

Annual Report 2024



Water Resources Board
Ministry of Environment



CONTENTS

	Page No.
Introduction	04
Vision	05
Mission	05
Objectives	06
Functions	07
Corporate Information	08
Corporate Governance	09
Key Players	
Audit & Management Committee	
Senior Executive Officers	
Cadre Information	15
Major Activities	16
Operational Activities Performed during the Year	17
Financial Statements	92
Statement of Financial Performance	
Statement of Financial Position	
Statement of Changes in Net Assets / Equity	
Cash Flow Statement	
Treasury Grant Disclosure	
Accounting Policies	
Notes to the Financial Statement	
Auditor General's Report	113
Comments on the AG's Report	124
Physical Progress Summery – 2024	134



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.



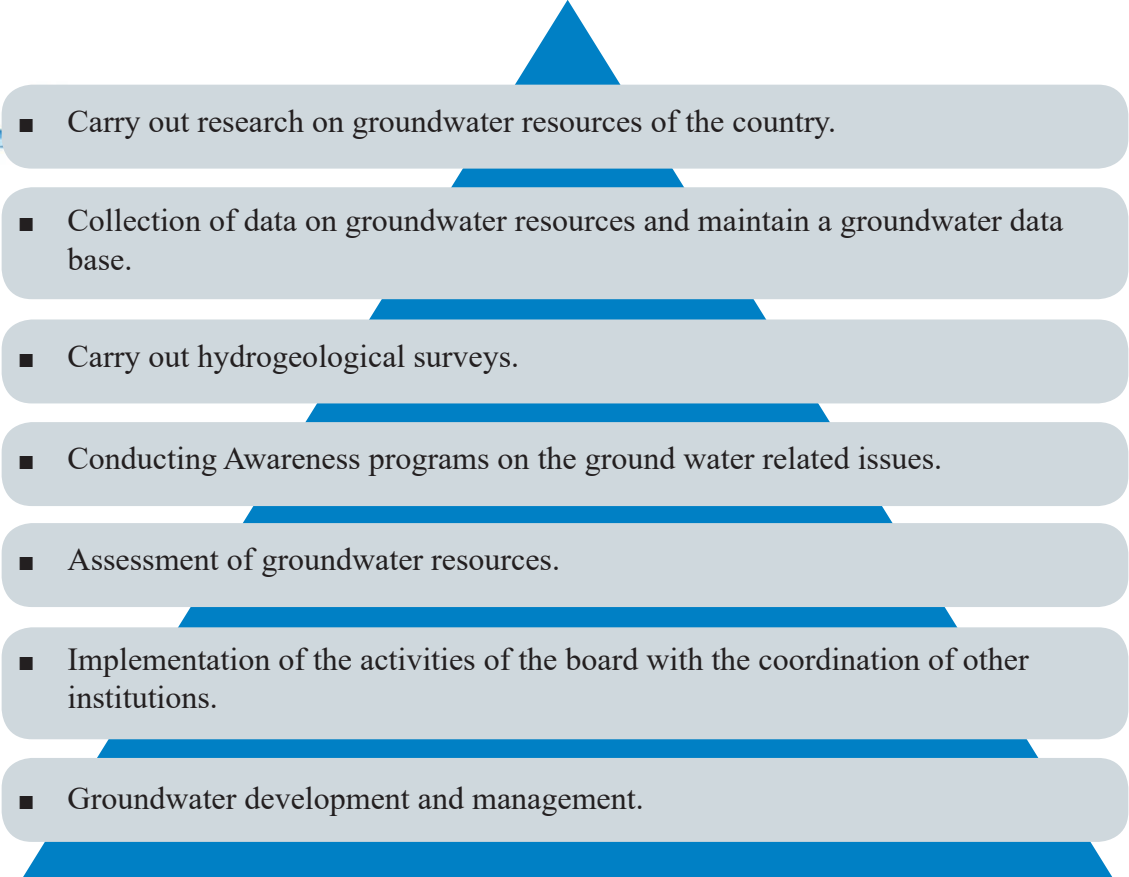
VISION

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

- 
- 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.
 - Conducting Awareness programs on the ground water 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: wrb.itunit@gmail.com

Web: www.wrb.lk

Line Ministry

Ministry Of Environment
(2024.11.25 – to up to date)

Minister of Environment, Wildlife, Forest
Resources, Water Supply, Plantation and
Community Infrastructure
(2024.09.27 – 2024.11.24)

Ministry of Water Supply & Estate Infrastructure
Development (up to 2024.09.26)

Tax Identification No.

409018017

Bankers

Bank of Ceylon
National Savings Bank

Income Tax Consultants

S & A 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.S.Y.Pillai	- Director
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

Mr.T.H.B.A.Deshapriya
General Manager (Acting) –[Director (Land) -
Ministry of Water Supply]

Mr. M.A. Pushpakumara
D.G.M. (HR & Finance) (Up to 2024.01.25)

Mrs. 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)
(Up to 2024.01.24)

Mr.A.S.M.N.B.Samarakoon
Act. Assistant General Manager (Operation)
(2024.06.18)

Mr. R.R.G.R. Rajapakshe
Assistant General Manager (Research &
Development)

Mrs.C.Kudahetty
Act. Assistant General Manager (Project)
(2024.06.18)

Mr.K.D.A.Samaraweera
A.d. Assistant General Manager (Drilling)
(2024.06.18)

Miss. P.H.D.S.Silva
A.d. Assistant General Manager (Lab)
(2024.06.18)

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. 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

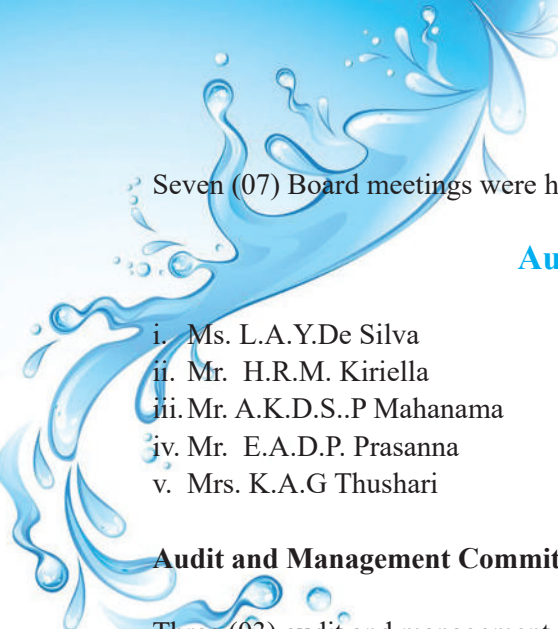
- **Director Water Resources Board**
- Managing Director of scan 3M Holdings (Pvt) Ltd.
- Managing Director of Steapherhead Consumer Associated Network (Pvt) Ltd., A Parliament Secretary of MP in 8th & 9th Parliament Sri Lanka.

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.



Seven (07) 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. H.R.M. Kiriella | - Director |
| iii. Mr. A.K.D.S..P Mahanama | - Director |
| iv. Mr. E.A.D.P. Prasanna | - Observer - Government Audit |
| v. Mrs. K.A.G Thushari | - Observer - Ministry of water supply- CIA |

Audit and Management Committee Meetings

Three (03) audit and management committee meetings were held during the year 2024.

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 2024 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.

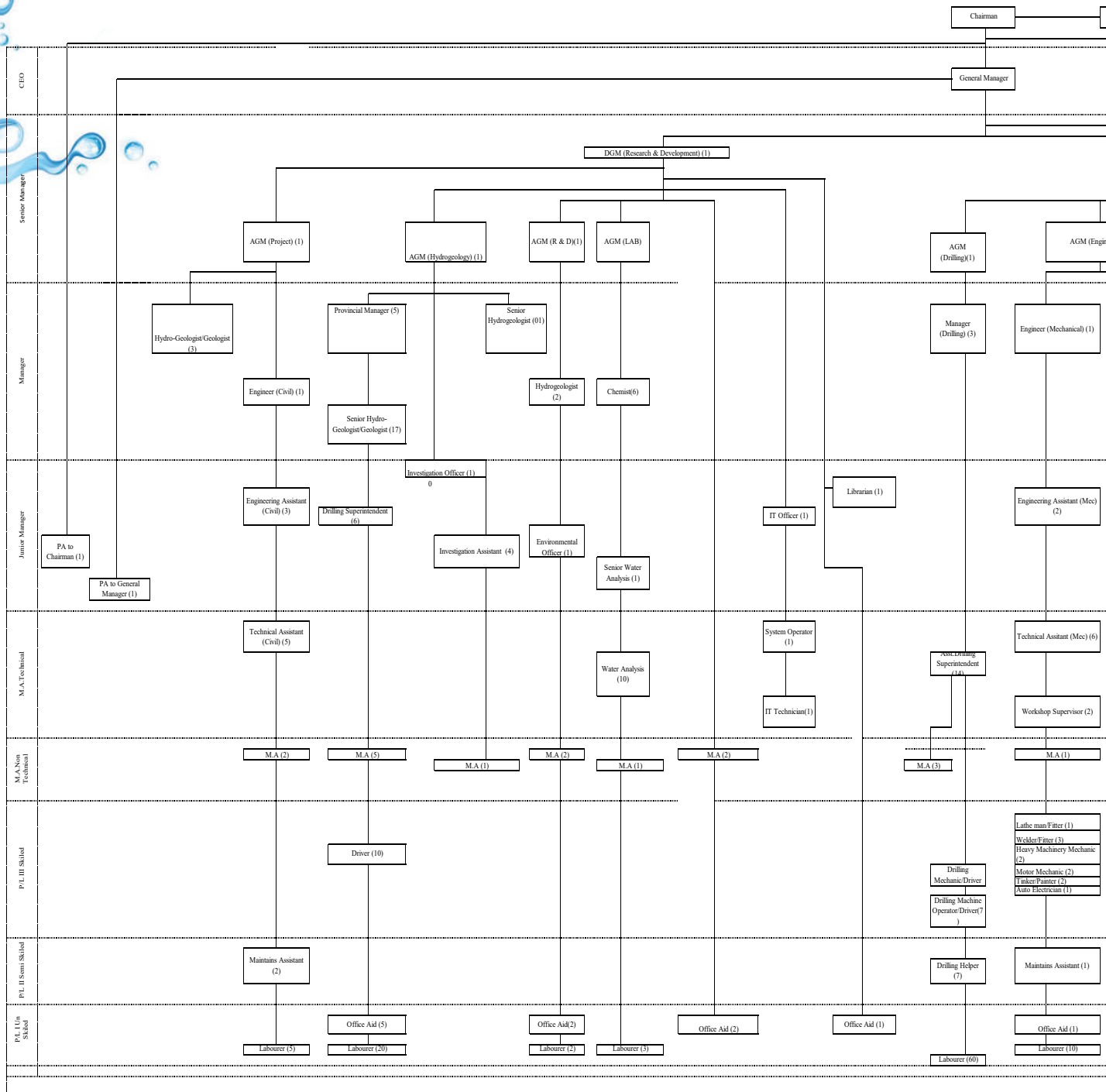
Under research studies, the Water Resources Board conducts studies on the changes in groundwater levels and its quality in the sensitive zones of 18 districts as a long-term process and uses the results for the regulation and management strategies of groundwater resources. The Water Resources Board is 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.

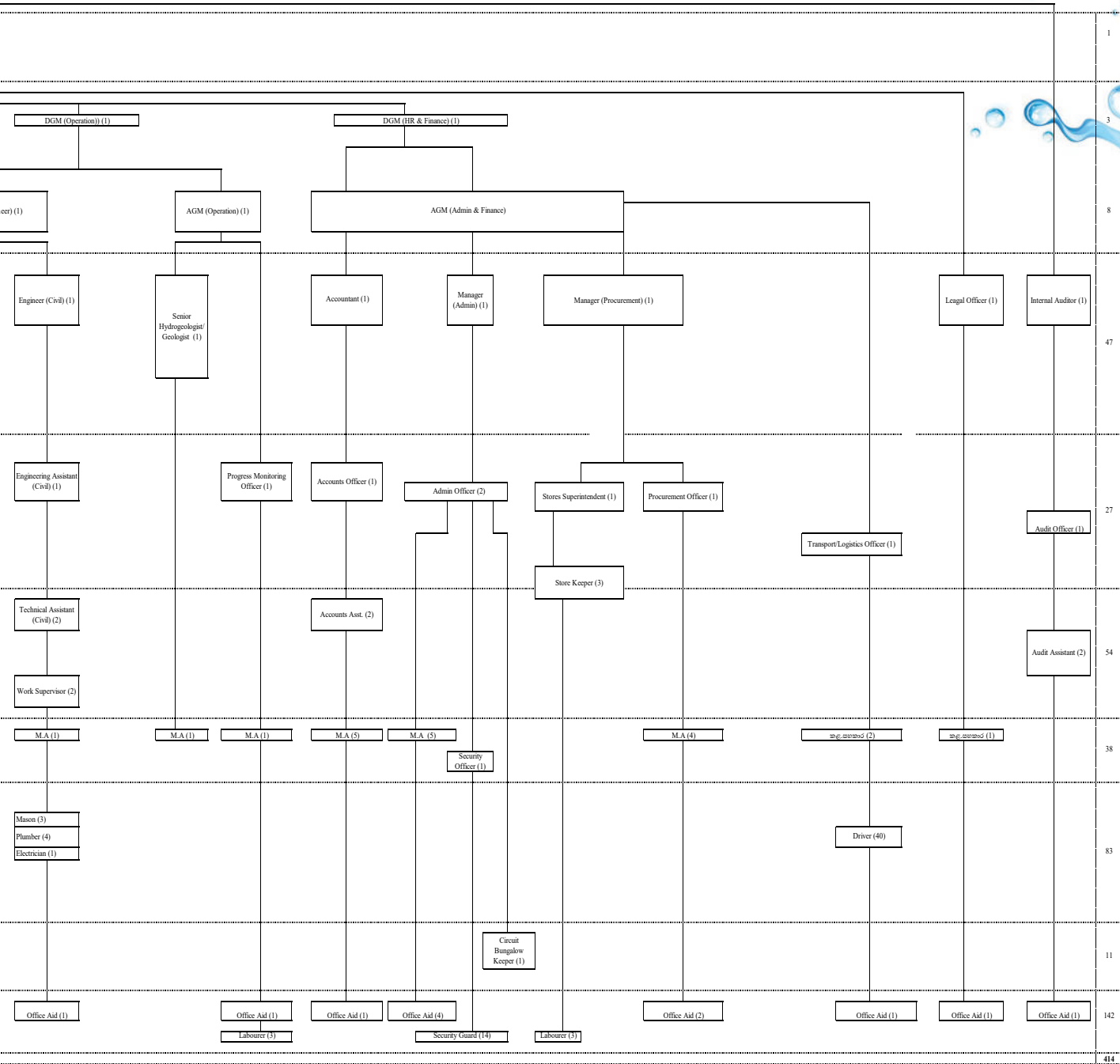
ORGANIZATIONAL STRUCTURE





OF WATER RESOURCES BOARD

Board Of Directors



Cadre Information as at 31st December 2024

Salary Scale	Approved Cadre Permanent	Existing Cadre Permanent
HM	12	02
MM	47	31
JM	27	09
MA	92	46
PL	236	132
Total	414	220



Cadre Information as at 31st December 2024



Designation	Salary Scale	Approved cadre	Existing cadre	Vacancies to be filled
General Manager	HM	1	0	1
Dy. General Manager	HM	3	0	3
Asst. General Manager	HM	8	2	6
Provincial Manager	MM	5	0	5
Hydro Geologist/Snr Hydro Geologist	MM	24	24	0
Engineer (Mechanical)	MM	1	0	1
Engineer (Civil)	MM	2	0	2
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	09	05
Investigation Asst.	MA 2-2	4	0	4
Water Analyst	MA 2-2	10	09	01
Work Supervisor	MA 2-2	2	1	1
Workshop Supervisor	MA 2-2	2	0	2
System Operator	MA 2-2	1	0	1
Accounts Asst.	MA 2-2	2	0	2
Store Keeper	MA 2-2	3	2	1
IT Technician	MA 2-2	1	0	1
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	72	33
Office Aide	PL 1	23	13	10
Security Guard	PL 1	14	05	09
Total		414	220	194

Major Activities

Construction of Tube Wells



Conducting pumping tests



Conducting geophysical investigations

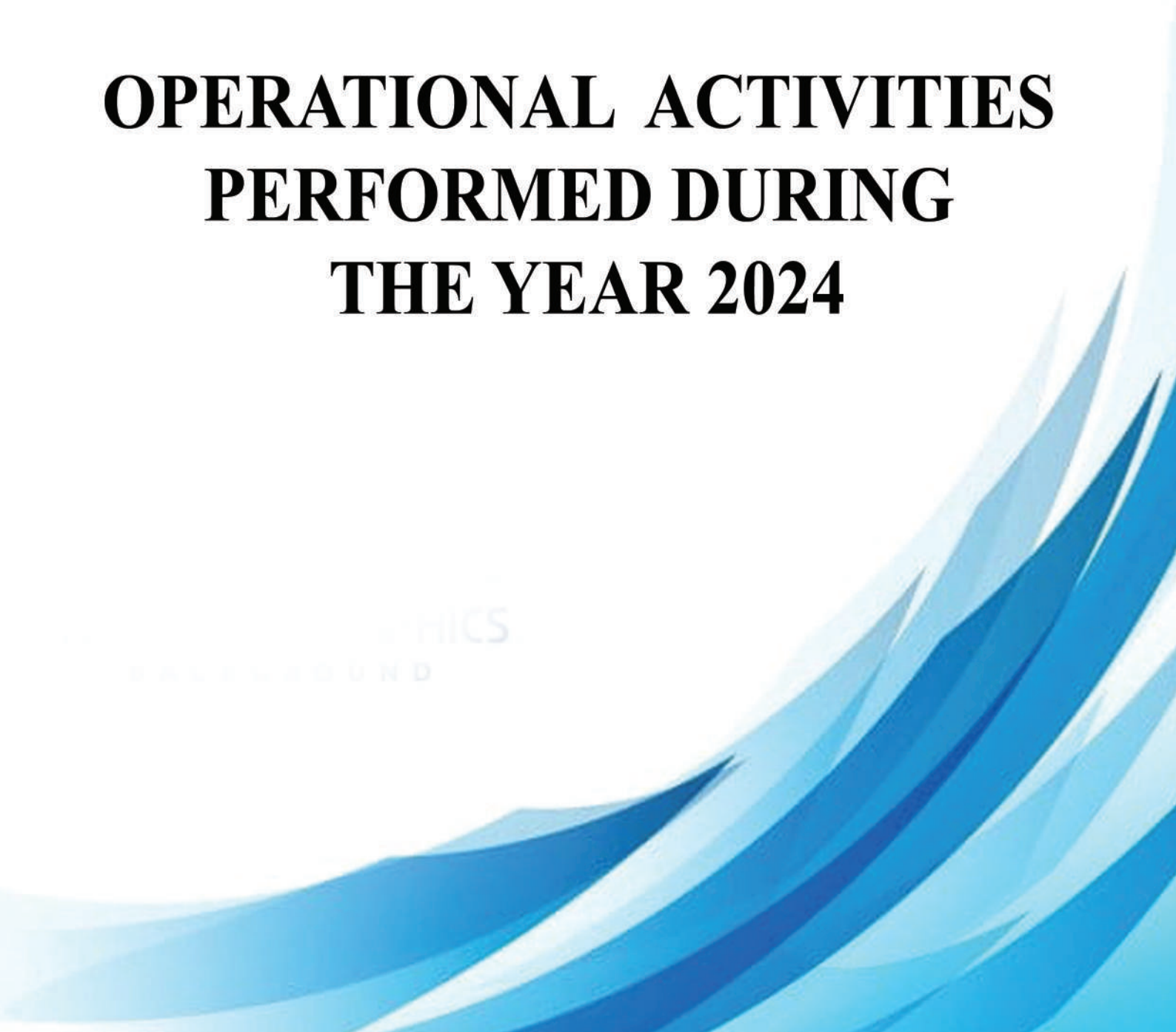


Analyzing of water samples





OPERATIONAL ACTIVITIES PERFORMED DURING THE YEAR 2024



THE UNIVERSITY OF THE
PHILIPPINES
MARICUAGA CAMPUS

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.

Water resources board is performing different set of activities and services which related to groundwater management of Sri Lanka.

Hydrogeological Services

1. Geophysical (1D, 2D & 3D Imaging) & hydrogeological investigations for assessment of potential groundwater resources sites/zones.
2. Extensive hydrogeological mapping for the implementation of sustainable groundwater development / Management.
3. Feasibility studies for prospecting of groundwater resources development.
4. Development of groundwater resources & implementation of small-scale water supply systems.
5. Impact assessment studies on groundwater resources due to mining or environmental issues.
6. Feasibility study on artificial groundwater recharge & its implementation.
7. Remediation for control of groundwater pollution.
8. Qualitative & quantitative groundwater resources monitoring.
9. Technical consultancy & advisory role in groundwater sector.

Regulatory Operations

1. Test pumping for safe abstractions with necessary technical recommendations.
2. Regulate of commercial scale groundwater abstractions.
3. Regulation on well construction process (well siting, well drilling, drilling machinery registration).
4. Awareness programs on the management of groundwater resources

Drilling & Tube Well Constructions

1. Technical designing & constructions of tube wells.
2. Cleaning and rehabilitation of tube wells, hand pump tube wells.

Water Quality Analysis

1. Physical, chemical & heavy Metal analysis on water.
2. Microbiological Analysis on water.

Central Groundwater Information System

1. Assessment & analysis studies on groundwater sector based on the updated database system.
2. Developing & upgrading of a national atlas on groundwater resources for all users.
3. Sharing of manual & real time monitoring data / information on Groundwater resources.
4. Development of hydrogeological and geochemical spatio-temporal maps for specific studies.

Activities planned for year 2024

All the activities of Water Resources Board has been scheduled in action plan are mainly under three categories. These categories are based on the nature of financial allocations for different type of activities such as groundwater related research activities, infrastructure developments, preparation of groundwater management plans, etc. Table 01 illustrates about the activities in each category.

Table 01: Financing category and relevant hydrogeological activities

#	Sub Projects/ Sub Activities	Expected Benefits/ Results
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 2024.
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.
3	Foreign funded projects	Subcomponent 1.3.2 “Strengthening of Groundwater Resources Management in Sri Lanka” under Integrated Water Resources & Watershed Management Project (IWRMP)

The aim of this report is to discuss about the progress, findings and recommendations of above projects.

Table 02: Summary of allocated budget - 2024

#	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.	4.50	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)	1.00	Assessment and evaluation of changes on GW resources due to climatic changes in Coastal areas of the country
3	Combine Inspections on Groundwater Relating Environmental Issues (INSP)	1.00	Addressing for remediation and conflict resolution on issues of GW use for sustained management and make equality of water rights within the society
4	Human Resources & Institutional Development (HRID)	4.00	Infrastructure development of the institution
5	Emergency use for disaster events related to water sector (drought, floods, catastrophic event of contamination on GWR) (E-USE)	2.00	Addressing & remediation measures implementation on national level water related disaster events
6	Development and management of groundwater resources in water supply schemes (DMWSS)	1.00	Implementing Managed Aquifer Recharge (MAR) mechanisms to the country
7	Statistical Survey on the Groundwater Sources & its users in Sri Lanka(SSGS)-	1.50	Aid program for regulatory process of groundwater resources of the country
	Total	15.0	

1. Treasury Funded Groundwater Studies

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

The long-term groundwater monitoring project is an integrated program that involves continuous monitoring of groundwater levels and quality across 15 hydrogeologically sensitive areas. These areas were initially studied by WRB, which conducted groundwater assessments and completed preliminary evaluations.

At the beginning of these studies, test boreholes were drilled to address specific groundwater issues identified in each project area. These boreholes were established to create a long-term monitoring network for the respective regions. The number of constructed test boreholes and monitoring shallow wells is provided in the table below.

Table 3: Long term groundwater monitoring projects 2024

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 District	Vavuniya District	35
5.	Hydrogeological studies in Kilinochchi District	Kilinochchi district	
6.	Long term groundwater monitoring in Monaragala district	Monaragala district	29
7	Hydrogeological study in limestone aquifer system in Mannar district	Mannar District	40
8	Detailed hydrogeological study in Kirindi Oya River Basin	Kirindi Oya basin	25
9	Jaffna Well monitoring program	Jaffna Peninsula	43
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	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 04: Progress of Long-Term Groundwater Monitoring project – 2024

	Activity	Target of the year 2024	Progress of the year 2024
1	Groundwater level monitoring & head measurements (Biannual basis monitoring at 662 locations)	1324	138%
2	Chemical & heavy metal analysis (biannual basis at 662 locations)	1324	92%
3	Isotope analysis on selected groundwater resources (Outsource activity-10 nos.)	10	100%
4	Data Processing, Analysis & final report		60%

Under this project, the following research activities were performed in the year 2024 in each area.

1.1.1 Study on Coastal sand belt from Colombo to Negombo

The Colombo-Negombo coastal sandy aquifer is a critical groundwater resource in Sri Lanka's western coastal region. It supports domestic, agricultural, and industrial needs for the densely populated areas of Colombo and Negombo.

Numerous public and private entities, including the airport, BOI Katunayake, other industries, and hotels, use this aquifer to extract a sizable amount of water. With the increasing of water demand, excessive groundwater extraction has a negative influence on the environment since it should be limited by aquifer features. As a result, the area would get salinized and lose portable water.

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 to Negombo region.

In 2024, as part of a long-term groundwater monitoring project in the western coastal sandy aquifer extending from Colombo to Negombo region and Gampaha district, water sampling was conducted at 80 locations during both the pre-monsoon and post-monsoon periods. During these sampling events, in-situ analyses were carried out to measure critical parameters, including water level, electrical conductivity (EC), pH, salinity, total dissolved solids (TDS), and temperature. Additionally, water samples were collected for comprehensive chemical and heavy metal analysis, enabling a detailed evaluation of groundwater quality. These measurements captured seasonal variations in groundwater characteristics and hydrological dynamics. To further illustrate these findings, pre-monsoon and post-monsoon maps of water level variations are presented, highlighting the spatial and temporal changes in groundwater availability across the district.

