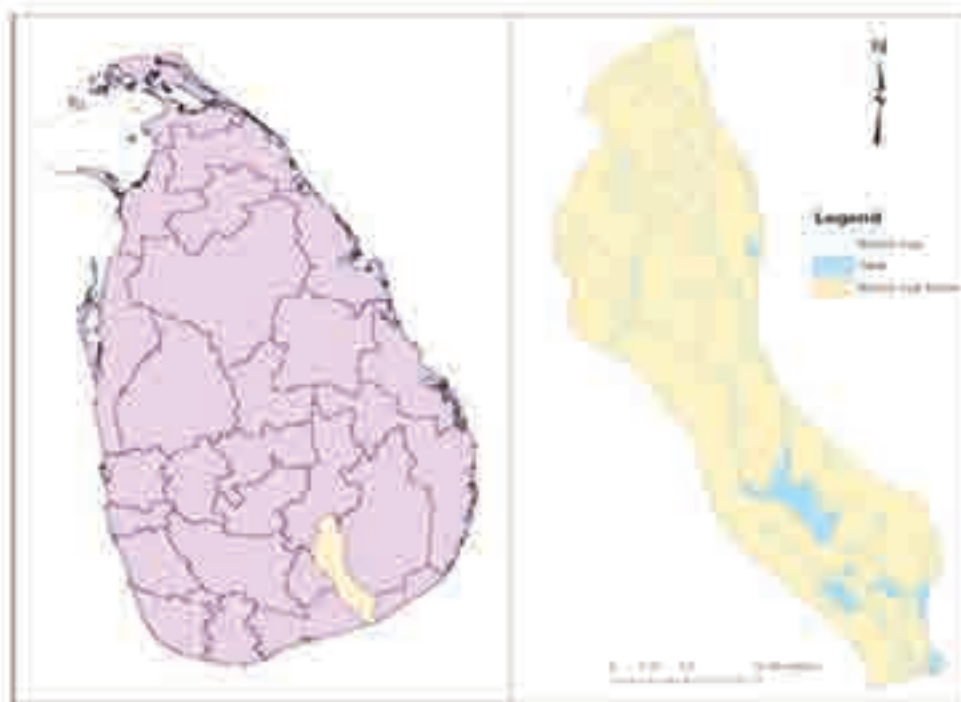


Figure 9: The map showing the study area.

The climate of the area is tropical and is characterized by nearly constant year-round temperatures (260 –280C). The study area falls within the low-country dry zone and low-country intermediate zone. Evaporation is uniform throughout the year, with an annual average approximating 2,000 mm. Mean annual rainfall is 1,000 mm with the maha(wet) season rainfall (October-March) approximately three times that of the yala(dry) season (April-September) (IIMI 1995a)(Bakkar et al., 1999).

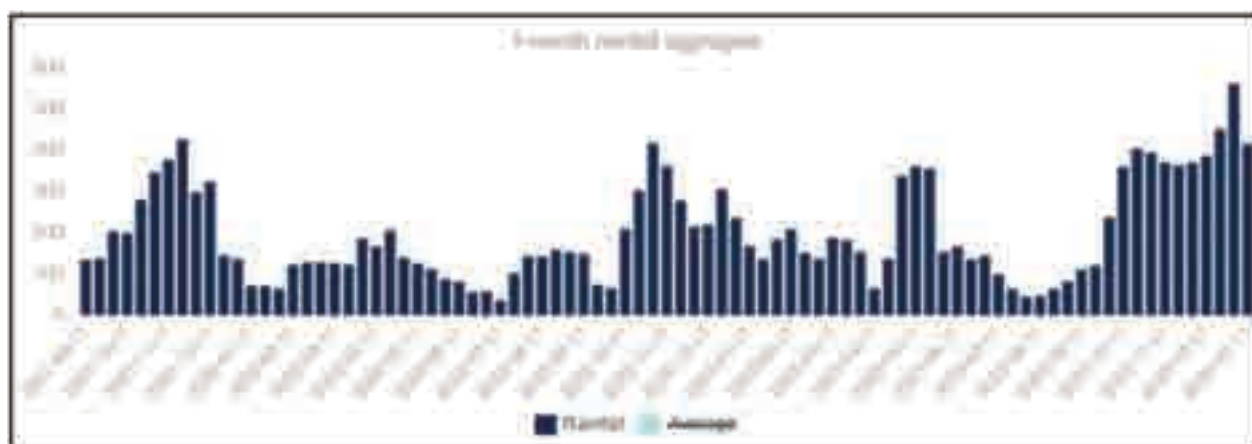


Figure 10: Monthly rainfall pattern in 2022 and 2023

There are 25 samples were collected for the analysis in quarter basis.

Electrical conductivity

According to the Data set, Electrical conductivity values are significantly different in 2022 and 2023 years. In first quarter 2022 EC values are higher than first quarter 2023 EC values. High EC values are showing in Thanamalvila and Lunugamvehera DS area. But all values are within permissible levels.

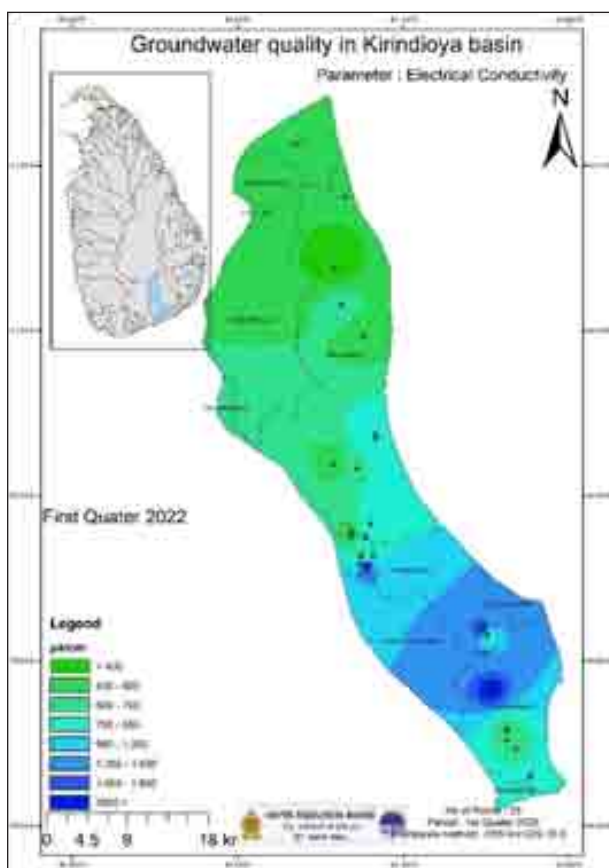


Figure 11: EC distribution in 2022 1st quarter

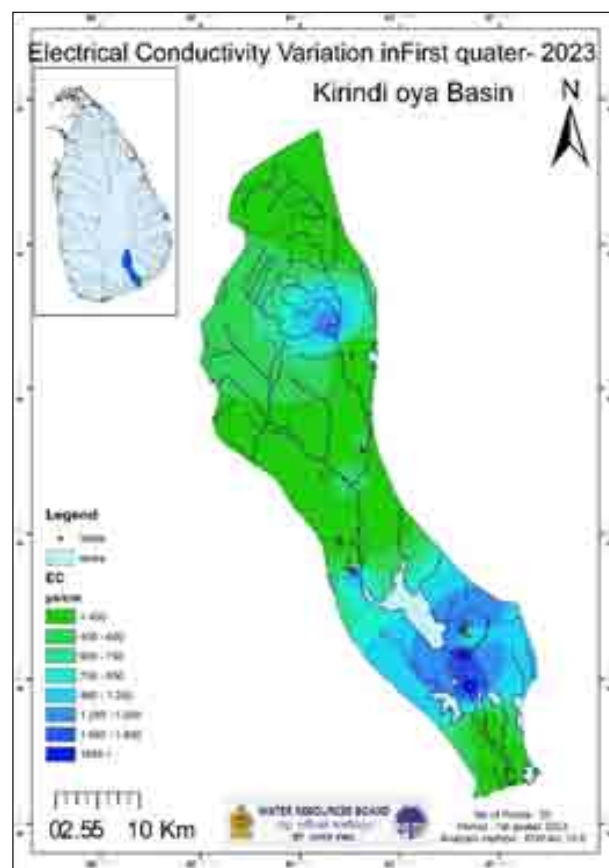


Figure 12: EC distribution in 2023 1st quarter



Figure 53: EC value variation chart 2022 1st Quarter and 2023 1st Quarter.

Total Hardness

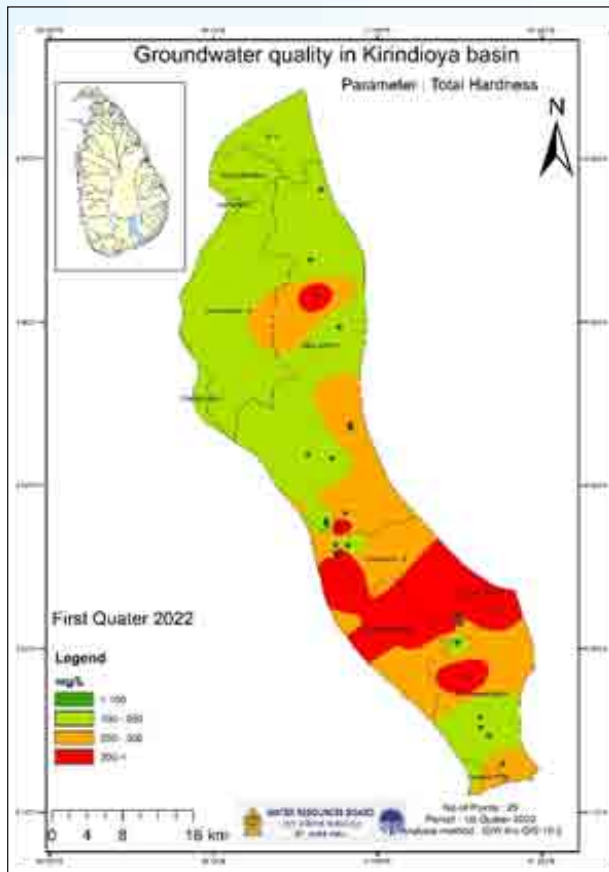


Figure 14: Total Hardness Distribution in 1st Quarter 2022

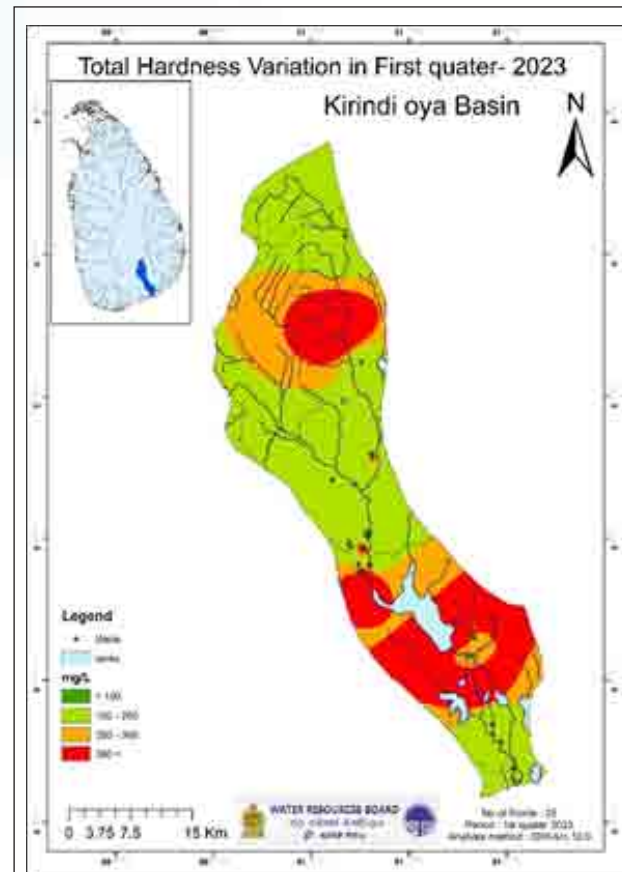


Figure 15: Total Hardness Distribution in 1st quarter 2023

Total hardness values are showing high values in Thanamalvila and Lunugamvehera area.

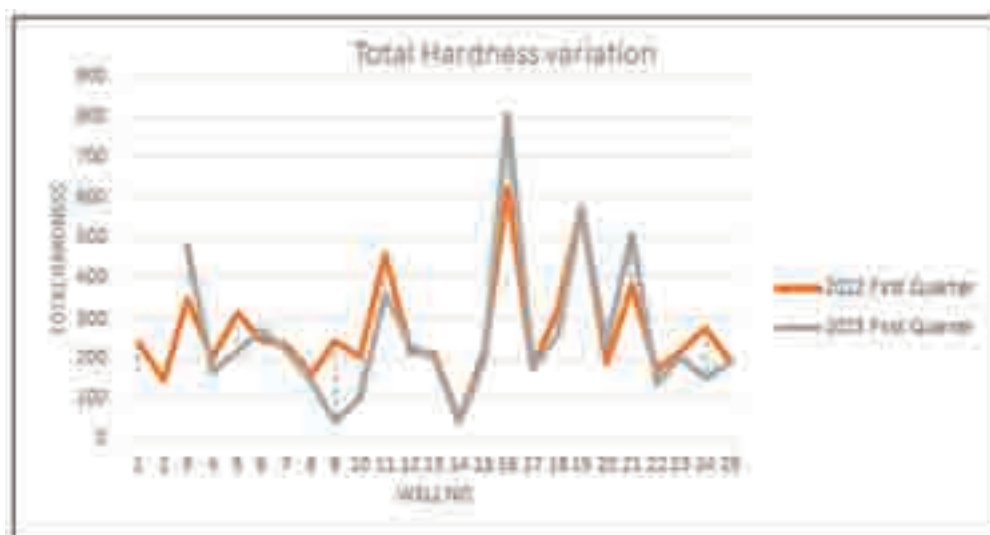


Figure 16: TH value variation chart 2022 1st Quarter and 2023 1st Quarter

Table 8: Progress 2023

Activity/Description	No. of items
Collection of Water Samples and groundwater level monitoring	50
Full Chemical Analysis	25
Heavy Metal analysis	Results not received

This study reveals the quality of groundwater in Thanamalwila and Lunugamwehera areas of Monaragala district is poor with respect to the values of EC and TDS. Therefore, the groundwater in these areas is not satisfactory for drinking purposes and it is highly recommended to use proper filtering system to provide drinking water to the rural community in these areas.

Most tube wells are occupied with hand pumps, and water levels cannot be measured using those wells. Therefore, another method should be applied to measure the groundwater level

1.1.8 Jaffna peninsular

Geology in the Jaffna peninsula comprises five types of significantly distinguished features. Miocene Limestone and the Red bed cover the top middle of the Peninsula, while Dune sand/Beach sand is restricted into the Eastern coastal region and a thin layer of northern coastal from Karainagar side to Point Pedro. The rest of the Peninsula is covered by unconsolidated Brownish Gray coastal sand, while that of the marginal areas are by Lagoon/Estuarine deposits. It's noted that the groundwater quality is varied and interrelated with these geological setups in the region. Shallower and deeper aquifers are encountered in the district with different water qualities, and this study covered the entire Peninsula to monitor the temporal and spatial distribution of water quality with time. This comprehensive assessment study provided a platform to acquire a broad knowledge of the current status of quality and quantity and impacts due to anthropogenic activities and natural phenomena such as seawater intrusion due to climate change.

Water level measurements and water quality analysis was conducted for the selected 121 numbers of wells representing shallow and deep aquifers of the district. Chemical analysis was conducted at the well site and in the laboratory. Laboratory testing for selected parameters followed by comprehensive physical and chemical analysis to identify quality deterioration and freshwater lenses intact.

Throughout the year 2023, activities were diligently executed, with a focus on 121 selected sampling locations for comprehensive monitoring. The project encompassed in-situ data collection and laboratory analysis of water quality. Table 2 provides a breakdown of the numerical representation of each activity. This comprehensive approach ensures a holistic understanding of the water level variation over the year and water quality changers within the Jaffna peninsula.

Table 9: Activities carried out during the year 2023 under LTGM Project-Jaffna & Islands

No.	Activity/Description	No. of items
01	Collection of Water Samples and groundwater level monitoring	224
02	Insitu Analysis of Water Samples	224
03	Chemical Analysis of water samples	
	Full chemical analysis	224
	Heavy Metal analysis	76

1.1.9 Polonnaruwa District

Initiated in 2014 under a Treasury grant, this study focuses on the Polonnaruwa District with the primary aim of identifying water quality distribution in areas affected by Chronic Kidney Disease of unknown etiology (CKDu). The summary report of activities conducted from January 2023 to December 2023 is outlined below.

Throughout this period, the study rigorously pursued its main objective, undertaking a comprehensive analysis of water quality in CKDu-affected regions in Polonnaruwa. The project encompassed various activities, including field investigations, in-situ data collection, and laboratory analyses. These endeavors aimed to provide a detailed understanding of the water quality dynamics, laying the groundwork for evidence-based interventions to address CKDu and related waterborne issues in the Polonnaruwa District.

The commitment to this study, supported by the Treasury grant, underscores the importance of proactive measures in safeguarding public health in regions affected by CKDu. The detailed summary report serves as a valuable resource, contributing to the broader body of knowledge on water quality and its implications for community well-being in the Polonnaruwa District.

Table 10: Activities carried out during the year 2023 under LTGM Project-Polonnaruwa

No.	Activity/Description	No. of items
01	Collection of Water Samples and groundwater level monitoring	150
02	Insitu Analysis of Water Samples	150
03	Chemical Analysis of water sample	
	Full chemical analysis	150
	Heavy Metal analysis	-

1.1.10 Matale District

The Matale District exhibits distinct geological formations in comparison to other regions covered by the LTGM (Land Tenure and Groundwater Management) project in the North Central and Central Provinces of Sri Lanka. Characterized by calcium-rich rock formations, Matale presents unique challenges and opportunities in the realm of groundwater quality. Notably, the geological composition has positively influenced the productivity of groundwater aquifers in the area.

A significant concern arises from the heightened levels of hardness in the groundwater, marking a critical condition for the region. Recognizing the potential impact on water usability, a monitoring project was initiated in 2011, and its continuity has been maintained up to the present date. This sustained monitoring effort aims to comprehensively track and understand the variations in groundwater quality, with a particular focus on hardness levels.

The unique geological attributes of Matale, while contributing to groundwater productivity, also underscore the necessity for vigilant monitoring and management strategies. The ongoing monitoring project stands as a proactive measure, providing essential insights into the dynamic groundwater conditions of Matale District, essential for informed decision-making and sustainable groundwater resource management in this distinctive geological setting.

Summary of conducted activities from January 2023 to December 2023 is as follows.

Table 11: Activities carried out during the year 2023 under LTGM Project-Matale

No.	Activity/Description	No. of items
1	Collection of Water Samples and groundwater level monitoring	70
2	Insitu Analysis of Water Samples	70
3	Chemical Analysis of water sample	
	Full chemical analysis	70
	Heavy Metal analysis	Not proceeded

1.1.11 Trincomalee District

Commencing in 2018 under Treasury Grants, the ongoing study, initially focused on Chronic Kidney Disease of unknown etiology (CKDu) affected areas, expanded its scope to include the Trincomalee district, specifically targeting the Padavi Sripura DS Division. The primary objective of this extended study is to discern the water quality distribution in CKDu-affected regions within the Trincomalee district. The summary of activities conducted during the period from January 2023 to December 2023 is detailed below.

Throughout this timeframe, the study diligently pursued its primary objective by conducting an array of activities. These included field surveys, in-situ data collection, and laboratory analyses, all aimed at comprehensively understanding the water quality landscape in CKDu-affected areas of Trincomalee. The project's emphasis on meticulous data collection and analysis underscores its commitment to generating accurate and reliable information for informed decision-making.

This extension of the study to Trincomalee district reflects the commitment to addressing waterborne health challenges in diverse regions. The comprehensive summary of activities serves as a valuable resource, contributing essential insights to the ongoing efforts in understanding and mitigating the impact of CKDu in the Trincomalee district.

Table 12: Activities carried out during the year 2023 under LTGM Project-Trincomalee.

No.	Activity/Description	No. of items
1	Collection of Water Samples and groundwater level monitoring	80
2	Insitu Analysis of Water Samples	80
3	Chemical Analysis of water sample	
	Full chemical analysis	80
	Heavy Metal analysis	Not proceeded

1.1 The Study on the Direct and Indirect Impacts on the Climate Changes on the Coastal Aquifer System of Sri Lanka

Climate change causes the melting of ice which in turn leads to sea level rise. Climate change also causes ocean warming, acidification, coastal erosion, and saltwater intrusion into freshwater sources. Island countries like Sri Lanka are highly vulnerable to the adverse impacts of sea level rise. According to the current projection, the sea level might rise by 0.2-0.6 meters by 2100 (IPCC). The water resources in areas bordering seas, and coastal aquifers are important sources of fresh water. One of the major problems that occurs in coastal groundwater aquifers is saltwater intrusion. Saltwater intrusion reduces the available fresh groundwater resources in coastal aquifers. So, information on the local or regional impacts of climate change on coastal water resources is becoming more important. The Water Resources Board initiated a research study in the

year 2015 on the possible direct and indirect impact of climate changes on the coastal aquifer system of Sri Lanka by giving special emphasis on the coastal aquifer which extends from Colombo to Hambantota and Trincomalee coastal belt. The main objective of this study is to monitor the impact on groundwater due to climate change, mainly on coastal regions. The studies included monitoring of groundwater table concerning the monsoon seasons, test well drilling, yield testing, and water sample analysis to achieve the project objectives.

Water level measuring, Water sampling and Water sample analysis

The selected existing monitoring points have been shown in Figure 23 and 24. During the year, the continuous water quality and groundwater level monitoring is scheduled.



Figure 17: Established groundwater monitoring network (Colombo to Weligama coastal belt).



Figure 18: Established groundwater monitoring network (Trincomalee coastal belt).

- Colombo to Weligama coastal groundwater aquifer

To achieve the project objectives of this project following activities have been carried out during the year 2023.

Table 13: Progress 2023

Study area	Study area	Target of the year 2023 (Nos.)	Progress in 2023
Colombo to Hambantota coastal area groundwater Aquifer	Chemical analysis of water samples (50) & heavy metal analysis (15 nos.)	50 15	100%
	Quarterly water level monitoring & in-situ analysis (50nos.), biannual water sampling (50 for full chemical analysis & 15 for heavy metal analysis)	50 15	100%

Water sampling and well monitoring - 50 nos

To identification of salinity level changes in the coastal aquifer system of Sri Lanka through a proper groundwater monitoring network and to determination of the fluctuation of freshwater groundwater interface, we selected 50 nos. of shallow wells in the western coastal zone which exists from Colombo to Hambantota coastal strip. We have measured the water levels and Collected water samples for the first quarter in February and 3rd quarter to be collected in August. In each quarter 50 nos. of samples collected for full chemical analysis and 15 nos. of samples collected for heavy metal analysis. They were analyzed for 17 physical and chemical parameters.



Figure 19: Water Sampling and Measuring Water Levels

EC Variation

Study area EC fell within the maximum possible EC level for the year 2015 to 2023. Also, more than 75% of the study area fell into the EC level of less than $750\mu\text{s}/\text{cm}$. However, in several areas, areas around Koggala Lake, Midigama, and Netolpitiya we can see high EC values. (greater than $1000\mu\text{s}/\text{cm}$)

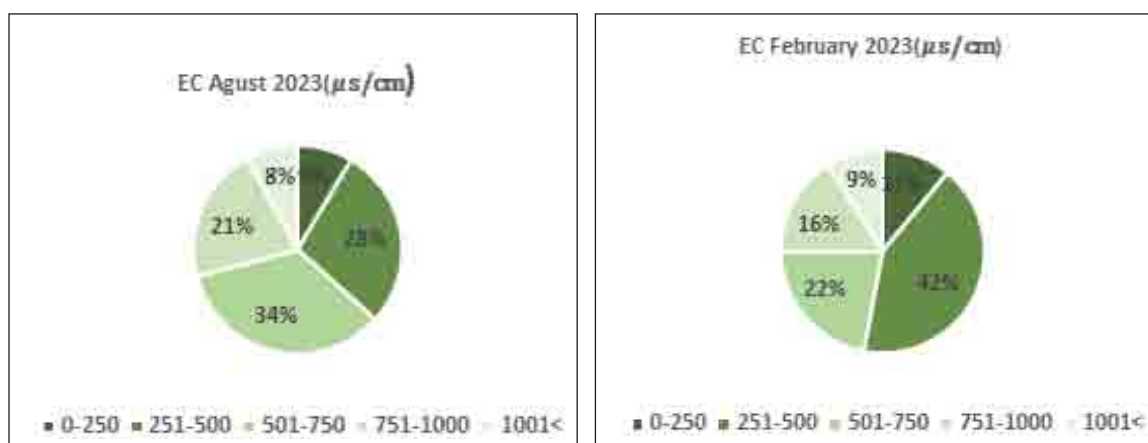


Figure 20: EC distribution of the area

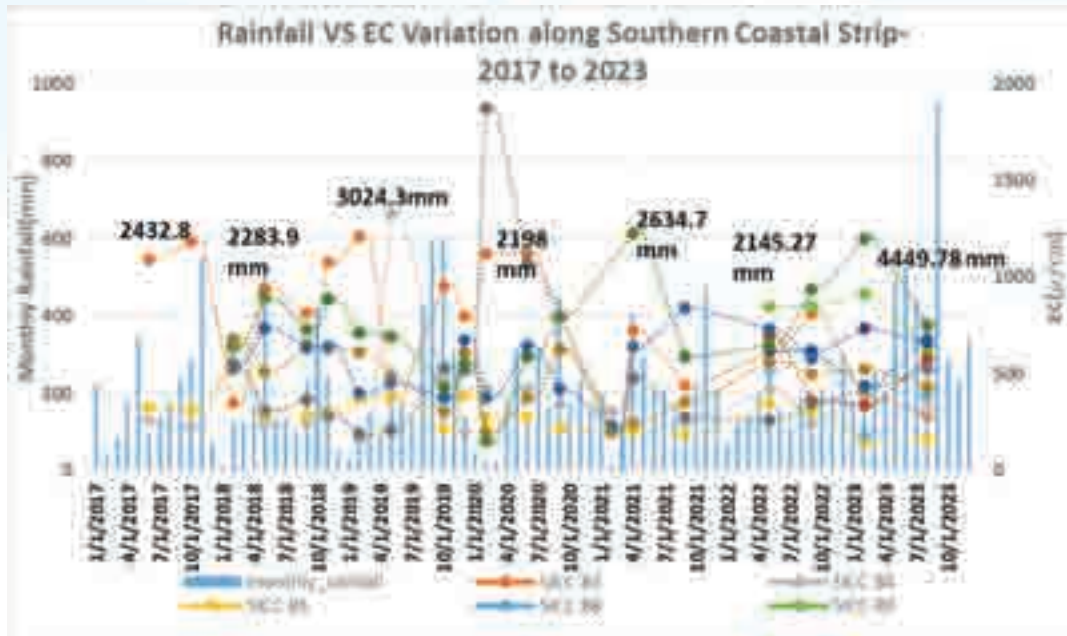


Figure 21: EC variation with rainfall from 2017 to 2023



Figure 22: Ec distribution maps 2023

We can observe the EC variation is in good agreement with the rainfall pattern.