The average rainfall recorded in the Colombo and Gampaha district during 2024 was 2828.3mm, while the average temperature was 32.15°C. The region experienced two monsoon periods: from May to June and from October to November, 2024 (climatic year 2023-2024) (climatic year 2024-2025). During the first monsoon period, total average rainfall amounted to 786.9 mm, spread across 61 rainy days, indicating moderate but consistent precipitation. In contrast, the second monsoon period experienced significantly

higher rainfall, totaling 996.5mm over 61 rainy days, reflecting the intensity and extended duration of this season. The monsoon periods collectively contributed significantly to the total annual rainfall, emphasizing their importance in groundwater recharge. Understanding these seasonal rainfall patterns is essential for devising effective water resource management strategies in the western coastal region extending to Colombo-Negombo region.

The relationship between rainfall and groundwater levels in the western coastal area extending from Colombo to Negombo region during 2024 demonstrates a clear seasonal pattern influenced by precipitation. Periods of increased rainfall, particularly during the monsoon seasons, are closely followed by a rise in water levels. For instance, the significant rainfall events recorded during the second monsoon period (October to November) corresponded to a notable increase in groundwater levels, as reflected in the data. Conversely, during dry periods (January and February) with minimal rainfall, groundwater levels gradually declined due to reduced recharge and ongoing extraction for industrial, domestic and agricultural purposes. This correlation emphasizes the critical role of seasonal rainfall in replenishing groundwater resources, with water levels showing delayed but direct responses to precipitation. These findings highlight the need for sustainable water management practices to mitigate the impacts of prolonged dry spells and ensure the availability of groundwater throughout the year.

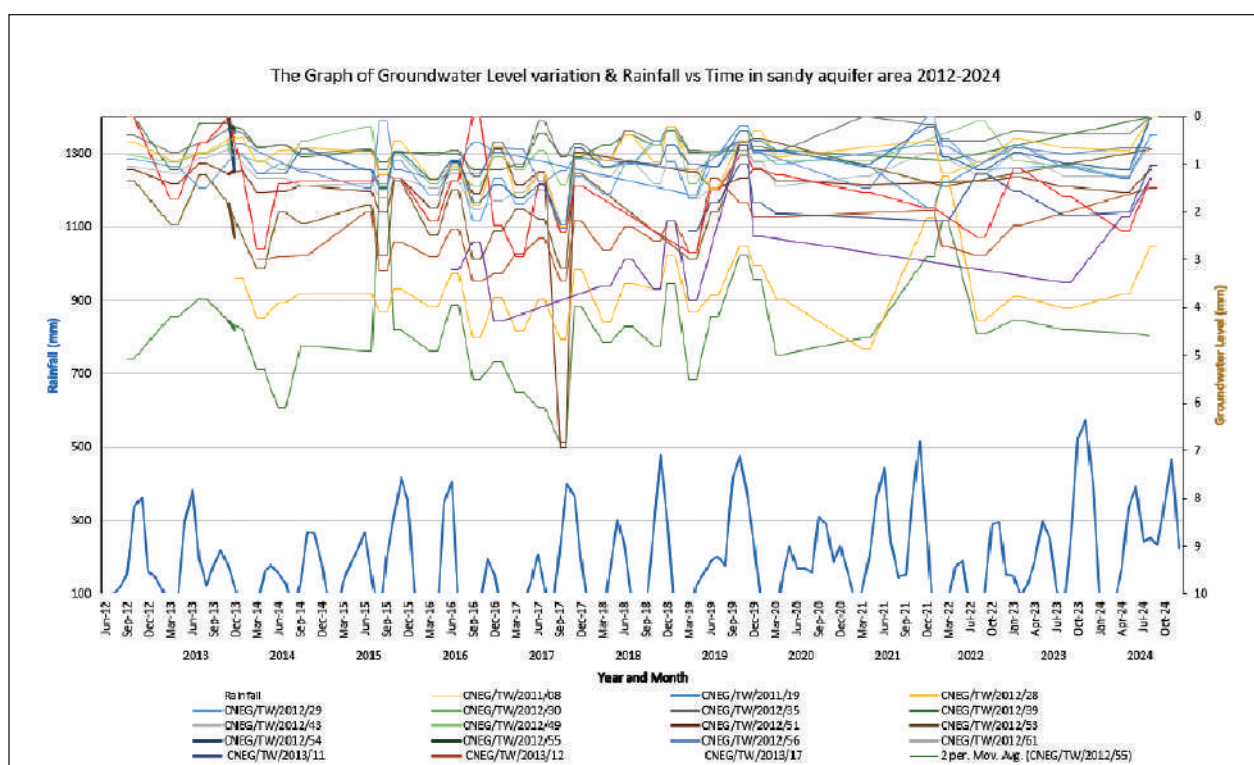


Figure 01: The graph of Rainfall and Water level over the time (Year 2024)

Water Level variation

The water level variation graphs for the western coastal area extending from Colombo to Negombo region in 2024 illustrate significant spatial and temporal differences in groundwater availability across the region. During the south-western monsoon period, extensive areas, particularly in the dry season (January to February) exhibit water levels exceeding 4-5 meters below ground level (mbgl). These areas suggest considerable groundwater depletion due to limited recharge. Additionally, moderate water levels between 1 and 2 mbgl are observed in the region.

In contrast, the wet period highlights substantial groundwater recharge following the monsoonal rainfall. Large portions of the region, demonstrate shallow water levels of $\leq 1\text{m}$ bgl. The comparison of these maps underscores the critical impact of monsoonal rainfall on groundwater recharge dynamics in western coastal region. It also highlights the spatial variability in aquifer recharge potential, emphasizing the need for targeted water management strategies to address localized groundwater stress and ensure sustainable water resource use.

Water Quality Analysis for Post-Monsoon (Quarter-01)

The chemical analysis of water samples collected across the western coastal sandy aquifer extending from Colombo to Negombo region in 2024 provides a comprehensive understanding of groundwater quality and its compliance with potable water standards (SLS 614:2013). The study analyzed 80 samples for key parameters, including pH, electrical conductivity (EC), total dissolved solids (TDS), major ions (such as calcium, magnesium, chloride, and sulfate), fluoride, nitrate, phosphate, and heavy metals like iron. These findings also shed light on seasonal and spatial variations in groundwater quality, offering insights into the hydrological dynamics of the region.

The pH levels across the samples ranged from 6.4 to 8.4, falling within the permissible range of 6.5 to 8.5, indicating that the groundwater is predominantly neutral to slightly alkaline. However, total alkalinity not exceeded the standard guideline of 200 mg/L, particularly in high abstraction zones, not indicating any quality variation so far.

Electrical conductivity values varied between 63 and 903 $\mu\text{S}/\text{cm}$, reflecting significant spatial differences in ion concentration. Correspondingly, total dissolved solids (TDS) levels ranged from 31 to 443 mg/L, remaining below the permissible limit of 500 mg/L in most samples. Isolated cases of elevated TDS were noted in certain wells, which may indicate localized groundwater salinization or contamination. Except for one well the total hardness levels also not varied, with several samples were not exceeding the recommended limit of 250 mg/L as CaCO_3 .

Fluoride concentrations ranged from 0.1 to 0.8 mg/L, which samples were not exceeding the permissible limit of 1.0 mg/L and not detect Fluoride.

Nitrate levels in the samples were found to range from 3 to 21 mg/L, well below the maximum permissible limit of 50 mg/L. Since the western coastal area is highly urbanized densely populated area still the sandy aquifer is not polluted by nitrate. This indicates minimal contamination from agricultural Phosphate concentrations were also low across most samples, reflecting limited anthropogenic input from agricultural runoff or sewage discharge. These findings suggest relatively low impacts of human activities on groundwater quality in the region.

Sulphate levels varied significantly from 3 to 21 mg/L, most of the samples taken from shallow tube wells not detect subpalette the permissible limit of sulphate is 250mg/L. This indicates minimal contamination from anthropogenic input from industrial runoff or sewage discharge. These findings suggest relatively low impacts of human activities on groundwater quality in the region.

Total Iron levels ranged from 0.1 to 5mg/L several samples exceeding the permissible limit of 0.30 mg/L. Elevated iron levels were primarily observed in some wells likely due to secondary weathering of minerals with the presence of wet conditions throughout the year and most of these wells are located closer to Muthurajawela Wetland area. These elevated levels not pose potential health risks, for local communities relying on groundwater for drinking purposes.

Overall, the results indicate that groundwater quality across western coastal sandy aquifer extending from Colombo to Negombo region exhibits significant spatial variability. There is no adverse effect on water

quantity deterioration on the abstraction of water from coastal sand aquifers. Besides, there are no extreme water quality changes of both tube wells and dug wells in the coastal sand aquifer as well as in the Gampaha pilot area. Overall, the chemical parameters of the wells are at or below the permissible levels of SLS potable water standards 614:2013.

Localized issues of non-compliance with standards were not observed for any parameter except iron. Moreover, sustainable groundwater extraction practices and site-specific remediation measures are crucial to safeguard water resources for future use. This analysis provides essential baseline data to guide water resource management and public health strategies in the district.

As part of the ongoing study, pre-monsoon water samples are currently being analyzed to complement the post-monsoon results. The comparative analysis of these two datasets will enable a detailed evaluation of seasonal variations in groundwater quality, recharge dynamics, and the impact of monsoonal rainfall on key parameters such as fluoride, nitrate, hardness, and turbidity. Spatial mapping of the combined datasets will provide insights into vulnerable regions and patterns of groundwater depletion or contamination. The results from both datasets will form the basis for developing actionable strategies to mitigate quality issues, optimize groundwater extraction, and ensure sustainable management of the water resources of the sandy aquifer area.

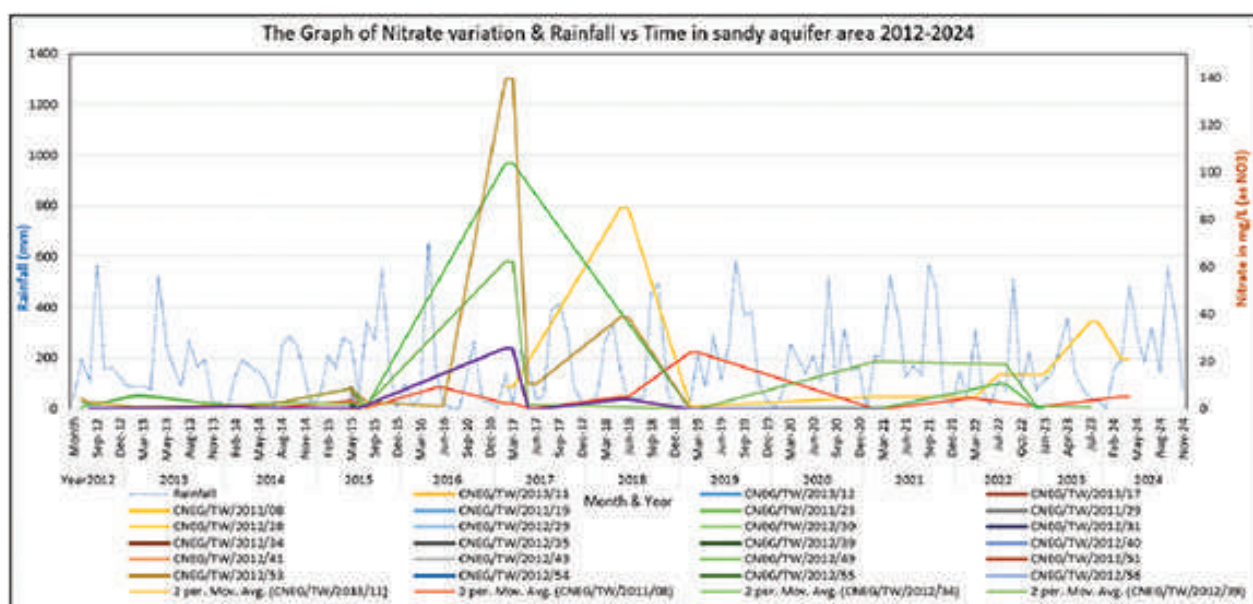


Figure 02: Nitrate variation of groundwater in dune sand area

Conclusions

The groundwater monitoring and analysis conducted in the coastal sandy aquifer extend from Colombo to Negombo region during 2024 provide critical insights into the hydrogeological conditions and water quality of the region. Key findings highlight significant seasonal and spatial variations in groundwater availability and quality, heavily influenced by monsoonal rainfall patterns. While the post-monsoon period demonstrated considerable recharge and improved water levels, the pre-monsoon period revealed areas of groundwater depletion, emphasizing the dependence on seasonal precipitation.

Chemical analyses indicate that groundwater across the region is predominantly neutral to slightly alkaline, with localized instances of non-compliance with potable water standards. Even though the elevated iron concentration levels in specific locations do not pose any potential health risks to local communities still the color of the water and odor is not pleasant. Seasonal and spatial variations in total dissolved solids, turbidity,

Nitrate, Sulphate and other parameters further underscore the impact of natural and anthropogenic factors on groundwater quality.

These findings confirm the importance of sustainable water resource management to address issues such as localized contamination, seasonal shortages, and over-extraction. By understanding the region's hydrogeological and quality dynamics, informed strategies can be developed to ensure the long-term sustainability of groundwater resources in very sensitive coastal sand region like Colombo to Negombo region.

Recommendations

1. Monitoring and Data Collection:
 - o Continue long-term groundwater monitoring across the costal sandy aquifer region extending from Colombo to Negombo region, with periodic analysis of pre- and post-monsoon water quality.
2. Pollution Control
 - o Enforce strict regulations on industrial discharge and promote environmentally friendly agricultural practices.
 - o Develop proper sewage and waste management systems to reduce contamination from domestic sources.
3. Recharge Enhancement
 - o Implement artificial recharge methods, such as rainwater harvesting and recharge wells, to increase aquifer replenishment.
4. Remediation and Treatment:
 - o Introduce water treatment plants where the water can be reuse
 - o Develop localized treatment plants to address water hardness, turbidity, and other contaminants in high-risk areas.
5. Integrated Water Management:
 - o Collaborate with regional and national agencies to develop a comprehensive water management strategy that integrates surface and groundwater resources.
 - o Use spatial mapping and hydrogeological models to identify vulnerable zones and prioritize interventions.
6. Policy and Research:
 - o Encourage further research on the impacts of climate change and land-use practices on groundwater quality and availability in Polonnaruwa.

By implementing these recommendations, the costal sandy aquifer extending from Colombo to Negombo region can address critical water quality issues, enhance water security, and promote sustainable development in this agriculturally vital region.

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.

to identify impact on groundwater due to over extraction and understand the sea water intrusions as well as to understand groundwater usage and the influence that agrochemical and pesticides have on the groundwater resources in order to establish suitability and sustainability groundwater resources management policies for the area. To achieve the objectives, temporal distribution of the water quality and water levels in Chilaw,

Arachchikattuwa, Vanathavilluwa, Puttalam, Karuwalagaswewa, Mundalama and Kalpitiya Divisional Secretary Divisions were studied in a long term manner.

Table 05: Summary of progress of the project activities -2024

Description of the activity	Programme for 2024	Progress of 2024
Quarterly ground water level monitoring & insitu analysis	214	214
Water Sample Collection	214	214
Full Chemical Analysis		
Heavy Metals	60	60
Analysis of Water Samples	214	
Full Chemical Analysis		214
Heavy Metals	60	

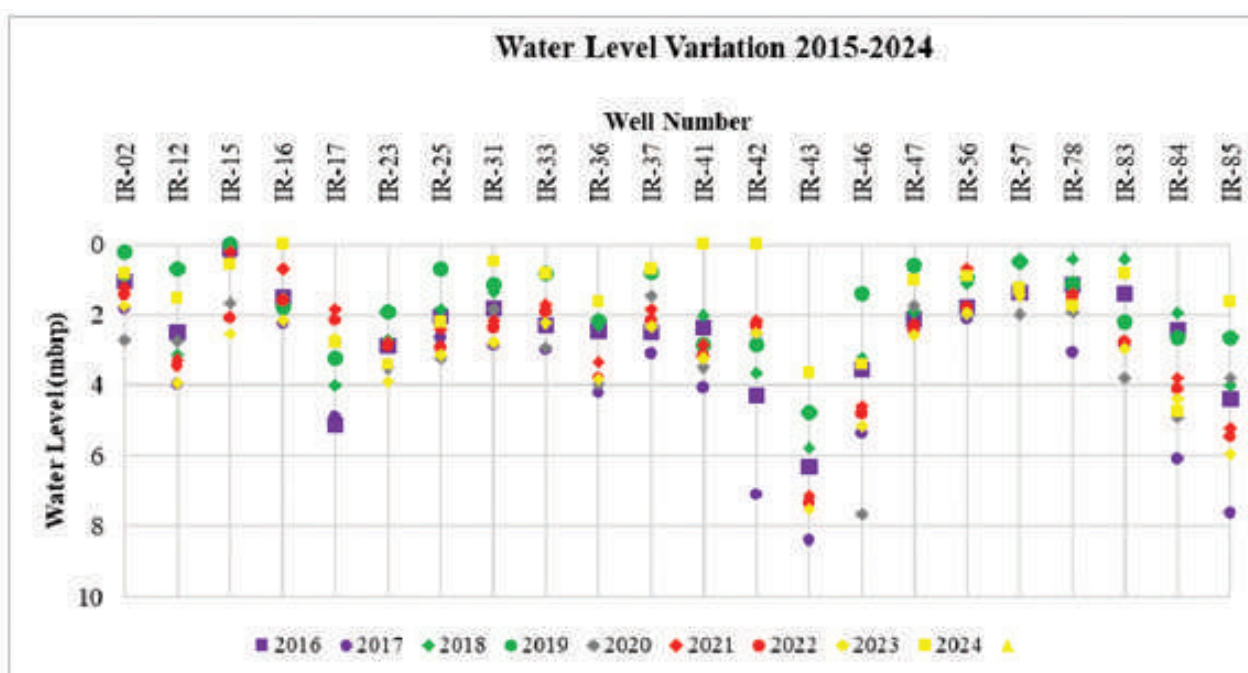


Figure 03: Water level fluctuation of the study area.

These are the water levels measured in the post monsoon period of each year. According to the above water level variation graph, water level of many wells are at a shallower level in 2019, and have gradually decreased in the consequent years of 2020,2021,2022 and 2023. According to the above water level variation graph, water level of many wells in 2024, are shallower than water level of 2023.

Considering the water level changes in shallow aquifer in Kalpitiya, Mundalama, Puttalam and Vanathavilluwa it can be seen that, rainfall acts a major role in recharging the shallow aquifer. In some areas, water level increasing may decrease the concentration of chemical parameters in groundwater.

1.1.3. Anuradhapura District

Groundwater and surface water (primarily tank water) serve as the lifeline for domestic and agricultural needs in the dry zone regions. The increasing reliance on groundwater in these areas has provided significant benefits, particularly for small-scale farmers, enabling them to cultivate more crops and mitigate the impact of prolonged dry spells. However, groundwater quality and availability vary across the region due to factors such as climatic changes, mineralogical weathering, and the geological structure of underlying rocks. Additionally, shallow aquifer systems in reservoir-adjacent areas experience rapid changes in water quality and quantity due to seepage and percolation.

The Anuradhapura District, spanning 7,179 km², is the largest in Sri Lanka, comprising 22 Divisional Secretariat Divisions and 694 Grama Niladhari Divisions. Geographically, it is bounded by Mannar, Mullaitivu, and Vavuniya to the north, Kurunegala and Matale to the south, Puttalam to the west, and Polonnaruwa and Trincomalee to the east. Of its total area, 6,664 km² is land, and 515 km² is water. The region is dominated by major tanks such as Nuwara Wewa, Tissa Wewa, Kala Wewa, and Nachchaduwa Wewa, along with key river basins like Malwathu Oya, Yan Oya, and Kala Oya, which influence the local hydrogeological conditions.

In 2024, Anuradhapura experienced two distinct monsoon periods: the first, from January 1 to February 26, was part of the 2023-2024 monsoon season, while the second, from September 25 to December 31, was part of the 2024-2025 monsoon season. The intervening period constituted the off-monsoon season. During the first monsoon period, the total rainfall was approximately 112.5 mm, with an average daily temperature of 30.37°C. The second monsoon brought significantly more rainfall, totaling around 670.0 mm, accompanied by a slightly lower average daily temperature of 29.34°C. In contrast, the off-monsoon period received 448.0 mm of rainfall, with higher average daily temperatures of 32.28°C, illustrating the variations in climate across different seasons.

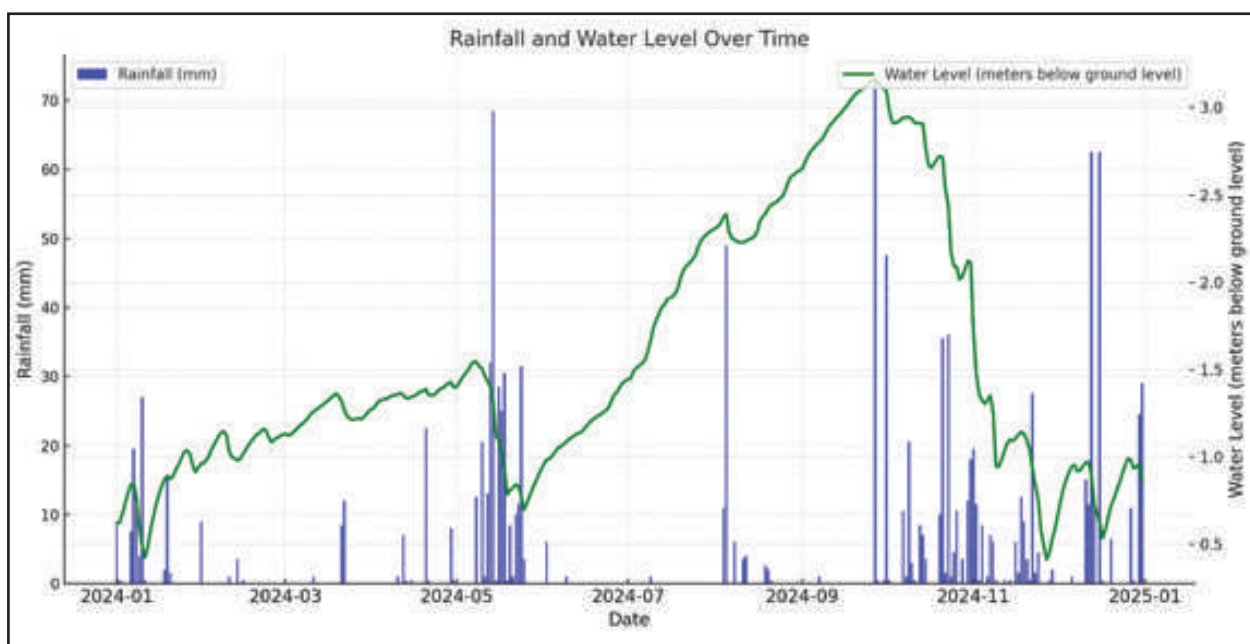


Figure 04: The graph of Rainfall and Water level over the time (Year 2024)

The graph above illustrates the relationship between rainfall (shown as blue bars) and water levels (depicted as a green line) over time. While rainfall events exhibit sharp, intermittent peaks, the water level follows a smoother trend, indicating that changes in groundwater levels do not immediately respond to rainfall. This suggests potential delays in water infiltration or the influence of other factors, such as groundwater extraction or seasonal variations. The visualization highlights the complex interplay between precipitation

and groundwater dynamics, emphasizing the need for further analysis to understand delayed or indirect effects.

Agriculture forms the backbone of Anuradhapura's economy, with cascading paddy fields and well-planned irrigation networks defining the landscape. The district is one of Sri Lanka's largest rice producers, generating over 500,000 metric tons of rice during the Maha season (2019/2020), facilitated by significant fertilizer application. Industrial activities are minimal, with negligible impact on groundwater resources. However, rising agricultural practices, economic development, and population growth have increased the demand for freshwater resources, straining the region's limited surface water reserves and highlighting the critical role of groundwater, especially during extended dry spells.

The prevalence of Chronic Kidney Disease of unknown etiology (CKDu) in parts of Anuradhapura raises serious concerns regarding water quality. Excessive use of agrochemicals and fertilizers, high water hardness, and fluoride content in groundwater are suspected contributors to this health crisis. As such, monitoring groundwater quality in CKDu-affected areas is imperative.

This study undertook a comprehensive assessment of the hydrogeological conditions, establishing a baseline for groundwater quality and levels in Anuradhapura District. Shallow and deep groundwater sources were evaluated, and a monitoring network was developed to observe seasonal and climatic variations. These efforts aim to identify regions experiencing groundwater depletion or quality deterioration, facilitating sustainable groundwater management and the development of guidelines for future extraction and use. The results will support better planning, informed decision-making, and the development of long-term solutions to safeguard the region's water resources.

Water Level variation

In 2024, as part of a long-term groundwater monitoring project in the Anuradhapura district, water sampling was conducted at 85 locations during both the pre-monsoon and post-monsoon periods. During these sampling events, in-situ analyses were carried out to measure critical parameters, including water level, electrical conductivity (EC), pH, salinity, total dissolved solids (TDS), and temperature. Additionally, water samples were collected for comprehensive chemical and heavy metal analysis, enabling a detailed evaluation of groundwater quality. These measurements captured seasonal variations in groundwater characteristics and hydrological dynamics. To further illustrate these findings, pre-monsoon and post-monsoon maps of water level variations are presented, highlighting the spatial and temporal changes in groundwater availability across the district. The maps above illustrate the spatial variation in groundwater levels during the pre-monsoon and post-monsoon periods across the Anuradhapura district in 2024. These maps reveal distinct seasonal changes in water levels, with noticeable differences in groundwater availability before and after the monsoon. Areas marked in red indicate regions with deeper groundwater levels, highlighting zones of lower water table availability, whereas green and blue regions represent shallower water levels, reflecting better groundwater accessibility. The visual comparison between the two maps underscores the significant recharge of aquifers during the monsoon, which is vital for understanding regional water resource management and planning.