- pH Variation**

pH level variation in the study area ranges from 7.0 to 8.5

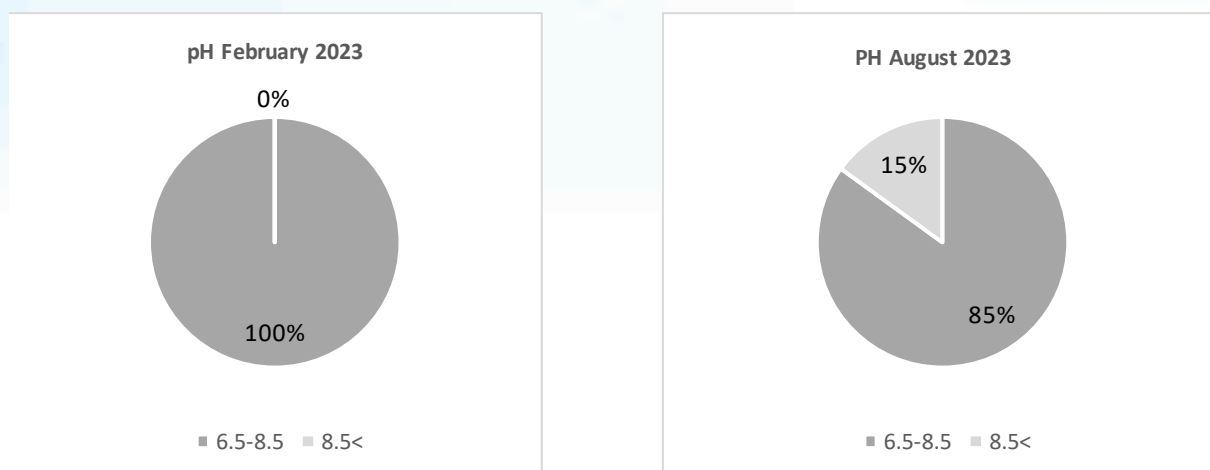


Figure 23: PH variation in 2023

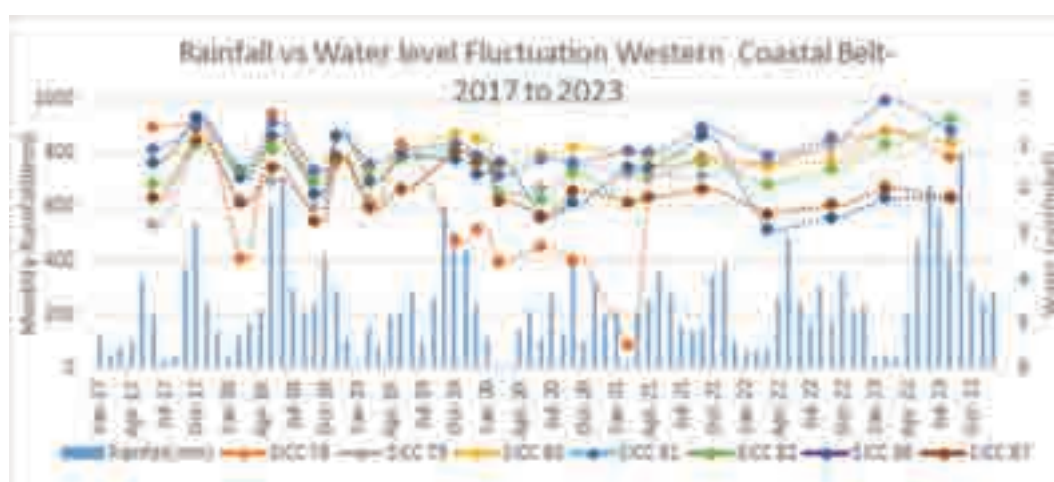


Figure 24: Water Level Variation with Rainfall from 2017 to 2023

We can observe the water level variation is in good agreement with the rainfall pattern and also can observe a relatively deeper groundwater table around the Benthota area than that of other areas.

Recommendations

- Based on the result of the study conducted so far (2015-2023), the water quality of most monitoring points is not changing considerably except in wells around rivers, lakes outfalls, and close to the sea.
- Further well monitoring using selected wells along the study area is necessary to identify the saline intrusion into the freshwater aquifer and to identify the other environmental impacts on the coastal aquifer.

1.3 Hydrogeological Assessment & Identify of favorable Aquifer recharge with in Ma Oya River Basin (Ma-Oya)

The middle part of the Ma Oya basin face to the groundwater scarcity in dry periods. Since the upper part of the basin receives a sufficient rainfall all over the year, it would be better to plan an artificial recharge system for the middle part of the basin. For this purpose, a detailed hydrogeological assessment is important.

Specific Objectives

- Identifying of high groundwater abstraction zones within Ma oya basin.
- Identify the capacity of groundwater resources (Productivity and water quality) and options for storage enhancement by artificial recharge.
- Adaptation of users for sustainable management and importance of groundwater storage for affective usages through necessary findings and recommendations.
- Follow up investigations on the implementation of recommendations and activities.

Activities done during the year -2023

- Carried out groundwater investigations to select suitable locations for test wells.
- Test well drilling (03 Nos.)
- Collected information of factories with high groundwater abstraction from central environmental authority
- Visited the factories with high groundwater abstractions and gathered information to check the possibility to implement groundwater recharge structures in that premises.



Figure 25: Groundwater investigations to find out the high groundwater potential zones in the Ma Oya basin

Table 14: Progress summary of Ma-Oya project -2023

Activity	Target	Progress
Identifying of high groundwater abstraction zones within the Ma Oya River Basin & Assessment of aquifer stress/ Impact Analysis	100%	100%
Identify capacity of GWR (productivity and WQ) & options for storage enhancement by artificial recharge	100%	100%
Adaptation of users for sustainable management & importance of groundwater storage for affective usages with necessary findings and recommendations	100%	90%

1.4 Combined Inspections on Groundwater relates issues

In addition to the above main groundwater studies, the combined inspections on the issues related to groundwater resources are carried out with the coordination of stake holder agencies. The most of the related activities are quarry mining influences on groundwater resources, illegal tube well construction and

tapping of groundwater at commercial scale without the necessary testing & guidelines obtained from Water Resources Board and water sharing & water right issues within the community.

During this year, altogether water Resources Board have attended for 149 number of such incidences in Colombo, Gampaha, Kurunegala, Puttalam, Anuradhapura, Monaragala, Kegalle, Mannar and Kalutara Districts with the participation of officers from CEA, GSMB, NBRO and other relevant authorities.



Figure 26: Join inspection at Nuwara Eliya area



Figure 27: Community engagement for groundwater issues due to soil excavation projects

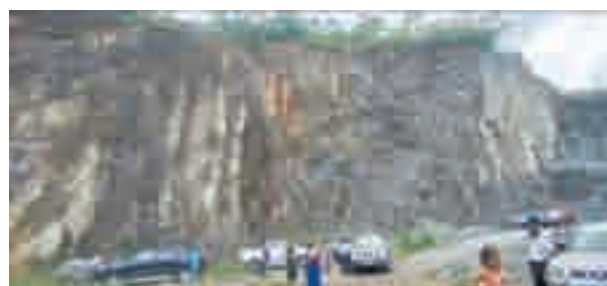


Figure 28: combine inspection at a rock quarry.

Table 15: Progress summary of INSP project- 2023

Activity	Target	Progress
Meeting & Combined inspection of Groundwater Resources (100 Nos.)	100%	149%
Implementation of Groundwater Regulations (Awareness programs on community & stakeholder Agencies) (25 Nos.)	100%	56%

1.5 Development of groundwater Atlas for Sri Lanka.

01. Introduction

In recent decades, groundwater resources have become economically and socially significant national resources. Nevertheless, a systematic and exhaustive atlas of groundwater resources has not yet been prepared, although there have been a few attempts in the past. The Water Resources Board is currently concluding a groundwater atlas for Sri Lanka with the aid of all available information pertaining to the groundwater sector, which would be useful for the long-term management of these limited resources. Moreover, the groundwater atlas has been opened for further discussion as in order to publishing a comprehensive output. The project was implemented in 2022 as a treasury-funded initiative under the Groundwater Studies and Infrastructure Development of the Ministry of Water Supply. The Atlas is intended to assist policymakers, water managers, and their respective technical staffs in making tough groundwater related decisions. It will also be informative for the general public and groundwater specialists.

The Groundwater Atlas has been prepared in a language that non hydrologists and professionals can understand. Simple language is used to explain technical terms. The principles that govern the presence, flow, and quality of groundwater in various climatic, topographic, and geologic environments are illustrated in detail. As a result, the Atlas will be considered as a teaching tool for courses in hydrogeology at the college level, as well as an overview of groundwater conditions for consultants looking for information on a specific aquifer/ Area. It also provides an introduction to regional and national groundwater resources for legislators, personnel from municipal, state, and governmental agencies, and anyone else interested in groundwater occurrence, movement, and quality.

The lack of reliable groundwater data and information was a serious obstacle to developing groundwater resources in Sri Lanka, as well as an extra barrier to doing research. This project's major goal was to provide detailed and relevant information about Sri Lankan groundwater resources to a variety of stakeholders, including:

- Hydrogeologists and other practitioners looking for knowledge and data on groundwater conditions in specific regions or country.
- Policy and decision makers that require an overview of a groundwater conditions and concerns.

02. Methodology

The Groundwater Atlas of Sri Lanka aims to compile, in a single publication in a consistent manner, the most important groundwater data collected over many years by the Water Resources Board.

The study was being progressed in a stepwise manner with the activities of a preliminary desk study to collect and collate all available information on groundwater resources, Data compilation, screening and processing of available information, Analysis of data & preparation of spatial water quality & quantity maps, preparation of vulnerability map on groundwater resources, preparation of hydro stratigraphic cross-sections and field verification of the processed maps. Due to the fact that the finances have to be cut off, field verifications have not been carried out in the present economic state of the country.

The atlas has been developed under 09 chapters and considering types of aquifers, deep study and discussion was carried out through 06 different chapters.

03. Outcome

In order to produce spatial maps, 7746 different sampling locations were considered. The maps are being prepared for the entire country as well as a series of spatial distribution within a few years past sensitive areas such as the Jaffna peninsula, the eastern and western coastline strips of the country, and the crystalline

Hardrock terrain considering the pre and post monsoonal period in the area. A few instances are provided below.

Distribution of Groundwater Level

- Average groundwater level distribution (MBGL) of the country illustrates the average groundwater level less than 10 meters from the existing ground levels except in some highland areas like Badulla district (30m – 60m) & North- Western coastal strip (10m – 30m).
- Groundwater level distribution with respect to the Mean Sea Level (MSL) follows the general elevation and higher altitudes and typically indicate above MSL.
- Low lands and coastal area groundwater level generally above, below (Ex- especially, Hambantota & Puttalam) and equal to the MSL due to local geological conditions .
- Distribution of general groundwater level in the country has been analyzed using 840 nos. of monitoring wells and time to time constructed boreholes by WRB since 1974.
- Spatial-temporal distributions and groundwater flow regimes for some hydrogeologically sensitive areas (Jaffna Peninsula & Western coastal sandy aquifer) have been prepared by the data gathered through continuous monitoring.

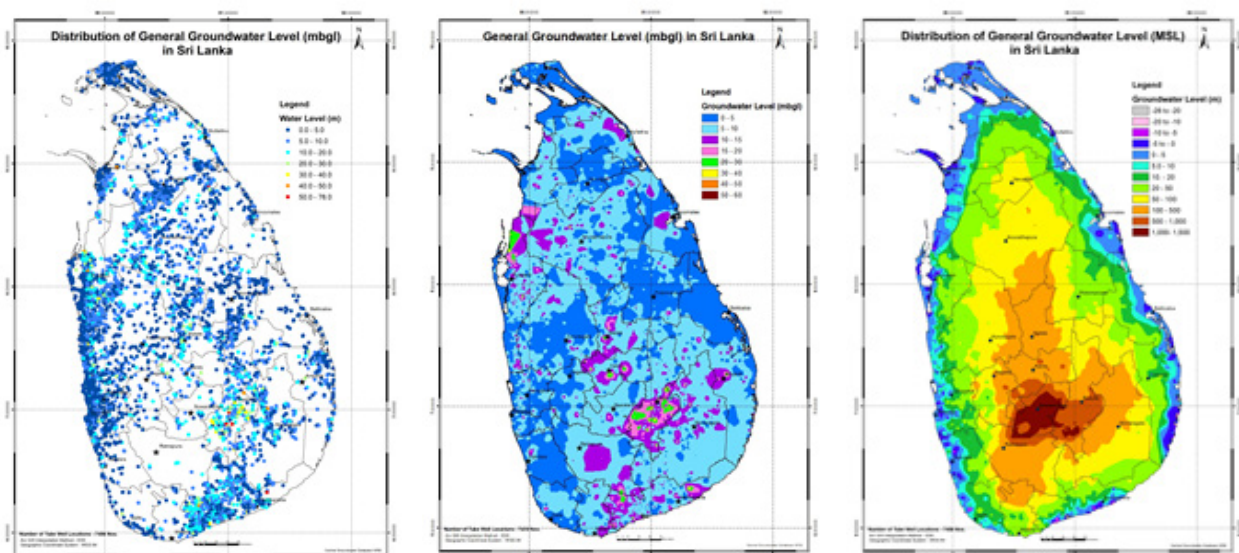


Figure 29: General groundwater level of Sri Lanka

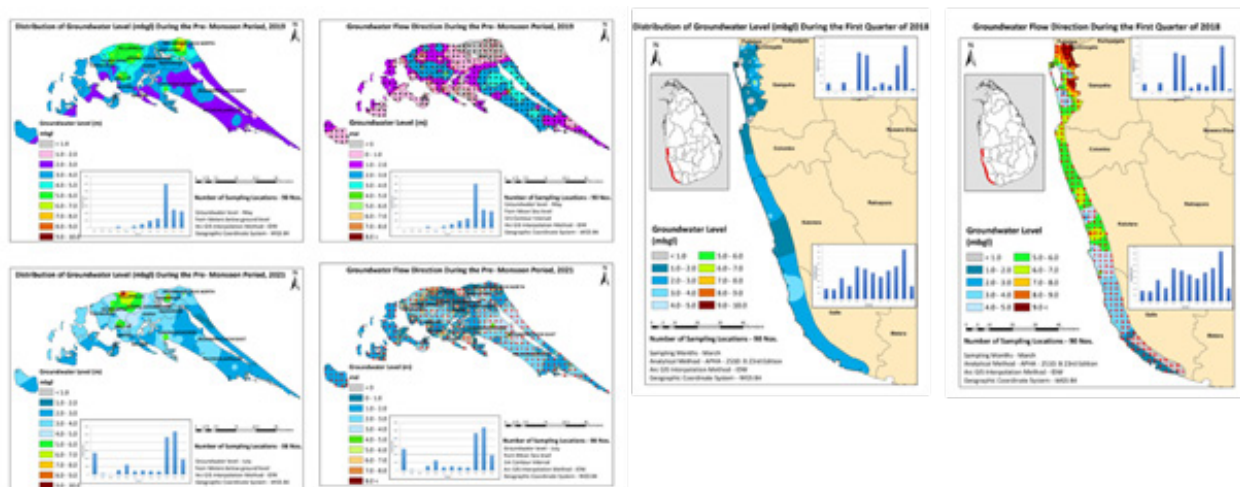


Figure 30: Groundwater flow direction maps

Distribution of Groundwater Quality

General distribution of groundwater quality with respect to the 9 parameters have been prepared using both monitoring wells and constructed tubewells. Distribution of Electrical conductivity, Nitrate, Total iron and Fluoride as follows

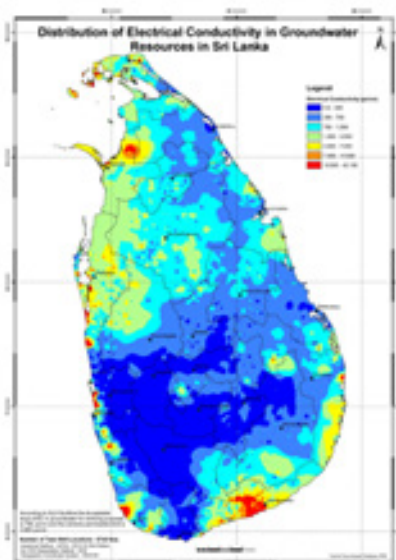


Figure 31: EC distribution of Sri Lanka

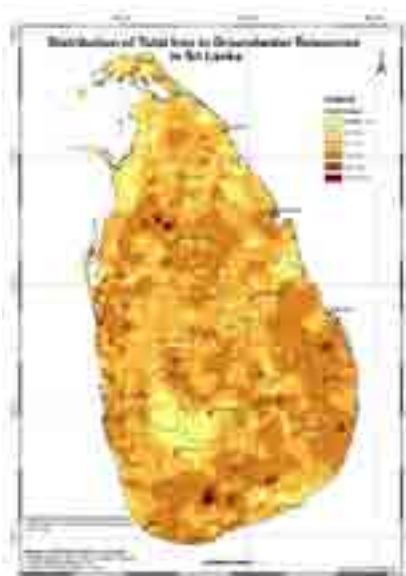


Figure 32: Iron distribution of Sri Lanka

- Jaffna peninsula - the groundwater has an EC range of 750 to 5,000 ($\mu\text{S}/\text{cm}$) due to the sea water enter towards the land area because of the low elevation and the seasonal fluctuation in rainfall patterns and high groundwater abstraction.
- Anuradhapura district – the groundwater EC ranges from 750 to 3,500 $\mu\text{S}/\text{cm}$ due to the weathering of rocks and the concentration of dissolved solids.
- Puttalam district, groundwater EC ranges from 1,500 to 10,000 $\mu\text{S}/\text{cm}$ due to the presence of saline aquifers.
- In coastal areas, seawater intrusion can cause elevated EC values in groundwater.
- Generally, highland areas exhibit low EC levels which may dissolved iron easily wash out through the stream network
- Total iron distribution in Sri Lanka's groundwater exhibits notable variations across different regions and geological formations.
- Iron presence and its associated levels are influenced by the specific characteristics of various areas.
 - Fe deposits in Anuradhapura; Eppawala
 - Eastern Provinc; Seruwila iron ore deposit
 - Several iron ore deposits are located in the Kurunegala and Kegalla Districts are typically associated with metamorphic rocks and are part of the country's iron-bearing geological formations.
 - In Western and southern region of the country presence of lateritic aquifer generally presence iron in groundwater due to consist of iron-rich minerals in lateritic formations.

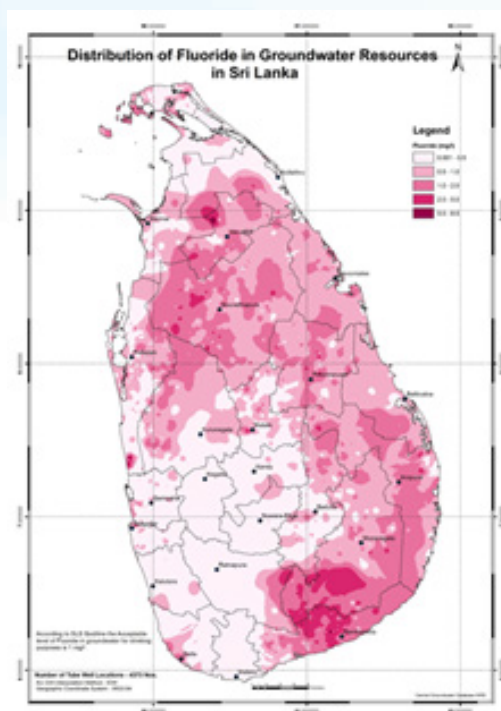


Figure 33: Fluoride distribution of Sri Lanka

The Dry Zone experiences higher fluoride levels in groundwater due to high temperature and extensive evaporation, which tends to concentrate dissolved fluoride bearing minerals in groundwater

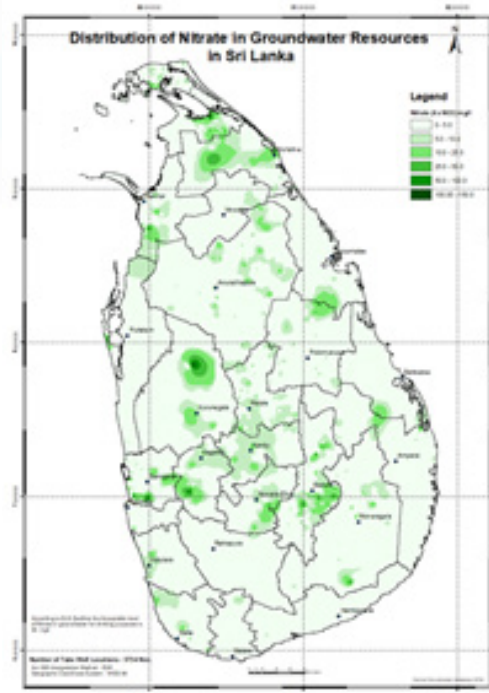


Figure 34: Nitrate distribution of Sri Lanka

Generally, Nitrate distribution in groundwater is remarkably less than its permissible level of 50 mg/l as NO₃ except few agricultural areas.

Hydro Stratigraphic Cross-sections

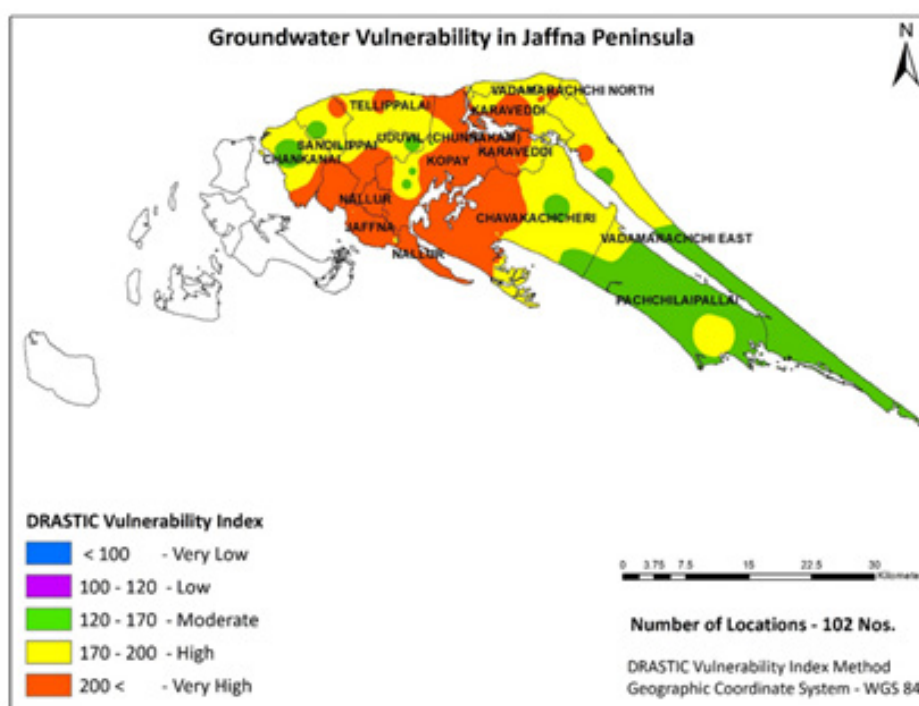


Figure 35: Groundwater vulnerability map of Jaffna peninsula

Groundwater Vulnerability

Using borehole information, a detailed vulnerability assessment for Jaffna peninsula has been performed to identify the hydrogeological characteristics which are significantly influence on aquifer vulnerability to contamination.

Assessing vulnerability for entire country is being conducted as a motive for further development of the Groundwater Atlas.

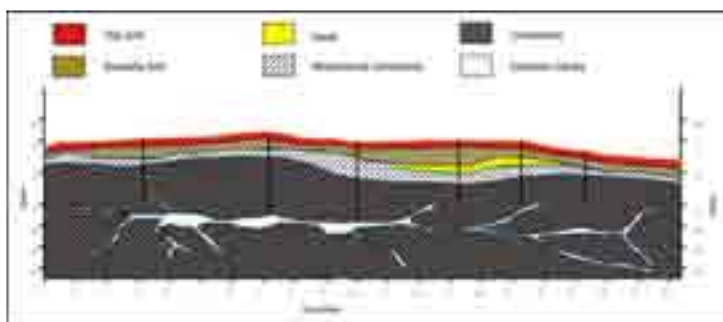


Figure 36: Cross section A-B

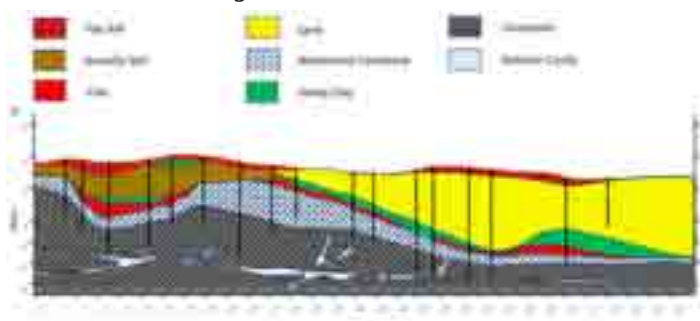


Figure 37: Cross section X-Y

Hydro stratigraphic Cross-sections for hydrogeologically sensitive areas were prepared to identify the presence of aquitards and confining units within the subsurface geology.

04. Further Development

For future sustainable water supply, and economic expansion groundwater atlas must be successfully and sustainably developed. In order to obtain a groundwater atlas that is both accurate and dependable, it is necessary to take into consideration further development along the following pathways.

- Before finalizing the Atlas report, obtain essential directions from an editorial board of groundwater experts, such as academic professionals.
- Publication of a handbook of groundwater atlas.

1.6 Infrastructure Development, improved capacity in scientific equipment and enhance of skill development within the Institution.

The renovation of Research & Training Center at Anuradhapura was completed while the expansion of officer quarters at A'pura was started but the construction activities have stopped by now due to financing constraint resulted by the economic crisis of the country.

Several scientific equipment such as Submersible pumps for the aquifer testing, Water level recorders which was in the requirement for the research activities of the year and proceeded for the procurement. However, the equipment was not procured due to the economic crisis resulting fund unavailability. Two nos of pH meters were only managed to procured during the year.

Table 16: Progress of REIMP - 2023

No	Activity	Target	Progress
1	Machinery & Vehicle Improvement	100%	100%
2	Reburshment of A'pura Research Centre	100%	50%
3	Improvement of fencing structure at Monaragala and Puttalam PM regional office	100%	100%
4	Maintenance of Laboratory and Geophysical Equipment	90%	95%

1.7 Emergency use for disaster events related to water sector (drought, floods, catastrophic event of contamination on GWR) (E-USE)

Groundwater explorations, construction of production boreholes and conducting pumping tests were the activities carried out according to requirements of the community with in the affected areas identified under this project in the year 2023.

Table 17: Details of constructed tube wells are as follows

No	Well No.	Location
1	EMUSE/2023/01	Angurumale, Unagolla, Hali Ela
2	EMUSE/2023/02	Kiulara S.K. Primary School, Thanamalvila
3	EMUSE/2023/03	Ch/St. Anthony's College, Thoduwawa
4	EMUSE/2023/04	Gamewela, Monaragala
5	EMUSE/2023/05	Eramina attamada, Allakona, Monaragala
6	EMUSE/2023/06	Saliyapura Shanthi Sewana Government Elder's Home, Anuradhapura

**Figure 38: Tube well construction**

Table 18: Progress Summary of EM USE project -2023

No	Activity	Target	Progress
1	Preliminary investigations and Groundwater exploration assessment Activities as per the requirement arises	100%	100%
2	Construction of production boreholes for provision as an alternative source for drinking requirement of the community with in the affected areas identified	100%	100%

1.8 Development and management of groundwater resources in water supply schemes (DMWSS)

As a consequence of ever-increasing water demand, climatic variabilities & improper management of abstraction has led to deplete & deteriorate of groundwater resources which has threatened its long-term sustainability. This is seriously affected on the groundwater dependent water supply schemes where the optimum & continuous supply of drinking water to the communities is interrupted & threatened by high vulnerability on the quality aspect as well. In some part of the country, the groundwater dependent water supply schemes had to abundant mainly due to these resources depletion & quality deterioration with time by aforementioned reasons. If no appropriate mechanism or strategies for adaptation & remediation is in place, the most of the groundwater dependent water schemes are susceptible for failure of providing the drinking water to the community which is a fundamental requirement & more ever the indicator of the country's prosperity.

This situation is aggravated & pronounced by the ever-increasing demand. The supply-demand management of water could only be addressed through appropriate management including adaptation strategies such as unearthing of adjoining potential aquifer zones or application of Managed Aquifer Recharge (MAR) mechanism for enhance the aquifer qualitatively & quantitatively. This enables the groundwater resources to maintain its sustainability in long-term basis.

Main Objective:

Identification of proper mechanism and management plan to enhance & manage of groundwater aquifers qualitatively & quantitatively within the identified highly vulnerable water supply schemes which is operated entirely by groundwater sources.

Study Area

The groundwater storage depletion due to increase of water demand, climatic variabilities, increased runoff, reduced areas of potential groundwater recharge zones have seriously impacted on the groundwater dependent water supply schemes (WSS) of the country, especially in dry areas in Sri Lanka. These WSS are now in a situation need for an emergency management plan to sustain its uninterrupted water supply operations. Therefore, introducing of a sustainable management planning would be benefitted to remediate the risk impact on the groundwater resources.

In the initial stage of this pilot project some CBOs that were identified as seriously impacted in Jaffna, Anuradhapura, Puttalam & Monaragala districts were selected for the study.



Table 38: Progress Summary of EM USE project -2023

Completed activities in 2023

- Identify 30 nos of high groundwater abstraction WSS and Identify of present & future groundwater demands of WSS
- Analysis of 6 real time monitoring Data & information to interpret the present aquifer stress and future forecast
- Conducted 12 pumping test to Assess the safe abstraction of the existing water sources based on the analysis & available information
- 55 Water Samples collected from 30 nos of CBO scheme to assess of groundwater chemistry
- Conducted 08, 2D geophysical investigations and 35, 1D geophysical surveys to assess of subsurface hydrostratigraphy

2. Generated Fund Activities

2.1 Commercial activities

The following commercial activities were performed on the requests made by Government and other organizations including public requirements.

1. **Groundwater investigations** - (to explore groundwater to construct tube wells, to give recommendations to ensure the groundwater protection in rock quarrying, soil and sand excavations areas and for other development activities in the country)



Figure 39: Conducting 1D resistivity surveys to understand about the sub surface conditions.



Figure 40: Conducting 2D resistivity surveys in central highway trace to understand about the sub surface



Figure 41: Groundwater investigations for soil excavation area



Figure 42: Monitoring of proposed rock excavation project area

2.2 Generated Funds (Commercial Activities) – Rs. 91.50 million

The following commercial activities (see Table 01) were performed on the requests made by Government and other organizations including public requirements. The progress of the year 2023 has shown in Table 01 and income generated by main government projects were included in the commercial progress. The main commercial projects are as follows,

- Rural water supply and sanitation development project - Ministry of Water Supply
- Implementation of manage aquifer recharge systems on groundwater resources within the community base organization and rural water supply schemes - Department of National Community Water Supply (UNICEF fund)
- Management plan for restoration of paliment lake catchment – Groundwater quality assessment within the parliament lake catchment – Ministry of Environment
- Groundwater monitoring of in and around the power plant premises as an environmental concern in Lakvijaya Power Plant -Ceylon Electricity Board

Groundwater investigations, design and construction of production tube wells, recharge wells, groundwater quality assessment, conducting of pumping tests and water sample analysis were mainly carried out by the Water Resources Board under the above commercial projects.

Table 01: Summary of the generated fund in year 2023

No.	Activity	Physical target 2023 (Nos)	Physical progress 2023 (Nos)	Progress of year 2023 %	Financial Target 2023 (Rs. Mn.)	Financial Progress 2023 (Rs.Mn)
01	Hydrogeological Surveys	350	398	113.71	91.50	101.708
02	Tube Well Constructions	75	53	70.67		
03	Pumping Tests	225	190	84.44		
04	Tube Well cleanings	10	21	210.0		
05	Analysis of Water Samples	500	397	79.40		

2. Tube well constructions

According to the requests of community, government and private organizations, WRB engage with tube well construction activities as a commercial activity. Hydrogeology division and the Drilling divisions are mainly engaged with these activities and there are 6 drilling machines for tube well drilling in all over the country.



Figure 43: Tube well drilling

3. Pumping tests

To ensure the groundwater protection and to determine the safe yield of production wells



Figure 44: Carrying out aquifer testing at a well site

4. Tube well cleaning

According to the requests of outside parties, tube well cleaning programs conducted by Water Resources Board as a commercial activity.



Figure 45: Tube well cleaning

5. Water sample analysis

According to the requests of the private parties, water samples are analyzed in the 3 laboratories of Water Resources Board. Water samples are analyzed to check whether the water quality is within the SLS drinking water standards.



Figure 46: Water sample analysis in the laboratory

The progress of year 2023 under generated funds is given below.

Table 19: Progress summary –2023

No	Activity	Target	Progress
1	Hydrogeological Surveys (350Nos.)	100%	114%
2	Tube Well Construction (75 Nos.)	100%	71%
3	Pumping Test (225Nos.)	100%	84%
4	Tube Well Cleaning (10 Nos.)	100%	210%
5	Water Sample Analysis (500 Nos.)	100%	79%

2.2 Groundwater Regulations

The summary progress of the Groundwater regulation activities commenced by the Water Resources Board in the year 2022 given as follows.

This year mainly focused to collect information of the Groundwater Resources utilized for the commercial, agriculture and domestic purposes in Divisional Secretariat levels. To success the above activities, the circular was issued by the secretary, state Ministry of Home Affairs to all Divisional Secretariat regarding the collecting information as requested by the secretary to the Ministry of Water Supply. After receiving information from the DSD levels to the Water Resources Board, the relevant data were evaluated and relevant maps have been prepared according to the available information.

Mainly the well inventory would be prepared for the commercial utilization groundwater wells. The progress of the data receiving up to now is given as follows.

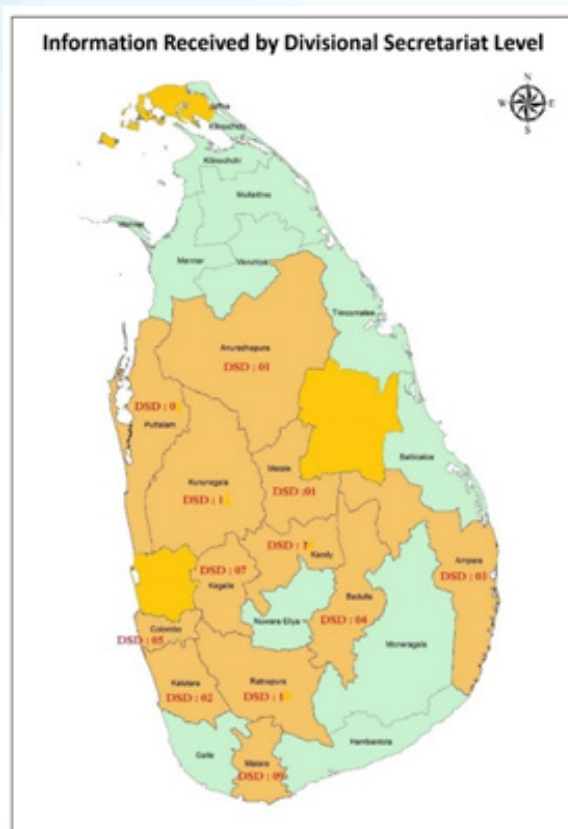


Figure 47: Groundwater sources information received Divisional secretariats.

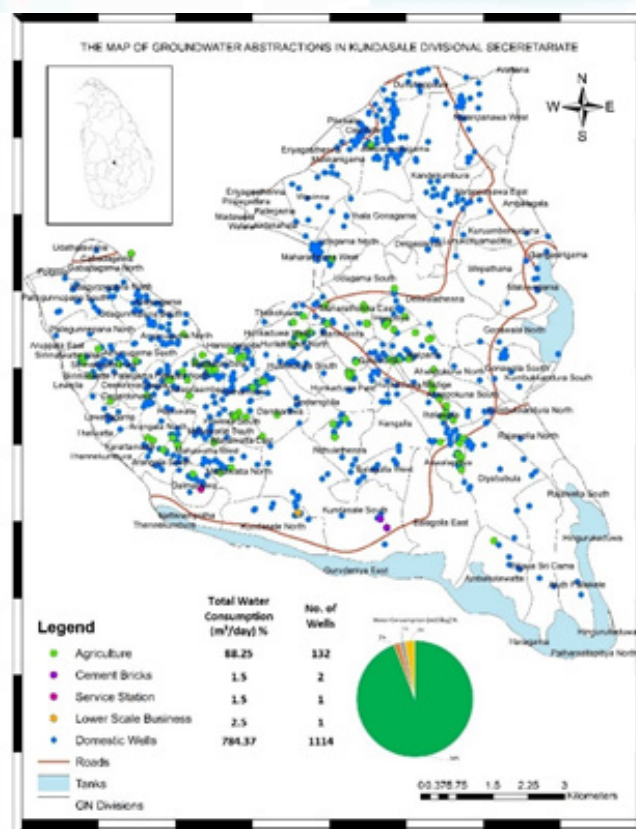


Figure 48: Groundwater consumption in commercial activities at Kundasale DS Division.

Table 20: Progress summary –2023

Activity	Target	Progress
Registration of External Hydrogeologists (20 Nos.)	100%	60%
Registration of drilling Companies (110 Nos.) & Machineries (20 Nos.)	100%	43%
Approval of external Hydrogeological reports. (500 Nos.)	100%	69%
Inspection of Flow Meters (50 Nos.)	100%	20%
Flowmeters Installation (05 Nos.)	100%	20%

2.3 Research oriented Commercial activities

2.3.1 Detailed hydrogeological and geochemical assessment on the peripheral area of the Lakvijaya power plant, Norochholei.

The Lakvijaya power station also known as the Norochcholai power station is the largest power station in Sri Lanka. The power station is in Norochcholai, Puttalam, on the southern end of the Kalpitiya Peninsula. According to the Ceylon Electricity Board, the US\$455 million first phase generates nearly 1.7 TWh of electricity annually; a significant amount when compared to Sri Lanka's total production of 11.5 TWh in 2011. The plant is connected to the grid via 115 km (71 mi) 220-kilovolt transmission line to Veyangoda. Power station exhausts are emitted through a 150 m (492 ft) tall chimney, one of the country's tallest man-

made structures. In the plant, basically the electricity is produced using a steam turbine which is capable of producing 300MW. Coal is used as the fuel to produce steam that will then be used to rotate the turbine in the speed of 3000 rpm.

Lakvijaya power plant is using groundwater for landscaping activities of its premises land which is approximately 100 acres in extent. The required water is extracted by means of existing shallow well field at the premises of this power plant which was initially constructed for the requirement of water for the constructions of power plant. Altogether, 74 nos. of shallow tube wells are have constructed which are off merely 6m in depth with diameter of 225 mm. The static groundwater level is around the depth range 2.50-3.50 meters below the ground level. Despite the well field of 74 Nos, the extraction of groundwater for the landscaping purpose was utilized intermittently on different sets of wells without a systematic practice. However, with the request from Lakvijaya Power plant, the test pumping was carried out and determine the safe yield including a pumping plan for the selected well field during the first phase of this study by Water Resources Board.



Figure 49: Google map view of the study area in and around the Norochcholai Power plant with monitoring locations



Figure 50: Water sampling

Finally it was recommended to further monitoring of groundwater abstraction through establishment of flow meter system on the well field.

The awareness & provide of necessary guidelines on the use of groundwater resources of the area to the community about these changes in groundwater of their territory specially to the framing community is beneficial in the long run to sustained this productive and highly vulnerable aquifer to sea water intrusion and other all possible contmaniations by anthropogenic activities.

Activities of 2023

100 no.of water samples were collected and handed over for chemical analysis. The chemical analysis are in progress.

3. Foreign Funded Projects

3.1 Implementation of Manage Aquifer Recharge Systems on Groundwater Resources within Community Base Organizations (CBO) & Rural Water Supply Schemes (RWSS)

Groundwater is the only source of water in certain areas where, the surface water availability is scarce or almost nonexistence. As a consequence of ever-increasing water demand, climatic variabilities & improper management of abstraction has led to deplete & deteriorate of groundwater resources which has threatened

its long-term sustainability. This is seriously affected on the groundwater dependent water supply schemes where the optimum & continuous supply of drinking water to the communities is interrupted & threatened by high vulnerability on the quality aspect as well. In some part of the country, the groundwater dependent water supply schemes had to abundant mainly due to these resources' depletion & quality deterioration with time by aforementioned reasons. If no appropriate mechanism or strategies for adaptation & remediation is in place, the most of the groundwater dependent water schemes are susceptible for failure of providing the drinking water to the community which is a fundamental requirement & more ever the indicator of the country's prosperity.

When the groundwater is continuously over pumping, the volume withdrawn from the respective aquifer cannot be replaced by the natural recharge, subsequently emerging of an imbalance within aquifer system with cumulative overdraft ultimately resulting of a groundwater level depletion including quality deterioration in most of the occasions.

This situation is aggravated & pronounced by the ever-increasing demand. The supply-demand management of water could only be addressed through appropriate management including adaptation strategies such as unearthing of adjoining potential aquifer zones or application of Managed Aquifer Recharge (MAR) mechanism for enhance the aquifer qualitatively & quantitatively. This enables the groundwater resources to maintain its sustainability in long-term basis.

Main Objective:

Enhance & manage of groundwater aquifers qualitatively & quantitatively within the identified highly vulnerable water supply schemes which is operated entirely by groundwater sources.

Results and Discussion

The present status of the groundwater sources are as follow.

Anuradhapura district

Nildiyawara CBO at Sirimapura, Rajanganaya. (Shallow dug well)

- Pumping Details and number of connections with year

Year	2018	2019	2020	2021	2022
Number Of Connection	100	120	140	150	210
Average Daily Pumping hours	10	10	10	8	8

- Insufficient water availability in the dry season for supply demand
- Hardness and Total Alkalinity of Water is higher than the drinking water quality
- Coliform bacteria are high than the recommended levels for drinking standards (64 unit as at 2021 june)

Two large diameter dug wells are there to obtain water for this CBO scheme. One dug well is located near a paddy land area. This well is recharging from the water that coming from the irrigation canals through the paddy land (Figure 02). Therefore, during the period when the water is allocating for the paddy land, the quantity of water that can be extracted with pumping is sufficient for the water demand of the consumers. But during the off season of the paddy cultivation, the water availability could not be satisfactory due to the groundwater level is depleted significantly while pumping. However, due to the paddy lands and polluted water coming through the paddy land, the groundwater quality is not in good conditions in this well.



Figure 51: Dug well that located near to paddy land

Second dug well of this CBO is located near to the Rajanganaya Reservoir. In generally, the groundwater level of the nearby area is around 1 to 1.5 mbgl. Although the groundwater level is high, during the pumping the water level of the dug well is depleting significantly and the more time taken for recovery the water level. During the year 2018 to 2020, CBO could pump water continuously about 5 hours and recovery done within few hours. Again, they have pump additional 5 hours in the evening session to fulfill their requirements. However, during last two, three years their pumping period has become reduced due to the water level depletion and recovery period become high. It was observed that during pumping from the well, although the water level of the inside of the well is depleting, the surrounding nearby groundwater level was not depleted in accordingly. This would be created due to the well loss due to the clogging near to the outside area of the well wall. Due to these factors, the water scarcity has been increased.

After considering the present aquifer status, and possible water sources for enhance the capacity of wells, the second dug well was selected to introduced the MAR application.

For the first well mentioned in here is severe affected due to groundwater contamination and also surrounding shallow aquifer system (Regolith aquifer). Therefore, it would be difficult to convert this source of water in to good quality during the short time period. Due to that reason, under this study it was selected to apply MAR to the second well.



Figure 52: Dug wells locations in Nildiyawara CBO, Rajanganaya

Then the source water availability and hydrogeological aspects were considered to analysis the possibility of enhances the water level of the dug well.

Source water availability and proposed method of recharging.

The availability of source water, one of the prime requisites for ground water recharge, is basically assessed in terms of non-committed surplus monsoon run off, which as per present water resource development scenario is going unutilized. But in this case, the issue is not the groundwater level depletion in surrounding area. This has caused to the reducing of well efficiency (well loss is becoming high) due to that clogging the surrounding area of the well wall by depositing any clogging materials. First, near the surface the interstices of the soil may be filled up and a layer of mud and deposited on the surface or covered the side wall of the well by siltation of mud or suspended particles and accumulate there.

Therefore, in this case it can be applied Lateral recharge Shaft or **Ground Water Dams Or Sub-Surface Dykes** to recharge the well directly use of water collecting from the subsurface seepage that flowing the downstream from the Rajanganaya tank.

This will be the most efficient and cost-effective structures to recharge the well directly in present conditions of the aquifer. In the areas where source of water is available for perennially due to the reservoir. The main advantages of this technique are as follows: -

1. It does not require acquisition of large piece of land like percolation tanks.
2. There are practically no losses of water in the form of soil moisture and evaporation, which normally occur when the source water has to traverse the vadose zone.
3. The potential disaster like collapse of dams can be avoided.

Identification of Hydrogeological Aspects

The main purpose of applying geophysical methods for the selection of appropriate site for implementation artificial recharge structure is to assess the unknown subsurface hydrogeological conditions economically, adequately and unambiguously.

Generally, the prime task is to compliment the exploratory programme. Mostly it is conducting to narrow down the target zone, pinpoint the probable site for artificial recharge structure and its proper design. Nevertheless, the application of geophysical methods is to bring out a comparative picture of the subsurface lithological environment, surface manifestation of such structures, and correlate them with the hydrogeological setting.

2-D resistivity survey (Geophysical Survey) shows (Figure 4) that the upper regolith soil layer (3 to 7 m depth level) is having low resistivity values and it may indicate that the layer may be saturated with water.

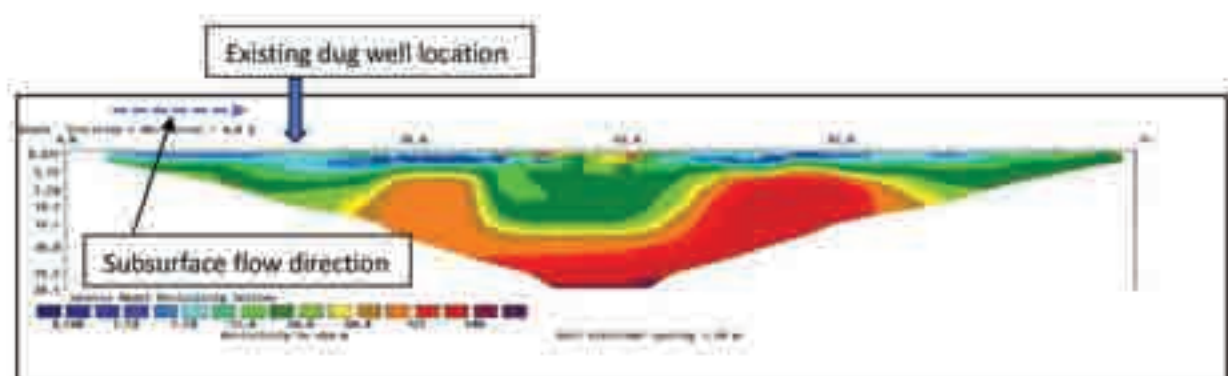


Figure 53: 2D resistivity profile along the groundwater flow direction with align the existing dug well

According to the field observation, geophysical survey results, groundwater level variation of inside and outside of the well and land availability, it could be decided to construct a subsurface dam structure to collect seepage water. These are basically ground water conservation structures and are effective to provide sustainability to ground water structures by arresting sub surface flow. A ground water dam is a sub-surface barrier across stream which retards the natural ground water flow of the system and stores water below ground surface to meet the demands during the period of need. The main purpose of ground water dam is to arrest the flow of ground water out of the sub-basin and increase the storage within the artificial aquifer. While pumping from the well, due to the water level head variation the water can automatically flow under gravity to the dug well directly through pipes.

The proposed structure for this mechanism is shown in the annexure 01.

Ikrah CBO at Rambewa, Anuradhapura (3 Deep tube wells nearby)

- Pumping Details and number of connections with year

Year	2018	2019	2020	2021	2022
Number Of Connection	818	823	830	830	840
Tube well 2: Average Daily Pumping hours	10	8	8	8	8
Tube well 2: Average Daily extraction (CM)	150	125	125	125	100
Tube well 1: Average Daily Pumping hours	5	5	4	4	4
Tube well 1: Average Daily extraction (CM)	50	40	40	40	40
Tube well 3: Average Daily Pumping hours	17	10	10	8	8
Tube well 3: Average Daily extraction (CM)	300	200	200	200	120

- Insufficient water availability in the dry season for supply demand
- Hardness and Total Alkalinity of Water is higher than the drinking water quality
- Coliform & E.Coli bacteria are high than the recommended levels for drinking standards

One large diameter dug well and three deep wells are there to obtain water for this CBO scheme. These wells are located near a Akrigollewa wewa. At present, the existing dug well was abandoned due to low yield of the shallow regolith aquifer. Nearby 3 deep tube wells were using their water demand of the CBO at present. According to the information taken from the CBO officers, the existing tube wells are having three different depth levels. According to the well numbers shown in above table the depth levels are 50, 60 and 70 m respectively in 1st, 2nd and 3rd tube wells. In accordingly the groundwater extractions levels also varies as 40, 125, 200 CM per day.

As per the information taken from the respective CBO officers, and analyzing it can be seen that gradually the yield of the shallow depth levels of the deep aquifer is going to be dried. Locations of well field is shown in figure 05. Although almost total water demand is

obtaining from the deep aquifer, the water quality is not in good conditions to drink at present. Because, the Total Coliform and E-coli bacteria are having high values as not suitable for drinking.



Figure 54: Study area for the Ikrah CBO, Akirigollawa, Rambewa, Anuradhapura

The groundwater level and Electrical conductivity values varying with rainfall is as follows (Figure 06). Groundwater level shows that, from 2021 November to 2023 October (About 2-year period) the groundwater levels of deep fractures formations are decreasing pattern. Although the Intensity of rainfall in some days are high during that period, it would not be affected to the deep formations significantly with the abstraction levels. However, after the period of 2023 October, the deep fractured groundwater levels have been increased gradually due to with continuous rain fall was appeared.

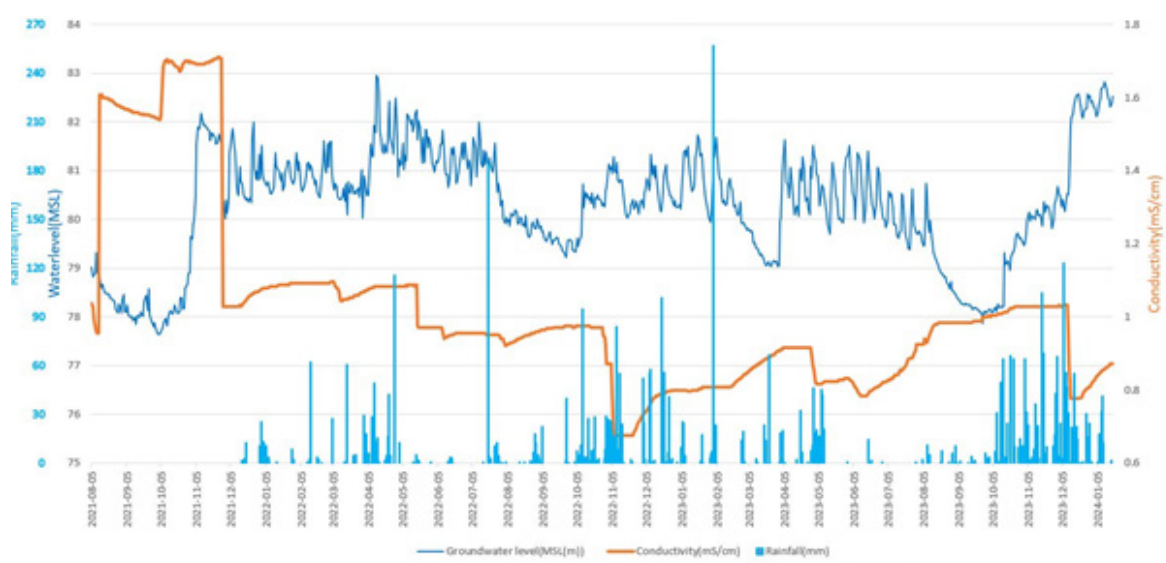


Figure 55: Water level, Conductivity variation in groundwater with rainfall variation in Ekirigollewa CBO

It shows that the continues rainfall can be made significant impact to the deep fractured formations in the area.