Water Quality Analysis for Post-Monsoon (Quarter-01)

As part of the groundwater monitoring project in the Anuradhapura district, water samples collected from 85 locations during the post-monsoon period (Quarter-01) were analyzed for chemical parameters following Sri Lanka Standards (SLS 614: 2013) for potable water. The analysis included critical parameters such as pH, electrical conductivity (EC), total dissolved solids (TDS), salinity, hardness, chloride, sulphate, fluoride, nitrate, phosphate, and heavy metals.

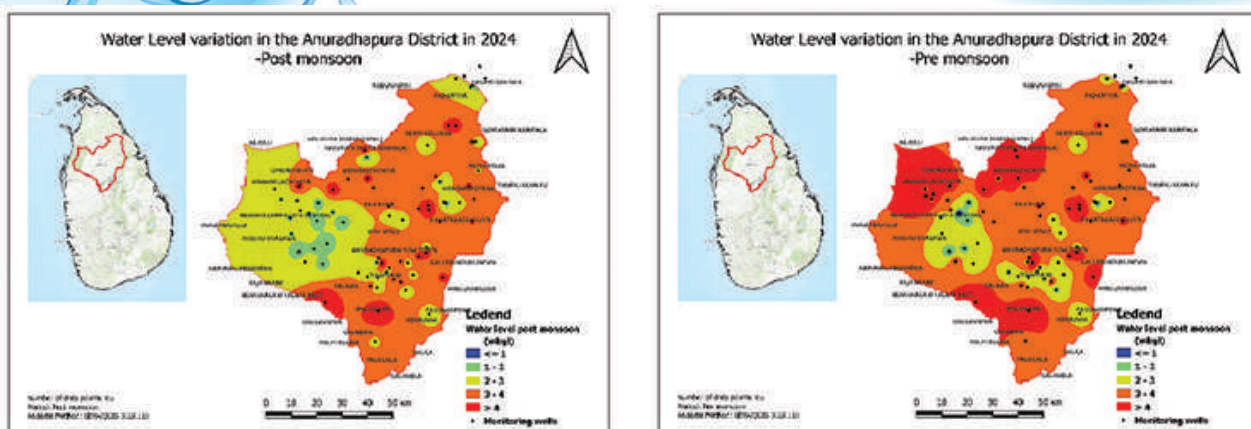


Figure 05: Water level variation in Anuradhapura district (Year 2024)

The pH values ranged between 7.4 and 8.7 across the sampling points, remaining within the SLS permissible range of 6.5 to 8.5, indicating the absence of overly acidic or basic water. Electrical conductivity (EC) levels varied significantly, from 256 $\mu\text{S}/\text{cm}$ to 5520 $\mu\text{S}/\text{cm}$, with several locations exceeding the recommended limits, which may indicate high salinity or dissolved ion concentrations in certain areas.

Total dissolved solids (TDS) values ranged from 91 mg/L to 3240 mg/L, with some samples surpassing the maximum allowable limit of 500 mg/L. This suggests elevated levels of dissolved salts or organic matter in the groundwater at these locations. Salinity levels were observed between 0.1 ppt and 3.2 ppt, with higher values indicating salinity intrusion in specific areas.

Total hardness ranged from 62 mg/L to 2148 mg/L, with many samples exceeding the SLS guideline of 250 mg/L. Elevated hardness levels could lead to scaling in water systems and reduced suitability for domestic use without treatment. Chloride levels varied widely, from 11 mg/L to 2288 mg/L, with higher concentrations indicating possible salinity intrusion or anthropogenic contamination, while sulphate levels remained within safe limits in most locations.

The analysis of heavy metals showed that iron concentrations in most samples were within the permissible limit of 0.3 mg/L, ensuring compliance with potable water standards. However, fluoride levels ranged between 0.2 mg/L and 3.6 mg/L, with a few samples exceeding the SLS limit of 1.0 mg/L, potentially posing a risk of fluorosis. Nitrate concentrations ranged from undetectable to 30 mg/L, while phosphate levels remained within acceptable limits across all samples.

These findings highlight significant spatial variability in water quality across the Anuradhapura district during the post-monsoon period. Areas with elevated salinity, hardness, fluoride, and TDS levels require targeted interventions to improve groundwater suitability for domestic use. Regular monitoring and community education are essential to ensure sustainable water resource management and safe water supply in the region.

Conclusion

The findings from the groundwater monitoring project in the Anuradhapura district provide a comprehensive understanding of the hydrogeological conditions and groundwater quality dynamics during 2024. The seasonal variations in water levels and quality parameters highlight the district's dependence on monsoonal rainfall for aquifer recharge. However, issues such as elevated salinity, hardness, fluoride levels, and TDS at certain locations indicate localized challenges to groundwater sustainability and usability.

The project underscores the critical need for sustainable groundwater management in the region. Seasonal monitoring revealed that while monsoonal rains significantly recharge aquifers, the recharge process is spatially variable, and certain areas remain vulnerable to groundwater depletion. Furthermore, elevated concentrations of dissolved solids and fluoride in some locations raise concerns for potable water safety and public health.

Recommendations:

1. **Targeted Water Treatment:** Install community-level water treatment facilities, particularly in areas with high salinity, hardness, and fluoride levels, to ensure safe drinking water.
2. **Sustainable Groundwater Management:** Promote water conservation practices and regulate groundwater extraction to prevent overexploitation of aquifers. Strengthen policies to safeguard groundwater resources in CKDu-affected zones.
3. **Periodic Monitoring:** Continue seasonal groundwater monitoring to track changes in water quality and quantity. Expand the network to include additional sampling points in vulnerable areas for better spatial coverage.
4. **Public Awareness:** Conduct awareness programs to educate local communities about sustainable water usage and the health implications of poor water quality.
5. **Agricultural Practices:** Encourage farmers to adopt water-efficient irrigation techniques and reduce the use of agrochemicals to minimize their impact on groundwater quality.
6. **Data-Driven Planning:** Utilize the findings to inform regional water resource management strategies, ensuring that development activities align with the district's hydrogeological realities

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, 2023 & 2024 it was focused to monitor groundwater quality and quantity variation of the district.

In the year 2024 1st quarter, selected 20 sample locations were monitored and samples were collected for chemical analysis in the laboratory. Also, in 3rd quarter, selected 20 sample locations were monitored and samples were collected for chemical analysis in the laboratory.



Figure 06: Water quality monitoring – In-site



Figure 07: Figure 06: Water quality monitoring – Laboratory

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, 2023, & 2024 it was focused to monitor groundwater quality and quantity variation of the district.

In 2024 1st quarter, selected 20 sample locations were monitored and samples were collected for chemical analysis in the laboratory. Also, in 3rd quarter 2024, selected 20 sample locations were monitored and samples were collected for chemical analysis in the laboratory.



Figure 08: Water level measuring

1.1.6 Monaragala district

The main objective of this study is to identify qualitative and quantitative changes in groundwater resources within the area over the long term.

Long-Term Groundwater Monitoring (LTGM) is used to track groundwater level fluctuations and variations in water quality across the study area to facilitate the development and implementation of effective management plans for the sustainable use of groundwater.

Monitoring wells have been selected to cover most areas of the district and collected physical and chemical data during both dry and wet periods of the year. Using this data, changes of water quality and quantity were analyzed.

Ultimately, this study helps to identify optimal locations for dug wells and tube wells and determine areas where proper filtration systems should be implemented to provide safe drinking water to rural communities.

Table 06: Completed activities in 2024 under LTGM Project-Monaragala

Activity/Description	No of items
Collection of Water Samples and groundwater level monitoring	60
Full Chemical Analysis	30
Heavy Metal analysis	Results not received

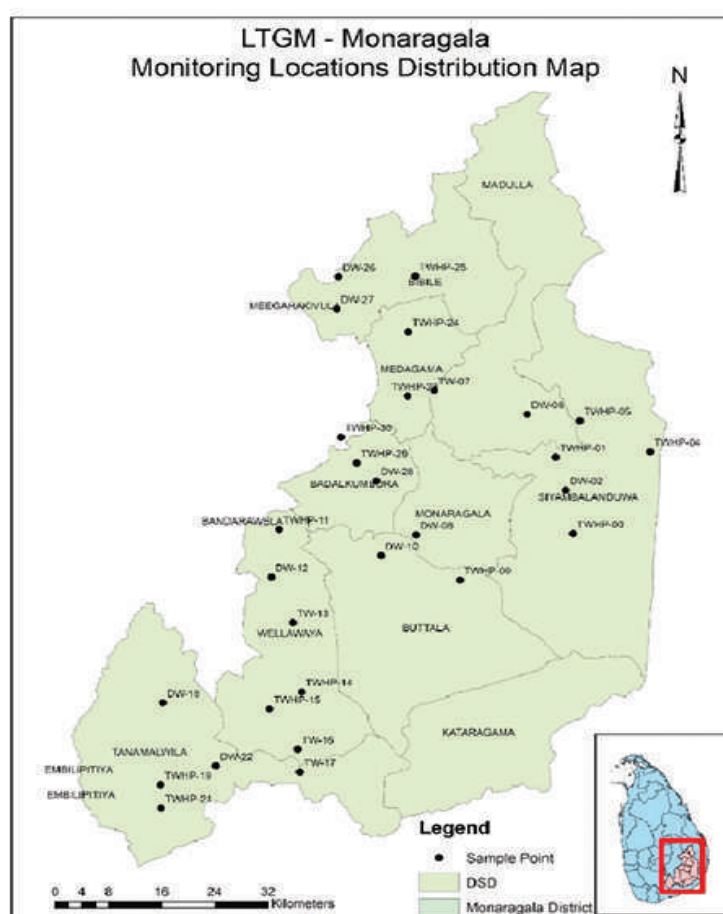


Figure 09: Study area and monitoring locations

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 Mahaweli 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.

The climate of the area is tropical and is characterized by nearly constant year-round temperatures (260°C – 280°C). 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).

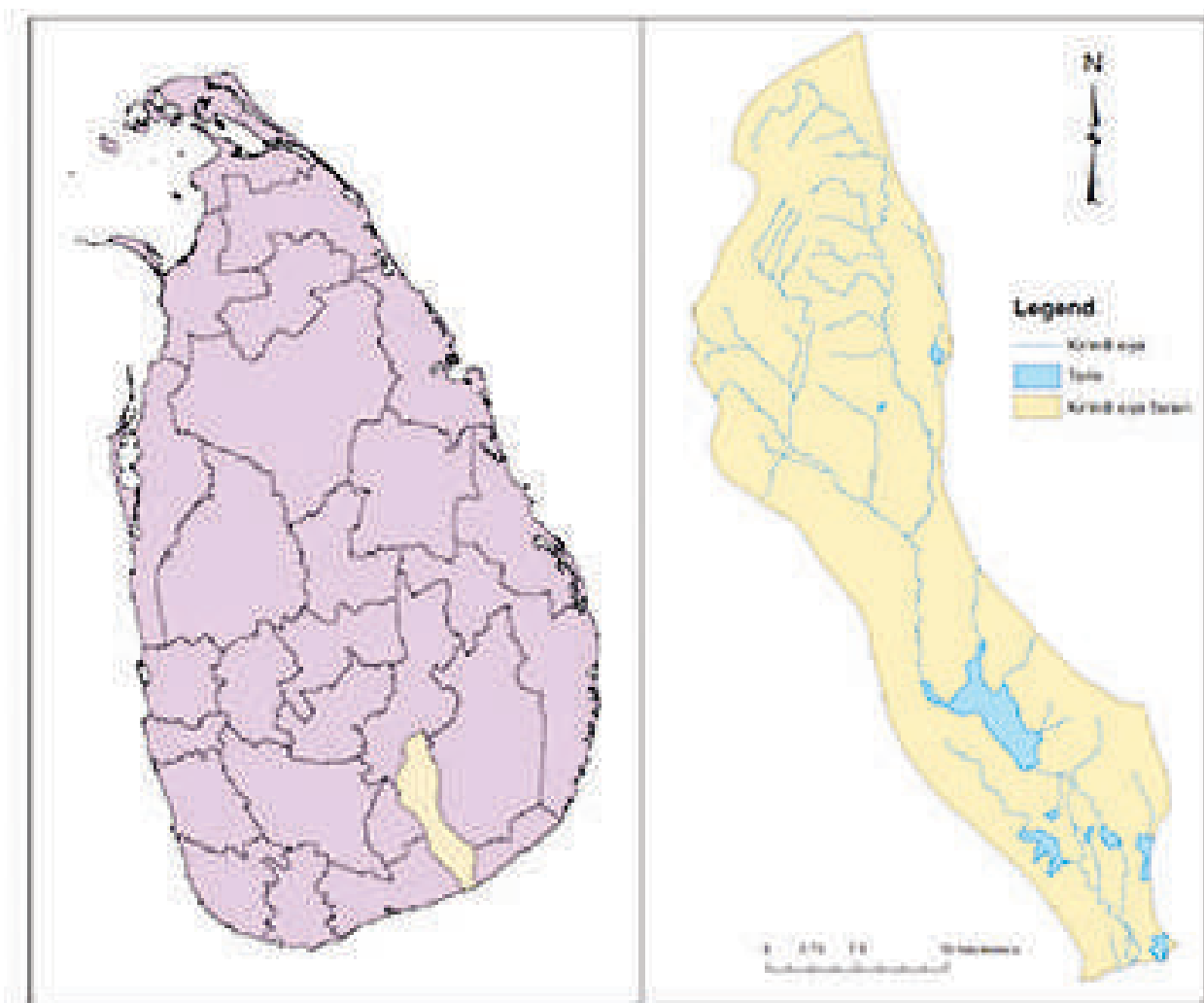


Figure 10: The study area – Kirindi Oya basin

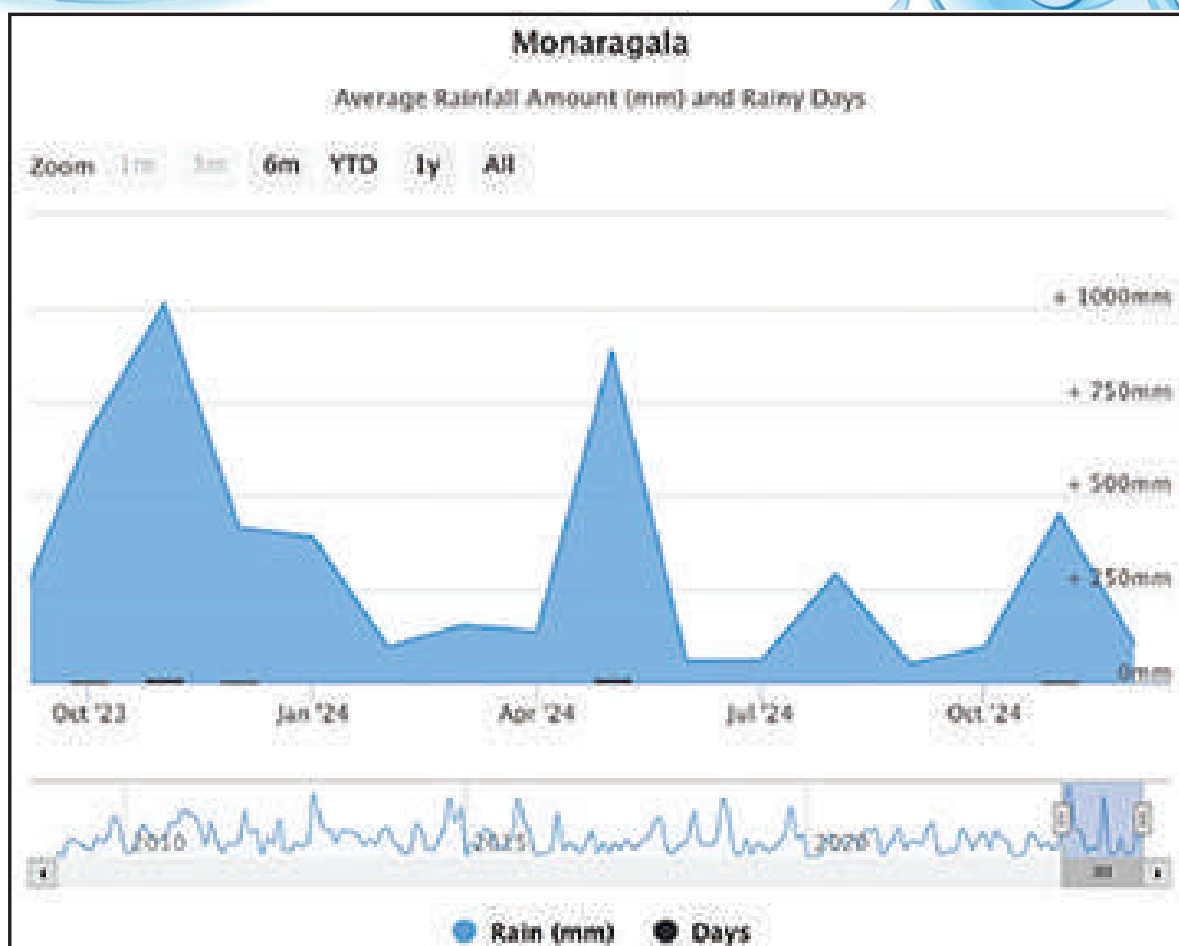


Figure 11: Monthly rainfall pattern in 2024

There are 50 samples were collected for the analysis in quarter basis.

Table 07: Completed activities in 2024 under LTGM Project- Kirindioya Basin

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



Figure 12: Collecting water samples



Figure 13: Measuring water levels

1.1.7 Mannar

The study examines the hydrogeological conditions of the limestone aquifer system in the Mannar District, Sri Lanka, focusing on long-term groundwater monitoring initiated in 2012. The project aims to ensure sustainable use of groundwater resources for domestic, industrial, and agricultural purposes amid increasing demands. Spanning approximately 300 km², the study area is characterized by sedimentary limestone, tropical savanna climate, and notable seasonal variations in precipitation.

The project monitored groundwater levels and quality, analyzing parameters such as electrical conductivity (EC), pH, total dissolved solids (TDS), nitrate, and total alkalinity. Data analysis was conducted using GIS techniques and IDW interpolation. Findings reveal seasonal fluctuations in groundwater quality, with improved parameters during high precipitation and signs of deterioration during dry spells. Coastal areas exhibited higher salinity and EC values, attributed to seawater intrusion, while inland regions showed relatively stable conditions.

At present, the Mannar region is rapidly developing due to resettlement activities and the expansion of agricultural areas, especially in paddy cultivation. It is noted that groundwater development is undertaken by both state agencies and private parties. The recent trend in groundwater use has shown increasing levels by private parties including individual farmers for paddy cultivation, and small-scale other agricultural activities. The groundwater depletion in the long run is resulting due to this over-abstraction and it subsequently affects the natural equilibrium of the area where the seawater intrusion & groundwater resources quality changes are imminent if not appropriately controlled for sustained management of the sources immediately. Most of the tapping water sources are of the tube wells and hand pumps which are distributed within the rural areas to fulfill the domestic water requirements.

Under this study, the hydrogeological condition was assessed and the groundwater quality and levels were initially monitored to identify the baseline status of the area. With this assessment, it was identified the locations where the groundwater quality & quantity are to be monitored on a long-term basis to represent the aquifer systems of the region. In this respect, shallow and deep groundwater sources were assessed, and established a monitoring network to study the entire region and monitor the groundwater quality, water level changes with the seasonal variation, and climatic changes. This is helpful to understand the groundwater depleting areas and variation of quality for recommending a better solution or remediation for the groundwater extraction for any activities in the future. Further, this information provides baseline information for management and planning or the introduction of guidelines to use groundwater sustainably within the region.

The main objective of the study is to identify the qualitative and quantitative changes of groundwater

resources within the area which facilitates baseline information for understanding the dynamic behavior of this finite resource and subsequent implementing of management practices using regulation activities through necessary guidelines.

In 2024, a groundwater level monitoring program was conducted. Also, in the 1st and 3rd quarters, 37 samples for each quarter were collected in the field and analyzed in the water resources board laboratory.

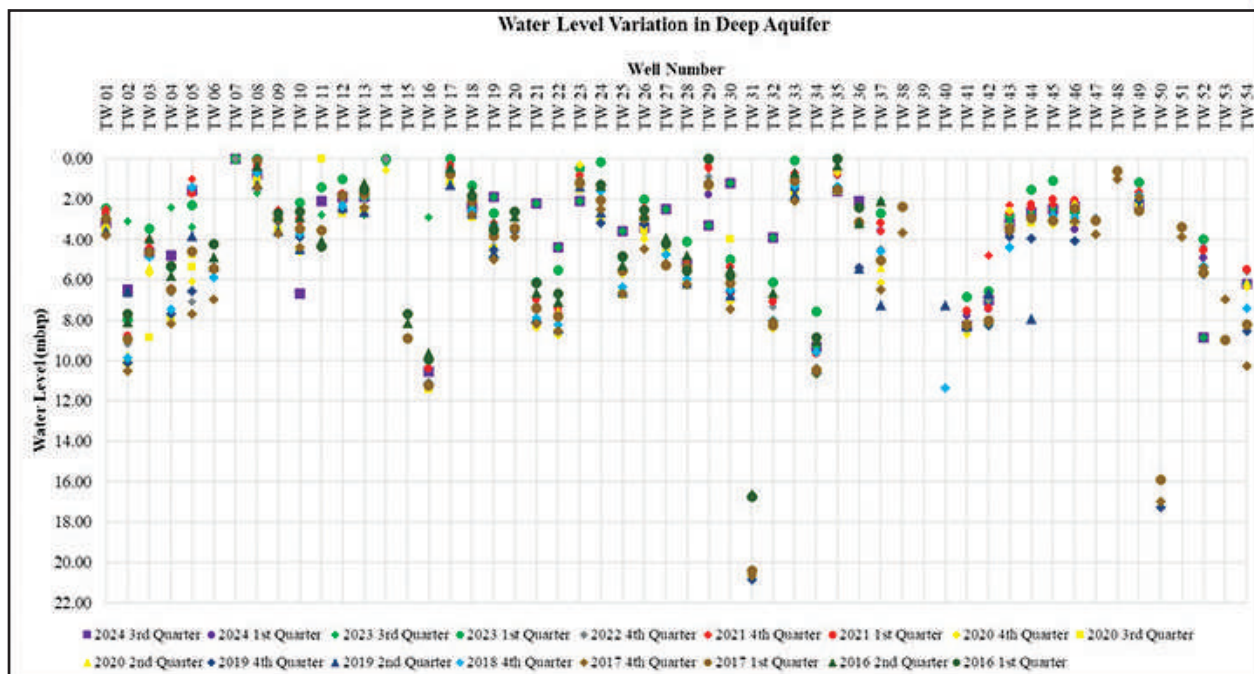


Figure 14 : Water level fluctuation of deep aquifer

Water level fluctuation takes place during the rainy and drought periods within the Mannar region. Most probably, the North-East monsoon made a major contribution to the water level fluctuation. Generally, the water level gradually increased during the high precipitation that takes place in the Mannar region from October to December. However, there has not been a gradual decrease in water levels during the period of lower precipitation from January to October. Because during that time, inter-monsoons took place, and the water level changed.

Previous studies emphasize that EC values decreased from October to December and the lowest value is recorded at the end of the northeast monsoon. But increment of EC values can be observed from February to September. The water quality of the deep aquifer improved with precipitation. Therefore, it seems that the karstic Limestone aquifer is recharged through precipitation.

The coastal side in the Manthai west divisional secretariat shows high EC values in both dry and wet periods. With the precipitation, the EC value decreases, but it exceeds the permissible level all the time. The area is very close to the sea and saline water intrusion is the reason for the very high EC value.

The analyzed chemical parameters change with precipitation and drought. Most of the chemical parameters improved with the precipitation and some of the parameters depleted. Water level fluctuation also affected the precipitation and during the 3rd quarter of the year, the water table increased. Considering all factors, the study area mainly recharges from the northeast monsoon, and the quality of the water slightly improved.

The following activities will be helpful for further study of the area.

01. Well monitoring program should be continued to identify the groundwater level fluctuation and the sampling should be done two times per year to identify the chemical variation. Both monitoring and sampling should be done in the same month of every year to obtain the best outcome.

1.1.8 Jaffna peninsular

This study covered the entire Jaffna peninsula to monitor the temporal and spatial distribution of water level and water quality with time. Shallower and deeper aquifers are encountered within the study area with different water qualities. 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 82 numbers of wells representing shallow aquifer of the Jaffna peninsula. 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.



Figure 15: Field activities – Collecting water samples, Measuring water levels

1.1.9 Polonnaruwa District

Groundwater and surface water (primarily tank water) continue to be the primary sources of water for domestic and agricultural purposes in the dry zone areas of Sri Lanka. The demand for groundwater has steadily increased over the years, bringing significant benefits to smallholder farmers by enabling them to cultivate more crops and mitigating the impact of prolonged dry periods. However, groundwater quality and quantity in these areas often vary considerably due to factors such as climatic fluctuations, mineral weathering processes, and the geological characteristics of underlying rock formations. In addition, shallow aquifer systems in reservoir areas are particularly vulnerable to changes in water quality and quantity due to seepage and percolation from the reservoirs.

The Polonnaruwa district, located in the plain valley of the Mahaweli River within Sri Lanka's North Central Province, is predominantly an agriculture-based region. It is characterized by cascading paddy fields and well-planned irrigation networks. As part of Sri Lanka's dry zone, Polonnaruwa faces high demand for freshwater resources driven by intensified agricultural practices, economic development, and population growth. Surface water resources are often insufficient and unreliable during extended dry spells, leading to an increased dependence on groundwater. Many areas in the district experience significant water shortages during the dry seasons, creating challenges for local communities in meeting their water needs.

The prevalence of Chronic Kidney Disease of unknown etiology (CKDu) in parts of Polonnaruwa has raised further concerns about water quality. Excessive use of agrochemicals and fertilizers is believed to be a contributing factor to CKDu. Additionally, groundwater hardness and the presence of fluorides are considered potential contributors to the disease. As a result, monitoring water quality in CKDu-affected areas remains a critical priority.