Hydrogeological Survey

2D resistivity surveys were conducted to identified the subsurface regolith conditions and the deep fractured formations in the well field.



Figure 56: 2D Survey line with align the existing deep wells

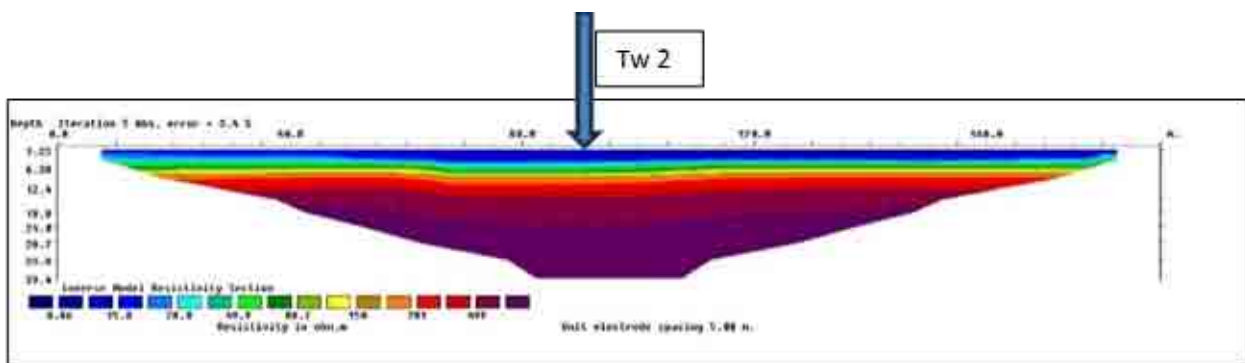


Figure 57: Survey line 1 at the Ekriyagollawa CBO well sites

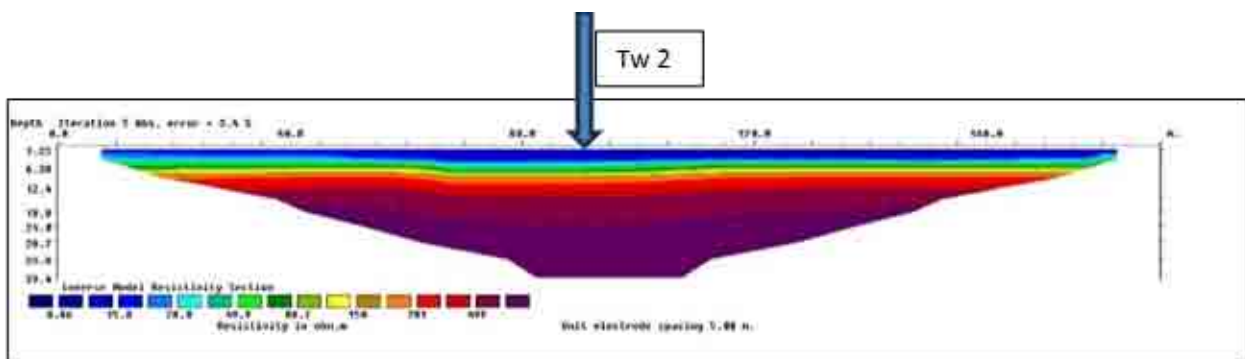


Figure 58: Survey line 2 at the Ekriyagollawa CBO well sites

According to the geophysical data, the overburden depth of the regolith aquifer is around 8-10 m depth. Beyond that level the hard rock formation is very massive. However, the center part of the survey line 2 is indicated that there is a structural feature in the both shallow and deep formations. Real time monitoring well and the Most abstraction well (well 3) has constructed in that zone.

To identify the recharge mechanism to deep aquifer is complex to decide within short time period. Therefore, additional data such as Pumping test data with monitoring the water level fluctuation of other deep wells, storativity calculations, Hydraulic conductivity, groundwater level variation in post and pre monsoon etc. should be identified to study the feasibility to recharge mechanism in future.

Puttlam district

Suniladiya dahara CBO at Walpaluwa, Mahakumbukkadawala.

- Pumping Details and number of connections with year

Year	2019	2020	2021	2022
Number Of Connection	80	120	160	220
Dug well: Average Daily extraction (CM)	30	20	10	0
Dug well: Average Daily Pumping hours	03	04	03	0
Tube well: Average Daily extraction (CM)	50	70	100	140 _Well dried
Tube well: Average Daily Pumping hours	03	04	03	0

- Insufficient water availability in the dry season for supply demand



Figure 59: Dug wells location in Sinila Diya dahara CBO, Mahakumbukkadawala

One large diameter dug well and one deep tube well are there to obtain water for this CBO scheme. The dug well is located near the Peththigama tank. This well is recharging from the seepage water coming from the tank. When considering the subsurface seepage flow direction, the well is located little bit far from the flow path. Therefore, the recharge possibility during the dry period is very low. During the rainy season surrounding water table may be increased and well can collect water from the regolith aquifer in the well

field and quantity of water that can be extracted with pumping is sufficient for the water demand of the rainy season. But during the dry season of the year, the water availability could not be satisfactory due to the groundwater level is depleted significantly while pumping.

According to the information gathering from the CBO officers, it will take recovery period is about two days to increase of water level to the initial level. The deep tube well of this CBO is located about 750m far from this above mentioned dug well. Technical information of that tube well are as follow.

- Total Depth is about 70 m
- Blank PVC depth is about 23 m
- Screen PVC depth about 23-30 m
- Pump installation depth 55 m



Figure 60: Dug well and nearby tank.

- Recommended pumping capacity from the tube well is about 85 CM/Day
- According to the pumping test report, the initial static water level is about 0.3m above from the ground level and it shows the confine nature if the deep aquifer.

However, this tube well was abandoned due to technical fault of the tube well or the submersible pump that has installed to the well.

Although the groundwater level near to the downstream site of the tank is around 0.5 to 1.0 mbgl, during the pumping from the dug well, the water level is depleting significantly and the more time taken for recovery the water level. During the year 2019 to 2021, the daily extractable amount of groundwater is gradually decreased as 30, 20, 10 CM/day and during the year 2022, pumping of water couldn't be done. It shows some indication about the increasing of well loss due to the clogging gradually near to the outside area of the well wall. Due to these factors, the water scarcity has been increased.

After considering the present aquifer status, and possible water sources for enhance the capacity of wells, this dug well can be selected to introduced the MAR application.

Then the source water availability and hydrogeological aspects were considered to analysis the possibility of enhances the water level of the dug well.

Source water availability and proposed method of recharging.

This case also same as the location in rajanaganaya well (3.1) and it can be applied Lateral recharge Shaft or Ground Water Dams Or Sub-Surface Dykes to recharge the well directly use of water collecting from the subsurface seepage that flowing the downstream from the Peththigama tank.

Identification of Hydrogeological Aspects

2-D resistivity survey (Geophysical Survey) shows that the upper regolith soil layer (3 to 5 m depth level) is having high resistivity values in the existing dug well location and the seepage flow path and it may indicate that the layer may consist with high sand percentage. It may be helpful for increase the permeability of the groundwater.

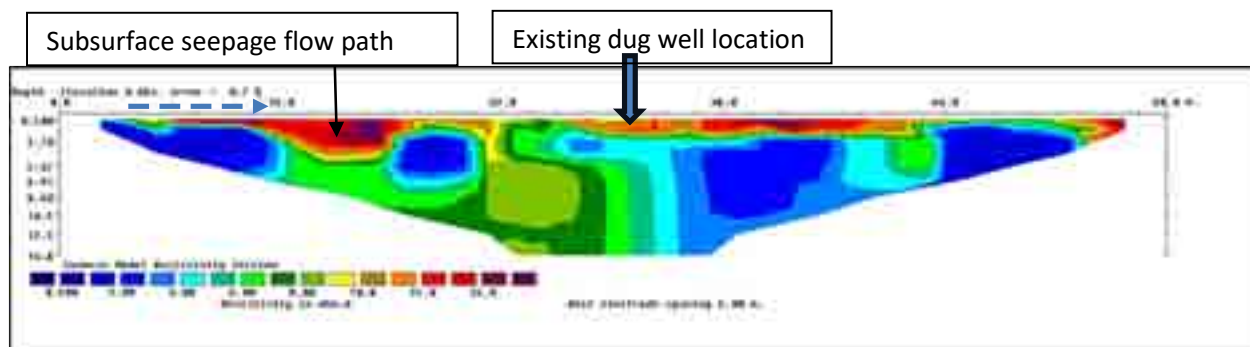


Figure 61: 2D resistivity profile along the groundwater flow direction with align the existing dug well

According to the field observation, geophysical survey results, groundwater level variation of inside and outside of the well and land availability, it could be decided to construct a subsurface dam structure or lateral shaft to collect seepage water. These are basically ground water conservation structures and are effective to provide sustainability to ground water structures by arresting sub surface flow. While pumping from the well, due to the water level head variation the water can automatically flow under gravity to the dug well directly through pipes.

However, when considering the ground elevation deference and the distance to the dug well from the groundwater flow path, the cost for the structural setup may be high. Therefore, the feasibility of implementing such structure should be tested before applying the MAR technique to this well. In addition, it is necessary to clean or repair the existing tube well to get that again into working condition.

Badulla district

Puranagama Water Supply project at Akiriyankumbura, Ridemaliyadda.

- Pumping Details and number of connections with year

Year	2019	2020	2021	2022
Number Of Connection	337	366	373	377
Dug well: Average Daily extraction (CM)	40	40	40	40
Dug well: Average Daily Pumping hours	08	08	18	18

Ekiriyankumbura tube well has constructed under the puranagama water supply project in 2017. This well was constructed by Water Resources Board and the flushing yield of the well was 1200 lpm (liter per minute) at that time. Tube well is located in the near to the Ekiriyankumbura base hospital.



Figure 62: tube well location of puraneguma CBO, Ekiriyanakumbura base hospital land

At the same time to monitor the groundwater level variation due to extraction of Groundwater by CBO well (High extraction well), a real time monitoring unit has established in this site. The technical details of said Well and the CBO well are as follow.

Well	CBO well	Monitoring well
Total Depth (mbgl)	60	50
Blank PVC casing depth (mbgl)	0	0 - 12.00
Rock hole	12.30 - 60	12.0 – 50.0
Fracture depth (mbgl) & GW Yeild	1. 24.30 -24.40 / yield 200 lpm	1. 14.00 -14.10 / Dry Fracture
	2. 29.10–29.20 / Dry Fracture	2. 41.20- 41.25 / yield 35 lpm
	3. 39.20–39.30 / yield 100 lpm	3. 41.80- 41.85 / yield 20 lpm
	4. 48.9– 49.10 / yield 900 lpm	4. 42.60-42.65 / yield 30 lpm
		5. 43.90- 43.95 / yield 20 lpm
		6. 45.3 – 45.35 / yield 15 lpm
Total Flushing Yield (lpm)	1200	120

During the pumping test for identifications of the safe abstraction levels from the CBO well, it had recommended to pump 450 lpm rate for 12 hours per day. Accordingly, more than 300 CM/day could be extracted from that well at that time. However, within two-year period that yield has decreased rapidly and now it use to extract about 40 CM/day. At present about 15 hours pumping to collect 40 CM per day. This can be happened due to,

1. well efficiency is getting lower due to having some disturbance to the groundwater fractured network or clogging.
2. Groundwater level is depleting rapidly and well recovery taken much time to refill.
3. Fractures becoming dry and piezometric head has become lower in deep aquifers.

Groundwater level fluctuation in deep aquifer

The groundwater level and Electrical conductivity values varying with rainfall is shown that (Figure

63), from 2022 January to 2023 October (About 2-year period) the groundwater levels of deep fractures formations are decreasing pattern. If the rain fall was occurred, their groundwater levels were not recovered as usually due to the long period of raining. When consider the groundwater yield in around 40 m depth level, it has decreased with time. Due to that reason the pumping period to extract groundwater is became high. Therefore, this well was consider to study for apply MAR technique to enhance the groundwater level and yield of the well.

Although the Intensity of rainfall in some periods (2022 December to 2023 May) are high during that period, it would not be affected to the deep formations significantly with the abstraction levels (Figure 63). However, after the period of 2023 October, the deep fractured groundwater levels have been increased gradually due to with continuous rain fall was appeared.

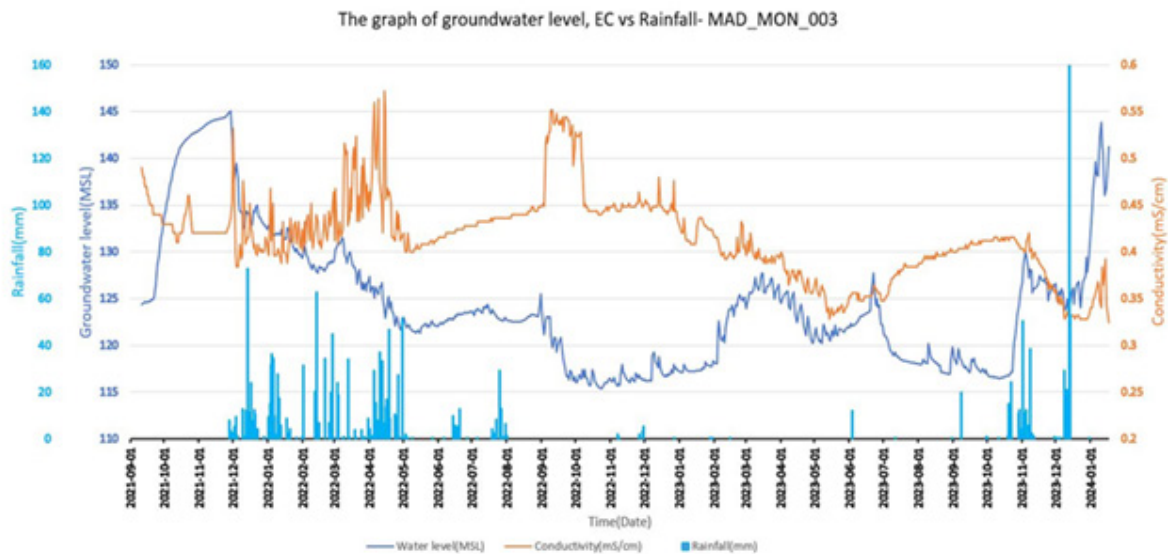


Figure 63: Water level, Conductivity variation in groundwater with rainfall variation in Ekriyankumbura CBO

It shows that the continues rainfall can be made significant impact to the deep fractured formations in the area. However, the pumping yield has not increased as achieving the water demand of the consumers.

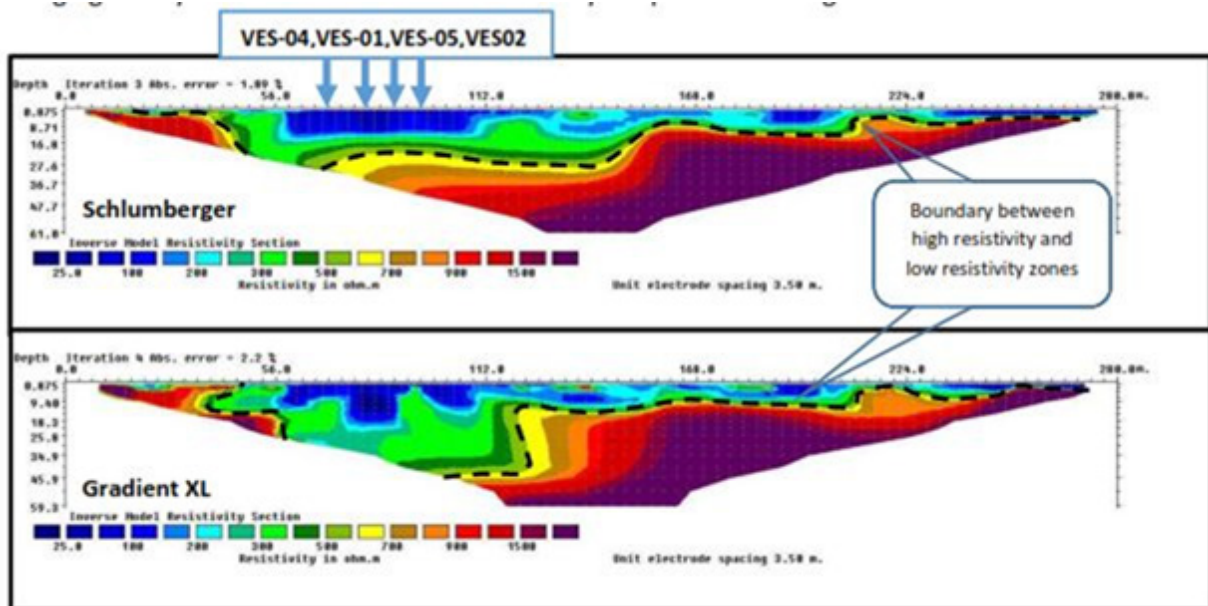


Figure 64: 2D resistivity survey line conducted with aligning the existing deep wells

According to the geophysical data, the overburden depth of the regolith aquifer is around 10 to 15 m depth in the target area to groundwater recharge. Beyond that level the hard rock formation is very massive especially in right side of the survey line. However, the left part of the survey line is indicated that there is a structural feature in the both shallow and deep formations. Both Real times monitoring well and the CBO well that more abstraction have constructed in that zone.

Source water availability and proposed method of recharging.

During the past few years, groundwater level of the monitoring well has been depleted around 20 to 25 m (Figure 63). Therefore, CBO needed to continues pumping to obtain their water requirement. However, it may be led to this water scarcity issue increased because over pumping led to deplete groundwater level significantly.

According to the tube well technical data, pumping data, well drilling data, groundwater level fluctuation data and geophysical data it was decided to construct additional tube well up to 40 m depth for artificial recharge to deep fractured formation using rain water harvesting.

In that site, the hospital roof top rainwater can be conserved and used for recharge of ground water. This approach requires connecting the outlet pipe from rooftop to divert the water to either existing wells/ tubewells/borewell or specially designed wells. According to the groundwater level fluctuation in the well field, from 2022 to end of 2023, GW level decreased around 20 – 25 m and again during the past three months the GW level has being increased about 25 m due to the rainfall.

During past two years CBO had to face severe water scarcity problem due to low yield of the well.

According to the recharge well drilling records, it has many dry fractures in various depth levels. Dry fractures have encountered in 12.50mbgl, 17, 24.5, 25 and 39 depths. Accordingly, it was design to construct groundwater recharge structure at that location by using rain water harvesting method by using storm water or intermediate rain falls.

Recommendation

According to the data & information on the present stress condition of groundwater table in water sources, Geophysical investigations, aquifer testing (Yield test), amount of groundwater extraction and possible recharge sources, two locations were selected to apply MAR application specially to enhance of groundwater quantity.

Tube well in Akiriyankumbura base hospital under Puraneguma Water Supply project.

Rain water harvesting is the method of groundwater recharge has been planned to implement for this tube well source. The roof top rainwater can be conserved and used for recharge of ground water. This approach requires connecting the outlet pipe from rooftop to divert the water to new specially designed tube well. The hospital building has large roof area and can be utilizing for harvesting roof top rainwater to recharge aquifer in this location.

Shallow dug well in Sirimapura under Nildiya Communit base organization.

For enhance the groundwater capacity of the well field, can be applied Lateral recharge Shaft or **Ground Water Dams Or Sub-Surface Dykes** to recharge the well directly use of water collecting from the subsurface seepage that flowing the downstream from the Rajanganaya tank. This method is used according to the hydrogeological setup of the regolith aquifer. This method is the most efficient and cost-effective structures to enhance water quantity in well directly. In the areas where source of water is available as base

flow, groundwater dams can be constructed to recharge the well directly.

The monitoring of water levels and water quality is of prime importance in any scheme of artificial recharge of Ground Water. The monitoring data will be useful for measuring the efficacy of structures constructed for artificial recharge and greatly helps in taking effective measures for Ground Water Management on scientific lines.

3.2 Strengthening of Groundwater Resources Management in Sri Lanka - Integrated Water Resources & Watershed Management Project (IWRMP)

Considering present issues in the groundwater sector, the need to develop and strengthen proper groundwater management is of prime importance for its protection & use at sustainable levels. However, currently there is limited groundwater management in the country with inadequate resources dedicated to the task and a general lack of capacity within the government organizations even the legal framework and mandate has given to Water Resources Board. Further, it is required the strengthening of existing legal framework and policies on groundwater through appropriate revisions or amendments as required.

This groundwater component is designed to support the development and implementation of a fully integrated and conjunctive groundwater management program in the ID and MASL pilot river basins, undertake the development of the groundwater management knowledge base and framework for management in several other basins strongly dependent on groundwater, along with the development of the required institutional capacity at central, provincial and basin levels.

Objectives

The objective of Sub-component 3.2 is to develop the Institutional framework and capacity, acquire and install the necessary technology and infrastructure, and establish a strategic groundwater management policy and plan to enable sustainable groundwater management in Sri Lanka. The groundwater management plan will be formulated to:

- ♦ Mitigate and prevent the adverse impacts of over exploitation,
- ♦ Mitigate the adverse impacts of drought and climate change,
- ♦ Reduce threats to groundwater quality,
- ♦ Enhance sustainable recharge, and
- ♦ Provide mechanisms for equitable conflict resolution.

Expecting Results

The principal outcome of the project is the sustainable availability and use of groundwater resources in the pilot river basins. The specific results will include:

- ♦ A groundwater management plan and monitoring system is developed, adopted and under implemented in consultation with basin groundwater stakeholders in the pilot river basins
- ♦ The capacity, capability and institutional framework for implementing the newly gazetted system for regulation and permitting groundwater use is in place in the pilot river basins

This Sub-component will provide the communities and other groundwater users in the pilot basins with the knowledge to undertake sustainable use of their groundwater resources by enhancing their awareness of the vulnerability of the resource and their knowledge of the ways to conserve and protect the resource for their sustainable benefit, and strengthening of groundwater user groups.

At the national and regional level, the Water Resources Board will manage the groundwater resources more effectively and efficiently by building its capacity, capability and appropriate staffing, and by establishing provincial groundwater management and basin offices in selected cases. At present, the development of groundwater management plans is ongoing in 3 river basins and one region (the Jaffna Peninsula) as listed in the table below (identified as ongoing) and shown on the map below. The three WRMP supported river basins are also listed in the table below and shown on the map below.

Table 21: *Covering areas and current status of IWWRM project.*

	Project Pilot	River Basin	Status Provincial location of the Basin Management Centre
1	Kelani River Basin	New Start	Western Province (Head office of WRB)
2	Deduru Oya Basin	New Start	North Western Province
3	Ma Oya Basin	New Start	North Western Province
River Basins and Regions Supported under other Projects			
4	Jaffna Peninsula	Ongoing	North Province
5	Malwathu Oya Basin	Ongoing	North Central Province
6	Kumbukkan Oya Basin	Ongoing	Uva & Eastern Province
7	Maduru Oya Basin	Ongoing	North Central Province

Sub-component 3.2 tasks and activities

The tasks and activities outlined below will be carried out in each of the pilot river basins and in the provinces that encompass these basins.

Aquifer investigation, mapping and productivity assessment

Preparation of hydrogeological and productivity maps including hydro-geochemical maps of the respective basins are scheduled through series of field activities, processing and analysis of obtained data/information. The field activities include comprehensive geophysical explorations, test borehole drilling, test pumping, water quality testing etc

And also, the identification of groundwater recharge zones and mechanisms and assessment of their relative importance; identification of recharge management requirements in coordination with the SW basin planning team.

Development of groundwater management tools, guidelines and regulations

The groundwater management plan for each river basin drafted under this sub-component (3.2) would be integrated with the surface water management plans prepared under sub-component 3.1a in each of the pilot basin areas – providing a basis for an overall integrated and conjunctive water management plan for the basins.

Establishment of Provincial Groundwater Management Centers (PGWMC)

The highly variable pattern of aquifer availability, recharge potential, and groundwater demand across Sri Lanka suggest that a large part of the responsibility for the preparation and implementation of basin groundwater management plans should be shifted to the Provincial and basin levels.

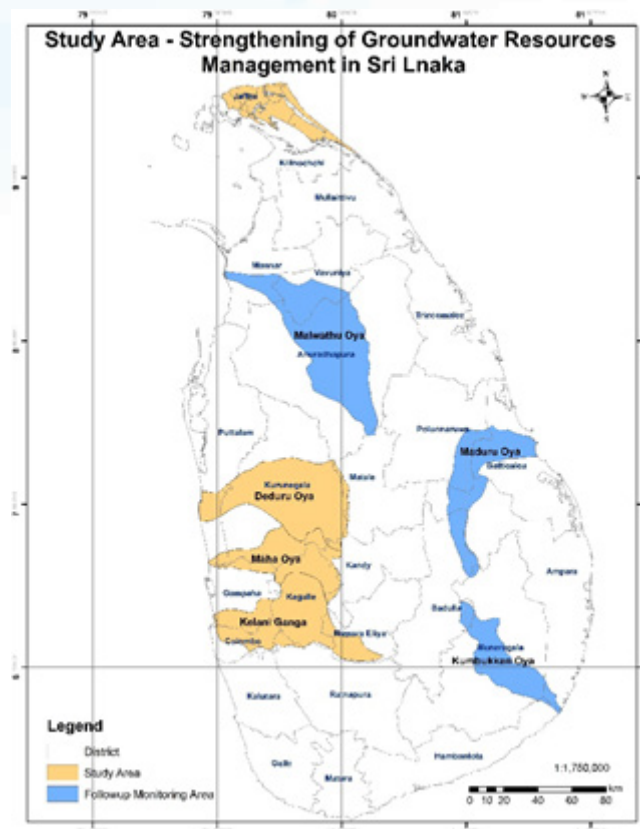


Figure 58: Pilot areas of IWWRMP

Under this project following activities were completed.

1. Desk study for Kelani River, Ma Oya and Deduru Oya basins were completed.
2. 20 Hydrogeological surveys were completed to identify the underneath geological formations and structures within the Kelani and Ma Oya basins.
3. Proposed initial water sampling locations were finalized in the new three basins.
4. Evaluation of Consultancy Service for Development of Groundwater Management Plans for selected river basins was completed.

	Sub Projects/ Sub Activities	TEC (Rs. Mn)	Allocation for 2023 (Rs. Mn)	Financial progress	Physical progress
1	Longterm Groundwater Monitoring Project (LTGM): Colombo-Negombo, Ampara, Mannar, Vavuniya, Kilinochchi, Jaffna, Anuradhapura, Polonnaruwa, Matale, Puttalam, Monaragala, Kelani River Basin	4.00	4.00	3.34	68%
2	Study on Direct and Indirect Impact of Climate Changes on Groundwater Resources (SICC)	1.50	1.50	0.97	71%
3	Hydrogeological Assessment & identify of favorable zones for aquifer recharge with in Ma Oya Basin (Ma-oya)	1.40	1.40	0.91	73%
4	Combine Inspections on Groundwater Relating Environmental Issues (INSP)	1.50	1.50	0.88	103%
5	Development of Groundwater Atlas for Sri Lanka (GW-ATLAS)	0.60	0.60	0.02	75%
6	Emergency Use for Disaster Events Related to Water Sector (Droughts, Floods, Catastrophic events of Contamination on GWR (E-USE)	3.00	3.00	3.00	100%
7	Rehabilitation and improvement of WRB infrastructure (REIMP)	4.00	4.00	3.67	86%
8	Development and Management of Groundwater Resources in Water Supply Scheme (DMWSS)	4.00	4.00	1.68	83%
	Total	20.00	20.00	14.48	82%

4. Projects Forecast for the year 2024

During the year 2024, the following project studies are scheduled to carry out as per the priority area on groundwater sector defined and incorporated in SDG, NAP (national action plan) in water sector, NDC (nationally determined contributions) of Sri Lanka, WRB act & other national plans such as Integrate water management plans, policies where these all are of long-term goals to achieve sustainable management of the resources of the country at national or global scale. However, due to the present economic crisis of the country, the treasury budgeting activities have minimized to cutdown the expenses. The following table is only illustrated the tentative project plans under treasury funds and the other categories to be scheduled. The component of “Strengthening of Groundwater Resources Management in Sri Lanka” implemented under Integrated Watershed & Water Resources Management Project (IWWRMP) is scheduled to carry out its activities in 2024 as well. This project is operated under the Ministry of Irrigation and funded by the world bank.

Project Forecast (Foreign Funded):

SN	Project	TEC (LKR/ Mn)	Objective	Output	Outcome	Project Period	Budget - 2024 (LKR/ Mn)	Funds	Compatibility on National Action Plans / Policies
1	Strengthening Groundwater Resources Management (IWW/RMP) in Sri Lanka	225.00	To develop the institutional capacity & developing of knowledge base (including management plans) for managing of GWR effectively & efficiently.	Setting up the Institutional arrangement & make enabling environment to manage, develop, protection of GWR at provincial, district level with the capacity build up and necessary technical improvements	Managing of the groundwater resources of the country	1/1/2024 - 31/08/2025	129.50	World Bank	WRB Act; NEAP (National Environmental Action Plan - Strategy 7.6 in IWRM

Projects Forecast (Treasury Funds) - Year 2024

SN	Project	Objective	Output	Outcome	Project Period	Budget - 2024	Funds	Compatibility on National Action Plans / Policies
1	Long-term Groundwater Monitoring Project (LTGM): Colombo-Negombo, Ampara, Mannar, Vavuniya, Kilinochchi, Jaffna, Anuradhapura, Polonnaruwa, Matale, Puttalam, Moneragala, Trincomalee, Maduru oya river basin	Assessment of water quality and GW level variations in highly sensitive GW aquifers of the country for long term management and planning	Identify of groundwater resources behavior and its variation spatio temporally in the high sensitive aquifers of the country	Managing of the groundwater resources of the high sensitive areas in the country	1/1/2024 - 31/12/2024	4.50	Treasury	WRB Act; NEAP(National Environmental Action Plan - Strategy 7.6 in IWRM
2	Study on Direct and Indirect Impact of Climate Changes on Groundwater Resources (SICC)	Assessment and evaluation of changes on GW resources due to climatic changes in Coastal areas of the country	Managing the GWR & identify the areas required of salinity barriers to control the salinity intrusion	Provide the findings for implementation of salinity barriers by the stake holder Agencies & Managing of the groundwater resources country	1/1/2024 - 31/12/2024	1.00	Treasury	WRB Act; NEAP(National Environmental Action Plan - Strategy 7.6 & 8.1 in IWRM
3	Combine Inspections on Groundwater Relating Environmental Issues (INSP)	Addressing for remediation and conflict resolution on issues of GW use within the community	Sustained management and make equality of water rights within the society	Sustained management and make equality of water rights within the society	1/1/2024 - 31/12/2024	1.00	Treasury	WRB Act; WRB Gazette -2017; NEAP(National Environmental Action Plan - Strategy 7.2 in IWRM
4	Rehabilitation and improvement of WRB infrastructure (REIMP)	Infrastructure development of the institution	Enhanced institutional operational setup	Improved efficiency in managing GWR of the country	1/1/2024 - 31/12/2024	3.50	Treasury	

5	Development & Management of Groundwater Resources in Water Supply Schemes (DMWSS) – Phase II	Assess the feasible zones for augmenting of MAR in stressed aquifers of identified CBO & RWSS water schemes of the country	Integrated management of water resources for sustainable use	Minimize the impact on GWR; Managing the GWR as alternative provision of water needs on disaster situations.	1/1/2024 - 31/12/2024	2.00	Treasury	WRB Act; NDC (Nationally determined contributions) in Water Sector under 2.3
6	Emergency Use for disaster events related to water sector (drought, floods, catastrophic event of contamination on GWR)	Addressing & remediation measures implementation on national level water related disaster events	Minimize the impact on GWR or managing the GWR for well-being of community	Managing of Groundwater Resources for its sustainability with conjunctive use of surface water for water requirement of the country	1/1/2024 - 31/12/2024	1.5	Treasury	WRB Act; WRB Gazette -2017; NDC (Nationally determined contributions) in Water Sector under 2.6
7	Statistical Survey on the Groundwater Sources & its users in Sri Lanka(GW/SM) – Aid programme for regulatory process of groundwater resources of the country	Assessment of the Groundwater users & their purposes for groundwater Re-sources Management within the country	Regulate of the groundwater sources with equal sharing & identifying the water priorities	Effective & efficient operational management for the delivery of institutional scope	1/1/2024 - 31/12/2024	0.50		
8	Capacity Improvement Training	Institutional human resources skill development relevant to the priority needs				15.00		

Drilling Division

Main Duties

- Construction of Deep Tube Wells
- Cleaning and Flushing of Tube Wells
- Installation of Hand Pumps
- Rehabilitation and Maintenance of Tube Wells
- Construction of Boreholes for Hydrogeological Research / Studies

The main duties of drilling division are to construct deep or various types of tube wells to fulfill water demands of Sri Lankan society. All drilling works are conducted by drilling division in accordance with the job orders provided by the Hydrogeology and Operation divisions. Drilling division has enough technical knowledge as well as equipment/machineries to adopt two drilling methods such as Air drilling and Mud drilling. Consequently, deep tube wells are able to construct at any problematic geological terrain in Sri Lanka.

At present, Drilling Division has the several number of employees who are managed by Assistant General Manager (Projects) and Drilling Manager. This division has 11 numbers of drilling officers who have comprehensive knowledge of drilling techniques.

According to the above activities, following works have been completed during the year 2023.

Sonic Drilling

Sonic drilling is a relatively new technique, where a high-frequency vibration is combined with rotation to advance the drill stem. The core barrel is retrieved and the sample vibrated into a plastic sleeve or core trays. This technique is relatively continuous and undisturbed geological samples are obtained without the use of drilling fluids or other potential contaminations.

This technique is best suited to drilling unconsolidated formations, but its depth capability is somewhat limited by current technology.

Sonic drilling techniques will be started from W.R.B. after finished of ongoing monitoring network project. Two no of drilling officers are assigned to the training of drilling technics from Ground Water Monogramming Network project to get knowledge from the Netherlands team.

DRILLING DIVISION SUMMARY - 2023**TUBE WELL DRILING & WELL CLEANING**

MONTH	WASSIP	EMUSE	MA-OYA	COMMERCIAL	WELL CLEANING	REHABILI- TATION	HAND PUMP IREPAIR	TOTAL
JANUARY	1	–	–	6	–	–	–	7
FEBRUARY	–	–	–	2	–	–	–	2
MARCH	–	–	–	5	–	–	–	5
APRIL	–	–	–	5	–	–	–	5
MAY	–	–	–	2	2	–	–	4
JUNE	–	1	–	5	3	–	–	9
JULY	–	–	–	5	6	–	–	11
AUGUST	–	–	2	4	5	–	1	12
SEPTEMBER	–	–	–	2	7	–	–	9
OCTOBER	–	1	–	4	5	–	–	10
NOVEMBER	–	–	–	5	–	–	–	5
DECEMBER	–	–	–	8	–	–	–	8
TOTAL	1	2	2	53	28	0	1	87

DRILLING DIVISION SUMMARY OF SITES 2023

OIC NAME	TUBE WELL CONSTRUCTED	HAND PUMP INSTA- LLED	BASIN CONSTR- UCTED	WELL CLEANED	HAND PUMP REPAIRED	REHABILITATED WELLS
A.M.C.P.B ALAHAKOON	2	–	–	13	–	–
J.P.C SANDARUWAN	3	–	–	3	1	–
C.B.S GUNATHILAKA	4	–	–	1	–	–
K.VIJITHARAN	8	–	–	4	–	–
J.J.M.P.K CHANDRASIRI	25	–	–	4	–	–
G.G.D NAYANAJITH	8	–	–	2	–	–
P.A.I BANDARA	6	–	–	1	–	–
C.K WICKRAMASINGHA	2	–	–	–	–	–
TOTAL	58	0	0	28	1	0

Drilling activities in 2023



Annual Progress of the 2023 Laboratories In WRB

Description of the water samples analysis and improvements of the Laboratory in Head Office & other three Laboratories during the year 2023 is forwarded for your information.

LABORATORY ANALYSIS

	Type of analysis	Number of water sample	Income (Rs.)
1	Chemical analysis (Full & Partial) : Commercial	321 (Head Office, Puttalam, Anuradhapura, Jaffna)	
2	Microbiological analysis : Commercial	55 (Head Office, Puttalam, Anuradhapura, Jaffna)	
3	Chemical & Microbiology : Treasury grant projects	1683 (Head Office, Puttalam, Anuradhapura, Jaffna)	
4	Heavy metal Commercial	50 (Head Office, Puttalam, Anuradhapura, Jaffna)	
5	Total income with VAT	All Laboratories excluding Treasury grant projects	6,438,891.59

DESCRIPTION OF THE ANALYSIS

1. Chemical and Microbiological Analysis

In 2023, commercial water samples were analyzed under the categories of total and selected water parameters, microbiological parameters and heavy metals, and the commercial income of the Water Resources Board was 6.4 million.



Figure 1: Microbiology Analysis Laboratory (Puttalam)

One thousand six hundred and eighty three (1683) numbers of water samples from treasury grant projects were tested during the year 2023.

2. The Quality Assurance Process in WRB Laboratories (ISO 17025:2017)

Anuradhapura Laboratory of Water Resources Board is in the process of obtaining International Quality Certificate (ISO 17025: 2017) for chemical analysis.



Figure 2: Chemical Analysis Laboratory (Anuradhapura)

3. Heavy Metal Analysis (As, Cd, Cr, Pb, Mn, Na, K, Zn etc..)

Water samples were received to the Laboratory from the various projects & commercial parties for heavy metal, conducted by using AAS in Head Office & ICP-MS in Anuradhapura Laboratory.



Figure 3: Heavy Metal Analysis in the Head Office Laboratory



Figure 4: Heavy Metal Analysis in the Anuradhapura Laboratory

Head Office

The head office consists of the administration division, finance division, supply division, groundwater division, laboratory, drilling division, operation division, audit division, transport division and 4 provincial offices namely Puttalam, Anuradhapura, Monaragala and Jaffna.

Groundwater Division

The main functions of the Water Resources Board are performed by the Ground Water Division.

Operations Division

All operational activities of the Water Resources Board are carried out by the Operations Division.

Supply Division

The supplies division provides goods, services and works to achieve the goals of the Water Resources Board.

Finance

The total income for the year concerned was Rs. 2122 million. Rs. 189 million and Rs. 14 million were respectively received from the General Treasury as the recurrent and capital grant for the year 2023. The reported deficit in the year was Rs. 1383 million.

Administration

The total number of staff of the Water Resources Board in the year 2023 was 238 nos. There are no new recruitments for permanent staff. In this year, 06 nos. employees were resigned, Vacation of post 01 and 12 employees were retired.

Fleet of Transport

In the year concerned, the fleet of transport of the board was comprised with 74 nos. vehicles and out of which 58 nos. vehicles were in running condition. Those were mainly, cabs, cars, jeeps, lorries, and cranes.

Regional Offices

There are four (4) regional offices in Water Resources Board. (Anuradhapura, Puttalam, Jaffna and Monaragala) Mainly those regional offices responsible for geophysical prospecting with hydrogeological investigation/ research for assessment and identification of groundwater resources potential in specific areas. Coordinating with Government and private institution for construction of deep tube wells and providing reports related to water conservation activities and ground water. Laboratories are maintained in Anuradhapura, Puttalam and Jaffna offices and chemical and microbiological analysis of water samples are carried out and bare metal analysis is carried out only from the Anuradhapura provincial office.

Circuit Bungalow – Anuradhapura

The purpose of maintaining the circuit bungalow was to provide accommodation for the officers of the Water Resources Board and the Minister of the Water Supply in their official tours and spending their leisure time. Addition to that, an action was taken to provide accommodation for other government officers and general public.

Acknowledgement

The board is in pleasure to thank and place on record of appreciation to the Minister of Water Supply and State Minister of the Water Supply, Secretary, officers and staff of the same Ministry, all the officers and consultants of the other government departments, board and corporations, foreign and private institutions. The active involvement and the loyal service rendered by the employees of the Water Resources Board are highly acknowledged.

Dr. J.D. Samarasinghe
Chairman
Water Resources Board

An abstract background featuring a complex, overlapping pattern of light blue and white geometric shapes, resembling a stylized leaf or a network of veins. The pattern is concentrated on the left side of the image, with the right side being a solid white background.

Financial Statements

WATER RESOURCES BOARD**Statement of Financial Performance****For the Month ended 31st December 2023**

NOTE NO		2023						2022	
		Rs'000						Rs'000	
		All Sectors	Sector no 01 Drilling	Sector no 02 Hydrology	Sector no 03 Lab	Sector no 04 General	Revised Budget	Actual	
01	Revenue from Operating Activities	1,903,684	1,538,249	164,209	33,019	168,207	1,931,499	88,060	
	Treasury Grants- Recurrent	189,595	47,951	55,055	15,984	70,605	192,000	191,600	
02	Treasury Grants-Capital(Operational)	14,158	-	14,158	-	-	20,000	6,904	
03	Other Income	15,277	-	204	-	15,073	16,600	10,592	
	Total Revenue	2,122,714	1,586,200	233,626	49,003	253,885	2,160,099	297,156	
4.1	Administrative Costs	(206,857)	(48,644)	(57,697)	(15,482)	(85,034)	(207,065)	(218,801)	
4.2	Supplies & Requisites	(41,215)	(15,405)	(3,817)	(3,308)	(18,685)	(41,800)	(42,019)	
4.3	Contractual Services & Maintenance expenses	(470,267)	(1,916)	(259)	(252)	(467,840)	(490,385)	(52,838)	
4.4	Other Operational Expenses	(5,961)	(221)	(20)	(3)	(5,717)	(6,995)	(4,100)	
4.5	Other Project Expenses	(802)	-	(802)	-	-	(7,850)	-	
4.6	Treasury Grants - Capital (Research Studies)	(14,158)	-	(14,158)	-	-	(20,000)	(6,904)	
	Total Expenses	(739,260)	(66,186)	(76,753)	(19,045)	(577,276)	(774,095)	(324,662)	
	Surplus / (Deficit) from Operations	1,383,454	1,520,014	156,873	29,958	(323,391)	1,386,004	(27,506)	
	Tax	-	-	-	-	-	-	-	
	Surplus / (Deficit) for the period	1,383,454	1,520,014	156,873	29,958	(323,391)	1,386,004	(27,506)	

WATER RESOURCES BOARD
Statement of Financial Position

As at 31 December 2023	NOTE NO.	Restated	
		2023 Rs'000	2022 Rs'000
ASSETS			
Current assets			
Cash and cash equivalents	05	84,143	74,350
Trade and other receivables	06	33,279	36,224
Inventories	07	124,688	131,946
Prepayments	08	33	225
		<u>242,143</u>	<u>242,745</u>
Non - current assets			
Property,Plant & Equipment	09	1,429,584	1,824,502
		<u>1,429,584</u>	<u>1,824,502</u>
TOTAL ASSETS		<u>1,671,727</u>	<u>2,067,247</u>
LIABILITIES			
Current liabilities			
Other Provisions & Payables	10	7,062	11,605
Deferred Income (Advances for Services)	11	4,079	16,847
		<u>11,141</u>	<u>28,452</u>
Non - current liabilities			
Retirement Benefit Obligations	12	56,129	60,783
Deferred Income (For Government Grants)	13	-	1,796,809
		<u>56,129</u>	<u>1,857,592</u>
TOTAL LIABILITIES		<u>67,270</u>	<u>1,886,044</u>
NET ASSETS		<u>1,604,457</u>	<u>181,203</u>
NET ASSETS / EQUITY			
CAPITAL & RESERVES			
Contributed Capital	14	489,891	489,891
Accumulated Profit/(Deficit)	14	1,065,603	(328,188)
Revaluation Reserve	14	48,963	19,500
TOTAL NET ASSETS / EQUITY		<u>1,604,457</u>	<u>181,203</u>

The Accounting Policies and the Notes from pages 06 To 20 form an integral part of these Financial Statements.

We certify that the above Financial Statements are true and correct as per the records available of the Board.

C. Abeysooriya

Assistant General Manager (Admin & Finance) - Acting

T.H.B.A. Deshappriya

General Manager (Acting)

The Directors are responsible for the preparation & presentation of the Financial Statements. Approved and Signed on behalf of the Board

Dr. J.D. Samarasinghe
Chairman

27th February 2024

WATER RESOURCES BOARD

]

Water Resources Board

L.A.Y. Darshanie De Silva
Treasury Representative

Stanister Yogaraj Pillai
Board Director

Statement of Changes in Net Assets/ Equity
For the Month Ended 31 December 2023

NOTE : 14

	Contributed Capital Rs'000	Revaluation Reserve Rs'000	Accumulated Profit/Deficit Rs'000	Total Rs'000
YEAR - 2022				
Balance as at 31st December 2021 B/F	489,891	19,500	(308,980)	200,411
Adjustments made for prior period events	-	-	-	-
Restated Balance	489,891	19,500	(308,980)	200,411
Surplus / (Deficit) for the period	-	-	(27,506)	(27,506)
Actuarial Gain/(Loss) on retirement benefit obligation	-	-	8,298	8,298
Balance as at 31st December 2022	489,891	19,500	(328,188)	181,203
YEAR - 2023				
Balance as at 31st December 2022 B/F	489,891	19,500	(328,188)	181,203
Adjustments made for prior period events	-	-	1,638	1,638
Restated Balance	489,891	19,500	(326,550)	182,841
Surplus / (Deficit) for the period	-	29,463	1,383,454	1,412,917
Actuarial Gain/(Loss) on retirement benefit obligation	-	-	8,699	8,699
Balance as at 31st December 2023	489,891	48,963	1,065,603	1,604,457

CASH FLOW STATEMENT FOR MONTH ENDED 31 DECEMBER 2023

	2023 Rs'000	2022 Rs'000
Cash Flows from operating activities		
Surplus / [Deficit] for the year before Treasury Grants (Recurrent)	1,193,859	(219,106)
Add: Treasury Grants received (Recurrent)	189,595	191,600
Surplus / [Deficit] before Tax for the year	<u>1,383,454</u>	<u>(27,506)</u>
Adjustments DIFFERRED INCOME	(1,796,809)	
Less: Prior Year adjustments	-	-
	<u>(413,355)</u>	<u>(27,506)</u>
Non Cash Movements		
Depreciation	424,485	8,691
Increase in Provisions to Gratuity	14,734	11,201
[Decrease] / Increase in payables	(17,264)	(17,433)
[Decrease] in Other Current Assets	7,450	4,534
Gain / [Losses] on sale of Property plant & Equipment's	(4,963)	(638)
[Decrease] / Increase in receivables	2,945	3,819
	<u>14,032</u>	<u>(17,332)</u>
Interest received for gratuity & bank Savings	(6,232)	(7,046)
Tax Paid	-	-
Net cash flows from operating activities	<u>7,800</u>	<u>(24,378)</u>
Cash Flows from Investing activities		
Proceeds from sale of Property Plant & Equipments	4,963	637
Purchase of Property Plant & Equipment's	(107)	(1,896)
Interest received for gratuity & Bank Savings	6,232	7,046
Payment of gratuity	(9,095)	(1,541)
Net cash flows from Investing activities	<u>1,993</u>	<u>4,246</u>
Cash Flows from financing activities		
Government Grants [Capital for Property Plant & Equipments]	-	494
Net cash flows from financing activities	<u>-</u>	<u>494</u>
Net Increase/[decrease] in cash & cash Equivalents	<u>9,793</u>	<u>(19,638)</u>
Cash & Cash Equivalents at beginning of Period	<u>74,350</u>	<u>93,988</u>
Cash & Cash Equivalents at end of Period	<u>84,143</u>	<u>74,350</u>

- NOTES TO THE CASH FLOW STATEMENT**

01 Cash and cash equivalents consist of balances with banks. Cash and Cash equivalents included in the Cash Flow Statement comprise the following Statement of Financial Position amounts.

	2023 Rs'000	2022 Rs'000
Current Account Balances with Banks	60,753	56,299
Savings with National Savings Bank	23,390	18,051
	<u>84,143</u>	<u>74,350</u>

02 Cash Flows from Treasury Grant (Capital) for the operational activities are included in the Cash Flows from operating activities.

TREASURY GRANT RELEASES RECONCILIATION - YEAR 2023

Disclosed Statement

	Releases (Rs. 000)	As per Treasury Printout (Rs. 000)	Provision for the year (Rs. 000)
01 RECURRENT GRANT			
Vote: 166-01-02-4-1503			
Financial Performance	177,595	177,595	180,000
Vote: 166-01-02-4-1509			
Financial Performance	12,000	12,000	12,000
	<u>189,595</u>	<u>189,595</u>	<u>192,000</u>
02 CAPITAL GRANT			
Vote: 166-01-02-4-2201			
Financial Performance - Operational	14,158	14,158	20,000
Statement of Financial Position	<u>14,158</u>	<u>14,158</u>	<u>20,000</u>

1. Corporate Information

General

The Water Resources Board is a statutory Board established in 1966 under the provisions of Act No. 29 of 1964. In year 2023 it is under Ministry of Water Supply & Estate Infrastructure Development

Principal Activities and Nature of Operations

During the year, the principal activities of the Board Comprised of carryout Hydrogeological Surveys, Construction of Tube Wells, Chemical Analysis of Water Samples, Preparation of Groundwater Maps and supervision & direction of the use of natural water springs or ground water for certain activities or projects as per the gazette notification no. 2010/23 of 16th March 2017.

Directors Responsibility Statement

The Board of Directors take the responsibility for the preparation and presentation of these Financial Statements as per the provisions of Sri Lanka Public Sector Accounting Standards.

Address of the Registered Office and the Principal Place of the Activities of the Board

No.488/A Nawala Road, Koswaththa Rajagiriya.

2. Significant Accounting Policies

2.1. Statement of Compliance

The financial statements of the Water Resources Board are prepared in accordance with the Sri Lanka Public

Sector Accounting Standards (SLPSAS) laid down by the Public Sector Accounting Standards Committee of the Institute of Chartered Accountants of Sri Lanka (CA Sri Lanka) with the Participation of the Ministry of Finance & Planning. (Ref: Circular: PED/03/2013 dated 02.10.2013)

2.2. Basis of Preparation

The Financial Statements are prepared on the Historical Cost Basis.

2.3. Functional and Presentation Currency

These Financial Statements are presented in Sri Lankan Rupees, which is the Board's Functional Currency and all Financial Information has been rounded to the nearest thousands unless otherwise specifically indicated.

3. Assets and Basis of their Valuation

3.1 Property, Plant & Equipment

Property Plant and Equipment are initially recorded at cost less accumulated depreciation. The cost of Property, Plant & Equipment is the Cost of purchase/revaluation or construction together with any incidental expenses thereon.

Buildings in Lease hold land

The buildings which are constructed using own funds or granted to the WRB land which has leased for 30 years are accounted under Property, Plant and Equipment.

3.2 Revaluation Model

The board applies the revaluation model for the entire class of freehold land for measurement of initial recognition. All the other class of assets are being revalued when there is a substantial difference between the fair value and the carrying amount or where these come down to the zero level of net book balance.

When assets are being disposed, the revaluation reserves relevant for the particular assets would be transferred to retained earnings.

In year 2023, Revalue assets Rs.29,462,603.09 and take to depreciation relevant to Puttalam, Monaragala & Anuradhapura provincial Office Assets.

NOTES TO THE FINANCIAL STATEMENTS & ACCOUNTING POLICIES

3.3 Depreciation

Depreciation of an asset begins when it is available for use and ceases at the earlier of the dates on which the asset is derecognized.