This study focuses on assessing the hydrogeological conditions, monitoring groundwater quality, and analyzing groundwater levels to establish a baseline understanding of the Polonnaruwa district. Long-term monitoring locations were identified to represent the aquifer systems of the study area. Both shallow and deep groundwater sources were evaluated, and a comprehensive monitoring network was established to analyze groundwater quality, seasonal variations in water levels, and climatic influences across the region. This approach is critical for identifying groundwater depletion zones and understanding quality variations to develop sustainable solutions or remediation measures for groundwater extraction in the future. Furthermore, the findings serve as baseline data for regional water resource management, planning, and the development of guidelines to ensure sustainable groundwater use.

The total rainfall recorded in the Polonnaruwa district during 2024 was 3206.5 mm, while the average temperature was 32.15°C. The region experienced two monsoon periods: from January 1 to February 14, 2024 (climatic year 2023-2024), and from September 30 to December 31, 2024 (climatic year 2024-2025). During the first monsoon period, total rainfall amounted to 683.5 mm, spread across 23 rainy days, indicating moderate but consistent precipitation. In contrast, the second monsoon period experienced significantly higher rainfall, totaling 1706.5 mm over 53 rainy days, reflecting the intensity and extended duration of this season. The monsoon periods collectively contributed significantly to the total annual rainfall, emphasizing their importance in groundwater recharge and agricultural sustainability. Understanding these seasonal rainfall patterns is essential for devising effective water resource management strategies in the district.

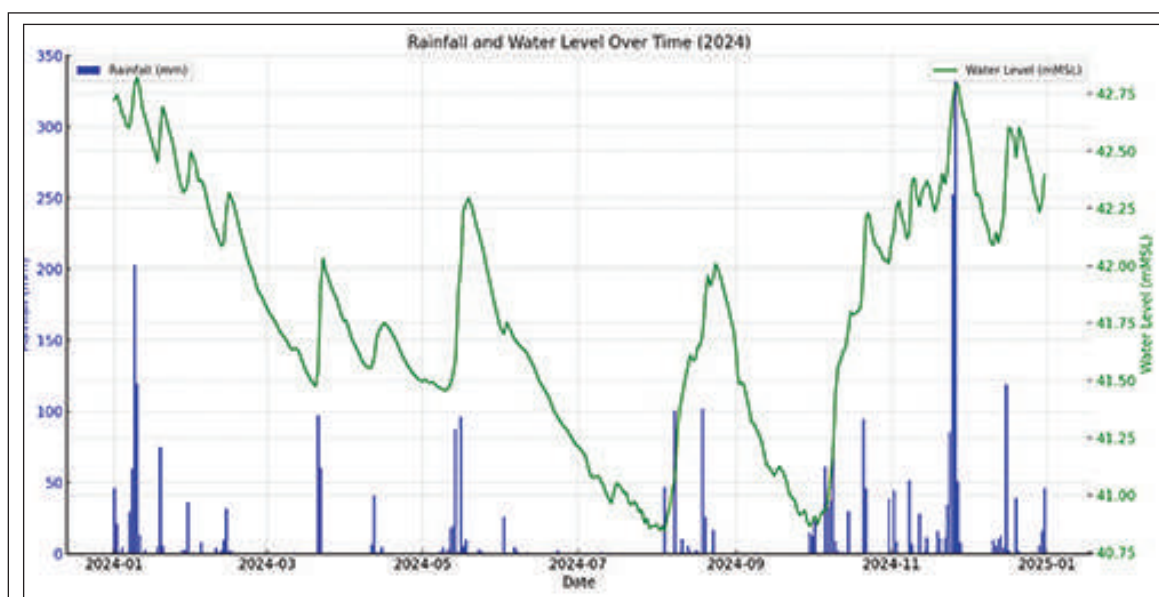


Figure 16: The graph of Rainfall and Water level over the time (Year 2024)

The relationship between rainfall and groundwater levels in the Polonnaruwa district during 2024 demonstrates a clear seasonal pattern influenced by precipitation. Periods of increased rainfall, particularly during the monsoon seasons, are closely followed by a rise in water levels. For instance, the significant rainfall events recorded during the second monsoon period (September to December) corresponded to a notable increase in groundwater levels, as reflected in the data. Conversely, during dry periods with minimal or no rainfall, groundwater levels gradually declined due to reduced recharge and ongoing extraction for agricultural and domestic use. This correlation emphasizes the critical role of seasonal rainfall in replenishing groundwater resources, with water levels showing delayed but direct responses to precipitation. These findings highlight the need for sustainable water management practices to mitigate the impacts of prolonged dry spells and ensure the availability of groundwater throughout the year.

Water Level variation

In 2024, as part of a long-term groundwater monitoring project in the Polonnaruwa district, water sampling was conducted at 75 locations during both the pre-monsoon and post-monsoon periods. During these sampling events, in-situ analyses were carried out to measure critical parameters, including water level, electrical conductivity (EC), pH, salinity, total dissolved solids (TDS), and temperature. Additionally, water samples were collected for comprehensive chemical and heavy metal analysis, enabling a detailed evaluation of groundwater quality. These measurements captured seasonal variations in groundwater characteristics and hydrological dynamics. To further illustrate these findings, pre-monsoon and post-monsoon maps of water level variations are presented, highlighting the spatial and temporal changes in groundwater availability across the district.

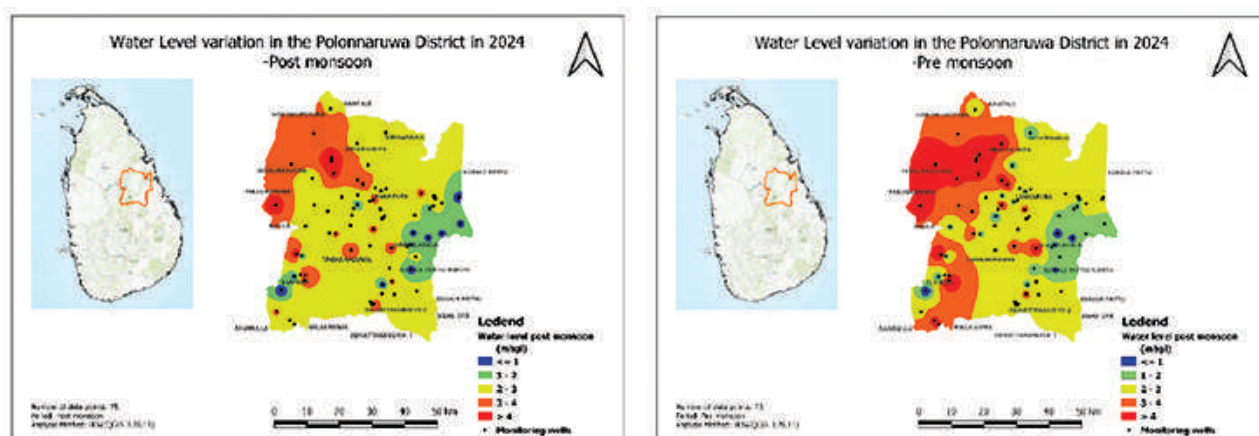


Figure 17: Water level variation in Anuradhapura district (Year 2024)

The pre-monsoon and post-monsoon water level variation maps for the Polonnaruwa district in 2024 illustrate significant spatial and temporal differences in groundwater availability across the region. During the pre-monsoon period, extensive areas, particularly in the northwestern and southwestern regions, exhibit water levels exceeding 4 meters below ground level (mbgl), indicated by red zones on the map. These areas suggest considerable groundwater depletion due to limited recharge and higher water extraction during the preceding dry season. Additionally, moderate water levels between 2 and 4 mbgl are observed in the central and southern parts of the district, while isolated pockets of shallow water levels (≤ 1 mbgl) appear in areas with higher localized recharge potential.

In contrast, the post-monsoon map highlights substantial groundwater recharge following the monsoonal rainfall. Large portions of the district, especially in the central and eastern regions, demonstrate shallow water levels of ≤ 2 mbgl, indicated by blue and green zones. These areas suggest effective recharge and reduced groundwater stress during this period. However, pockets of deeper water levels (> 4 mbgl) persist in certain parts of the northwest and southwest, potentially reflecting localized hydrogeological constraints or continued over-extraction.

The comparison of these maps underscores the critical impact of monsoonal rainfall on groundwater recharge dynamics in Polonnaruwa. It also highlights the spatial variability in aquifer recharge potential, emphasizing the need for targeted water management strategies to address localized groundwater stress and ensure sustainable water resource use.

Water Quality Analysis for Post-Monsoon (Quarter-01)

The chemical analysis of water samples collected across the Polonnaruwa district in 2024 provides a comprehensive understanding of groundwater quality and its compliance with potable water standards (SLS 614:2013). The study analyzed 75 samples for key parameters, including pH, electrical conductivity (EC), total dissolved solids (TDS), major ions (such as calcium, magnesium, chloride, and sulfate), fluoride, nitrate, phosphate, and heavy metals like iron. These findings also shed light on seasonal and spatial variations in groundwater quality, offering insights into the hydrological dynamics of the region.

The pH levels across the samples ranged from 6.4 to 8.4, falling within the permissible range of 6.5 to 8.5, indicating that the groundwater is predominantly neutral to slightly alkaline. However, total alkalinity exceeded the standard guideline of 200 mg/L in several locations, particularly in high recharge zones, suggesting the presence of elevated carbonate and bicarbonate concentrations. These results highlight the influence of the geological characteristics of the region on groundwater quality.

Electrical conductivity values varied between 154 and 1594 $\mu\text{S}/\text{cm}$, reflecting significant spatial differences in ion concentration. Correspondingly, total dissolved solids (TDS) levels ranged from 41 to 796 mg/L, remaining below the permissible limit of 500 mg/L in most samples. Isolated cases of elevated TDS were noted in certain wells, which may indicate localized groundwater salinization or contamination. Total hardness levels also varied widely, with several samples exceeding the recommended limit of 250 mg/L as CaCO_3 . The elevated hardness levels were linked to higher concentrations of calcium and magnesium, naturally derived from the dissolution of limestone and dolomite in the aquifers.

Fluoride concentrations ranged from 0.1 to 3.4 mg/L, with several samples exceeding the permissible limit of 1.0 mg/L. Elevated fluoride levels were primarily observed in deeper aquifers, likely due to natural enrichment through rock-water interactions. These elevated levels pose potential health risks, including dental and skeletal fluorosis, for local communities relying on groundwater for drinking purposes.

Nitrate levels in the samples were found to range from 0.2 to 15.9 mg/L, well below the maximum permissible limit of 50 mg/L. This indicates minimal contamination from agricultural fertilizers or septic systems. Phosphate concentrations were also low across most samples, reflecting limited anthropogenic input from agricultural runoff or sewage discharge. These findings suggest relatively low impacts of human activities on groundwater quality in the district.

Turbidity levels varied significantly, with some samples exceeding the permissible limit of 2 NTU, particularly in shallow or highly turbid wells. Aesthetic parameters, such as water clarity and color, were generally acceptable but exhibited slight deviations in wells near agricultural areas.

Overall, the results indicate that groundwater quality across Polonnaruwa district exhibits significant spatial variability. Localized issues of non-compliance with standards were observed for fluoride, hardness, alkalinity, and turbidity. These findings highlight the need for targeted interventions to address specific quality concerns. Elevated fluoride concentrations, in particular, present a notable health risk that warrants regular monitoring and public awareness campaigns to mitigate exposure. Moreover, sustainable groundwater extraction practices and site-specific remediation measures are crucial to safeguard water resources for future use. This analysis provides essential baseline data to guide water resource management and public health strategies in the district.

As part of the ongoing study, pre-monsoon water samples are currently being analyzed to complement the post-monsoon results. The comparative analysis of these two datasets will enable a detailed evaluation of seasonal variations in groundwater quality, recharge dynamics, and the impact of monsoonal rainfall on key parameters such as fluoride, nitrate, hardness, and turbidity. Spatial mapping of the combined datasets will provide insights into vulnerable regions and patterns of groundwater depletion or contamination. The results from both datasets will form the basis for developing actionable strategies to mitigate quality issues, optimize groundwater extraction, and ensure sustainable management of the district's water resources.

Conclusions

The groundwater monitoring and analysis conducted in the Polonnaruwa district during 2024 provide critical insights into the hydrogeological conditions and water quality of the region. Key findings highlight significant seasonal and spatial variations in groundwater availability and quality, heavily influenced by monsoonal rainfall patterns. While the post-monsoon period demonstrated considerable recharge and improved water levels, the pre-monsoon period revealed areas of groundwater depletion, emphasizing the dependence on seasonal precipitation.

Chemical analyses indicate that groundwater across the district is predominantly neutral to slightly alkaline, with localized instances of non-compliance with potable water standards. Elevated fluoride concentrations in deeper aquifers and high hardness levels in specific locations pose potential health risks to local communities. Seasonal and spatial variations in total dissolved solids, turbidity, and other parameters further underscore the impact of natural and anthropogenic factors on groundwater quality.

These findings confirm the importance of sustainable water resource management to address issues such as localized contamination, seasonal shortages, and over-extraction. By understanding the region's hydrogeological and quality dynamics, informed strategies can be developed to ensure the long-term sustainability of groundwater resources in Polonnaruwa.

Recommendations

1. **Monitoring and Data Collection:**
 - Continue long-term groundwater monitoring across the district, with periodic analysis of pre- and post-monsoon water quality.
 - Expand the monitoring network to include additional wells in regions with high fluoride, hardness, or turbidity levels.
2. **Public Awareness and Community Engagement:**
 - Conduct awareness campaigns to educate local communities about the health risks associated with elevated fluoride and hardness levels.
 - Promote the adoption of low-cost, household-level water treatment technologies to mitigate fluoride exposure.
3. **Sustainable Water Resource Management:**
 - Implement policies to regulate groundwater extraction, particularly in areas prone to over-extraction or contamination.
 - Promote water-saving agricultural practices, such as precision irrigation and crop diversification, to reduce groundwater demand during dry periods.
4. **Remediation and Treatment:**
 - Introduce fluoride removal techniques, such as activated alumina or reverse osmosis, in areas where concentrations exceed safe levels.
 - Develop localized treatment plants to address water hardness, turbidity, and other contaminants in high-risk areas.

5. Integrated Water Management:

- Collaborate with regional and national agencies to develop a comprehensive water management strategy that integrates surface and groundwater resources.
- Use spatial mapping and hydrogeological models to identify vulnerable zones and prioritize interventions.

6. Policy and Research:

- Encourage further research on the impacts of climate change and land-use practices on groundwater quality and availability in Polonnaruwa.
- Develop and enforce regulatory frameworks to ensure compliance with potable water standards.

By implementing these recommendations, the Polonnaruwa district can address critical water quality issues, enhance water security, and promote sustainable development in this agriculturally vital region.



1.1.10 Matale District

The Water Resources Board (WRB) was initiated a long-term groundwater monitoring project at Mathale District year 2012 under the treasury funded Dam Safety and Water Resources Planning Project (DSWRPP) which explored any management plan and guidelines to be implemented for sustained use of the available groundwater resources. 252 Agro wells were observed in this area to mentor shallow aquifer characteristics. To study the deep aquifer characteristics 82 tube wells were observed which were located close to the previously studied agro wells to identify any relationship.

Later, most suitable places were selected for the long term monitoring (LTGM) based on results of this study and this project area consists of five DS divisions named as Dambula, Naula, Galewela, Laggala-Pallegama and Pallepola. Therefore, the wells located in heavy pumping places and heavily cultivated places were used as monitoring points. For this purpose, 35 wells were currently selected as the long-term monitoring points and started monitoring groundwater quality and water levels at 2 transitional periods included with dry and wet periods of the year. Water level monitoring and In-situ analysis were carried out at the field and laboratory analysis was carried out at the Anuradhapura laboratory. Hence ground water monitoring involves seasonal collection, analysis and storage of ground water data.

In Mathale area ground water is predominantly used on domestic, agricultural and industrial purposes. Meanwhile with the increased agricultural practices, economic development and increased population have resulted in increased demand on fresh water resources within the area. Therefore, ground water availability is lower in upper parts of Dambulla and higher parts of Laggala- Pallegama areas.

In this regard, assessment of the groundwater resources of the area, its use and present condition is needed to be explored to implement any management plan and guidelines to maintain the sustainable use of the available groundwater resources since the substantial portion of the regional water requirement relies on groundwater either as a sole source or conjunction of surface water sources. As the demand for groundwater continue to escalate, the need for proactive and sustainable management strategy become paramount. Therefore, detailed hydrogeological explorations and monitoring in long term basis is a prerequisite for achieving these aforesaid objectives.

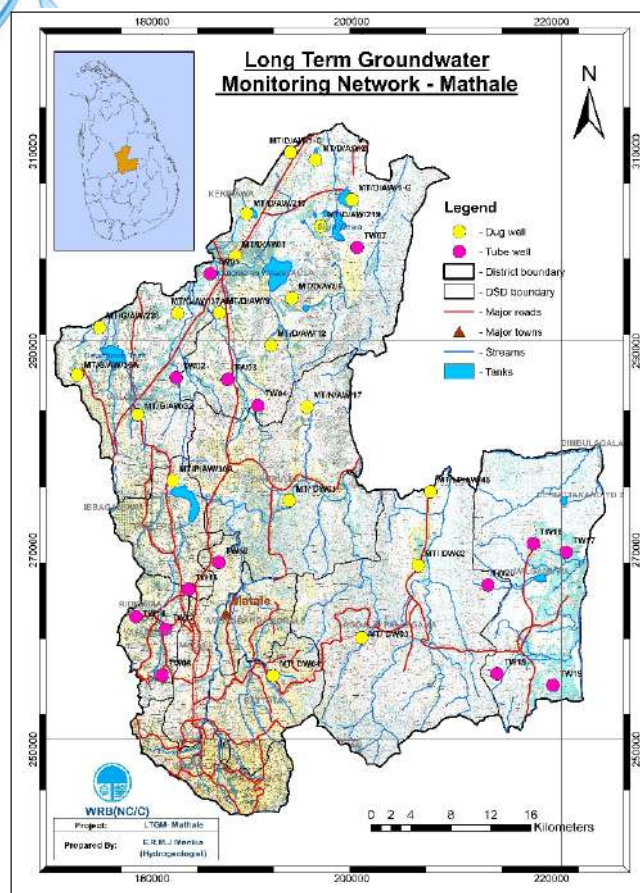


Figure 18: Sampling locations of LTGM-Mathale project

Hence the purpose of the study is to identify changes in water level and water quality and water quality trends associated with the over extraction and contamination situation posing a serious threat to its long-term viability. Therefore, the final product of this study which came as annual report is included with a summary of the hydrogeology and groundwater conditions present in the area associated with the discussion of the analytical results based on the data collected from wet and dry periods. Outcome of this project will spread through various sectors including domestic users, agricultural and industrial practices etc. to protect and sustainably manage groundwater resources for future generations.

Work completed during year 2024

As per the result of fuel deficiency and sudden increase of the price of fuels LTGM- Mathale project water sampling was not conducted as usual for all four quarters. Therefore, in year 2024 water sample collection and water level monitoring associated with in-situ analysis was limited to 1st and 3rd quarters for 35 sampling locations including 15 tube well locations and 20 dug well locations same as to the year 2023.

For each quarter, 35 water samples were collected for full chemical analysis and 14 samples were collected from selected locations for heavy metal analysis.

In-situ sample analysis was conducted in the field using the Multiparameter and EC, TDS, and pH values were measured.

Full chemical analysis of the 1st quarter samples was carried out at the Water Resources Board, Anuradhapura laboratory. Meanwhile 3rd quarter samples were sent to Head office.

However, the heavy metal analysis for the water samples were unable to carried out due to the technical malfunctions and reagent issues.

Following analytical procedures has been continued after field work in order to summarize the each year findings,

- IDW analysis/map preparation was carried out by using ArcGIS software to elaborate the spatial distribution of chemical parameters across Mathale distric
- Preparing Annual report for year 2024 by studying and describing chemical distribution maps, water level variation during seasonal sampling process etc.
- Finally, the recommendations were given in order to make necessary awareness and remediation for sustaining the groundwater resources of the region.

So far, following chemical distribution maps have been prepared for 1st quarter of year 2024 and both maps prepared for 2023, 2024 1st quarters are shown here for further comparison.

I. Distribution of Electrical Conductivity

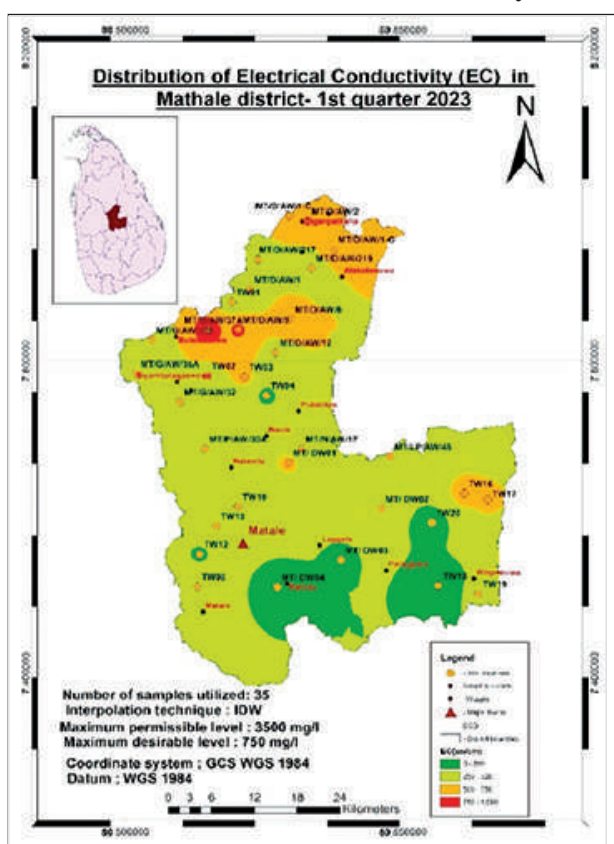


Figure 19: Electrical conductivity variation for 1st quarter 2023

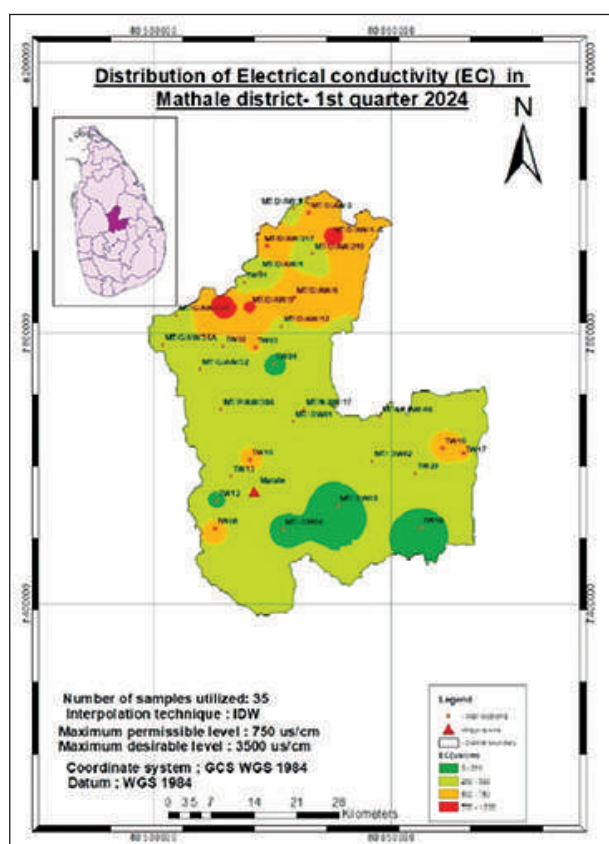


Figure 20: : Electrical conductivity variation for 1st quarter 2024

Electrical conductivity assesses the water's ability to conduct electrical current, reflecting its

dissolved ion content. According to the analytical results well located at Nothern as well as Northeastern region of Mathale district has shown highest EC values relative to the other regions. Those wells are concentrated within Dambulla, Dewahuwa, Sigiriya, Kimbissa areas. Meanwhile, maximum EC value was recorded as 927us/cm in a well belongs to Dewahuwa area. At the same time, all the measured EC values are lying below the maximum permissible level of 3500us/cm. Northeastern part of the study area belongs to limestone terrain with waste dumping locations. Rest of the locations which show higher EC values are located near or around lakes recharged from direct rain fall and surface run off with various concentrated

ions. EC variation in year 2023 shows almost similar patterns. In addition to that most of these locations are encountered within the northern and northwestern part of Matale district with low ground water availability due lack of rain fall characterized in dry zone. As a result of agricultural practices, some of these areas undergo over extraction which in turn influences ion concentration in ground water.