Depreciation is calculated so as to write off the Cost / Revaluation of Property, Plant and Equipment on a Straight - Line Basis over the expected useful lives of the Assets concerned. The principle annual rates used for this purpose are,

Buildings	5%
Motor Vehicles	25%
Machinery	20%
Laboratory Equipment	20%
Scientific Equipment	20%
Computers & Accessories	20%
Furniture, Fittings & Office Equip.	10%

3.4 Government Grants

Assets received by way of grants from treasury, line ministry and other related government projects are recognized according to SLPSAS 11.

3.5 Inventories

Inventories consist of vehicle spares, stores materials, machinery spares, fuel and other consumables, etc. The cost of inventories are based on the first-in-First-out (FIFO) principle.

3.6 Receivables

3.6.1 Receivables are stated at the amounts they are estimated to realize.

3.6.2 Bad and Doubtful Debts.

The estimated losses to these debts are based on continuous review of all invoices and claims identified as bad and doubtful.

4. Accounts Payables and Accrued Expenses

Trade and other payables are stated at cost.

4.1 Deferred Income

Advances received for services to be rendered are shown as deferred income under current liabilities in the statement of Financial Position until recognize the income.

4.2 Provisions

Provisions are recognized when the entity has a present obligation (legal or constructive) as a result of a past event, and it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the obligation. The expense relating to any provision is presented in the Statement of Financial Performance of any reimbursement.

5. Revenue Recognition

Revenue is recognized to the extent that it is probable that the economic benefits will flow to the Water Resources Board and the revenue can be reliably measured, regardless of when the payment is being made.

Major sources of income

Hydrogeological surveys, construction of Tube wells, pumping tests, Water sample analysis and fitness certificate income are major sources of income. Revenues from these sources are recognized upon the realization.

Other income

Other income consists of circuit bungalow reservations, fines & surcharges, sundry income, disposal income, solar power income, rent income and they are recognized on an accrual basis.

NOTES TO THE FINANCIAL STATEMENTS & ACCOUNTING POLICIES

Interest Income

Interest income mainly derived from interest on Distress loans, interest on Deposits at National Savings Bank maintained for the purpose of gratuity payments and the interest on Fund Management Account at Bank of Ceylon.

6. Employee Benefits

6.1 Defined Benefit Plan

The Water Resources Board is liable to pay retirement benefit under Gratuity Act No.12 of 1983. The liability recognized in the Financial Statements in respect of defined benefit plan is the present value of the defined benefit obligation as at the reporting date in respect of employees. The defined benefit obligation is calculated by a qualified Actuary namely, Actuarial & Management Consultants (Pvt) Ltd as at the reporting date using the Projected Unit Credit (PUC) method as recommended by Sri Lanka Public Sector Accounting Standards (SLPSAS 19), Employee Benefits.

Such Actuarial valuations will be carried out every year. The liability to an employee arises from their date joined.

The Water Resources Board measured the present value of promised retirement benefits of gratuity using the actuarial valuation method. SLPSAS 19 Employee Benefits was effective from 01.01.2018. Plan Asset

The liability is not externally funded. The Water Resources Board maintain a separate Savings Account in National Savings bank for the purpose of funding the defined benefit obligation of the Board.

6.2 Defined Contribution Plans – EPF & ETF

Employees are eligible for Employees' Provident Fund Contributions and Employees' Trust Fund

Contributions in line with respective Statutes and Regulations. The Board contributes 12% and 3% of personal emoluments of employees to EPF and ETF respectively.

7. Taxation

Tax expense Comprises Current and any adjustment to tax payable in respect of previous years.

8. Research Studies Expenses.

Operational expenses which have been identified directly to Research Studies under Treasury Grants capital vote have been Charged to the Statement of Financial Performance.

9. Director remuneration value of Rs.1,765,908.50/- included in Note No.4.1 Salaries & wages expense account.

Monthly Allowance	15,82,908.50
Board Meeting Sitting Allowance	1,38,000.00
Travelling	45,000.00
Total	17,65,908.50

10. Cash Flow Statement

The Cash Flow Statement is prepared using the indirect method as stipulated in SLPSAS 02 Cash Flow Statement,

Whereby gross cash receipts and gross cash payments of operating activities, financing activities and investing activities have been recognized. Cash and cash equivalents comprise mainly balances with banks.

11. Events after the reporting period

All the material events after the reporting period have been considered and appropriate adjustment and disclosures have been made into the financial statement, where necessary.

NOTES TO THE FINANCIAL STATEMENTS & ACCOUNTING POLICIES

12. Foreign Funded Projects.

Establishment of Groundwater Monitoring Network - Pilot Project for Malwathu Oya, Maduru Oya & Kumbukkan Oya River Basins

The Project covers Malwathu Oya, Maduru Oya and Kumbukkan Oya basins where establishing of monitoring points increased

to 190 locations with addition of new pilot areas of Puttalam and Jaffna Peninsula. Ground water level, Electrical conductivity and temperature are the basic parameters monitored with these automated systems. In addition, the heavy metal concentrations in groundwater are periodically assessed. The main objective is to implement as an initiative step towards the establishment of National Groundwater Monitoring Network for Sri Lanka in order to collect real time data on (a) Groundwater Level (b) Water Quality.

A centralized Data management centre is to be located in Colombo. In addition, grass root level community awareness is carried out to change the attitudes on the use and protection of groundwater resources. The total cost of this pilot project is 20.63 Euro Millions which is funded as a soft loan by Rabo Bank, Netherlands. The activities commenced in March 2018 & completed in December 2022. The project was operated as a Turn-key project by the contractor "Royal Eijkelcamp" of Netherlands and executed under the Ministry of Irrigation where the project agreement was signed between the Ministry & the contractor, Eijkelcamp, Netherlands. The payments were recommended by the Project Director based on the progress of the project activities as per the work plan on quarterly basis. The payments as per the project progress has been completed in December 2022. The fixed assets which was utilized during the project operations (2018-2022) has been transferred to W.R.B. and the consumables items & development activities didn't submitted to Water Resources Board at the end of the year. Secretary of Irrigation Ministry

appointed a Revaluation Committee to revalue this project assets and Committee works in progress regarding revaluating of project assets. These previous project assets Accounts as SLPSAS 11 in year 2023.

Identifying of potential monitoring sites were completed within the three river basins.

At present, the dedicated monitoring well constructions in Malwathu Oya, Maduru Oya and Kumbukkan Oya basins has been completed. In addition, the drilling of wells at Puttalam area is in progress. The existing monitoring wells constructed already by WRB has been utilized to develop as automated dedicated monitoring well (40 Nos.) in Jaffna Peninsula. The installation of 121 automated sensor systems are completed at Malwathu Oya, Maduru Oya and Kumbukkan Oya river basins. Installation of the balance monitoring systems and centralized data centre is scheduled to be completed by December 2022.

**NOTES TO THE FINANCIAL STATEMENTS.
REVENUE FROM OPERATING ACTIVITIES**

	2023				2022	
	Rs'000				Rs'000	
	Sector no 01	Sector no 02	Sector no 03	Sector no 04	Revised	Actual
All Sectors	Drilling	Hydrology	Lab	General	Budget	
Hydro Geological Surveys	-	15,932	-	-	20,000	16,077
Tube Well Constructions	44,836	-	-	-	50,000	36,308
Pumping Tests	-	31,283	-	-	37,500	26,146
Tube Well Cleaning	3,424	-	-	-	6,000	1,091
Water Sample Analysis	-	-	6,439	-	7,200	4,284
Sub Total	48,260	47,215	6,439	-	120,700	83,906

NOTE NO:01

HYDRO: INVESTIGATIONS / EXPLORATION

IMPLEMENTATION OF GROUNDWATER REGULATIONS

Registration of Drilling Machines	2,975	2,975	-	-	4,000	3,218
Registration of External Hydrogeologists	385	-	385	-	625	329
Hydrogeological Reports Income	532	-	532	-	900	574
Flow Meters Installation Income	43	-	43	-	90	33
Inspection Income Of Flow Meters	-	-	-	-	150	-
Training of External Drillers	-	-	-	-	375	-
Sub Total	3,935	2,975	960	-	6,140	4,154

GROUNDWATER DEVELOPMENT

Strengthening Groundwater Resources Management	141	-	141	-	-	3,850	-
Implementation of Manage Aquifer Recharge System on GW Resources	885	-	885	-	-	4,000	-
Other Projects Income- {DSWRPP,GWMNP. etc. (Deferred Income)}	1,796,809	1,487,014	115,008	26,580	168,207	1,796,809	-
Sub Total	<u>1,797,835</u>	<u>1,487,014</u>	<u>116,034</u>	<u>26,580</u>	<u>168,207</u>	<u>1,804,659</u>	<u>-</u>
GRAND TOTAL	<u>1,903,684</u>	<u>1,538,249</u>	<u>164,209</u>	<u>33,019</u>	<u>168,207</u>	<u>1,931,499</u>	<u>88,060</u>

NOTE NO: 02**TREASURY GRANT - CAPITAL****(RESEARCH STUDIES - OPERATIONAL)**

Long Term G. W. monitoring in most sensitive G.W. Terrains	3,340	-	3,340	-	-	4,000	3,000
Study on the direct & indirect impacts of climatic changes	966	-	966	-	-	1,500	322
Inspections relating to G. water depletion & pollutions	884	-	884	-	-	1,500	254
Improvements of scientific & other capital works	-	-	-	-	-	-	378
Research Study on natural springs - Maoya	916	-	916	-	-	1,400	839
Rehabilitation & Improvements works expenses	3,640	-	3,640	-	-	4,000	1,313
Development of Groundwater Atlas for Sri Lanka	20	-	20	-	-	600	62
Emergency use for disaster related to water sector	2,729	-	2,729	-	-	3,000	347
Staff Training	-	-	-	-	-	-	389
Development & Mgt of GW. Resources ine	1,663	-	1,663	-	-	4,000	-
Water Supply Schem							
GRAND TOTAL	<u>14,158</u>	<u>-</u>	<u>14,158</u>	<u>-</u>	<u>-</u>	<u>20,000</u>	<u>6,904</u>

NOTE NO:03

OTHER INCOME

Circuit Bungalow Reservation	267	-	-	267	350	190
Fines & Surcharges	23	-	-	23	50	302
Disposal Income	4,882	-	-	4,882	5,000	73
Interests on Loans & Bank Deposits	6,232	-	-	6,232	6,500	7,045
Staff Accommodation Income	229	-	-	229	400	89
Providing Data	204	-	204	-	300	1,764
Sundry Income	982	-	-	982	1,000	1,129
Solar Power Income	100	-	-	100	600	-
Land Rent Income	2,358	-	-	2,358	2,400	-
GRAND TOTAL	15,277	-	204	15,073	16,600	10,592

NOTE NO: 4.1

ADMINISTRATIVE COSTS

Salaries & Wages	158,600	40,985	47,074	13,662	56,879	161,000	172,623
Defined Contribution Plan (Cost - EPF & ETF)	19,169	5,175	5,943	1,725	6,326	20,000	20,826
Defined Benefit Plan Cost - Retiring Gratuity	14,734	-	-	-	14,734	11,400	11,201
Overtime & Holiday Pay	4,965	133	1,378	67	3,387	5,200	6,633
Director's Fees	183	-	-	-	183	220	227
Other Allowances	363	-	-	-	363	400	113
Travelling - Local	1,651	100	752	13	786	1,800	5,092
Staff Package Expenses	4,746	2,217	2,529	-	-	4,500	-
Travelling - Overseas	50	-	-	-	50	50	-
Welfare & Sports facilities	230	-	-	-	230	250	195
Medical Scheme	685	-	-	-	685	725	752
Entertainment	1,216	34	21	15	1,146	1,250	1,035
Vacation Leave Encashment	14	-	-	-	14	15	104
Staff Insurance	251	-	-	-	251	255	-
GRAND TOTAL	206,857	48,644	57,697	15,482	85,034	207,065	218,801

NOTE NO: 4.2**SUPPLIES REQUISITES**

Fuel & Lubricants	28,678	10,094	3,633	-	14,951	29,000	28,688
Drilling Works Consumables	8,766	5,266	-	-	3,500	7,300	9,817
Laboratory Consumables & Others	3,308	-	-	3,308	-	5,000	3,420
Other Consumables	463	45	184	-	234	500	94
GRAND TOTAL	41,215	15,405	3,817	3,308	18,685	41,800	42,019

NOTE NO: 4.3**CONTRACTUAL SERVICES & MAINTENANCE EXPENSES**

Postage & Telecommunication	1,922	6	24	6	1,886	2,100	1,906
Electricity	6,949	-	-	172	6,777	6,600	3,076
Building Rent & Leases	15,755	-	-	-	15,755	18,000	17,186
Rates & Taxes	454	-	-	-	454	500	747
Cash in Transit Insurance	12	-	-	-	12	15	12
Audit Fees	470	-	-	-	470	470	458
Printing	35	-	-	-	35	350	1,111
Workshop & Seminars	147	-	-	-	147	150	194
Water Bills	721	-	-	-	721	850	642
Accommodation Expenses	234	142	70	-	22	250	333
Consultancy Charges	454	-	-	-	454	400	968
Sundry Expenses	1,001	191	19	5	786	1,000	1,446
Maintenance of Motor Vehicles	6,290	131	10	-	6,149	7,000	5,705
Maintenance of Machinery	5,738	1,381	12	-	4,345	3,000	5,227
Maintenance of Office Equipments	3,941	45	100	38	3,758	3,600	4,007
Maintenance of Buildings	1,659	20	24	31	1,584	1,100	1,129
Depreciation	424,485	-	-	-	424,485	445,000	8,691
GRAND TOTAL	470,267	1,916	259	252	467,840	490,385	52,838

NOTE NO: 4.4**OTHER OPERATING EXPENSES**

Stationery & Office Requisites	1,249	4	15	3	1,227	1,400	1,009
Uniforms	894	217	-	-	677	1,000	169
Periodicals & Newspapers	1	-	-	-	1	10	14
Publicity & Advertising Expenses	541	-	-	-	541	600	549
Bank Charges	182	-	-	-	182	155	151
Medical Test Charges	5	-	-	-	5	7	166
Legal Expenses	101	-	-	-	101	300	239
Stamp Duty	14	-	-	-	14	300	282
Vehicle Service - Ratmalana	158	-	-	-	158	200	45
Hiring Charges	3	-	3	-	-	8	41
Fines & Surcharges	-	-	-	-	-	10	10
Operating Lease Rentals	-	-	-	-	-	-	1,425
Data Collection Expenses	2	-	2	-	-	5	-
Social Security Contribute Levy	2,811	-	-	-	2,811	3,000	-
	<u>5,961</u>	<u>221</u>	<u>20</u>	<u>3</u>	<u>5,717</u>	<u>6,995</u>	<u>4,100</u>
GRAND TOTAL							

NOTE NO: 4.5**OTHER PROJECT EXPENSES**

Strengthening Groundwater Resources Management	141	-	141	-	-	3,850	-
Implementation of Manage Aquifer Recharge							
System on GW Resources	661	-	661	-	-	4,000	-
GRAND TOTAL	<u>802</u>	<u>-</u>	<u>802</u>	<u>-</u>	<u>-</u>	<u>7,850</u>	<u>-</u>

NOTE NO: 4.6**TREASURY GRANT - CAPITAL****(RESEARCH STUDIES - OPERATIONAL)**

Long Term G. W. monitoring in most sensitive G.W. Terrains	3,340	-	-	3,340	-	-	4,000	3,000
Study on the direct & indirect impacts of climatic changes	966	-	-	966	-	-	1,500	322
Inspections relating to G. water depletion & pollutions	884	-	-	884	-	-	1,500	254
Improvements of scientific & other capital works	-	-	-	-	-	-	-	378
Research Study on natural springs - Maoya	916	-	-	916	-	-	1,400	839
Rehabilitation & Improvements works expenses	3,640	-	-	3,640	-	-	4,000	1,313
Development of Groundwater Atlas for Sri Lanka	20	-	-	20	-	-	600	62
Emergency use for disaster related to water sector	2,729	-	-	2,729	-	-	3,000	347
Staff Training	-	-	-	-	-	-	-	389
Development & Mgt of G.W. Resources in Water Supply Scheme	1,663	-	-	1,663	-	-	4,000	-
GRAND TOTAL	14,158	-	-	14,158	-	-	20,000	6,904

NOTES TO THE FINANCIAL STATEMENTS CONTD.

		Actual	
		2023	2022
		Rs.'000	Rs.'000
NOTE NO:05			
CASH & CASH EQUIVALENTS			
(1) Bank of Ceylon York Street Branch (0002026295)		27	245
(2) Bank of Ceylon Torrington Branch (0002323267)		59,927	55,818
(3) Bank of Ceylon Torrington Branch (0002323268)		663	17
(4) Bank of Ceylon Torrington Branch (0005342839)		136	219
Sub Total		60,753	56,299
EMPLOYEE BENEFIT - PLAN ASSET			
(5) National Savings Bank - Bambalapitiya (100230211818)		23,390	18,051
GRAND TOTAL		84,143	74,350

NOTE:- FUND MNAGEMENT ACCOUNT

The Board has opened (Board Paper No. 1203) a Fund Management Account (A/C No. 83141035) on 07.09.2018 adjoining to the existing Current Account of 0002323267 of Bank of Ceylon Torrington Branch to earn an Interest for the available funds from the Current Account.

		2023	2022
		Rs.'000	Rs.'000
NOTE NO:06			
TRADE & OTHER RECEIVABLES			
STAFF			
(01) Distress Loan		25,199	23,869
(02) Festival Advance		11	25
Sub Total		25,210	23,894
OTHERS			
(03) Trade		4,368	5,027
(04) Advance to Suppliers		-	185
(05) Retention Receivable		1,978	3,956
(06) V.A.T. Receivable (Refund)		-	1,263
(07) Other Debtors		250	-
(08) Staff Debtors		80	-
(09) Withholding Tax Receivable		393	-
(10) Other Receivables		1,000	1,899
Sub Total		8,069	12,330
TOTAL RECEIVABLES		33,279	36,224

NOTE NO: 07
INVENTORIES

	2023 Rs.'000	2022 Rs.'000
MATERIALS & SPARES		
Vehicle Spares	2,550	3,182
Vehicle Spares (DSWRPP)	1,924	1,964
Fuel & Lubricants	1,189	1,237
Ground Water Consumables	23,879	28,114
Building Materials	539	783
Stationery	238	296
Machinery Spares (with 2 KR)	54,618	56,319
Machinery Spares (DSWRPP)	35,040	35,942
Machinery Spares (MINISTRY)	2,113	2,208
Laboratory Consumables	2,598	1,901
GRAND TOTAL	124,688	131,946

NOTE NO:08

PRE-PAYMENTS

License & Insurance	19	183
Cash In Transits	10	10
Maintenance of Office Equipments	-	32
Building Rent	4	-
GRAND TOTAL	33	225

NOTES TO THE FINANCIAL STATEMENTS CONTD.

PROPERTY, PLANT & EQUIPMENT

NOTE: 09

Cost	Balance as at 01.01.2023 Rs'000	Additions / Revaluation Rs'000	Disposal / Adjustments Rs'000	Balance as at 31.12.2023 Rs'000
Lands	1,897	90	-	1,987
Buildings	50,590	-	-	50,590
Motor Vehicles	171,447	-	(250)	171,197
Machinery	1,895,939	4,325	(7,846)	1,892,418
Laboratory Equipments	90,460	5,465	(50,234)	45,691
Furniture Fittings & Office Equipments	41,403	31	-	41,434
Computers & Accessories	17,270	1,040	(1,054)	17,256
Scientific Equipments	200,466	18,663	(19,563)	199,566
Buildings (Work in Progress)	1,789	34	-	1,823
GRAND TOTAL	2,471,261	29,648	(78,947)	2,421,962

Depreciation	Balance as at 01.01.2023 Rs'000	Additions Rs'000	Disposal / Adjustments Rs'000	Balance as at 31.12.2023 Rs'000
Buildings	4,419	2,528	-	6,947
Motor Vehicles	65,206	42,858	(169)	107,895
Machinery	408,541	336,832	(7,846)	737,527
Laboratory Equipments	63,569	12,751	(50,234)	26,086
Furniture Fittings & Office Equipments	9,728	4,139	-	13,867
Computers & Accessories	9,860	1,806	(1,054)	10,612
Scientific Equipments	85,436	23,571	(19,563)	89,444
GRAND TOTAL	646,759	424,485	(78,866)	992,378
NET BOOK VALUE	1,824,502			1,429,584

NOTES TO THE PROPERTY PLANT & EQUIPMENT

cont.... NOTE: 09

01 Depreciation Charges to the Financial Performance is made as follows.

Depreciation	Charges for the Year Rs'000
Buildings	2,528
Motor Vehicles	42,858
Machinery	336,832
Laboratory Equipments	12,751
Furniture Fittings & Office Equipments	4,139
Computers & Accessories	1,806
Scientific Equipments	23,571
GRAND TOTAL	424,485

02 Land of Korakahawewa Training Center (2.166 Hect.) has leased agreement on paying with annual rental basis

03 An extent of 40.0 perches land at Battaramulla has allocated from the Urban Development Authority to the Water Resources Board.

04 Land Of Circuit Banglow at Anuradhapura (0.0759 Hect.) has been transferred for a period of 30 years on lease basis by the Gazette notification no 1982 dated 26.08.2016.
The provision has not been made due to unavailability of Annual assessment notice.

05 Land of Jaffna for construct provincial office (0.0506 Hect:) has leased on paying with annual rental Basis. Current annual rental is Rs. 50,000/= (Rs. 2,500,000/= * 2%)

06 Details of the Land & Buildings which are utilizing of the Board without having legal ownership as at 31.12.2023 are as follows.

LAND	(Appox.)
Work Shop at Rathmalana	1.79378 Hect.
Work Site at Vauniya	0.1050 Hect.

07 During the year Asset purchases /Granted Assets values are shown as additions in the note no. 09 of Property, Plant and Equipment.

NOTES TO THE FINANCIAL STATEMENTS CONTD;

NOTE NO:10

OTHER PROVISIONS & PAYABLES

	2023 Rs'000	2022 Rs'000
(1) Provision for Audit Fees	469	464
(2) Accrued Expenses (Pl. see Page No.21 for details)	4,300	5,161
(3) Other Payables (with grativity)	1,723	5,942
(4) Retention Payable	-	38
(4) VAT Payable	570	-
(4) Bid Bond & Refundable Deposit	-	-
(4) WHT Payable	-	-
(4) APIT Payable	-	-
(4) VAT Cash	-	-
s/duty		
GRAND TOTAL	7,062	11,605

NOTE NO:11

DEFERRED INCOME

Flow Meter Advance	-	903
Service Advance (Pl.see Page No. 26 to 27 for details)	4,051	15,920
Survey Reports Advance (Pl. See Page No. 28 for details)	28	24
GRAND TOTAL	4,079	16,847

NOTE : 12

EMPLOYEE BENEFITS

12.1 Defined Contribution Plans

The following contributions have been made to the Employees' Provident Fund and Employees' Trust Fund during the year.

Employees' Provident Fund		
Employers' Contribution - 12%	15,335	16,661
Employees' Contribution - 10%	12,779	13,884
	-	
Employee Trust Fund - 3%	3,834	4,165

12.2 Defined Benefit Plan

Defined Benefit obligation as at beginning of the Year	60,783	59,089
Interest cost for the Period	10,941	6,795
Current Service cost	3,793	4,406
Past Service cost	-	2,116
Actuarial (Gain)/Loss	(8,699)	(8,298)
Benefit paid during the year	(9,095)	(1,541)
Benefit Payable	(1,594)	(1,784)
	56,129	60,783

12.2.1 Expense recognized during the year in Income Statement

Current Service Cost	3,793	4,406
Interest cost for the Period	10,941	6,795
	14,734	11,201

Equity Statement - (Please see page No.03)

Actuarial Gain / (Loss) on Retirement benefit obligation	(8,699)	(8,298)
--	----------------	----------------

12.2.2. An actuarial valuation for gratuity liability was carried out as at 31.12.2023 by Mr.Poopalanathan of Ms. Actuarial & Management Consultants (Pvt) Ltd, a firm of Professional Actuaries.

The following Assumptions and data were used in valuing the defined benefit obligation by the actuarial valuer.

	2023	2022
Discount rate	13%	18%
Salary Increment rate	10%	15%
Staff Turnover Rate	6%	3%

NOTES TO THE FINANCIAL STATEMENTS CONTD.**12.2.3 Defined benefit plan**

Assumptions regarding future are based on A1967/70 mortality table, issued by the Institute of Actuaries, London.

The normal retirement age of an individual is assumed to be 60 years and employees over 60 years are assumed to retire on their respective next birthdays.

According to the Payment of Gratuity Act No: 12 of 1983, the liability for gratuity to an employee arises only on completion of 05 years off continuous service.

12.2.4 Sensitivity Analysis

Variables Changed by 1% while all other assumptions remain unchanged, the following would be the impact on employee benefits.

	2023	
	Increase by +1% Rs. '000'	Decrease by -1% Rs. '000'
Discount rate	53,022	59,616
Salary increment rate	59,728	52,873

2023
Rs'000

NOTE NO:13

Deferred Income (Pl. see Page No.20 for details)

-

NOTE NO:14

Please see Page No 03 for Statement of changes in Net assets / Equity

NOTE NO:15**OTHER DISCLOSURE****COMMITMENTS AND CONTINGENCIES****Contingent liabilities****Litigation Against the Board**

The claim for a lawsuits filed against the board by Secretariat ,Thibrigasyaya for leaving the head office at the address of No:2A,Hector Kobbekaduwa Mawatha,Colombo 07.Although, there can be no assurance, the Directors believe, based on the information currently available that the ultimate resolution of such lawsuits are not likely to have a material effect on the results of operations, financial position or liquidity.

NOTE: 13**Deferred Income**

	Balance as at 01.01.2023	Additions During the Year	Charges for the Year		Balance as at 31.12.2023
			Depreciation	Revaluation Adjustments/ Disposal	
	Rs'000	Rs'000	Rs'000	Rs'000	Rs'000
Lands	-	-	-	-	-
Buildings	41,792			(41,792)	-
Motor Vehicles	98,687			(98,687)	-
Machinery	1,487,013			(1,487,013)	-
Laboratory Equipments	26,580			(26,580)	-
Furniture Fittings & Office Equipments	21,052			(21,052)	-
Computers & Accessories	6,069			(6,069)	-
Scientific Equipments	115,007			(115,007)	-
Building Work in Progress	609			(609)	-
GRAND TOTAL	1,796,809	-	-	(1,796,809)	-

EFFECT ON THE FAIR VALUE OF PROPERTY PLANT & EQUIPMENTS.