II. Distribution of pH

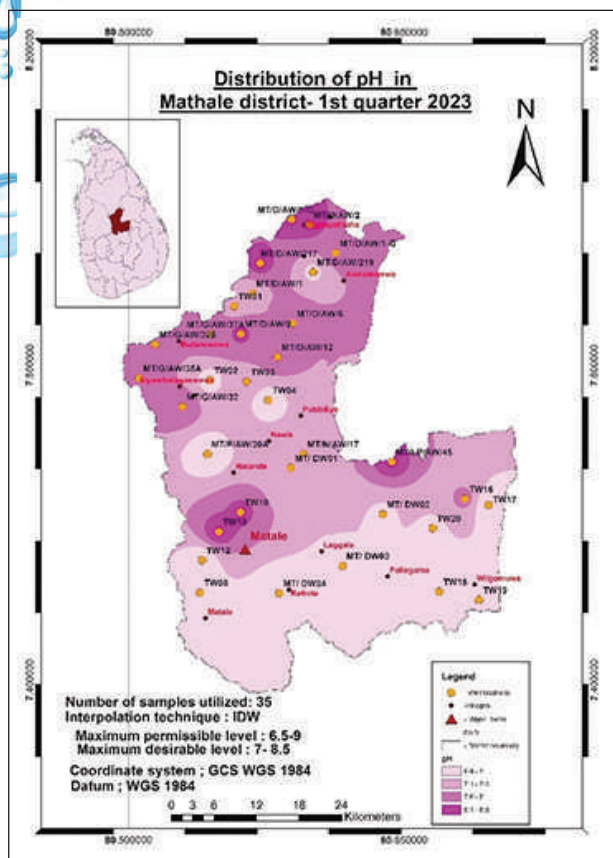


Figure 21: Variation of pH for 1st quarter 2023

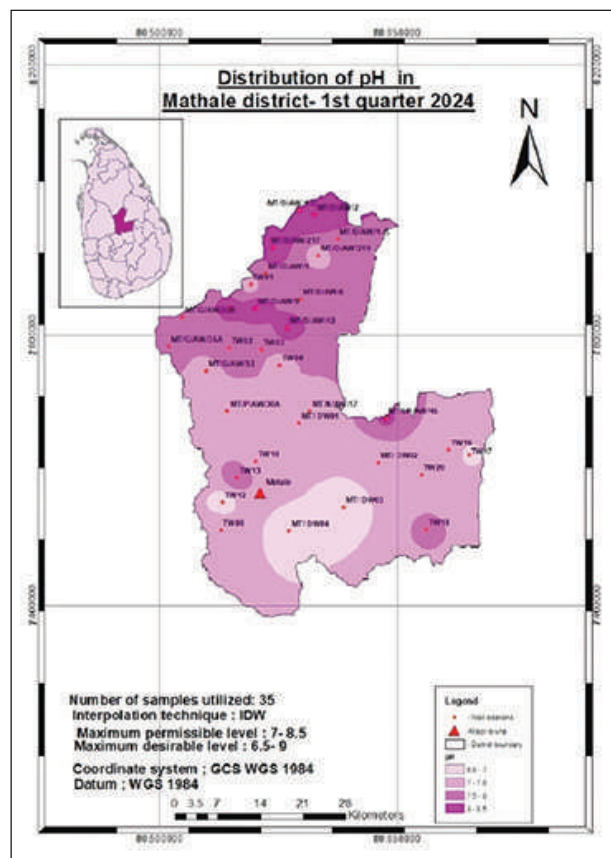


Figure 22: Variation of pH for 1st quarter 2024

pH indicates the acidity or alkalinity of water and is crucial for maintaining chemical equilibrium. Most of pH values recorded for 2024 1st quarter are within the desirable range as a result of rain fall events which aid to escalate acidic content in ground water. Maximum value of 8.5 was detected in well close to paddy field located at Diyagampathana area. Geogenic setup of those area composed with Microcline gneisses which has an abundant amount of hydroxyl ions. Therefore, certain dissolved minerals such as Calcite, Dolomite, Biotite and Hornblende etc associated with Hornblende Biotite gneiss and Calc gneiss bearing formations contributed to the escalated pH levels. Apart from that high values occurring relatively dry areas with high evaporation rates with lack of rain fall compared to the locations in Sothern part belongs to the intermediate region. Meanwhile detected pH values ranges from 6.5- 8.5 for the 2024 1st quarter indicate that the pH was vary within maximum permissible level.

III. Distribution of Total Dissolved Solids

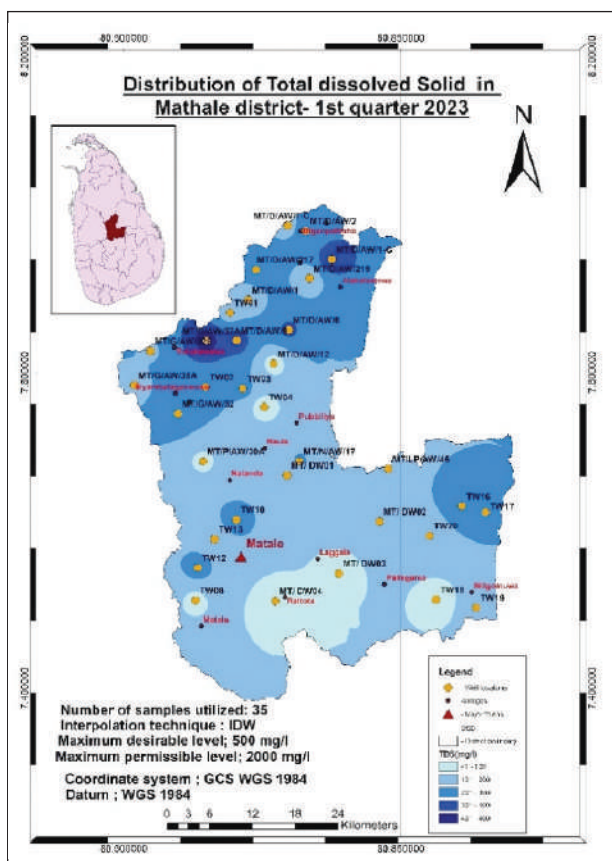


Figure 23: Variation of Total Dissolved Solid concentration for 1st quarter 2023

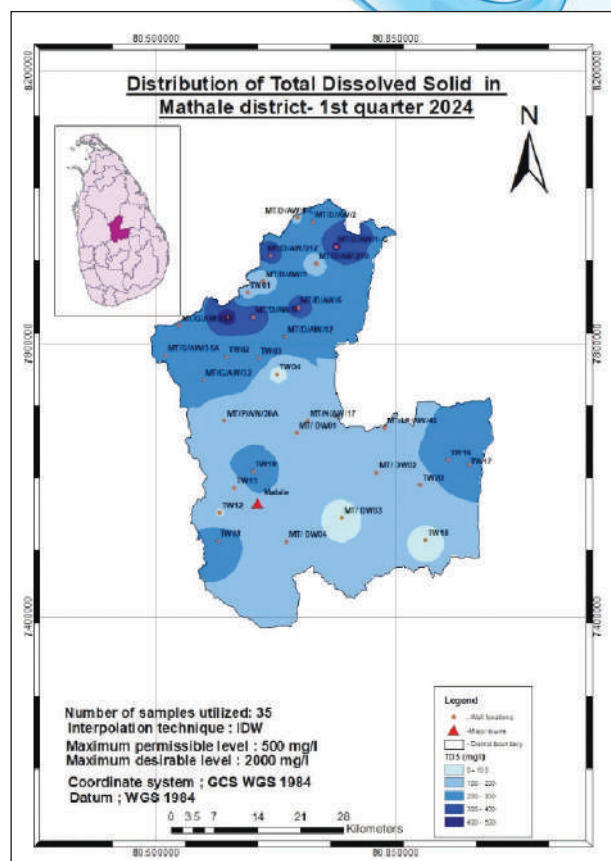


Figure 24: Variation of Total Dissolved Solid concentration for 1st quarter 2024

Total Dissolved Solids (TDS) is a measure of the combined content of all inorganic and organic substances contained in a liquid. Elevated TDS levels may indicate contamination from natural or anthropogenic sources. All the TDS values measured for 2024 1st quarter are below the maximum desirable level. Maximum TDS value is observed in MT/G/AW/37A which is located in Dewahuwa area. Respective TDS values are 456mg/l. Total dissolved solids (TDS) show similar variation as electric conductivity. Northern, northeastern and northwestern part of the areas belongs to Kakirawa, Digampathana, Sigiriya, Bulanewewa show relatively high TDS values compared to Southern portion of the district. Agricultural practices are common in those areas belongs to dry zone characterized by excess fertilizer and pesticide applications and rapid ground water extraction. Despite of human practices, natural geological formations associated with Marble and Calc Gneisses are also encountered in Northeastern part of the area characterized with soluble carbonate rocks with high transmissivity values with concentrated ions. Apart from that Diayagampathana surface and deep toilet waste dumping areas might be connected with this Carbonate rock bearing areas causing the increase in TDS values.

IV. Distribution of Total Hardness

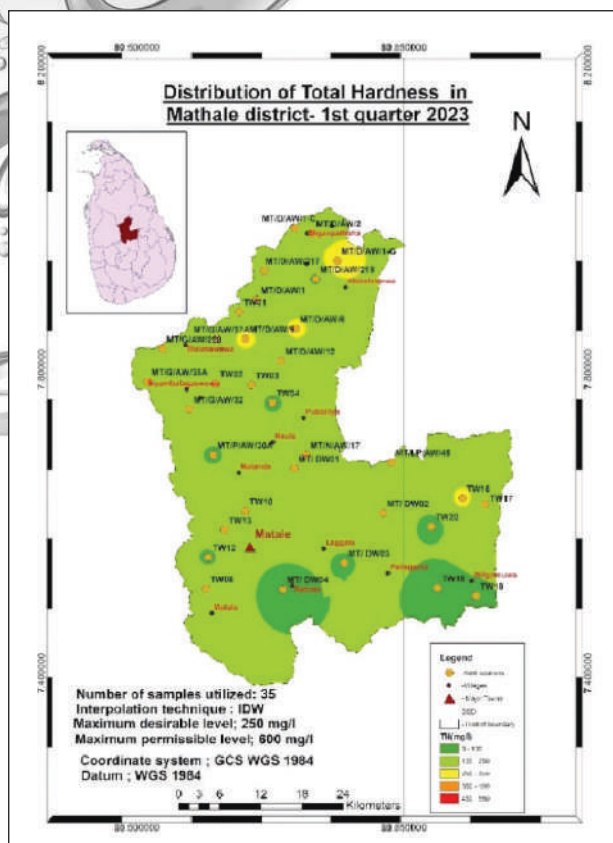


Figure 25: Variation of Total Hardness concentration for 1st quarter 2023

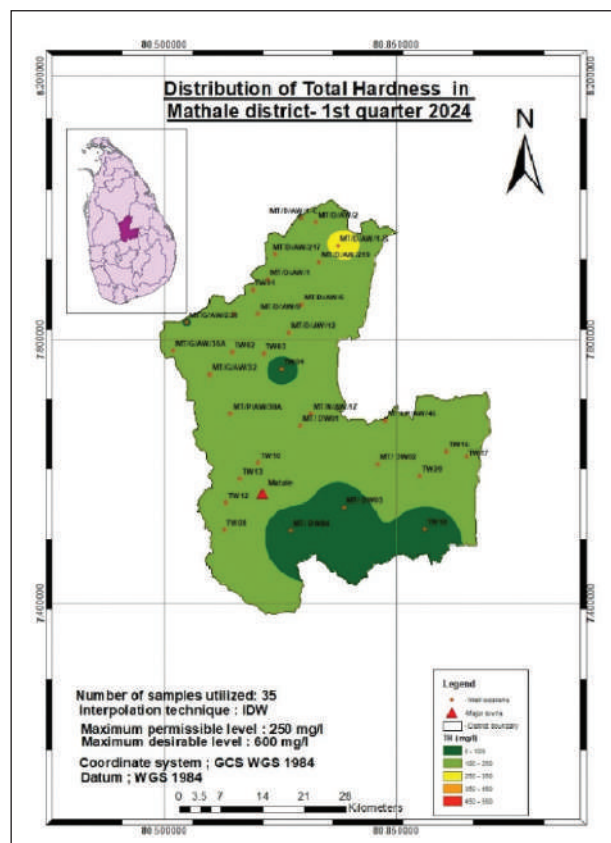


Figure 26: Variation of Total Hardness concentration for 1st quarter 2024

Total hardness quantifies the concentration of calcium and magnesium ions in water, primarily derived from dissolved minerals. According to the 2024 1st quarter analytical results, most of the samples indicate TH values which were fallen below desirable levels even though two sample exceed the limit. Maximum TH value of 351mg/l was noted in a well located at Kalapuraya, Sigiriya area which was underlain by Calc Gneiss formations. Apart from that all samples are within the maximum permissible level. Total hardness is directly governed by the geological formations of the area including rock type. Areas with higher TH values are mainly belongs to dry zone with Calcium Carbonate and Magnesium Carbonate bearing formations. All those samples have higher amounts of HCO₃⁻ and CO₃²⁻ amount compared to the other regions causing temporary hardness in water.

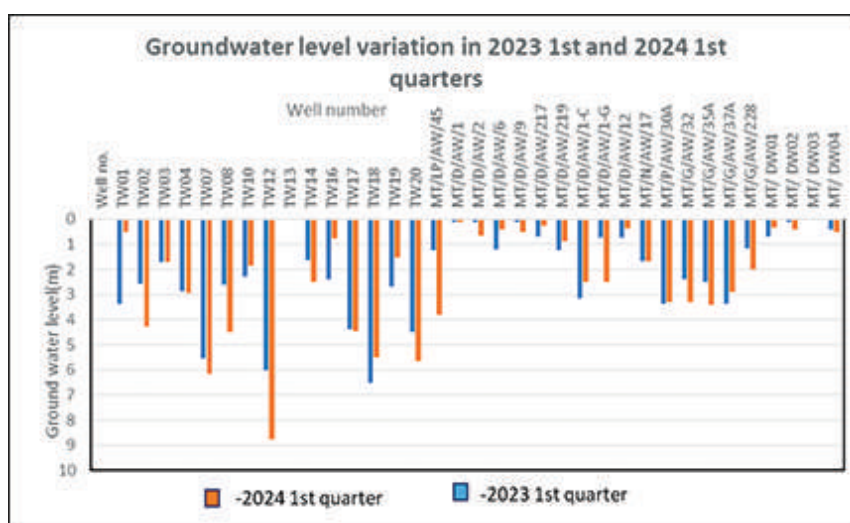


Figure 27: Elaboration of monitoring well water levels in 2023, 2024 1st quarter

Conclusion and recommendations

- Ground water level changes in Mathale district directly depend on the rainfall pattern. This area gets recharged mainly from monsoonal rainfall and natural and artificial irrigation systems.
- The water table is normally shallow in upper parts of Mathale area, due to low thickness of the overburden. As a result of rapidly developing agricultural activities, the water table at some locations in Dambulla DS division is deeper than in the other areas due to over extraction.
- The presence of Marble, calc gneisses and dolomite in certain regions contribute to elevate the total hardness and calcium, magnesium concentrations in ground water. Degraded water quality and challenges upon human health are the adverse effects of elevated concentrations.
- Based on the full chemical analysis conducted for both quarters, chemical constituents present in water are not highly affecting to humans or environment since post monsoon season contribute to the flushing and dilution effect followed by precipitation.
- It is better to implement sustainable groundwater extraction policies specially for northern region which enforce the regulations on groundwater extraction at least during the pre- monsoon season to reduce pressure on aquifers and to enhance its sustainable use.
- Improve sustainable agricultural practices by introducing alternative sources for chemical fertilizers and pesticides to minimize contamination of groundwater.
- In order to safeguard ground water quality, it is important to improve wastewater treatment facilities and waste/ garbage disposal techniques to prevent groundwater contamination from industrial, urban and domestic sources.
- Effective collaboration among stakeholders, informed by scientific research and data driven decision-making is essential to ensure the sustainable management and protection of groundwater resources in the Matale district.
- Conduct public awareness campaigns to educate communities about the importance of groundwater conservation, pollution prevention, and the health risks associated with contaminated water sources.

1.1.11 Trincomalee District

Water Resources Board was initiated a long-term groundwater monitoring project in Trincomalee district by considering chronic kidney disease (CKD) prevailing areas. Therefore, desk studies were conducted at Gomarankadawala, Padawisripura and Kanthale DS divisions that are severely affected from CKD. Data about Kidney patients were collected from Regional Director of Health office Trincomalee and MOH office of Gomarankadawala. Later, Padavisripura Divisional Secretariat was selected to study groundwater quality since there are lot of CKD patients living in this area.

Trincomalee District is located in Eastern Province of Sri Lanka and spread over which 2529 km² and 198 km² is water out of 2727 km² total extend. The district is divided into eleven DS Divisions, and further sub-divided into 230 GN Divisions. The total population in the district is approximately 378,182. As per the LLRC data sheets, the extent of Padawisripura area is about 217.1 km² which consists of 10 GN divisions and the area population is about 11,858. Kokkilai lagoon and wetlands are common topographical features in the area.

The major source of livelihood of the community is agriculture and fishing. Paddy cultivation stands as the main agriculture crop in the district. Other than that, seasonal crops, permanent crops and Mangrove bearing areas were observed across the area. Padvi-Sripura region receives much of its water from the central highlands and particularly during the dry season water may become limited. Also, the area is under the influence of Yaan Oya and Mee Oya basins. The water is found as surface water & groundwater. Accordingly, ground water is predominantly used on domestic, agricultural and industrial purposes. Meanwhile with the increased chronic kidney diseases associated with agricultural practices involved with intense usage

of agrochemicals, economic development and increasing population have resulted increased demand on freshwater resources within the area.

In this regard, assessment of the groundwater resources of the area, its use and present condition is needed to be explored to implement any management plan and guidelines to maintain the sustainable use of the available groundwater resources. Therefore, detailed hydrogeological explorations and monitoring in long term basis is a prerequisite for achieving these aforesaid plans. In This case, 40 water samples from dug wells which were previously used by CKD patients and adjacent dug wells close to them in Padavi-Sripura areas were collected for full chemical analysis.

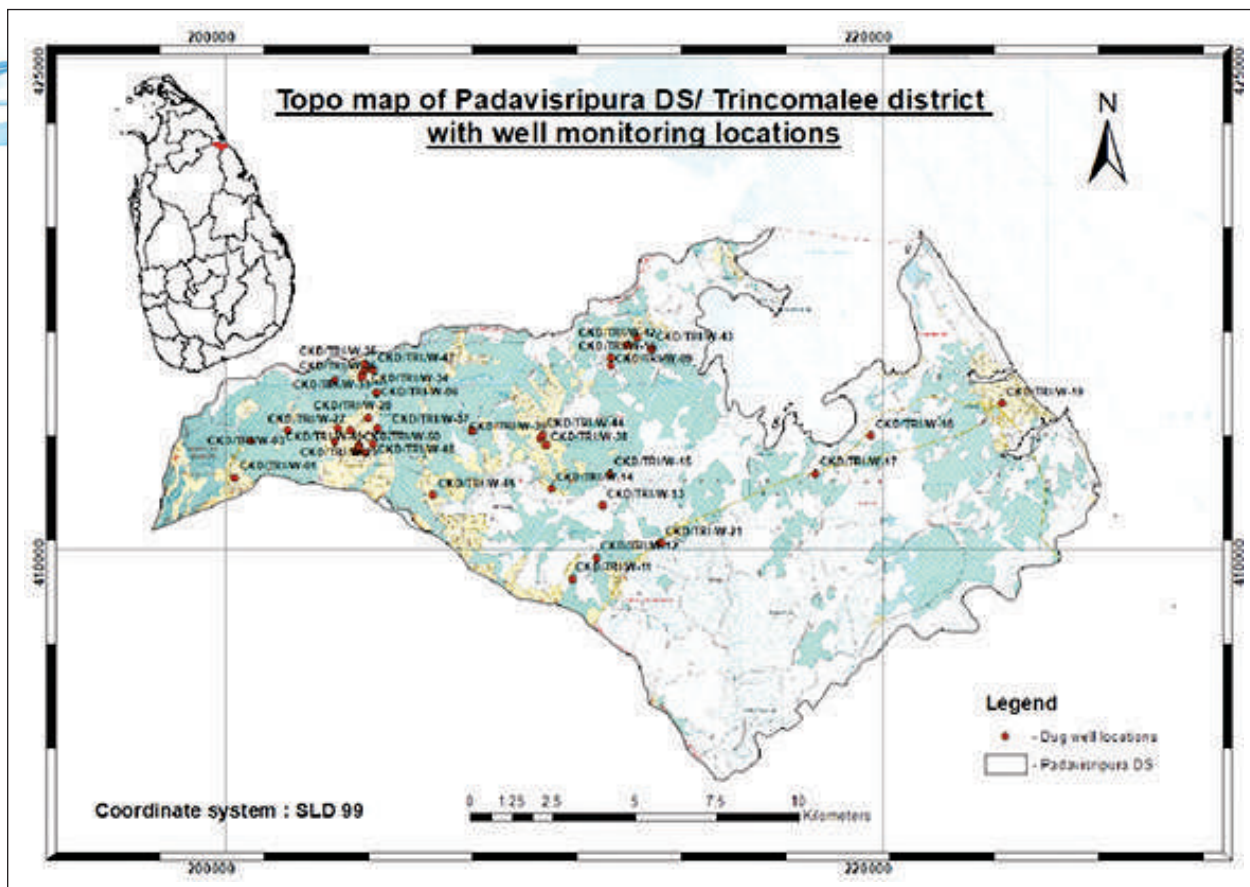


Figure 28: Topography map of the study area

Hence the purpose of the study is to identify changes in water level and water quality and water quality trends associated with the over extraction situation. Therefore, the final product of this study which came as annual report is included with a summary of the hydrogeology and groundwater conditions present in the area associated with the discussion of the analytical results based on the data collected from wet and dry periods.

Work completed during year 2024

As per the result of fuel deficiency and sudden increase of the price of fuels LTGM- Trincomalee project water sampling was not conducted as usual for all four quarters. Therefore, in year 2024 water sample collection and water level monitoring associated with in-situ analysis was limited to 1st and 3rd quarters for 40 dug well locations.

In-situ sample analysis was conducted in the field using the Multiparameter and EC, TDS, and pH values were measured.

Full chemical analysis of the samples was carried out at the water resources board chemical laboratory. The collected samples in 2.0 liters plastic bottles were submitted for physical and chemical parameter analysis at the laboratory with a dispatch note giving the sample number, source, location and date and time of sampling. Samples were submitted to analysis chemical parameters such as pH, Electrical Conductivity (EC), Total Hardness, Total Alkalinity, TDS, Sulphate (SO_4^{2-}), Calcium (Ca), Magnesium (Mg), Chloride (Cl^-), Fluoride (F^-), Salinity, Nitrate (NO_3^-), Nitrite (NO_2^-) and Total Phosphate (PO_4^{3-}) and for physical parameters such as Temperature and Turbidity. Analysis was conducted by using instruments such as Colorimeter, pH Meter, and EC Meter with the help of following methods named as colorimetry, conductometry and titrimetric analysis.

Following analytical procedures has been continued after field work in order to summarize the each year findings,

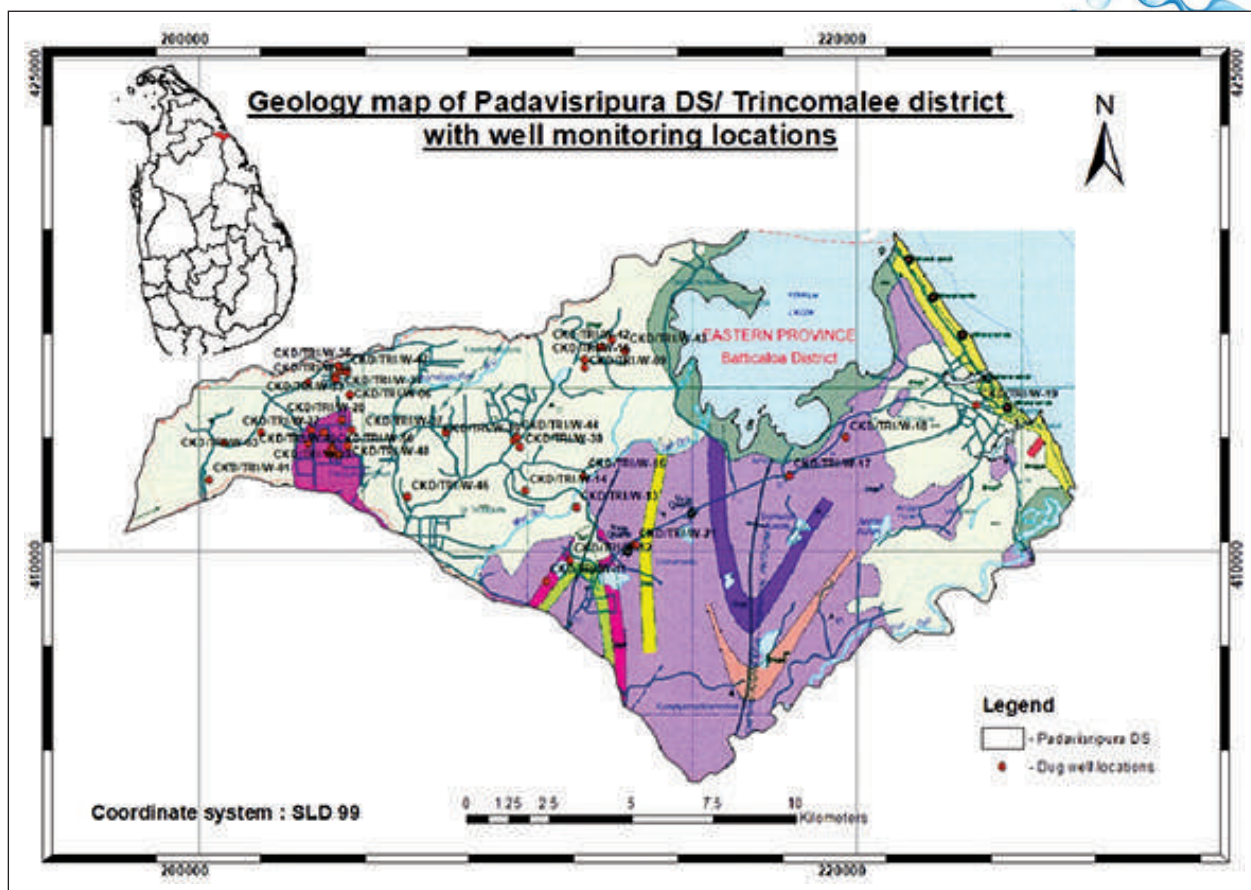


Figure 29: Geology map of the study area

- IDW analysis/map preparation was carried out by using ArcGIS software to elaborate the spatial distribution of chemical parameters across Padawi Sripura area
- Preparing Annual report for year 2024 by studying and describing chemical distribution maps, water level variation during seasonal sampling process etc.
- Finally, the recommendations were given in order to make necessary awareness and remediation for sustaining the groundwater resources of the region.

So far, following chemical distribution maps have been prepared for 1st quarter of year 2024 and both maps prepared for 2023, 2024 1st quarters are shown here for further comparison.