	YEAR 2020	YEAR 2018	YEAR 2017	YEAR 2016	
		Surplus	Deficit	Surplus	Deficit
	Rs'000	Rs'000	Rs'000	Rs'000	Rs'000
Motor Vehicles	15,100	-	-	916	-
Machinery	-	-	-	-	5,317
Laboratory Equipments	-	-	-	-	631
Furniture Fittings & Office Equipments	-	3,228	-	-	-
Computers & Accessories	-	-	-	256	-
Scientific Equipment	-	-	242	-	-
GRAND TOTAL	15,100	3,228	242	1,172	5,948
Effect	Financial Position	Financial Position	Income Statement	Financial Position	Income Statement



Auditor General's Report



ජාතික විගණන කාර්යාලය
தேசிய கணக்காய்வு அலுவலகம்
NATIONAL AUDIT OFFICE



මගේ අංකය
எனது இல
My No.

IWM/A/WRB/FA/2023

ඔබේ අංකය
உமது இல
Your No.

දිනය
திகதி
Date

2024 August 23

Chairman
Water Resources Board

Report of the Auditor General on the Financial Statements and other legal and regulatory requirements of the Water Resource Board for the year ended 31st December 2023 in terms of Section 12 of the National Audit Act No: 19 of 2018

1. Financial Statements

1.1 Qualified Opinion

The audit of the financial statements of the Water Resource Board for the year ended 31 December 2023 comprising the statement of financial position as at 31 December 2023 and the statement of financial performance, statement of changes in net assets and statement of cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies, was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with provisions of the National Audit Act No. 19 of 2018 and Finance Act No. 38 of 1971.

In my opinion, the accompanying financial statements give a true and fair view of the financial position of the Board as at 31 December 2023, and of its financial performance and its cash flows for the year then ended in accordance with Sri Lanka Public Sector Accounting Standards.

1.2 Basis for the qualified opinion

- (a) The value of Rs. 1,638,000 indicated as the adjustment in the previous year has not been disclosed, which should be done as per Para. 54 of Sri Lanka Public Sector Accounting Standards No: 03.
- (b) Only 150 out of 854 items belonging to 3 categories of assets have been revalued as Rs. 80,754,510 at the revaluation of property, plant and equipment and accounted deviating from Para. 49 of Sri Lanka Public Sector Accounting Standard No: 7. Further, the required disclosures have not been made as per Para. 90 of Sri Lanka Public Sector Accounting Standard No: 07 on revalued assets.
- (c) Since the useful life of 850 items belonging to 4 asset categories, which have been revalued as Rs. 298,147,287 within the period from 2016-2018 by the Board and are still in use, has been over, the book value was nil as at 31st of December 2023 and the said assets have not been revalued as per Para. 42 of Sri Lanka Public Sector Accounting Standard No: 7 and accounted.
- (d) Drilling machines worth of Rs. 3,360,000, drilling firms and the revenue of registering Geohydrologists have been accounted on cash basis deviating from Para. 14 of Sri Lanka Public Sector Accounting Standard No: 10.
- (e) Even though, the total income of Rs. 1,797,835,000 from the project of establishing a ground water monitoring network and other projects and other non-exchangeable receipts have been accounted as per Sri Lanka Public Sector Accounting Standard No: 11, the accounting policy used for recognition of the said revenue has not been disclosed as per Para. 107 of Sri Lanka Public Sector Accounting Standard No: 11.
- (f) The project of establishing a ground water monitoring network has been completed by the Ministry of Irrigation on 31st of December 2022 and handed over to the Board and the following observations are made in this regard.
 - (i) Even though, the non-current assets purchased under this have been handed over to the Board by the Project Director by the end of the year under review, the total assets of Rs. 336,301,185 has not been accounted.
 - (ii) The value of 190 tube wells with high-tech equipment assigned to the Board to a cost of Rs. 1,738,833,941 and their maintenance equipment and consumer goods worth of Rs. 1,534,077,024 assigned to the Board has not been accounted as per Para. 83 of Sri Lanka Public Sector Accounting Standard No: 11.

- (iii) Two double cabs have been purchased and converted into mobile laboratories and handed over to the Board by the project on 15th of February 2023 and their value has been accounted as Rs. 33,541,773 under machinery. Even though, the value of these two vehicles should be accounted as motor vehicles and the equipment fixed in the same as laboratory machines as per Para. 57 of Sri Lanka Public Sector Accounting Standard No: 7, action has not been taken accordingly. The cost of Rs. 21,700,000 of the two vehicles should have been depreciated by 25% each to be Rs. 4,746,875. However, Rs. 3,352,340 has been depreciated by 20% each. Therefore, depreciation has been accounted Rs. 1,394,535 less than the actual amount.
- (g) The value of 80 items of laboratory equipment revalued as Rs. 61,062,600 on 30th of October 2023, has been understated by Rs. 55,597,307. Therefore, the depreciation expense for the said assets has been under stated by Rs. 963,393.
- (h) All the components of cash and cash equivalents should be disclosed as per Para. 56 of Sri Lanka Public Sector Accounting Standard No: 2. However, the balance of Rs. 61,200,369 in the saving's account maintained in relation to the current account No: 0002323267 at Bank of Ceylon has been indicated together with the relevant current account instead of indicating it separately.

I conducted my audit in accordance with Sri Lanka Auditing Standards (SLAuSs). My responsibilities, under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of my report. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my qualified opinion.

1.3 Other information included in the Borad's Annual Report – 2023

The other information comprises the information included in the Board's 2023 Annual Report but does not include the financial statements and my auditor's report thereon, which is expected to be made available to me after the date of this auditor's report. The Management is responsible for the other information.

My opinion on the financial statements does not cover the other information and I do not express any form of assurance conclusion thereon.

In connection with my audit of the financial statements, my responsibility is to read the other information identified above when it becomes available and, in doing so, consider whether the other information is materially inconsistent with the financial statements or my knowledge obtained in the audit or otherwise appears to be materially misstated.

When I read the Board's Annual Report, if I conclude that there are material

misstatements therein, I am required to communicate that matter to those charged with governance for correction. If further material uncorrected misstatements are existed those will be included in my report to Parliament in pursuance of provisions in Article 154(6) of the Constitution that will be tabled in due course.

1.4 Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation of financial statements that give a true and fair view in accordance with Sri Lanka Public Sector Accounting Standards, and for such internal control as management determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Board's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Board or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Board's financial reporting process.

As per Section 16(1) of the National Audit Act No. 19 of 2018, the Board is required to maintain proper books and records of all its income expenditure assets and liabilities, to enable annual and periodic financial statements to be prepared of the Board.

1.5 Auditor's Responsibilities for the Audit of the Financial Statements

My objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Sri Lanka Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Sri Lanka Auditing Standards, I exercise professional judgment and maintain professional skepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal administration relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal administration.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the management.
- Conclude on the appropriateness of the management's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Board's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with those charged with governance regarding, among other matters, significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

2. Report on Other Legal and Regulatory Requirements

- 2.1 National Audit Act, No. 19 of 2018 includes specific provisions for following requirements.
- 2.1.1 I have obtained all the information and explanation that required for the audit as per the requirement of section 12 (a) of the National Audit Act, No. 19 of 2018 except the effect made by the matters described in the basis for opinion of my report;

2.1.2 The financial statements presented is consistent with the preceding year as per the requirement of section 6 (1) (d) (iii) of the National Audit Act, No. 19 of 2018.

2.1.3 The financial statements presented includes all the recommendations made by me in the previous year as per the requirement of section 6 (1) (d) (iv) of the National Audit Act, No. 19 of 2018 except the observations made in Para. (i), (ii), (iii) of sections 12 (c), (d), (e), (f), (g) in the basis for opinion of my report.

2.2 Based on the procedures performed and evidence obtained were limited to matters that are material, nothing has come to my attention.

2.2.1 To state that any member of the governing body of the Board has any direct or indirect interest in any contract entered into by the Board which are out of the normal cause of business as per the requirement of section 12 (d) of the National Audit Act, No. 19 of 2018 except for.

2.2.2 To state that the Board has not complied with any applicable written law, general and special directions issued by the governing body of the Board as per the requirement of section 12(f) of the National Audit Act, No. 19 of 2018 except the following observations.

Reference to law/ Direction -----	Observations -----
Orders made by the Minister by the Gazette Extra Ordinary No: 2010/23 dated 16th of March 2017 as per Section 16 of the Water Resource Board Act No: 29 of 1964 (i) Order 02	Even though, all the institutions, which are engaged in the construction of tube wells, should be registered with the Board, only 42 institutions were registered by the end of the year under review. 72 institutions were registered in the previous year and there was no system for the Board to verify whether the institutions which are not registered/ of which the registration is not renewed, are

	not constructing tube wells and identify the institutions which are not registered in the Board. Even though, a report including all the data of the tube wells newly built by the registered institutions as per the order should be submitted to the Board once in every 03 months, only 4 institutions out of the 42 registered institutions have submitted the above report.
(ii) Order 03	If an institution or a person engaged in the bottled water business and production of soft drinks is using a natural spring or ground water for their production, a sample of water from the said water source should be tested from a recognized government laboratory once in every 6 months and the relevant analysis report should be submitted for the approval. However, only 9 out of the institutions registered with the Board have submitted the above report.
(iii) Order 06	Legal action has not been taken as per Section 20 of the Water Resource Board Act No: 29 of 1964 amended by the Act No: 42 of 1999 against the institutions, organizations or persons that are not taking action as per the orders from 1 to 5, which includes the terms to be followed by the institutions that use natural springs or shallow or deep ground water.
(b) Section 10 and 11 of Employee Provident Fund Act (Amendment) No: 26 of 1981	The contribution of the employer to the fund should be 12% and the contribution of the employee to the fund should be 8% and a higher rate than this can be agreed upon. Even though, 10% has been recovered from the employees of the Board and paid

	while the contribution of employer was 12%, it was not informed to the Commissioner.
(c) (i) Guideline 2.2.1 of the Guidelines for Corporate Governance of Public Enterprises introduced by the Public Enterprises Circular No: 01/2021 dated 16th of November 2021	Performance indicators have not been determined or a corporate plan has not been prepared for the Board or action has not been taken to direct the Borad accordingly.
(ii) Guideline 2.2.2 (b) of the Guidelines for Corporate Governance of Public Enterprises introduced by the Public Enterprises Circular No: 01/2021 dated 16th of November 2021	Board of Directors have taken action to establish a strong governance framework to fulfill the requirements of submitting the Board Papers to the members of the Board to read and understand before the meeting of the Board of Directors, maintaining a proper reliable management information system required in making decisions and confirm the responsibility, taking follow up action regarding the decisions of the sub committees including the Audit Committee and take necessary measures and disclose the financial and non- financial information through the website of the institution in a user friendly manner to fulfill the requirements of the related parties.
(iii) Guideline 2.4 of the Guidelines for Corporate Governance of Public Enterprises introduced by the Public Enterprises Circular No: 01/2021 dated 16th of November 2021	Board of Directors have not submitted an annual statement to the Secretary of the Board with regard to the connections with the Board and the relevant disclosures on each Director has not been made in the Annual Report of the Board.
(i) Para. 6.6 of the Guidelines for Corporate Governance of Public Enterprises Manual introduced by the Public Enterprises Circular No: PED/01/2021 dated 16th of November 2021.	Even though, the draft should be submitted within 60 days from the end of the financial year, the draft annual performance report relevant to year 2023 has not been submitted by the Board along with the financial statements.

2.2.3 Action has been taken deviating from the power, role and functions of the Board except the following observations in accordance with the requirements indicated in Section 12 (g) of the National Audit Act No: 19 of 2018.

Board has registered Geohydrologists from year 2018 and granted permission to personally provide professional services. No legal provisions are available under the Water Resources Act No: 29 of 1964 and 12 to 18 Geohydrologists have been registered annually.

2.2.4 The resources of the Board have not been utilized efficiently, effectively and productively in accordance with the requirement of Section 12 (h) of the National Audit Act No: 19 of 2018 after procuring in compliance with the relevant rules and regulations within the prescribed time.

2.3 Other matters

(a) **Pilot project for the establishment of a Ground Water Monitoring Network.**

Approval has been granted by the Cabinet decision No: අමස15/1087/644/005 dated 29th of July 2015 to implement the pilot project for the establishment of a Ground Water Monitoring Network in Sri Lanka in the selected 4 districts of Anuradhapura, Polonnaruwa, Moneragala and Puttalam where the kidney disease is widely spread, in order to establish a system to manage the quantity and quality of the ground water in Sri Lanka. Secretary, Ministry of Irrigation has signed an agreement with Royal Eijkelpark in Netherland on 03rd of October 2017 to implement the said project for the cost of Euro 20,629,921 and the project has been completed on the 31st of December 2022. The Government of Sri Lanka has obtained a loan from Rabo Bank in Netherland to the value of Euro 17,535,433 which is 85% of the cost of the project which was Euro 20,629,921.18 (Rs. 5,521,329,000) to repay in 20 equal installments within 10 years on a concessionary interest rate of 1.45%. Euro 3,094,488.18, which is the balance 15% has been obtained by the government of Sri Lanka from the Hatton National bank of Sri Lanka to repay after a concessionary period of 3 years starting from the second half of year 2025 in 15 years. The following observations are made in this regard.

- (i) Even though, the project has been completed in year 2022, the main objectives and the expected outcomes of the project could not be achieved due to not constructing the building for the data center.
- (ii) Rs. 259.1 Million (Euro 1,473,462) has been allocated for the construction of a data center on a land, which belongs to the Urban Development Authority and it has been decided to utilize suspense allocations of Rs. 329.8 Million (Euro 1,875,447) for the data center. Even though, Rs. 544.2 Million (Euro 3,094,488), which is 15% of the said total value, has been paid to the Netherland contractor

as advance, the data center has not been constructed since the ownership of the land was not received and the advance of Euro 3,094,488 that was not utilized.

- (iii) As a task of the project, 2 double cabs have been purchased for Rs. 21,700,000 by the project for 2 mobile laboratories. They have been registered in the name of the Project Director and handed over to a private company to be converted into mobile laboratories and the procurement guidelines have not been followed when selecting a company for this purpose.
 - (iv) The relevant 2 vehicles have been converted into mobile laboratories and handed over to the Board on the 15th of February 2023 and Rs. 11,841,774 has been charged by the private company for the conversion. However, the rear tube tail body removed from the said two vehicles have not been handed over to the Board. An inquiry in this regard has not been conducted as per Financial Regulations 104(1) and determined the responsible persons for the same.
 - (v) Even though, the 2 mobile laboratories have been registered as Cabs in the name of the Chairman of the Board on the 02nd of May 2023, registration has not been revised as mobile laboratories.
- (c) It has been decided by the Cabinet decision No: අම/16/2500/724/099 dated 06th of December 2016 to grant the land in extent of 10 perches located at Denzil Kobbekaduwa Mawatha, Battaramulla that belongs to the Urban Development Authority to the Water Resource Board for a period of 30 years. The Government Chief Valuer has determined an amount of Rs. 2,700,000 for the said land in which the new Head Office building was proposed to be constructed. Even though, Rs. 24,906,879 has been paid by the Board to the Authority as the rental for the period from year 2016 to October 2023 without signing a lease agreement, the land has not been used. Further, allocations have been made for the construction of the Head Office building on this land from year 2018 under the pilot project for the establishment of a Ground Water Monitoring Network. However, the allocations could not be utilized since there has not been a formal lease agreement. Further, Urban Development Authority has refused to enter into a long-term lease agreement for this land located at Denzil Kobbekaduwa Mawatha until the amount of Rs. 56,409,666,000 in arrears to be paid for the land located at Hector Kobbekaduwa Mawatha, Colombo 7 is settled or written off under a proper methodology as per Section 6(1) of the State Land Ordinance.
- (d) (i) When restructuring certain posts belonging to the Salary Category of JM-1 at Junior Management Level before restructuring the staff of the Board or As per the provisions of the Management Service Circular No: 30, they have been converted into posts of MM Category (Middle Management Level). When issuing vehicle import permits on concessionary terms under Trade and Investment Policy Circulars No: 01/2010, 01/2013 and 01/2018 for 5 officers, who have been absorbed into the posts after the restructuring with effect from 03.10.2012, issuance of the above vehicle permit has

been recommended after incorrectly calculating the period of service considering the period before the restructuring as the period of holding the posts in MM category. Recommendations have been made to obtain the second vehicle permit in year 2018 for three officers out of the said officers, who have obtained the first vehicle import permit. Even though, 10 years have lapsed since the vehicle permit was obtained, the disciplinary inquiry that has been commenced against these officers was not completed. The Board has not taken disciplinary action against the officers, who have made recommendations in this regard.

- (ii) In addition, recommendations have been made to grant vehicle import permit on concessionary terms to 5 officers, who are already retired, before completing the prescribed period of service and they have obtained the vehicle permits. However, steps have not been taken to recover the losses caused by them by obtaining the vehicle permits and take disciplinary action against the officers, who have made recommendations in this regard and gratuity has been paid for these officers without recovering this loss at the time of retirement.
- (e) The service of an Attorney-at-Law and a law firm has been obtained to prepare the draft to make the following amendment to the Water Resource Board Act and Rs. 645,000 has been paid as at the audit date. Even though 4 years have lapsed since identifying that it is required to amend the Act, the task has not been performed.
- (f) The Board has made allocations of Rs. 7,850,000 by the Budget of the year under review for 2 projects for which the Board has acted as the Implementing Partner and only Rs. 802,000 has been spent. Since 89% of the allocations made by the annual Budget for the projects has not been utilized, the said amount has remained underutilized.
- (g) An assisting staff consisting of 52 persons including Drilling Manager, 11 Drilling Officers has been attached to the Drilling Division of the Board and an amount of Rs. 65,965,000 has been spent for salaries, overtime, travelling expenses and other costs of the staff under the year under review. Nine out of the 18 drilling machines belonging to the said division was in use and 2 drilling machines received from the project have not been used because the maintenance and service expenses and expenses for repairs are high. Only 58 tube wells have been built with the use of the rest of the 7 drilling machines within the year under review and accordingly only 8 tube wells have been built from one drilling machine, which was in working condition. A Drilling Officer and an assisting staff consisting of 8 persons have been attached to one drilling machine and only one tube well has been built by one such team for two months.

The orders received by the Drilling Division has been dropped continuously to 58 from 280. Accordingly, an analysis on the inefficiency of the said division has not been done and necessary rectifications have not been made.

- (h) Even though, Divisional Secretary, Thimbirigasyaya has informed the Board to pay the tax amount of Rs. 12,772,000 annually from year 2016 and obtain a annual tax

permit for the land where the Hed Office is located at Hector Kobbekaduwa Mawatha, Colombo 07 at which the Water Resource Board has been maintained from year 1978. Since action has not been taken by the Board accordingly, a case has been filed by the Divisional Secretary, Thimbirigasyaya at the High Court, Colombo in year 2019. Subsequently, the Attorney General has advised Divisional Secretary, Thimbirigasyaya to come to an agreement with regard to the possession of the land. However, action has not been taken accordingly and the complex where the Head Office has been maintained over 45 years, has been handed over to be used for the expansion of the official residence the then Prime Minister without the approval of the Cabinet of Ministers. The Head Office has been maintained at a private building in Rajagiriya from 18th of July 2021 to 15th of July 2022 and at private building in Nawala Koswatta from 01st of August 2022. An amount of Rs. 30,511,722 has been paid as the rental for the buildings from 2021 to 2023.

- (i) Even though, 7 years have lapsed since the land alienated to Board on rental basis for a period of 30 years in year 2016 where the Anuradhapura Circuit Bungalow was constructed, a rental agreement has not been signed and still action has not been taken to pay any rental for this land.

Auditor General's Report as per Article 12 of the National Audit Act No: 19 of 2018 on the Financial Statements and other legal and regulatory requirements of the Water Resource Board for the years ended 31st of December 2023

1.2 Basis for the qualified opinion			
	a)	The value of Rs. 1,638,000 indicated as the adjustment in the previous year has not been disclosed, which should be done as per Para. 54 of Sri Lanka Public Sector Accounting Standards No: 03.	The amount of Rs. 1,638,000 consists of 5 invoices, voucher for the telephone charges and extra amount allocated when allocating tax amount for the land in Densil Kobbakaduwa Mawatha, Battaramulla that should be included in the income of year 2022 after preparing the accounts. The details related to these items are presented in Annex 3 and if there are such transactions in the preparation of accounts for year 2024 action will be taken to disclose them in the financial statements.
	b)	Only 150 out of 854 items belonging to 3 categories of assets have been revalued as Rs. 80,754,510 at the revaluation of property, plant and equipment and accounted deviating from Para. 49 of Sri Lanka Public Sector Accounting Standard No: 7. Further, the required disclosures have not been made as per Para. 90 of Sri Lanka Public Sector Accounting Standard No: 07 on revalued assets.	The Water Resource Board has provincial offices such as Anuradhapura, Jaffna, Puttalam, Moneragala, Ratmalana and all the assets of the Board are under the purview of each division. We sought the support of the Water Resources Board, Water Supply and Drainage Board for the revaluation of the assets which are under the purview of Jaffna and Ratmalana provincial offices, due to the lack of staff in our Board and this situation has arisen since it was unable to do the revaluation due to the non-participation of the officials of the Water Supply Board for those two districts.
	c)	Since the useful life of 850 items belonging to 4 asset categories, which have been revalued as Rs. 298,147,287 within the period from 2016-2018 by the Board and are still in use, has expired, the book value was nil as at 31st of December 2023 and the said assets have not been revalued as per Para. 42 of Sri Lanka Public Sector Accounting Standard No: 7 and accounted.	The details related to the approved and actual cadre is indicated in Annex FD-0. Accordingly, the total number of vacancies at present is 187. As mentioned above, it is proved that there is no sufficient staff at the Water Resource Board to carry out other duties in addition to the daily duties and the assets at the district offices of Puttalam, Moneragala and Anuradhapura of which the useful life has expired has been revalued in the year 2023 and it is stated under 3.2 of the disclosures. Water Resource Board has attempted to revalue the assets of other two districts in year 2023 and the task could not be completed due to the difficulty of coordinating the relevant staff and external members.

	d)	Drilling machines worth of Rs. 3,360,000.00 drilling companies and the revenue of registering Geohydrologists have been accounted on cash basis deviating from Para. 14 of Sri Lanka Public Sector Accounting Standard No: 10.	The relevant fact is disclosed under recognition of revenue in accounting policies of page No: 8 of the Financial Statement.
	e)	Even though, the total income of Rs. 1,797,835,000.00 from the project of establishing a ground water monitoring network and other projects and other non-exchangeable receipts have been accounted as per Sri Lanka Public Sector Accounting Standard No: 11, the accounting policy used for recognition of the said revenue has not been disclosed as per Para. 107 of Sri Lanka Public Sector Accounting Standard No: 11.	The manner in which action has been taken with regard to the assets as per Sri Lanka Public Sector Accounting Standard 11 under the Accounting Policy has mainly been disclosed. Further, details in this regard are included under Note 13. The reason for this deficiency in operation is the preparation of the huge depreciation cost of Rs. 424,485,000.00 including the depreciation cost relevant to the non exchange transaction value.
	f)	The project of establishing a ground water monitoring network has been completed by the Ministry of Irrigation on 31st of December 2022 and handed over to the Board and the following observations are made in this regard. i. Even though, the non-current assets purchased under this have been handed over to the Board by the Project Director by the end of the year under review, the total assets of Rs. 336,301,185.00 has not been accounted.	The project staff has used a wrong method in preparing the cost of the assets received under this Netherlands project. Therefore, the cost was unacceptable and a committee was appointed by the Secretary, Ministry of Irrigation in the year 2023 to properly calculate the cost of the assets of this project. Even though, the Director - Projects should submit a report including the correct value of assets to the Water Resource Board as per the recommendations given by the said committee, it was unable to enter the said assets in the books since the report was not submitted by 28.02.2024. This report of the committee was submitted on 19.04.2024. Action will be taken to include these assets in the financial accounts of year 2024. This has been disclosed under Accounting Standard 11 in the financial statement.
		ii. The value of 190 tube wells with high-tech equipment assigned to the Board to a cost of Rs. 1,738,833,941.00 and their maintenance equipment and consumer goods worth of Rs. 1,534,077,024.00 assigned to the Board has not been accounted as per Para. 83 of Sri Lanka Public Sector Accounting Standard No: 11.	Same description as above

		iii. Two double cabs have been purchased and converted into mobile laboratories and handed over to the Board by the project on 15th of February 2023 and their value has been accounted as Rs. 33,541,773.00 under machinery. Even though, the value of these two vehicles should be accounted as motor vehicles and the equipment fixed in the same as laboratory machines as per Para. 57 of Sri Lanka Public Sector Accounting Standard No: 7, action has not been taken accordingly. The cost of Rs. 21,700,000 of the two vehicles should have been depreciated by 25% each to be Rs. 4,746,875.00. However, Rs. 3,352,340 has been depreciated by 20% each. Therefore, depreciation has been accounted Rs. 1,394,535.00 less than the actual amount.	1. I agree - Action will be taken to rectify the same in year 2024. 2. I agree - Action will be taken to rectify the same in year 2024.
	g)	The value of 80 items of laboratory equipment revalued as Rs. 61,062,600 on 30th of October 2023, has been indicated as Rs. 5,465,000.00 understating it by Rs. 55,597,307.00. Therefore, the depreciation expense for the said assets has been understated by Rs. 963,393.00.	The Water Resource Board has provincial offices such as Anuradhapura, Jaffna, Puttalam, Moneragala, Ratmalana and all the assets of the board are under the purview of each division. We sought the support of the Water Resource Board, Water Supply and Drainage Board for the revaluation of the assets which are under the purview of Jaffna and Ratmalana provincial offices, due to the lack of staff in our Board and this situation has arisen since it was unable to do the revaluation due to the non-participation of the officials of the Water Supply Board for those two districts.
	h)	All the components of cash and cash equivalents should be disclosed as per Para. 56 of Sri Lanka Public Sector Accounting Standard No: 2. However, the balance of Rs. 61,200,369.00 in the savings account maintained in relation to the current account No: 0002323267 at Bank of Ceylon has been indicated together with the relevant current account instead of indicating it separately.	This fund management account balance is also included in the balance indicated under account number 0002323267 in the financial statements. This has been disclosed and noted in page number 15 of the financial statements. Copies of those notes are presented as Annex 2.