I. Distribution of Electrical Conductivity

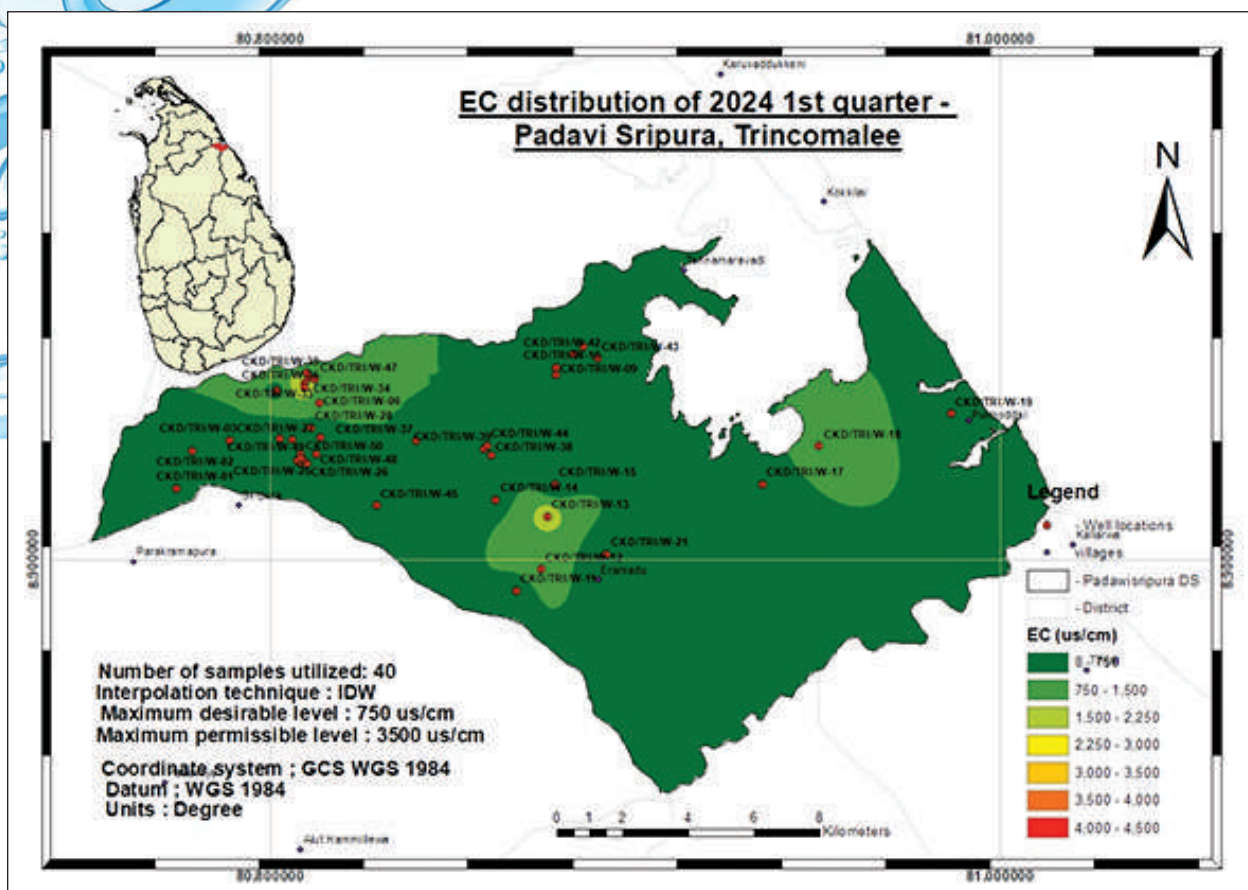


Figure 30: Distribution of Electrical conductivity for 2024 1st quarter

Electrical conductivity assesses the water's ability to conduct electrical current, reflecting its dissolved ion content. As per the analytical results, EC values vary between 278- 4395 $\mu\text{S}/\text{cm}$ for 1st quarter samples. Meanwhile, EC values measured from 3rd quarter samples vary from 220- 2390 $\mu\text{S}/\text{cm}$. Among them well no. CKD/TRI/W-33 which is located in Gemunupura indicates the maximum EC and values beyond desirable level were noted within the well clusters belongs to Gamunupura, Padavisripura regions. Meanwhile all the measured EC concentrations were within maximum permissible limit of 3500 $\mu\text{S}/\text{cm}$. Wells with higher EC values were located at populated regions. According to the Kokilai topography map agriculture is the predominant livelihood of the area where abstraction rates are increased. Other than that, those areas underlain by thin alluvial deposits which is in favor of paddy cultivation followed by bed rock formations. Also, wells selected close to the Kokilai lagoon demonstrate EC values within desirable levels since the freshwater lenses encountered in thick lagoonal sand deposits directly recharge from the rainfall is encountered in that area. Additionally, evaporation rates and recharge rates are comparatively escalated in inland areas. Therefore, limitations for recharge opportunities, concentrated levels of ions which came as a result of agricultural practices leads to gradual declination of ground water quality.

II. Distribution of Total Alkalinity

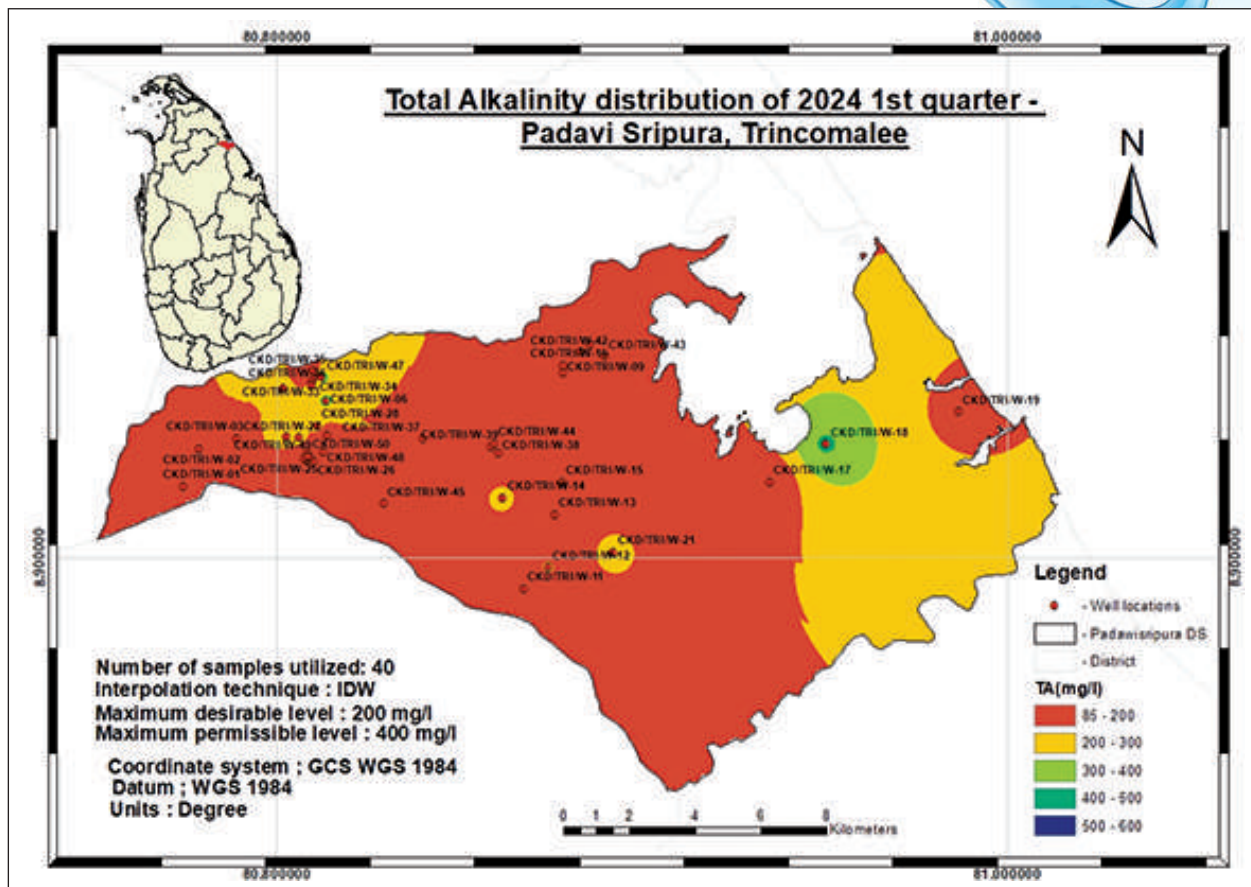


Figure 31: Distribution of Total Alkalinity for 2024 1st quarter

Alkalinity is the ability of water to neutralize incoming acid or the water's buffering capacity against changes in pH primarily attributed to bicarbonate, carbonate, and hydroxide ions. Total alkalinity values vary between 80- 425 mg/L for 1st quarter samples. Among them wells located at Gamunupura and Pulmoddai area close to the Kokilai lagoon indicates the maximum TH values of 425mg/l and 408mg/l for 1st quarter which were fallen beyond permissible limits. However, one fourth of the collected samples indicate values beyond desirable level. The amount of carbonate and bicarbonate ions play a major role in water alkalinity. In this case, underground geology does not indicate the presence of carbonate bearing rock formations. Meanwhile, other common natural components that can contribute to alkalinity include borate, hydroxide, phosphate, silicate, nitrate and dissolved ammonia. Therefore, subsurface geology and structure associated with weathered Hornblende biotite gneiss, Quartzofeldspathic gneiss and Feldspar rich granitic gneisses formations could be considered as one reason behind alkalinity as their rock forming minerals contain hydroxyl, fluoride, chloride ions etc. which leach into the ground water by producing excess ion concentrations which aid to neutralize incoming acid components. Other than heavy agriculture practices such as fertilizers and pesticides contain above mentioned ions and waste dumping areas also contributed to the alkalinity in ground water.

V. Distribution of Total Hardness

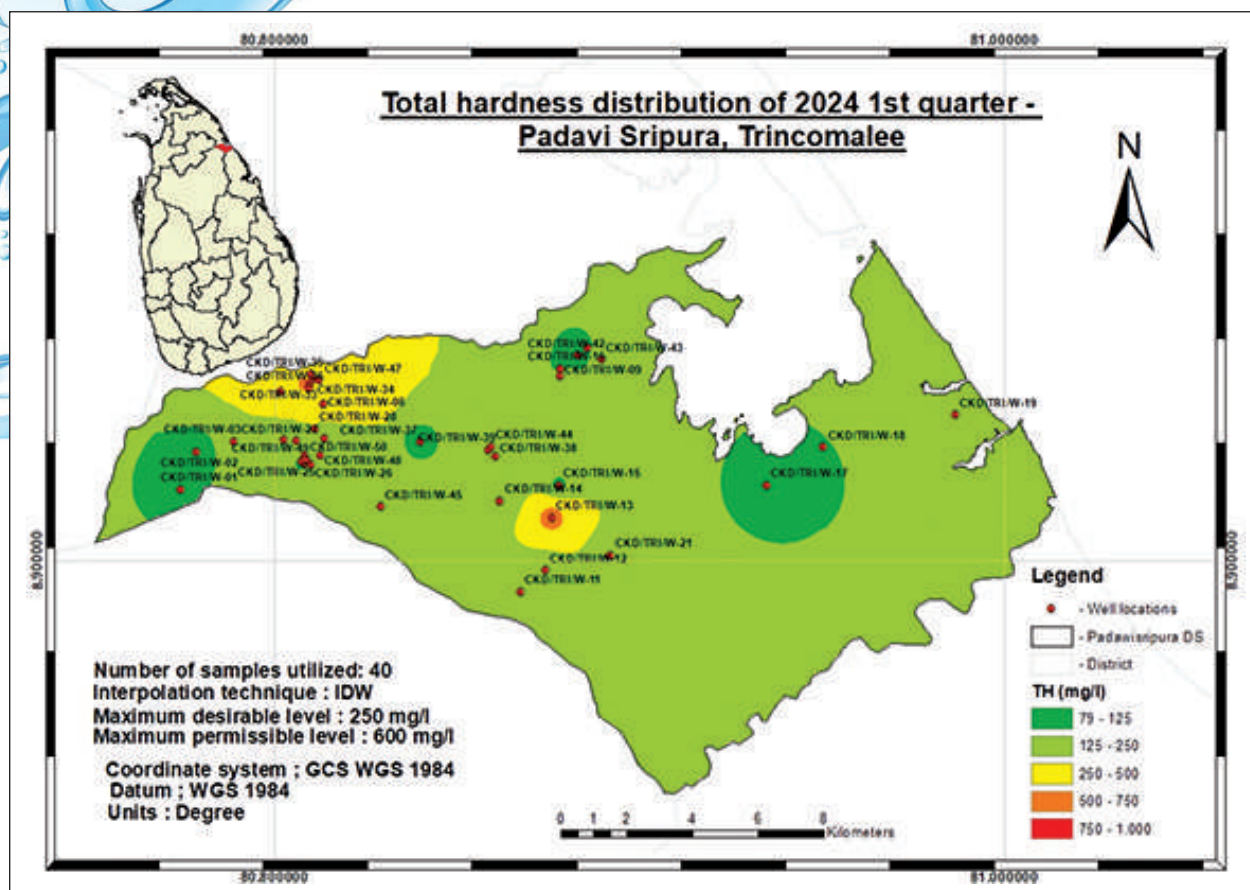


Figure 32: Distribution of Total Hardness for 2024 1st quarter

Total hardness quantifies the concentration of calcium and magnesium ions in water, primarily derived from dissolved minerals. Total hardness values vary between 71- 878 mg/ for 1st quarter samples while three samples exceed maximum permissible level. Those TDS values beyond permissible level were noted within the well clusters belongs to Gamunupura, Sripura regions. Also, a sample collected from Eranamadu, Parana Madawachchiya exceed the desirable limits of 250mg/l. Total hardness is directly governed by the underlying geological formations of the area including rock type. In that case, geology of the Padavisripura area does not apparently exhibit the presence of limestone bearing formations. Apart from that, agricultural applications such as extensive uses fertilizers which included calcite and dolomite mixtures might be one of the reasons which cause hardness in water. Permanent crops and seasonal crops are nourished by those practices and the existence of alluvial aquifers with highest transmissivity levels can increase the amount of carbonate presence in water.

VI. Distribution of Phosphate

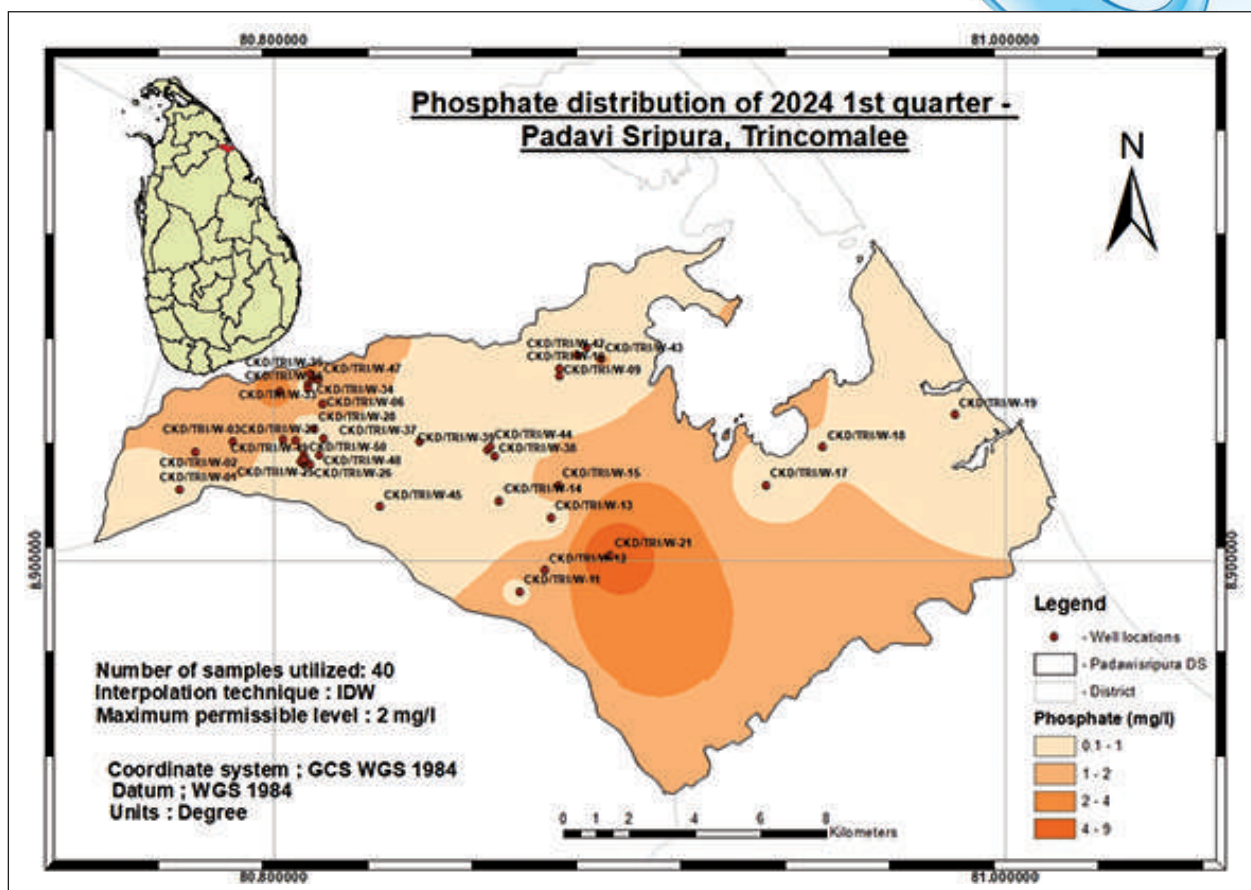


Figure 33: Distribution of Phosphate for 2024 1st quarter

Analyzing Phosphate concentrations is noteworthy in the areas where rely upon agriculture suggesting anthropogenic activities, geological and hydrogeological factors influencing nutrient availability in groundwater. In this case, most of the samples indicate the phosphate concentrations below maximum permissible level even though a few samples collected from Gamunupura, Eranamadu fell beyond permissible level of 2 mg/l. Meanwhile, phosphate concentrations vary respectively between 0.07- 7.2 mg/L. One possible reason for the consistently low nitrate and phosphate levels is the geological composition of the basin. Elevated phosphate levels in Padavisripura area are mainly attributed to the agricultural applications involve with phosphate containing fertilizers and chemicals. Meanwhile, precipitation plays a key role in chemical distribution by flushing off the accumulated nutrients stagnated in soil and aquifer systems creating low phosphate levels.

Conclusion and recommendations

- The effect of precipitation is directly affected to the fluctuation of the groundwater table of the area. The highest groundwater level occurred in the first quarter of the year and it is due to the effect of year-end precipitation.
- Nutrient such as phosphate was identified across the attributed to the absorption capacity of subsurface materials and agriculture practices contribute to nutrient levels in ground water.
- The presence of Biotite gneisses, Hornblende Biotite gneisses and Quartzofeldspathic gneisses in certain regions contribute to elevate the total alkalinity concentrations in ground water.

- Elevated total Hardness attributed to extensive use of fertilizer applications during cultivation activities since this area not indicate the presence of carbonate rock formations.
- It is better to implement sustainable groundwater extraction policies specially for Gamunupura, Sripura, Eranamaduwa, Pulmoddai coastal region which enforce the regulations on groundwater extraction, consumption and agriculture practices to reduce the aquifer pollution and to enhance its sustainable use.
- Improve sustainable agricultural practices by introducing alternative sources for chemical fertilizers and pesticides to minimize contamination of groundwater.
- In order to safeguard ground water quality, it is important to improve wastewater treatment facilities and waste/ garbage disposal techniques to prevent groundwater contamination from industrial, urban and domestic sources.
- Effective collaboration among stakeholders, informed by scientific research and data driven decision-making is essential to ensure the sustainable management and protection of groundwater resources in Padawi Sripura division.
- Conduct public awareness campaigns to educate communities about the importance of groundwater conservation, pollution prevention, and the health risks associated with contaminated water sources.

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

Climate change refers to long-term shifts in global temperatures and weather patterns, primarily caused by human activities such as burning fossil fuels, deforestation, and industrial processes. These activities increase greenhouse gas emissions, trapping heat in the Earth's atmosphere and leading to rising temperatures, extreme weather events, and disruptions to ecosystems. Climate change poses significant risks to biodiversity, food security, and human health, making it a critical global challenge that requires urgent action through sustainable practices and policy changes.

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.



Figure 34: Established groundwater monitoring network (Colombo to Weligama coastal belt).



Figure 35: Established groundwater monitoring network (Trincomalee coastal belt).

Water level measuring, Water sampling and Water sample analysis

The selected existing monitoring points have been shown in Figure 34 and 35. During the year, the continuous water quality and groundwater level monitoring is scheduled.

❖ Colombo to Weligama coastal groundwater aquifer

• 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 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 36: Conducting Water Sampling and Measuring Water Levels

• EC Variation

According to the Figure 04, It can be observed that EC variation is within the range of 100 to 1500 $\mu\text{S}/\text{cm}$ for the test well. According to the EC variation map 2024 March, more than 79 % of the study area fell to an EC level of less than 750 $\mu\text{S}/\text{cm}$

However, in area around Madampe Lake and Benthota, we can see high EC values (greater than 750 $\mu\text{S}/\text{cm}$).

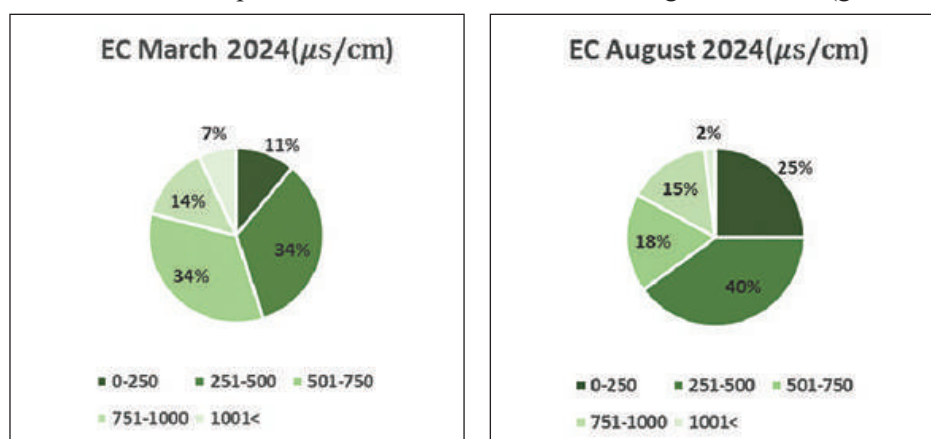


Figure 37: EC variation in 2024

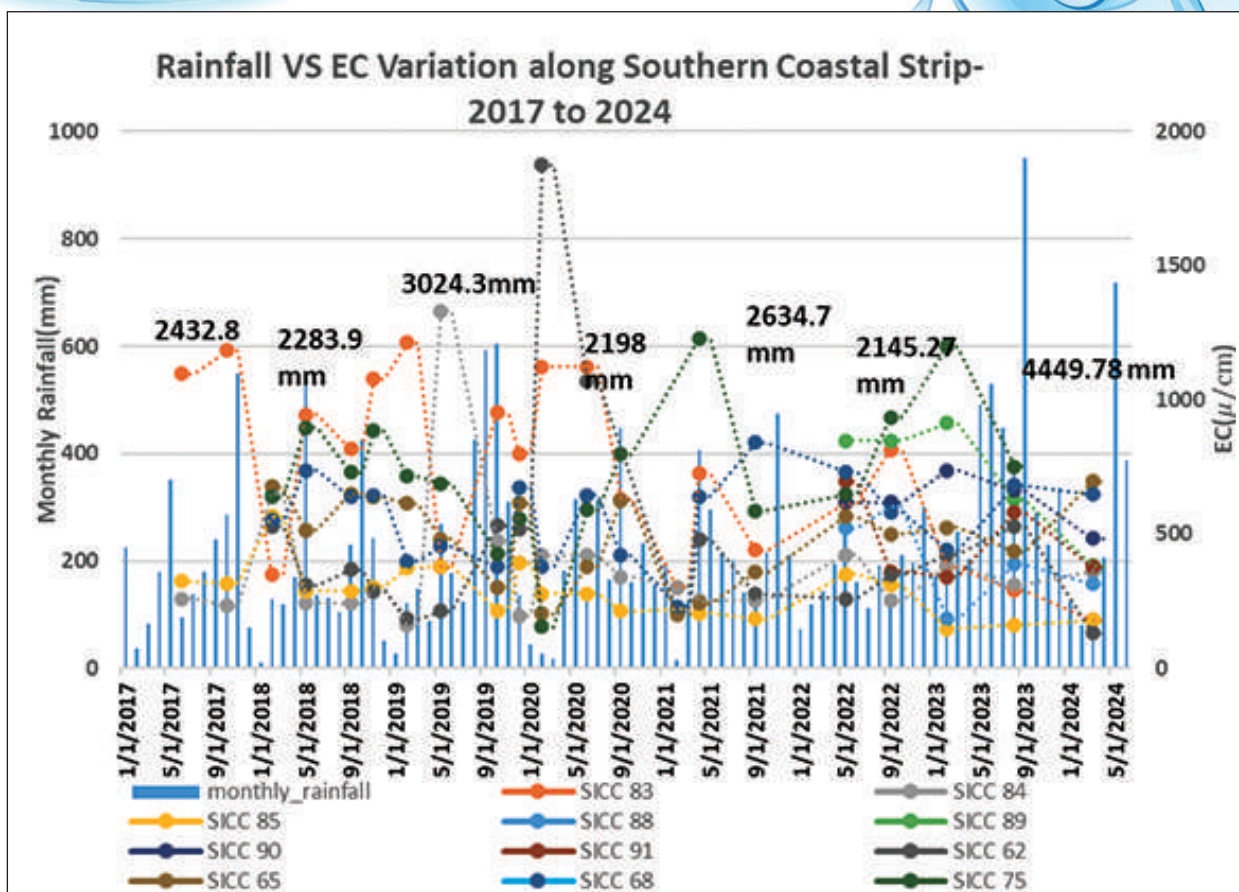


Figure 38: EC variation with rainfall from 2017 to 2024 Southern Province

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

• pH Variation

According to Figure 05 more than 91 % of the study area, pH level variation ranges from 7.0 to 8.5 in 1st quarter and more than 73 % of the study area, pH level variation ranges from 7.0 to 8.5 in 3rd quarter.

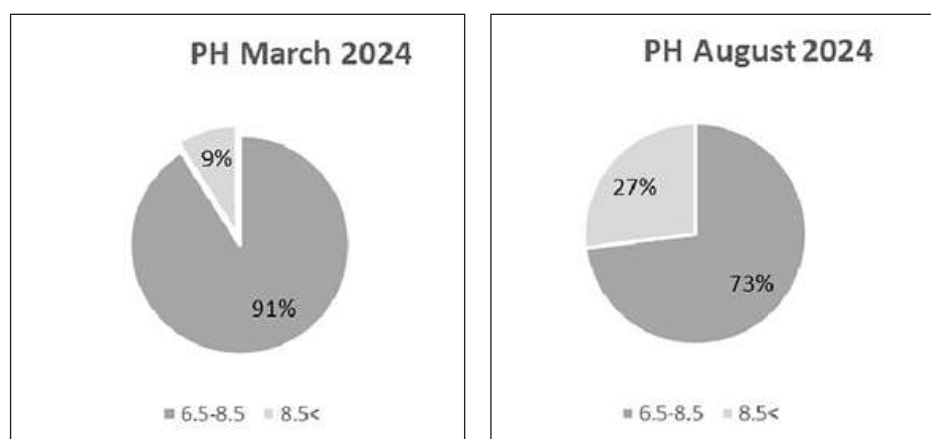


Figure 39: PH variation in 2024 March

• Water Level Variation

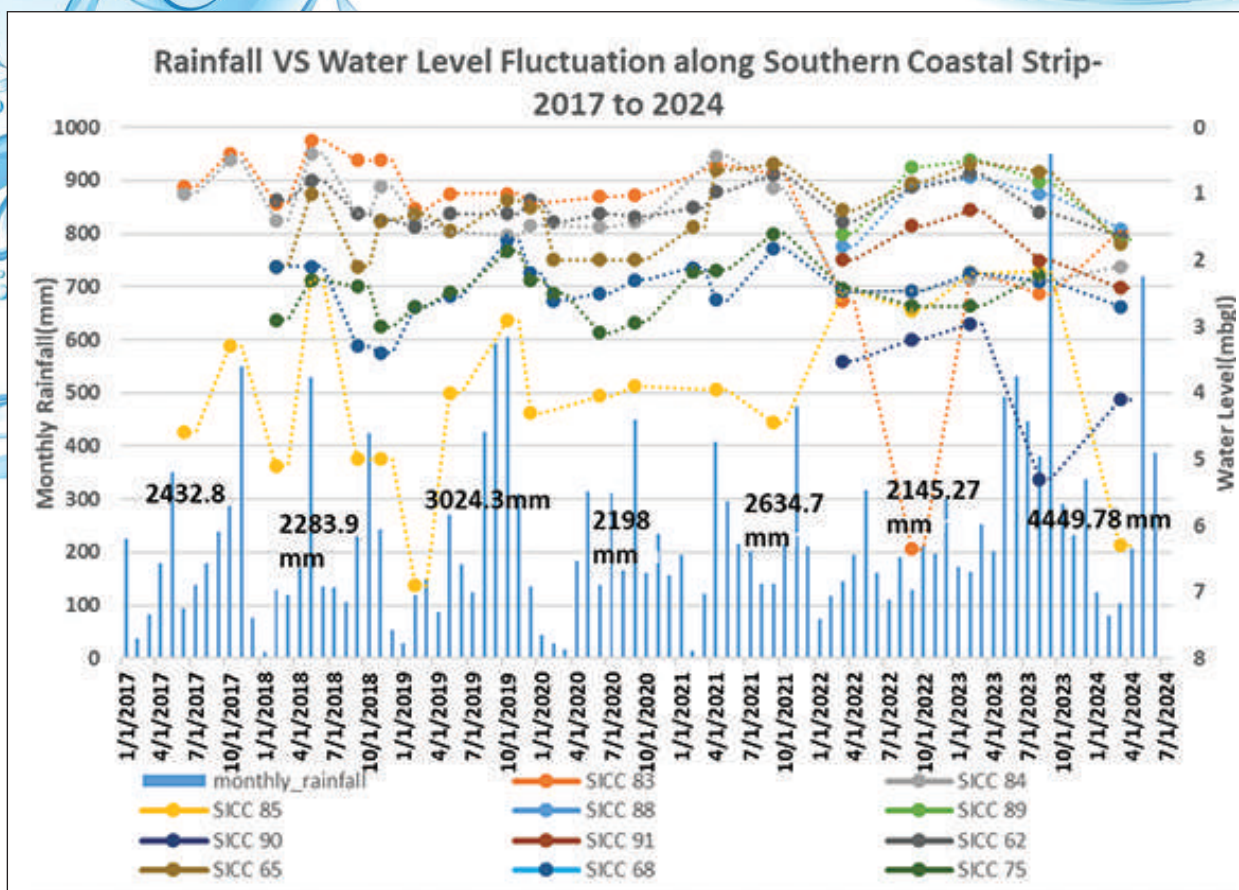


Figure 40: Water Level Variation with Rainfall from 2017 to 2024

Figure 39 shows the water level variation of the 11 monitoring points along the coastal strip from Aluthgama to Koggala for the years 2017 to 2024 concerning the monthly rainfall. According to Figure 06, It can be observed the relatively shallow groundwater table during the 2nd monsoon period whereas the relatively deep groundwater table during the 1st inter-monsoon period of the country. According to Figure 06, we can observe the water level variation is in good agreement with the rainfall pattern of the country.

Recommendations

- Based on the result of the study conducted so far (2015-2024), 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.
- Monitoring total iron variation along the Colombo to Hambantota coastal area is important for understanding the overall health of the marine environment and identifying potential sources of pollution or environmental stress. Continuous monitoring efforts, supported by both scientific research and environmental management initiatives, can help to assess the impact of human activities and natural processes on iron dynamics in coastal waters and inform sustainable management practices.

❖ Eastern Coastal Belt

Water Resources Board (WRB) has launched a research endeavor to investigate "The potential direct and indirect impacts of climatic changes on the coastal aquifer system of Sri Lanka," focusing on the Eastern Coastal Belt.

The primary objective of this project is to address water-related challenges arising from climate change, particularly in coastal regions. The project focuses on analyzing the changes in rainfall patterns in coastal areas and monitoring the salinity levels in Sri Lanka's coastal aquifer systems through a robust groundwater monitoring network. Additionally, it aims to study the fluctuations in the freshwater-seawater interface and assess the feasibility of implementing regulatory mechanisms or other instruments for the optimal use of groundwater resources. A key deliverable of the project is the development of a comprehensive database that establishes guidelines, norms, and criteria for future groundwater development in coastal aquifers. Furthermore, the project seeks to identify suitable locations for artificial recharge of groundwater systems, ensuring sustainable management and preservation of these critical water resources.

During the SICC Project – Eastern Coastal Belt, following activities were conduct in 2024.



Figure 41: Collecting water samples

Table 8: Progress of 2024 – SICC project

Activity	Target	Progress
Groundwater level monitoring & head measurements (Biannual basis at 100 locations)	100%	95%
Chemical & heavy metal analysis (biannual basis at 100 locations)	100%	100%
Data Processing, Analysis & final report	100%	70%

1.3 Combine Inspections on Groundwater Relating Environmental Issues (INSP)

Groundwater is a vital natural resource that supports drinking water supplies, agriculture, and industrial activities. However, contamination and groundwater depletion due to human activities pose significant environmental risks. Combined inspections refer to a multi-agency or interdisciplinary approach to assessing groundwater quality, identifying pollution sources, and ensuring compliance with environmental regulations. These inspections help in the early detection and mitigation of groundwater contamination. Additionally, they help resolve conflicts within communities that arise due to a lack of knowledge about groundwater and the regulatory process.

For these inspections, environmental protection agencies, water resource management authorities, and local health departments collaborate. Some of the key agencies involved include the Central Environmental Authority, Department of Wildlife Conservation, Forest Department, Geological Survey and Mines Bureau, local authorities, Ministry of Health, and Water Resources Board.

Responsible officers from relevant institutions visit the sites and engage with local communities to address conflicts or concerns. In most cases, the Water Resources Board plays a key role in inspecting sites related to rock quarrying, soil excavation, sand mining, gem mining, and tube well drilling. Additionally, large-scale projects such as tunneling, tourist hotel construction, and water bottling plants require expert knowledge in hydrogeology and other environmental disciplines to ensure sustainability and compliance with regulations. During this year, altogether water Resources Board have attended for 246 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 42: Join inspection at Kandy area



Figure 43: Addressing for groundwater issues due to sand excavation projects at Madampe area

Table 09: Progress of INSP project- 2024

#	Activity	Target	Progress
1	Meeting & Combined inspection of Groundwater Resources (100 Nos.)	100%	216 %

1.4 Human Resources & Institutional Development (HRID)

The Water Resources Board (WRB) plays a crucial role in managing and conserving groundwater resources. Over time, Human resources as well as its infrastructure also should be improved for an improved working environment.

Table 10: Progress of HRID - 2024

#	Activity	Target	Progress
1	Skill & capacity Development Training (office procedures & financial regulations- 40 Nos.)	100%	100%
2	Improvement of vehicle, machineries, Workshop -Ratmalana, PM Office - A'pura & Monaragala	100%	110%
3	Maintenance of Laboratory and Geophysical Equipment	100%	70%

1.5 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 2024.



Figure 44: Conducting 1D resistivity survey to select suitable locations for tube well constructions

Table 11: Completed works E-USE project - 2024

Job Number	Purpose	Address	Area
EMUSE/2024-01	Project works	Indikolapolassa Primary School, Sewanagala, Monaragala	Sewanagala
EMUSE/2024-02	Tube Well Rehabilitation	Secretary, Pradeshiya Sabha, Siyabalanduwa	Siyabalanduwa
EMUSE/2024-03	Tube well Cleaning	Principal, Meeyagala K.V, Uva, Gangodagama	Gangodagama
EMUSE/2024-04	Tube Well Construction	Mr.Dhammika Withanage, Irrigation and Water Supply, State Minister Office	Madulla
EMUSE/2024-05	Project Works	Mr.Dhammika Withanage, Irrigation and Water Supply, State Minister Office	Gamunupura
EMUSE/2024-06	Groundwater Investigation	Principal, North West/ Ibbagamuwa/Ridigama/Iriyagolla Primary School, Iriyagolla	Ibbagamuwa

EMUSE/2024-07	Groundwater Investigation	Principal, B/Welikemulla Maha Vidyalaya, Badulla	Welikemulla
EMUSE/2024-08	Tube Well Rehabilitation (Well Cleaning)	Sabha Lekam, Monaragala Pradeshiya Sabhawa, Monaragala	Weheragala (?)
EMUSE/2024-09	Tube Well Rehabilitation(Well Cleaning)	Divisional Secretary, Devisional Secretariate, Hali ela	Hali Ela
EMUSE/2024-10	Tube Well Rehabilitation (Well Cleaning)	Sabha Lekam, Padeshiya Sabhawa, Madulla	Madulla
EMUSE/2024-11	Tube Well Construction	Divisional Secretary, Divisional Secretariat Office, Kuruwita	Kuruwita
EMUSE/2024-12	Groundwater Investigation	Divisional Secretary, Divisional Secretariat, Valikamam East, Kopay	Kopay
EMUSE/2024-13	Groundwater Investigation	Divisional Secretary, Divisional Secretariat, Haliela	Haliela

Table 12: Progress Summary of E-USE project 2024

#	Activity	Target	Progress
1	Development of groundwater resources for emergency uses (drought, floods, catastrophic event of contamination on GWR)	100%	80%

To supply drinking water in the drought prone areas, some hand pump tube wells were constructed under this project. Other than that, some existing old tube wells were rehabilitated to provide drinking water for the affected families with the support of Divisional Secretaries in dry zones.

1.6 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.

The main objective of this project is 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.



Figure 45: Conducting 2D geophysics and Field investigation tube well constructions



Figure 46: Conducting pumping tests

Table 13: Progress of DMWSS – 2024

#	Activity	Target	Progress
1	Initial assessment of WSS (Groundwater resources vulnerability, exiting real time & other monitoring analysis)	100%	100%
2	Identify of feasible aquifer recharge for groundwater dependant WSS	100%	40%
3	Assessment of alternative Groundwater productive zones adjoining the WSS	100%	50%
4	Final Report with findings, necessary recommendations & follow up guidelines	100%	80%

2. Generated Fund Activities

In order to fulfill the domestic, agricultural and industrial water requirements of the community, government institutions and private parties, the Water Resources Board carried out the following activities to provide the quality services to ensure the sustainability of the water requirements and further detail studies to provide the guide lines and recommendations for the mining sites (sand, gravel, soil, rock and graphite) to minimize the effect to the groundwater resources due to mining activities by considering the groundwater management of the country. In addition, to regulate the groundwater resources of the country the detail pumping tests were carried out in commercial base groundwater sources by providing the necessary guide lines and recommendations.

2.1 Regulatory supported services - Commercial

Detailed Hydrogeological Surveys to identify groundwater potential zones.

Carried out detailed hydrogeological surveys to identify the high groundwater potential zones in shallow and deep aquifers in order to supply groundwater for drinking purposes in Community Based Organizations (CBO), individuals drinking requirements, agricultural activities, water bottling industries, BOI zones water requirements, industrial and commercial activities. Accordingly, total number of 357 servers conducted and the income was Rs. 13.39 Mn.



Figure 47: Field activities- Hydrogeological surveys

Detailed Hydrogeological Surveys for mining sites.

Conducted the detail hydrogeological investigations on soil, gravel, sand, rock and other mining activities to assess potential impacts on groundwater and provide necessary recommendations for mining to minimize environmental effects and issuing recommendations for an Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE). Accordingly, total number of 59 detail surveys are conducted and the income was Rs. 3.25 Mn.



Figure 48: Field activities- Hydrogeological surveys for sand mining projects

Pumping tests

According to Special Gazette No. 2010/23, dated 16th March 2017, conducting pumping tests and registering wells is required to regulate all wells extract more than 1,000 liters of water per day, ensuring the sustainability of the water source, determining the safe water quantity, pumping rate, and procedures for water extraction, with recommendations to be reviewed and validated every 2 to 3 years. Accordingly, total number of 153 tests conducted covering Island and total income was Rs. 23.70 Mn



Figure 49: Field activities- Pumping tests

Construction of deep tube wells.

Construction of tube wells using standard-type PVC as a service to fulfil the client requirements, following the established technical methods and best practices for well construction for drinking purposes in Community Based Organizations (CBO), individuals drinking requirements, agricultural activities, water bottling industries, BOI zones water requirements, industrial and commercial activities. The total number of 42 tube wells were constructed and the income was Rs. 32.10 Mn.



Figure 50: Construction of deep tube wells

Tube well cleaning

Tube wells should be cleaned once every few years to improve their efficiency, water quality, and sustainability. The cleaning is carried out by the Water Resources Board in accordance with established technical methods and best practices for tube well cleaning. Specially in Monaragala district to improve the drinking water facility for rural community. The total number of 56 tube well cleaning conducted covering Island and total income was Rs. 12.40 Mn.



Figure 51: Tube well cleaning

Water Sample Analysis

Conduct accurate chemical and microbiological testing using advanced equipment in the existing as a service for public. The total number of 112 water samples were analysed and total income is Rs. 0.80 Mn.

Data Providing, Site inspection and Constriction of Groundwater recharge structures.

The Water Resources Board has valuable data collected over several years, which is requested by university students, government agencies, and private sectors for academic and research purposes, and we provide this data accordingly. Additionally, the Water Resources Board conducts site inspections to address community issues, install flow meters for tube wells, and has implemented groundwater recharge systems at Rajanganaya and Akiriyankulama under the UNICEF project as pilot project as pilot project to improve the groundwater storage capacity, generating a total income of Rs. 2.839 Mn.



Figure 52: Water Sample Analysis

Table 14: Progress of activities carried out during the year 2024

#	Activity	Target	Progress	Percentage	Income
01	Hydrogeological investigations	400	416	104%	16.640
02	Construction of deep tube wells	75	42	56%	32.075
03	Pumping tests	300	153	51%	23.690
04	Well Cleaning	10	56	560%	12.364
05	Water sample analysis	500	112	22.4%	0.785
06	Other income data providing, Site inspection and Construction of Groundwater recharge structures.		06		2.839
Total					88.393

2.2 Groundwater Regulations

Groundwater is the water found beneath the Earth's surface. In Sri Lanka groundwater is relied upon to supplement surface water for human uses, such as drinking water, domestic use, agriculture, commercial and mining. Groundwater exists in different formation depending on the geological and hydrogeological conditions of the underground soil and rock. Unlike surface water, groundwater is often not visible. Therefore, it can be difficult to detect contamination or overuse, or determine the interconnectedness between groundwater and surface water.

Groundwater plays a vital role for agriculture, domestic use and industries and many other developing or emerging economies in Sri Lanka today. These societies are now in under threatened conditions in both quantitatively and qualitatively. 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 the groundwater level &

deteriorate of groundwater quality of the resources which has threatened its long-term sustainability and become severe problem in groundwater depend industries and also to domestic users in the country

Some environmental & social problems due to groundwater over extractions, could be resolved with the estimation of safe extraction quantity especially in the commercial bulk groundwater users. It is very much important to assure the sustainable groundwater quantity for both commercial and domestic groundwater users for sustainable development of the country. Therefore, implementing of groundwater regulation management mechanism for the country is very much important to mitigate the risk impact and for the long-term sustainability of the groundwater sources of the country.

Regulatory activities were primarily carried out to conserve groundwater while granting permission for its utilization. This included issuing permits with necessary recommendations for the construction of tube wells for various purposes, installing flow meters at groundwater extraction sources to ensure compliance with regulations, monitoring groundwater extractions for compliance, registering tube well drilling machinery and companies, registering external hydrogeologists, conducting awareness programs on groundwater regulations for divisional secretariats, and addressing social conflicts related to groundwater issues

The summary progress of the Groundwater regulation activities commenced by the Water Resources Board in the year 2024 given as follows.

Table 15 : Progress of Groundwater Regulatory activities –2024

#	Activity	Target	Progress
1	Registration of External Hydrogeologists	100%	45%
2	Renewal of drilling machinery registration (133 Nos.)	100%	37%
3	Aproval of external Hydrogeological reports.	100%	76%
4	(500 Nos.)	100%	14%
5	Flowmeters Inspection and supervision of Instalation	100%	

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.

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.



Figure 53: Google map view of the study area of the Norochcholai Power plant with monitoring locations

Activities of 2024

50 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)

For the objectives to Enhance & manage of groundwater aquifers qualitatively & quantitatively within the identified highly vulnerable water supply schemes which is operated entirely by groundwater sources the groundwater recharge structures were designed to construct in two locations were selected for implementation of groundwater recharge/ enhance systems.

1. Nildiyawara CBO at Sirimapura, Rajanganaya, Anuradhapura (Shallow dug well)
2. Puranagama Water Supply project at Akiriyankumbura, Ridemaliyadda, Badulla

Nildiyawara CBO at Sirimapura, Rajanganaya

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.

According to the proposed designed structural setup for collecting subsurface seepage flow, respective lands were belonging to a Privert owner and the Irrigation department. A bare land was selected to layout the delivery system (pipe line) and its land is belonging to a privet owner. The water collecting structure is located at the reservation area of the Rajanganaya tank. However, the implementation part was started at the end of the November in 2023. Although the procurement process for the construction materials was started,

due to the bad weather conditions, it was unable to access machineries and unable to do the construction work. Therefore, according to the proposed structure for implement the MAR system with constructing the recharge structure was completed during the year 2024.

structure for implement the MAR system with constructing the recharge structure was completed during the year 2024.



Figure 54 : Construction of recharge system (Filter system 1)



Figure 55 : : Final stage of the construction of Filter system

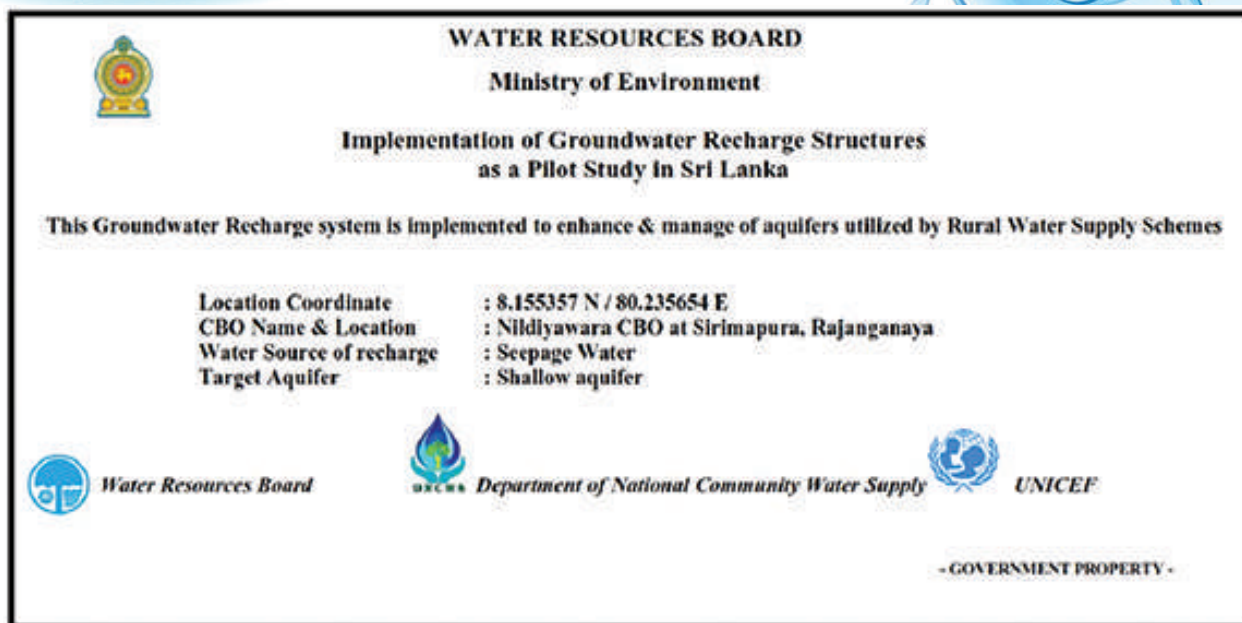


Figure 56: Sign board designed to display at the constructed recharge system

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.

This draft report is issued for the purpose of clearing the financial documents for the year 2024. Final report with findings, necessary recommendations and follow up guidelines for this MAR system will be submitted as soon as possible.

Akiriyanakumbura base hospital

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 groundwater quantity.

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

Rain water harvesting is the method of groundwater recharge that 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 a new specially designed tube well. The hospital building has a large roof area and can be utilized for harvesting roof top rainwater to recharge the aquifer in this location.

This rainwater harvesting and recharge structure system consists of four basic components.

1. Catchment (Surface) to collect rain water
2. Delivery system to transport water from the catchment to the temporary storage structures.
3. Temporary storage structures & filter medium
4. Injection well

Calculating potential rainwater collection

The amount of available rainwater depends on the amount of rainfall, the area of catchment and its run off coefficient.

Typical run off coefficient (ROC) of Asbestos is 0.8.

Available catchment area (A) in the roof top is $(11+11+12) \times 5.5 \text{ m}^2 = 187 \text{ m}^2$

Table 16: Estimate of possible rainwater amount to be collected according to average monthly rainfall of the area

Month	Average Month Rainfall (mm)	Estimated rain water collection (m ³)
January	140	21.1
February	137	20.6
March	81	12.2
April	258	38.7
May	102	15.3
June	75	11.3
July	36	5.4
August	49	7.4
September	127	19.1
October	228	34.2
November	284	42.5
December	371	55.6
Total	1895	283.5

Injection well

Injection well was constructed up to 45 m depth, according to the fracture information and the respective fracture yield for injecting water to the deep aquifers. For that purpose, previous bore well data and geophysical exploration data were used to determine the well depth.

However, after completing the construction of injection well, the other implementation activities have to be stopped due to unavoidable circumstance. Procurement activities of goods for constructions materials have to be stopped due to the ended the financial year 2023 and returned the remaining money to the DNCWS. Therefore, according to the proposed structure for implement the MAR system with constructing the recharge structure was completed during the year 2024.



Figure 57: Construction of groundwater recharge system

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.

This draft report is issued for the purpose of clearing the financial documents for the year 2024. Final report with findings, necessary recommendations and follow up guidelines for this MAR system will be submitted as soon as possible.



Figure 58: Sign board designed to display at the constructed recharge

Table 17: Progress of DMWSSP -2024

#	Activity	Target	Progress
1	Initial assessment of WSS (Groundwater resources vulnerability, existing real time & other monitoring analysis)	100%	100%
2	Identify of feasible aquifer recharge for groundwater dependant WSS	100%	40%
3	Assessment of alternative Groundwater productive zones adjoining the WSS	100%	50%
4	Final Report with findings, necessary recommendations & follow up guidelines	100%	80%

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

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 been 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 18: Covering areas and current status of IWWRM project.