2.2.2		Reference to law/ direction	Statement of the Management
	(a)	Orders published by the Minister by Extraordinary Gazette No. 2010/23 dated 16th March 2017 as per Section 16 of the Water Resource Board Act No. 29 of 1964. i. Order 02 Although all the institutions engaged in the construction of tube wells should be registered with the Board, only 42 institutions had been registered by the end of the year under review. 72 institutions were registered last year and the Board did not have a proper process to ensure that the companies which were not registered / not renewed the registration are not constructing tube wells and to identify which institutions are not registered with the Board. Further, the registered institutions should provide a report containing the data of all the newly constructed tube wells to the Board every 03 months as per the above order, but out of the 42 registered institutions, only 4 institutions had given the said report.	Arrangements are being made to prepare a proper program for registration of institutions that construct tube wells. Newspaper advertisements were published to inform the people in this regard. Since no legal provisions are available in the Water Resource Board Act on non-registration of institutions that construct tube wells, the relevant Act was amended and referred for necessary approvals. Until the Act is amended and necessary legal provisions are made after making the other public institution aware in this regard and obtaining their support, efforts are being made to reduce the use of unregistered tube well drilling machines. All the currently registered tube well drilling companies have been informed in writing to renew the registration with the Water Resource Board. Each drilling company has been informed in writing to submit the technical reports relevant to the tube wells constructed by them to the Water Resource Board. Accordingly, the drilling reports are being received and action is being taken to obtain the remaining reports.
		ii. Order 03 If an organization or a person engaged in the bottled water industry and manufacturing of beverages uses a natural water spring or ground water, a water sample from the said water source should be tested every 6 months by a laboratory recognized by the government and the relevant analysis report should be submitted for approval to the Board. However, only 9 institutions out of the 42 registered institutions, had submitted the above reports to the Board.	The respective institutions have been informed in writing to submit the chemical reports related to water quality of the ground water sources used for bottling water and manufacturing of beverages to the Water Resource Board. Accordingly, chemical reports are being received to the Water Resource Board at present. Arrangements are being made to take necessary legal measures against the institutions, which do not provide reports related to the ground water quality. Action is being taken to get the support of other government institutions to obtain these reports and regularize this process.

		iii. Order 06 Legal action had not been taken as per Article 20 of the Water Resource Board Act No. 29 of 1964 as amended by Act No. 42 of 1999 against the institutions, organizations or individuals, who do not act in accordance with orders 1 to 5, which include the orders to be followed by government or non-governmental institutions using natural water springs or deep or shallow ground water.	Arrangements have been made to take the necessary legal action as per the existing Act against the institutions, which do not provide reports relevant to the quality of ground water and drilling reports. Action is being taken to get the support of other government institutions to obtain these reports and regularize this process.
	(b)	Sections 10 and 11 of the Employees' Provident Fund (Amendment) Act No. 26 of 1981 - Employee contribution to the fund should be 12 percent and employee contribution should be 8 percent and no higher ratio can be agreed upon. Even though the board had collected and paid 10 percent from the employees while the employer contribution was 12 percent, the Commissioner was not informed in this regard.	It has been noted down to make necessary rectifications.
	(c)	In the Guidelines on Corporate Governance for State-Owned Enterprises introduced by Public Enterprise Circular No. 01/2021 dated 16th November 2021 - i. 2.2.1 Guidelines Key performance indicators for the board had not been determined or a corporate plan had not been prepared or action had not been taken to guide the Board accordingly.	Necessary steps are being taken to take legal action against identified entities that have not provided reports on water quality of groundwater sources used for commercial purposes to the Water Resources Board.
		ii. 2.2. 2. (b) Guidelines The Board of Directors had taken action to establish a strong governance framework to fulfill the requirements of providing the Board Papers to the members of	Noted down.

		the Board for studying before the meeting of the Board of Directors, maintaining a reliable management information system, taking follow up action with regard to the sub committees such as the audit committee and taking necessary measures and disclosing the financial and non-financial information in the web page of the institution so as to fulfill the requirements of the related parties.	
		iii.2.4 Guidelines The Board of Directors had not made an annual statement to the Secretary of the Board on the relationship with the Board and the related disclosure was not made in the annual report of the Board regarding each Director.	There is no post of Secretary in the Board and I have noted down to take necessary action with regard to the matters mentioned herein.
		iv. Paragraph 6.6 of the In the Guidelines on Corporate Governance for State-Owned Enterprises introduced by Public Enterprise Circular No. PED/01/2021 dated 16th November 2021 - Even though, the draft annual report should be submitted to the Auditor General within 60 days from the end of the accounting year, the Board had not submitted the draft annual performance report for year 2023 along with the financial statements.	The annual report for 2023 is being prepared and I have noted to submit the draft report with the final accounts of 2024.
	(c)	Guidelines of the Code of Guidelines for Integrated Management of State Enterprises introduced by State Business Circular No. 01/2021 dated 16 November 2021.	

	2.2.3	The Board had not acted in accordance with the powers, duties and functions of the Board as per the requirements mentioned in Section 12(g) of the National Audit Act No. 19 of 2018, except for the following observation. The board had registered Geo-hydrologists since year 2018 and allowed them to provide professional services privately. No legal provisions were available in the Water Resources Board Act No. 29 of 1964 for this purpose and between 12 and 18 Geo-hydrologists had been registered annually.	Since the approval should be given by the Water Resources Board for construction of tube wells, a ground water survey should be carried out at the relevant place and a report should be submitted for approval. Therefore, external Geo-hydrologists had been registered only for the purpose of conducting ground water survey and submitting the relevant report to the Water Resource Board for the construction of tube wells. The relevant matters have been included in the amendment of the Water Resource Board Act and submitted for approval. Further action is being taken in this regard by the Water Resource Board as per the instructions of the Board of Directors.
3		Other matters	Statement of the Management
	(a)	Pilot project for the establishment of a Ground Water Monitoring Network. i. Even though, the project was completed in the year 2022, the main objectives and expected benefits of the project could not be achieved properly since the building for the data center was not constructed.	A building in extent of 6000 sqf was to be constructed at Hector Kobbekaduwa Mawatha, where the Office of the Water Resource Board is located, for the data center which functions as a centralized operational unit through the information web portal. Since the said land was acquired by the Urban Development Authority, the data center including the Head Office, was planned to be constructed in extent of 24,000 sqft by the Water Resource Board in the land located in Battaramulla, which was granted as a policy decision with written agreement by the Urban Development Authority with the said revisions. As a proper lease agreement was not given by the Urban Development Authority by the month of July 2022, the construction work could not be commenced until the the project was almost completed. Accordingly, subjected to the advice of the Ministry of Irrigation and Water Resources Management/Water Supply and the approval of the Board of Directors, the approval of the Cabinet of Ministers was sought for Eijkelpamp Institute, Netherlands, the project contractor, to purchase a building that suit the requirements within the approved provisions and provide it to the project. It was recommended to replace the data center at a building owned by the Water

			Resource Board at present as per the draft Cabinet Paper dated 22.08.2022 and approval of the Cabinet Sub-committee on Public Expenditure Management to purchase a building. Under this situation, the data center has been established at Rathmalana Workshop with the required features as per the project objectives and requirements and it is being functioned at present.
		ii. Rs. 259.1 Million or 1,473,462.00 Euros was allocated for the construction of a building for the data center on a land belonging to the Urban Development Authority, Battaramulla and it was decided to utilize the contingency allocation of Rs. 329.8 Million or 1,875,447.00 Euros for the data center. Even though, 15% of the total value, which is Rs. 544.2 Million or 3,094,488.00 Euro, had been paid to the Netherlands Contractor as an advance, the data center was not constructed due to non-availability of the land ownership and the amount of 3,094,488.00 Euro had been idled.	Due to the establishment of the data center at a building where the Water Resource Board is located, the expenses were borne only for the required equipment. Therefore, the Project Director has informed the Director General, Foreign Resources Department, General Treasury along with copies to the Director (Foreign debts - 1), Department of Treasury Operations and Chief Accountant, Ministry of Irrigation with regard to the project savings by the letter No: PD/GWMNP/2022-15 dated 12.06.2023. Accordingly, the Department of Foreign Resources has informed that payment of debt is made including the said deductions, when the payment of loan installments are made.
		iii. In order to establish 2 mobile laboratories as part of the project, the project bought 2 double cabs for Rs. 21,700,000.00 and registered them in the name of the Project Director and handed them over to a private company to turn them into mobile laboratories. A company for the said purpose has been selected by following the procurement guidelines.	This project has been implemented as a Turnkey EPC (Engineering Procurement & Construction) through Eijelkamp, which is a Netherlands Contractor to establish Ground Water Monitoring Network in several areas in the country for the Water Resource Board under the Ministry of Irrigation. Even though, procurement activities have been performed by the company to which the contract was awarded, based on the basic technical requirements of the Water Resource Board in accordance with the agreed methodology of this project, it was not allowed to involve in the procurement process except the technical matters of the Water Resource Board.

		iv. Two relevant vehicles were turned into mobile laboratories and handed over to the Board on 15th of February 2023 and an amount of Rs. 11,841,774.00 had been charged by the private company for this conversion. However, the rear tube tail body, which was removed from the two vehicles, was not returned to the Board. An investigation was not conducted as per Financial Regulation 104 (1) and those who are responsible were not determined.	In obtaining these two mobile laboratory vehicles of the project, these two units will be referred to the Project Evaluation Committee appointed by the Cabinet to obtain the approval for this as customized units. Accordingly, this has been done by Eijelkamp, which is the company to which the contract was awarded, on the procurement and technical specifications based on the contract method of this project. The two double cabs purchased by the main contractor were directly handed over to the relevant sub contractor, which was customizing the vehicles. After the work was completed, the said mobile laboratories were handed over to the project in writing on 15.09.2022 by the Project Director. \
		v. Even though, the two mobile laboratory vehicles were registered as cabs in the name of Chairman of the Board on 02nd May 2023, the registration was not changed as mobile laboratories.	These two mobile laboratories were registered under the name of the Project Director and it was transferred to the Chairman, Water Resource Board after the completion of the project. Since these two vehicles have not been registered as two laboratories at the Department of Motor Traffic, action is being taken to find out the ability to change the registration.
	(c)	It had been decided to provide a land in extent of 40 perches located at Densil Kobbakaduwa Mawatha, Battaramulla belonging to the Urban Development Authority to the Water Resource Board for a period of 30 years by the Cabinet decision No: AMA/16/2500/724/099 dated 06th of December 2016. An annual tax amount of Rs. 2,700,000.00 was determined by the Government Chief Valuer for the said land where the new Head Office was suggested to be constructed. The Board had paid Rs. 24,906,879.00 as the rental to the Urban Development Authority from the year 2016 to October 2023 without signing a lease	The physical ownership of the land located at Kobbekaduwa Mawatha, Battaramulla used by Water Resource Board as per a Cabinet decision that has been given instead of the land located at No: 2A, Hector Kobbekaduwa Mawatha, Colombo 07, was given to the Water Resource Board on 10.10.2016. It had been mentioned in the letter dated 21.01.2016 sent by the Urban Development Authority that it intends to construct the laboratory of the Water Resource Board on this land. It was planned to construct the Data Center, which was due to be constructed under the Ground water monitoring network project implemented on the aids of the Netherlands Government of and the Head of the Water Resource Board and the laboratory, on this

		agreement with the Urban Development Authority for the land. However, the land had not been used. Even though, allocations had been made for the construction of the Head Office building on this land from the year 2018 under the pilot project to establish a ground water monitoring network, the allocations could not be utilized due to non availability of a formal lease agreement. Further, Urban Development Authority had refused to enter into a long term lease agreement for this land located at Hector Kobbekaduwa Mawatha, Colombo 7 until the outstanding tax amount of Rs. 56,409,666.00, which is due to be paid under Section 6(1) of State Land Ordinance or the said amount is deducted under a proper methodology.	land and the required approvals had been obtained for the same. This opportunity was lost as the Urban Development Authority delayed to sign the agreement in relation to the land and as a result the project period has ended. Since a huge amount of money has been paid to the Urban Development Authority, the land cannot be left aside. Since the government is not granting approval for the construction of new buildings, the approval of the Board of Directors has been given to consider the possibility to construct the proposed building by a public-private project. In considering the fact that the Urban Development Authority has informed that the agreement will be signed after the outstanding amount of Rs. 56,409,666.00 is paid or written off with the approval of the Cabinet of Ministers a Cabinet Memorandum has been submitted by the Water Resource Board to obtain the approval to write off the outstanding amount.
	(c)	i. As per the provisions of Management Service Circular No. 30, before the restructuring of the staff of the Board, certain posts belonging to the category of JM-1 at the Junior Management level had been converted into the posts in the category of MM during the restructuring. When issuing vehicle import permits on concessionary terms under Trade and Investment Circulars No: 01/2010, 01/2013 and 01/2018 to 5 officers, who have been absorbed into the posts after the restructuring with effect from 03.10.2012, recommendations had been made to issue the said vehicle import permits after miscalculating the service period considering that they have held posts in MM category even before the restructuring. Recommendations had been made in year 2018 to grant the second vehicle import permits on concessionary terms for three officers out of those who have obtained the first vehicle import permits on concessionary terms. Even though, 10 years have passed since the permits	The Ministry of Water Supply and Estate Infrastructure Development has conducted a preliminary investigation and given a report and accordingly, charge sheets have been issued to the relevant officers. A formal disciplinary investigation is being conducted in this regard and the relevant matters are currently being finalized and the investigation officers have informed that the report will be submitted by the end of May.

		were obtained, the disciplinary inquiry that was in process was still not completed. The Board had not taken any disciplinary action against the officers, who gave the relevant recommendations in this regard.	
		ii. In addition, recommendations were given to 5 retired officers to obtain a vehicle import permit on concessionary terms before completing the prescribes service period and those officers had obtained the permit. Action had not been taken to recover the losses incurred by those officers in obtaining the permits and no disciplinary action had been taken against the officers and the gratuity had been paid to the said officers on retirement without recovering the amount that should have been recovered to the government.	It has been noted to take action with regard to the officers, who have retired after obtaining vehicle import permits on concessionary terms after informing the Board of Directors and the Secretary to the Minister and obtaining the required advice on the same. The officers, who have made recommendations in this regard, have already retired. Further, the date of appointment to JM level should be corrected as the date of appointment MM level in the Audit Report and action is being taken to conduct an inquiry with regard to the officers, who have obtained vehicle import permits in this manner.
	(e)	The service of a private Attorney-at-Law and a Law Firm had been obtained to amend of the Water Resource Board Act and an amount of Rs. 645,000.00 had been paid for the same by the audit date. Even though, a period of 4 years has lapsed since identifying that the Act should be amended, the task had still not been completed.	Extensive discussions have been held to amend the Water Resource Board Act of 1964 and the Water Resource Board (Amendment) Act of 1999 and the said amendments were submitted to the Minister of Water Supply and Estate Infrastructure Development and they were submitted after including further amendments. However, amendment of Water Resource Board has been stalled due to the declaration of the suggested National Water Policy and establishment of the National Water Resource Secretariat and restructuring of the Water Resource Board.
	(f)	The Board had made an allocation of Rs. 7,850,000.00 from the budget of the year under review for 2 projects of which the Board was the implementing partner and only Rs. 802,000.00 had been spent. Accordingly, 89 percent of the allocations made annually from the budget for the related projects remained underutilized due to non-utilization during the year.	Water Resource Board had received an amount of Rs. 3.79 Million by 18.09.2023 as an advance from the allocation made for the fuel used when performing the field activities relevant to the project component due to be implemented by the Water Resource Board under the Integrated Watershed and Water Resources Management Project. However, difficulties

			arose when carrying out the field work relevant to year 2023, as planned due to the heavy rains in the final quarter. It is planned to perform these activities properly in year 2024. Water Resource Board had received an amount of Rs. 3.79 Million by 18.09.2023 as an advance from the allocation made for the fuel used when performing the field activities relevant to the project component due to be implemented by the Water Resource Board under the Integrated Watershed and Water Resources Management Project. However, difficulties arose when carrying out the field work relevant to year 2023, as planned due to the heavy rains in the final quarter. It is planned to perform these activities properly in year 2024.
	(g)	A Drilling Manager, Support Staff of 52 persons including 11 Drilling Officers were assigned to the Drilling Division of the Board and Rs. 65,965,000.00 was spent in the year under review as salary, overtime, travel expenses and other costs for the said staff. Only 9 out of the 18 drilling machines that the division had were in working condition and the 2 new drilling machines received from the project were not used due to high maintenance and service cost and repair costs. Only 58 tube wells were constructed in the year under review with the use of remaining 7 drilling machines and accordingly only 8 tube wells were constructed by one machine, which was in working condition. One Drilling Officer and the support staff including 8 persons were assigned to one machine and that one team had constructed only one tube well per two months. Since year 2018, the number of orders that the Drilling Division of the Board received had continuously decreased	3 out of the 18 drilling machines owned by the Drilling Division were auctioned in 2023. Six out of the remaining 15 drilling machines are old and cannot be used due to the need for repairs, difficulty in finding spare parts and high maintenance cost. Two out of the remaining 9 Drilling machines are new machines received from the Netherlands project and due to the high maintenance and service costs and repair costs, only the remaining 7 drilling machines were used for constructing tube wells in the year 2023. Two new drilling machines received through the Netherlands project are to be used for the construction of the test tube wells of the IWWRMP project.

		annually from 280 to 58. Accordingly, the operational inefficiency of that said division was not analyzed and necessary corrective measures were not taken.	
	(h)	Even though, the Board had been informed by the Divisional Secretary, Thimbirigasaya to pay an annual tax of Rs. 12,772,000.00 from year 2013 and obtain an annual tax license for the land at Hector Kobbakaduwa Mawatha, Colombo 07, where the Head Office of Water Resource Board was located since 1978, a case had been filed by the Divisional Secretary, Thimbirigasaya at Colombo High Court in 2019. Despite the instructions of the Attorney General to the Divisional Secretary, Thimbirigasaya to reach an agreement on the ownership of the land, the premises where the Head Office was maintained for around 45 years had been handed over without the approval of the Cabinet of Ministers to be used for the expansion of the official residence of the Prime Minister at that time. The Head Office was maintained at a private rented building in Rajagiriya from 18th July 2021 to 15th July 2022 and at a private building in Navala Koswatta from 1st of August 2022. Rs. 30,511,722.00 had been paid as the rental for the building from year 2021 to year 2023.	The reason for the Water Resource Board to vacate the relevant premises is the acquisition of part of the land to expand the official residence of former President and then Prime Minister Mahinda Rajapaksa located at No.117, Wijerama Mawatha, Colombo 7 which resulted in losing two buildings where two divisions of the Board were maintained. Further, it was informed by the letters of Secretary to the Prime Minister dated 12.02.2021 and 29.04.2021 sent to the Secretary, Ministry, Water Supply to hand over the said plot of land. The Chairman of the Water Resource Board had been informed to vacate this premises by the letter of Secretary to the Prime Minister No: PMO/2/13/20 Bldg dated 29.04.2021 along with copies to the Secretary, Ministry of Public Service, Provincial Councils and Local Government and the Secretary, Ministry of Water Supply. The secretary of the Ministry of Water Supply had also informed to leave. It has been informed to the Director General, Department of National Budget by the letter of Secretary to the Prime Minister No: PMO/3/2/12 dated 15.09.2021 along with copies to Secretary, Ministry of Water Supply and Director General of Treasury Operations to make allocations for the rental to obtain a building for this purpose. Even though, Rs. 200 Million was supposed to be granted under the loan aid of the Netherlands government to construct Head Office of the Water Resource Board and the Data Center on the land in extent of 40 Perches belonging to the Urban Development Authority located at Densil Kobbakaduwa Mawatha, Battaramulla the Head Office of Water Resource Board has been maintained in a rented building since the Urban Development Authority kept postponing the signing of the agreement.

	(i)	Anuradhapura Circuit Bungalow, was handed over to the Board on rental basis for a period of 30 years in year 2016. Even though, 7 years has passed, no rental agreement was signed for the land on which the the said Circuit Bungalow was built, and still no rent has been paid for this land.	Action has been taken to survey the land on which Anuradhapura Circuit Bungalow is located, to pay the taxed for the same by the authorized surveyor K.M.S.B. Kulathunga through the Divisional Secretary. Since this land is located within the lake land reserve, it has become difficult to solve this issue.
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Jayalath Gangoda

Ground water Studies- Summary 2023

WRB is the mandated Institution of the country responsible in all matters related to the groundwater resources. Considering this, the Board has given priority to the areas of research, monitoring, regulation and developing sustained groundwater management plans at river basin levels. Presently the Board has focusing mainly on regulatory and management aspect of groundwater resources adhering to the National Water Resources Policy of the country.

During the year 2023, the following projects & activities are scheduled to carry out as per the workplan. Basically, the projects and operations of activities are categorized into three areas.

Treasury grant projects, Generated activities and foreign funded projects.

Treasury grant projects

08 projects were conducted under treasury funds in 2023.

In long term groundwater monitoring project (LTGM), continuous groundwater quality and ground water level monitoring were carried out in about 12 areas of the country. 100% of water sampling was completed out of 2491 number of target samples. 62% water sample analysis were done out of 2491 of target samples. In the study on the direct and indirect impacts on the climate changes on the coastal aquifer system of Sri Lanka (SICC), western and eastern coastal belts have been selected to monitor water quality and water level changes. 100% of biannual water level monitoring and insitu water sample analysis were completed out of 400 of target samples. 73% of chemical analysis were completed out of 260 of target water samples.

In hydrogeological assessment and identify of favorable aquifer recharge within Ma oya basin (Ma-Oya) 100% of Identifying of high groundwater abstraction zones within the Ma Oya River Basin & Assessment of aquifer stress/ Impact Analysis were completed. Identify capacity of GWR (productivity and WQ) & options for storage enhancement by artificial recharge also 100% completed. Adoption of users for sustainable management & importance of groundwater storage for affective usages with necessary findings and recommendations were completed in 90%.

Under combined inspections on groundwater related issues, 149% of meetings & combined inspections of groundwater issues were covered out of 100 number of target. 50% of awareness programs were conducted out of 25 number of target.

In the activity of development of groundwater Atlas for Sri Lanka, desk study, data compilation, screening, and processing, Analysis of data, preparation of spatial maps from available information were completed, Vulnerability maps and productivity maps on GWR of the country were completed and final report were completed 100%.

Under Rehabilitation and improvement of WRB infrastructure, Machinery & Vehicle Improvement, Reburshment of A'pura Research Centre, Improvement of fencing structure at Monaragala and Puttalam PM regional office were completed in 100%. Maintenance of Laboratory and Geophysical Equipment was completed in 95%.

In the project of emergency use of disaster events related to water sector, all activities were completed in 100%.

Under Development and Management of Groundwater Resources in Water Supply Scheme, activities of Identify of high groundwater abstraction WSS and Identify of present & future groundwater demands of WSS, Analysis of real time monitoring Data & information to interpret the present aquifer stress and future

forecast, Assessment of groundwater chemistry, Geophysical exploration for groundwater prospecting & Assessment of alternative productive zones adjoining the WSS were completed in 100%. Other than that, Options for enhance the capacity of the existing

GWR utilized was completed in 80% and Final Report with findings, necessary recommendations and follow up guidelines was completed in 25%.

Generated Funds

Under generated funds, commercial activities, groundwater regulations and research oriented commercial activities were done.

Hydrogeological surveys (target-350, progress 114%), Tube well construction (Target – 75, progress 71%), Pumping tests (target – 225, progress – 84%), Tube well cleaning (Target – 10, progress -210%), chemical analysis of water samples (Target-500, progress – 79%) were completed under generated funds.

Other than that, 68% of privet drilling companies and machineries were registered (target -130). 80% number of external hydrogeologists (target – 20) were registered. Issued 86% of approvals for external hydrogeological reports (Target – 500). 60% number of flow meters were installed (Target – 05) and 30% of flow meters inspections were completed (Target – 30%).

Foreign funded projects

Strengthening groundwater resources management - Component 1.3.2 under IWWRMP was carried out under World Bank funds. Under this project, Desk study on the selected river basins (04 Nos. Kelani river, Ma Oya, Deduru Oya, Jaffna Peninsula) was completed in 50%. Well inventory & water sources surveys to identify the user groups & present status on availability, water quality & issues was completed in 10%. Geophysical Exploration for aquifer mapping (600 nos. 1D & 115 nos. 2D surveys) were completed in 5%. This project will be continued until 2025.

Measures taken to rectify the accounting and management weaknesses pointed out in the Auditor General's audit inquiries and audit reports

1. The Water Resources Board Act has been amended to include matters related to the regulation of all institutions engaged in the construction of tube wells and all institutions that obtain ground water at the commercial level, and it has been submitted for the approval of Hon. Minister and the Secretary of the Ministry.
2. The Data Center has been established at the Rathmalana Office for collection and analysis of the information on the rest tube wells under the pilot project for the establishment of a Ground Water Monitoring System.
3. Action has been taken to rectify the accounting weaknesses pointed out by the Audit Reports, as per Sri Lanka Accounting Standards and strengthen the method of internal administration of the financial matters.

Actions taken in 2023 to improve the performance of the Water Resources Board.

1. Under the IWWRM project implemented by the Ministry of Irrigation, scientific equipment and other items obtained under the project for establishing groundwater investigation network systems are being utilized by the Water Resources Board for activities related to the groundwater resources management plan in Sri Lanka, aimed at strengthening groundwater resources management in the country.
2. Conducting awareness programs at the divisional secretariat level regarding the methodology of drilling boreholes as part of the groundwater resources regulation process, and informing commercial entities extracting groundwater about conducting aquifer tests to estimate the safe yield as recommended by the Water Resources Board.
3. Conducting local inspections related to existing objections concerning groundwater reports provided by external hydrogeologists, informing the community, and providing necessary guidance.
4. Actively contributing to the preliminary review committees and technical committees related to the National Water Resources Policy by providing input on groundwater resources.
5. Selecting sensitive areas and coastal regions in Sri Lanka for long-term assessment of the qualitative and quantitative aspects of groundwater resources. This also includes identifying changes in the quality and quantity of coastal groundwater resources due to climate change.
6. Preparing the necessary plans for establishing two groundwater recharge systems based on the results of studies conducted under UNICEF assistance, aimed at systematically recharging groundwater aquifers in Sri Lanka."



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WATER RESOURCES BOARD