	Project Pilot River Basin	Status	Provincial location of the Basin Management Centre
1	Kelani River Basin	Ongoing	Western Province (Head office of WRB)
2	Deduru Oya Basin	Ongoing	North Western Province
3	Ma Oya Basin	Ongoing	Western Province (Head office of WRB)
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

**Figure 59:** Study area of IWWRM – Implementation of Groundwater management plans

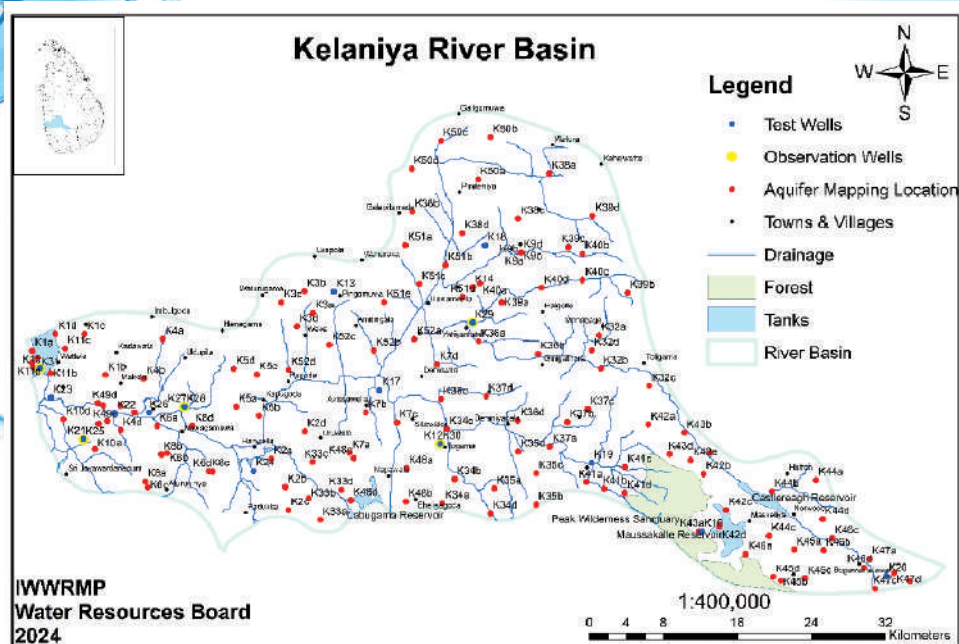


Figure 61: Completed Field Activities – Kelaniya Basin

Table 20: Progress summary - 2024

#	Projects/ Activities	TEC (Rs. Mn.)	Allocations for 2024 (Rs.Mn.)	Financial progress	Physical progress
1	Longterm Groundwater Monitoring Project (LTGM): Colombo-Negombo, Ampara, Mannar, Vavuniya, Kilinochchi, Jaffna Peninsula, Anuradhapura, Polonnaruwa, Matale, Puttalam Region, Monaragala, Madhuru Oya,	4.50	4.50	4.95	98%
2	Study on Direct and Indirect Impact of Climate Changes on Groundwater Resources (SICC)	1.00	1.00	0'90	88%
3	Combine Inspections on Groundwater Related Environmental Issues (INSP)	1.00	1.00	0.76	216%
4	Human Resources & Institutional Development (HRID)	4.00	4.00	3.68	93%
5	Emergency use for disaster events related to drinking water sector (EMUSE)	2.00	2.00	1.84	80%
6	Development and Management of Groundwater Resources in Water Supply Scheme (DMWSS)	1.00	1.00	0.22	68%
7	Statistical Survey of Commercial Groundwater Sources in Sri Lanka (SSGS)	1.50	1.50	0.12	8%
	Total	15.00	15.00	12.51	

Forecast For the year 2025

Table 21:- Details of Expenditure Estimates that Provisions to be Allocated as Sub-Projects / Items under Capital Expenditure

Serial No	Projects Name	Vote Particular of expenditure estimate 1	Approval 2	Priority area according to paragraph 03 of the circular (Mention the number)	Year of the commencement of the project	Expected year to complete the project	Total Revised Estimated cost	Cumulative expenses as at 31.07.2024	expected cost for the year 2024	Provision for the year 2025	Cumulative physical progress as at 31.07.2024	Estimates	
												2026	2027
1	Long-term Groundwater Monitoring Project (LTGM): Colombo, Negombo, Ampara, Mannar, Vavuniya, Kilinochchi, Jaffna, Anuradhapura, Polonnaruwa, Matale, Puttalam, Monaragala, Maduru Oya & Kelani River Basin	166-01-02-4-2201		XIII	Started from 2015 as continuous monitoring programme on groundwater resources (GWR) which is in requirement for managing GWR of the country		4.50	3.48	1.02	6.00	36%	7.00	7.00
2	Study on Direct and Indirect Impact of Climate Changes on Groundwater Resources (SICC)				Started from 2015 as continuous monitoring programme on groundwater resources (GWR) which is in requirement for managing GWR of the country		1.00	0.52	0.48	2.00	31%	3.00	3.00
3	Combine Inspections on Groundwater Relating Environmental Issues (INSP)				Started from 2017 as continuous programme enabling management and problem resolving on groundwater resources		1.00	0.60	0.40	1.50	123%	1.50	2.00
4	Emergency Use for disaster events related to water sector (drought, floods, catastrophic event of contamination on GWR) (E-USE)				2024.01.01	2024.12.31	2.00	0.99	1.01	4.00	60%	5.00	6.00

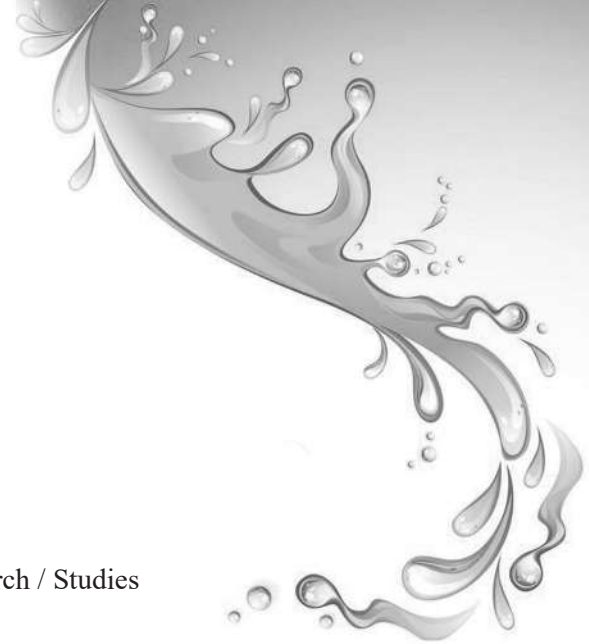
Serial No	Projects Name	Vote Particular of expenditure estimate 1	Approval 2	Priority area according to paragraph 03 of the circular (Mention the number)	Year of the commencement of the project	Expected year to complete the project	Total Revised Estimated cost	Cumulative expenses as at 31.07.2024	expected cost for the year 2024	Provision for the year 2025	Cumulative physical progress as at 31.07.2024	Estimates	
												2026	2027
6	Development and Management of Groundwater Resources in Water Supply Schemes (DMWSS)				2024.01.01	2024.12.31	1.00	-	-	1.00	15%	2.00	1.00
7	Statistical Survey on the Groundwater Sources & its users in Sri Lanka (SSGS)				2024.01.01	2024.12.31	1.50	1.46	0.04	-	8%	-	-
8	Assessment of Natural Springs & Hot Water Springs in Sri Lanka – (ANSP)				2025.01.01	2025.12.31	-	-	-	1.50	-	2.00	-
Total							15.00	10.07	3.93	42.00	48.57%	35.50	34.00



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.

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 mainly 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.

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. We currently have two drilling machines with this capability.

At present, Drilling Division has the several number of employees who are managed by Assistant General Manager (Drilling) and Drilling Manager. This division has 10 numbers of drilling officers who have comprehensive knowledge of drilling techniques.

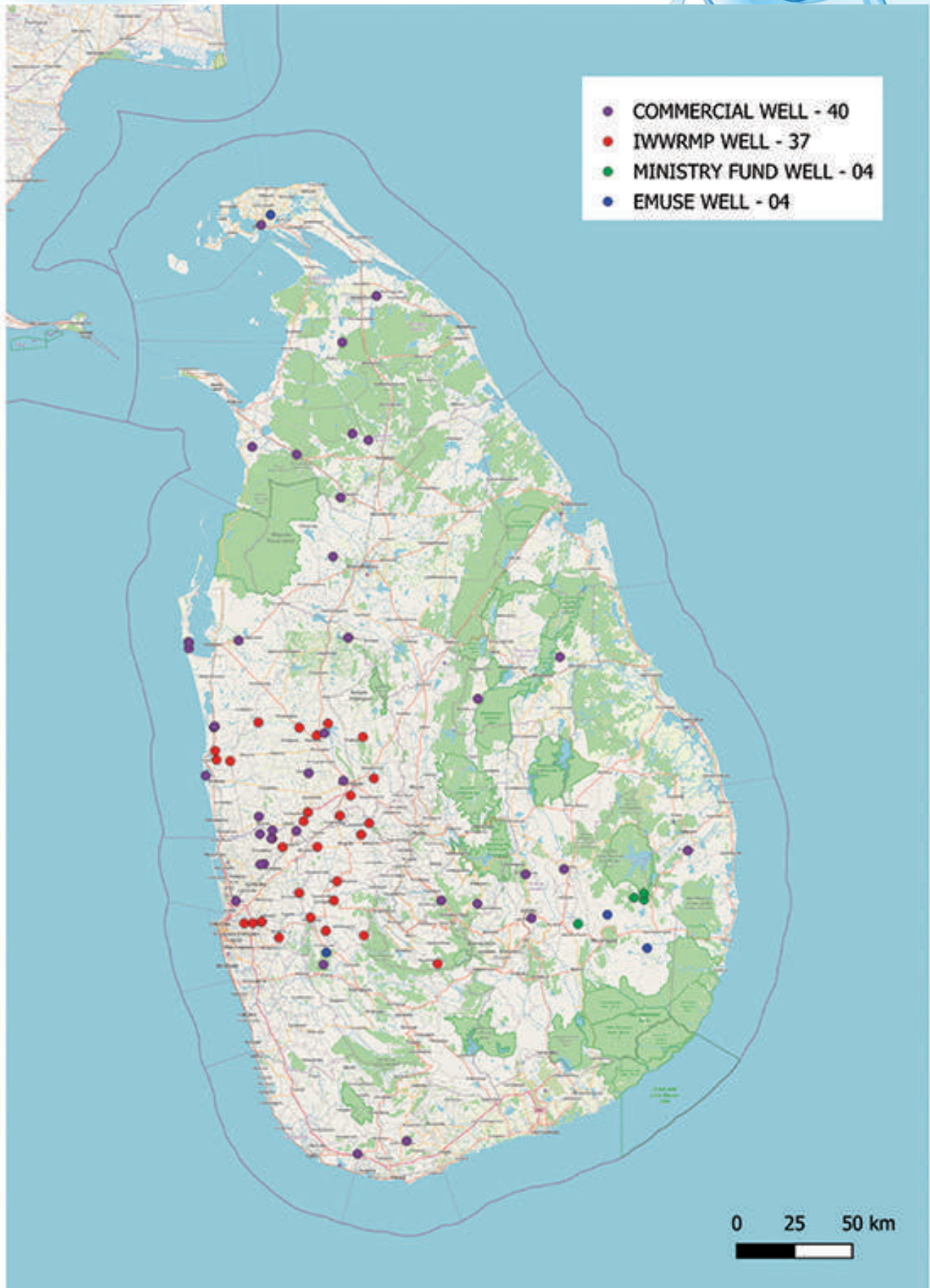
According to the above activities, following works have been completed during the year 2024.

DRILLING DIVISION SUMMARY - 2024**TUBE WELL DRILLING**

MONTH	IWWRMP	EMUSE PROJECT	MINISTRY FUND	COMMERCIAL	TOTAL
JANUARY	-	-	-	1	1
FEBRUARY	-	-	-	5	5
MARCH	2	-	-	4	6
APRIL	3	-	-	1	4
MAY	3	2	-	4	9
JUNE	5	-	-	2	7
JULY	4	-	4	1	9
AUGUST	7	-	-	7	14
SEPTEMBER	6	-	-	-	6
OCTOBER	5	1	-	6	12
NOVEMBER	1	-	-	4	5
DECEMBER	1	1	-	5	7
TOTAL	37	4	4	40	85

DRILLING DIVISION SUMMARY OF SITES 2024

Site	OIC NAME	TUBE WELL CONSTRUCTED	HAND PUMP INSTALLED	BASIN CONSTRUCTED	WELL CLEANED	HAND PUMP REPAIRED	REHABILITATED WELLS
Rig-17	G.G.D NAYANAJITH	22	-	-	21	-	10
Rig-18	K. VIJITHARAN	7	-	-	-	-	-
Rig-19	C.B.S GUNATHILAKA	5	-	-	2	-	19
Rig-20	J.P.C SANDARUWAN	13	-	-	2	1	-
Rig-21	P.A.I BANDARA	15	-	-	2	-	-
Rig-22	C.K WICKRAMASINGHA	-	-	-	-	-	-
Rig-23	J.J.M.P.K CHANDRASIRI	22	1	1	3	-	-
Rig-24	K. VIJITHARAN	1	-	-	-	-	-
	N.T. KALUWALGODA	-	-	-	2	-	-
TOTAL		85	1	1	32	1	29



Drilling Division Activities in 2024



Annual Progress of the 2024 Laboratories in WRB

In May 1983, the Chemical Laboratory was established for chemical analysis (expansion of the Hydrogeology division) on the funds of Institute of Geological Sciences, London and microbiology facility is established in 2000. North western province Laboratory, North Central Province Laboratory and Northern Province Laboratory is established in 2004, 2007, 2012 respectively.

With the identification of need of separate division for the Laboratory unit and considering the responsibility hold in one of main functions of WRB, in February 2022 made a cadre position for Assistant General Manager (Laboratory). In 18 June 2025 unit has been separated as the **Laboratory Division** under Assistant General Manager (Laboratory). Ms. P. H. D. S. Silva was appointed as the Assistant General Manager (Laboratory) under the condition of Attending to Duties.

The Division consists of four main Laboratories: Central Laboratory, North western Province Laboratory, North Central Province Laboratory & Northern Province Laboratory and Mobile unit with the capacity of analyzing water samples for Physical, Chemical & Metallic and Microbiological testing. Staff is specialized for handling bulk samples.



Under the analyzing facility selected major anions and cations, metals, nutrients (NO_3 , NO_2 , PO_4), and physical properties (color, pH, specific conductance, and turbidity) are determined in water samples. **Instrumentation** includes ion chromatograph, spectrophotometer, colorimeter, and inductively coupled plasma-mass spectrometer. **Titrimetric** includes Chlorides, Total Alkalinity, Total Hardness, etc.

Certifications and External Audits.

Demarcating one of another remarkable mile stone in laboratory division, North Central province Laboratory has been granted accreditation (ISO17025:2017) from Sri Lanka Accreditation Board (SLAB) in September 2024 for chemical tests and metals (metals-Ca, Mg, Na, K and Heavy metal-As.). PTB (Physikalisch- Technische Bundesanstalt Braunschweig und Berlin- German Government

funded project) had supported to implement quality management System (ISO 17025:017) since 2018 to until achieved the Accreditation.

Laboratory Proficiency Testing.

The laboratories demonstrated exceptional proficiency in testing for a range of constituents in various sample matrices by participating in inter-laboratory and certification programs administered by third-party agencies. The laboratories took part in national and international proficiency testing studies coordinated by PAFAS (UK), ITI (Sri Lanka) and SLS (Sri Lanka).

The WQL has consistently received ratings between (good) and (excellent) in the PAFAS evaluations, which include inorganic blind samples as well. Results of such studies offer an independent check of performance and capability while providing a means for laboratories to be uniformly evaluated.

Cooperate Social responsibility

Laboratory division support to undergraduates and graduates to complete their internship. In this year 4No of students are benefited from The Open University of Sri Lanka.

Total sample analysis

Laboratory division completed 2273 and 288 no of samples, for physical and chemical properties under Treasury Grant, world Bank grant and external parties respectively. Total samples for microbiological test were 4Nos. Cumulative generated income is LKR. 2,181,900.15 and received LKR 3,980,078.96 expenditure from above grants.

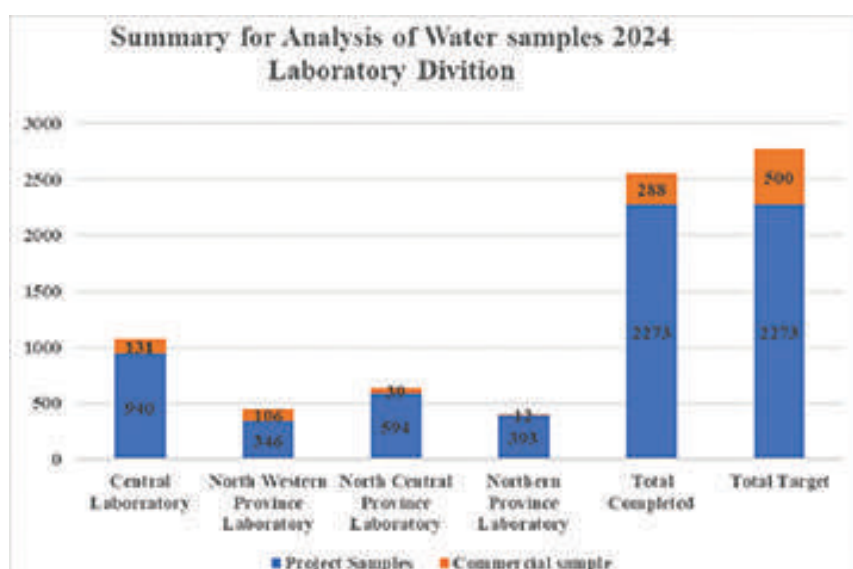


Figure 1: Summary for Analysis of Water Samples in 2024

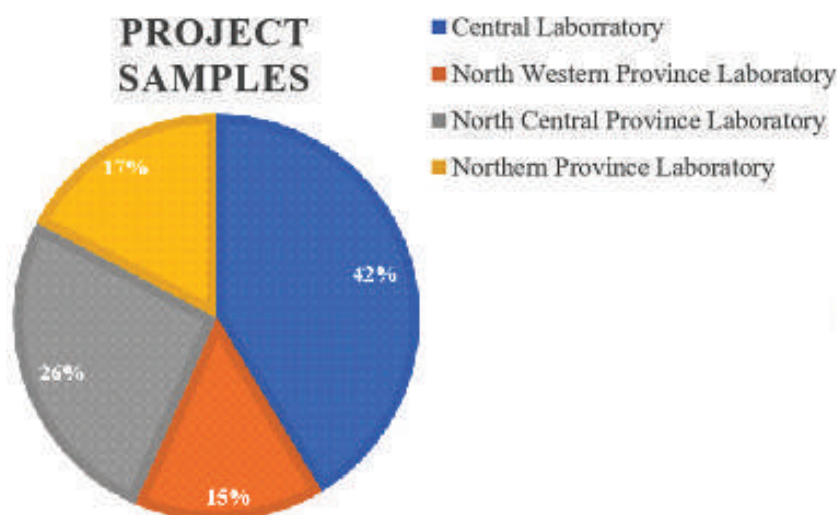


Figure 2: Sample analysis done by each laboratory in 2024

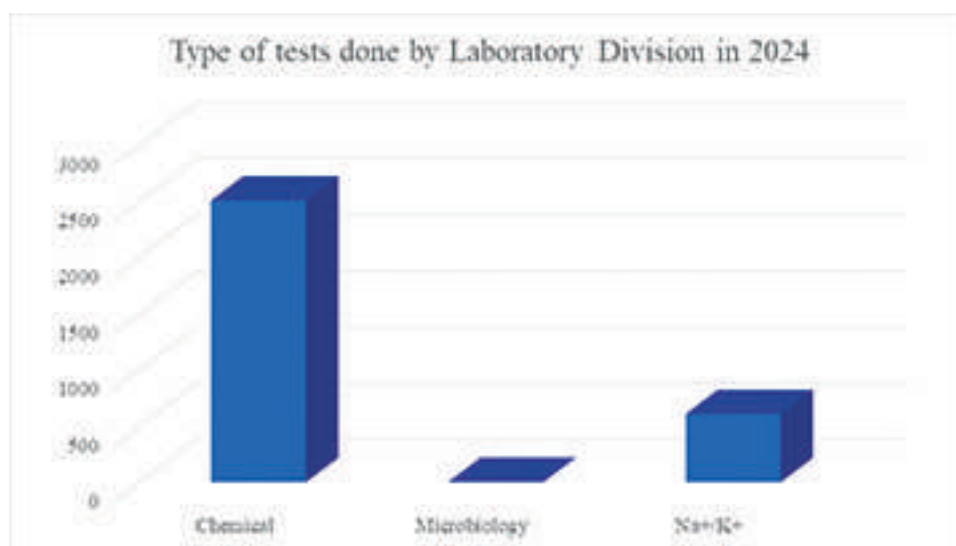


Figure 3: Type of tests done by Laboratory Division in 2024

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.

Water Resources Board

Finance

The total income for the year concerned was Rs. 2835.380 million. Rs. 196.089 million and Rs. 12.520 million were respectively received from the General Treasury as the recurrent and capital grant for the year 2024. The reported profit in the year was Rs. 2175.221 million.

Administration

The total number of staff of the Water Resources Board in the year 2024 was 220 nos. There are no new recruitments for permanent staff. In this year, 07 nos. employees were resigned, vacation of post 04 and 07 employees were retired.

Fleet of Transport

In the year concerned, the fleet of transport of the board was comprised with 67 nos. vehicles and out of which 51 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 & Estate Infrastructure Development and State Minister of the Water Supply & Estate Infrastructure Development 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.

R.M.S.Bandara
Chairman
Water Resources Board



Financial Statements



FINANCIAL STATEMENTS
BACKGROUND

WATER RESOURCES BOARD

Statement of Financial Performance

For the Month ended 31st December 2024

NOTE	2024						2023	
	Rs'000						Rs'000	
	All Sectors	Sector no 01	Sector no 02	Sector no 03	Sector no 04	Revised Budget	Actual	
NO		Drilling	Hydrology	Lab	General			
01	2,611,821	788,307	1,777,488	3,562	42,464	2,734,309	1,903,684	
	196,089	49,451	56,777	16,484	73,377	197,704	189,595	
02	12,140	-	12,140	-	-	15,000	14,158	
03	15,330	-	194	-	15,136	16,755	15,277	
Total Revenue	2,835,380	837,758	1,846,599	20,046	130,977	2,963,768	2,122,714	
Administrative Costs	(217,232)	(55,159)	(63,961)	(16,535)	(81,577)	(218,420)	(206,857)	
Supplies & Requisites	(38,249)	(17,719)	(7,891)	(2,964)	(9,675)	(37,400)	(41,215)	
Contractual Services & Maintenance expenses	(370,353)	(2,608)	(5,126)	(511)	(362,108)	(469,315)	(470,267)	
Other Operational Expenses	(4,782)	(3)	(75)	(6)	(4,698)	(6,271)	(5,961)	
Other Project Expenses	(17,403)	-	(17,403)	-	-	(19,500)	(802)	
Treasury Grants - Capital (Research Studies)	(12,140)	-	(12,140)	-	-	(15,000)	(14,158)	
Total Expenses	(660,159)	(75,489)	(106,596)	(20,016)	(458,058)	(765,906)	(739,260)	
Surplus / (Deficit) from Operations	2,175,221	762,269	1,740,003	30	(327,081)	2,197,862	1,383,454	
Tax	-							
Surplus / (Deficit) for the period	2,175,221	762,269	1,740,003	30	(327,081)	2,197,862	1,383,454	

WATER RESOURCES BOARD
Statement of Financial Position

As at 31 December 2024	NOTE	Restated	
	NO.	2024 Rs'000	2023 Rs'000
ASSETS			
Current assets			
Cash and cash equivalents	05	99,067	84,143
Trade and other receivables	06	36,388	33,279
Inventories	07	1,153,814	124,688
Prepayments	08	680	33
		<u>1,289,949</u>	<u>242,143</u>
Non - current assets			
Property,Plant & Equipment	09	2,621,400	1,429,584
		<u>2,621,400</u>	<u>1,429,584</u>
TOTAL ASSETS		<u>3,911,349</u>	<u>1,671,727</u>
LIABILITIES			
Current liabilities			
Other Provisions & Payables	10	8,526	7,062
Deferred Income (Advances for Services)	11	8,309	4,079
		<u>16,835</u>	<u>11,141</u>
Non - current liabilities			
Retirement Benefit Obligations	12	75,552	56,129
		<u>75,552</u>	<u>56,129</u>
TOTAL LIABILITIES		<u>92,387</u>	<u>67,270</u>
NET ASSETS		<u>3,818,962</u>	<u>1,604,457</u>
NET ASSETS / EQUITY			
CAPITAL & RESERVES			
Contributed Capital	13	489,891	489,891
Accumulated Profit/(Deficit)	13	3,224,511	1,065,603
Revaluation Reserve	13	104,560	48,963
TOTAL NET ASSETS / EQUITY		<u>3,818,962</u>	<u>1,604,457</u>

The Accounting Policies and the Notes from pages 06 to 24 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 Water Resources Board.

C. Abeysooriya

Assistant General Manager (Admin & Finance) - Acting

R.M.S. Rathnayaka

General Manager (Acting)

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

R.M.S. Bandara

Chairman

S.C. Senaratne

Treasury Representative

Prof. P. Liyanarachchi

Board Director

25th February 2025

WATER RESOURCES BOARD

Water Resources Board

**Statement of Changes in Net Assets/ Equity
For the Month Ended 31 December 2024**

NOTE : 14

YEAR - 2023

Balance as at 31st December 2022 B/F

Adjustments made for prior period events

Restated Balance

Surplus / (Deficit) for the period

Actuarial Gain/(Loss) on retirement benefit obligation

Balance as at 31st December 2023

Contributed Capital Rs'000	Revaluation Reserve Rs'000	Accumulated Profit/Deficit Rs'000	Total Rs'000
489,891	19,500	(328,188)	181,203
-	-	1,638	1,638
489,891	19,500	(326,550)	182,841
-	29,463	1,383,454	1,412,917
-	-	8,699	8,699
489,891	48,963	1,065,603	1,604,457

YEAR - 2024

Balance as at 31st December 2023 B/F

Adjustments made for prior period events

Restated Balance

Surplus / (Deficit) for the period

Actuarial Gain/(Loss) on retirement benefit obligation

Balance as at 31st December 2024

489,891	48,963	1,065,603	1,604,457
-	-	-	-
489,891	48,963	1,065,603	1,604,457
-	55,597	2,175,221	2,230,818
-	-	(16,313)	(16,313)
489,891	104,560	3,224,511	3,818,962

CASH FLOW STATEMENT FOR MONTH ENDED 31 DECEMBER 2024

	2024 Rs'000	2023 Rs'000
Cash Flows from operating activities	-	-
Surplus / [Deficit] for the year before Treasury Grants (Recurrent)	1,979,132	1,193,859
Add: Treasury Grants received (Recurrent)	196,089	189,595
Surplus / [Deficit] before Tax for the year	<u>2,175,221</u>	<u>1,383,454</u>
Adjustments DIFFERRED INCOME	-	(1,796,809)
Adjustments OTHER PROJECT INCOME	(2,500,439)	-
Less: Prior Year adjustments	-	-
	<u>(325,218)</u>	<u>(413,355)</u>
Non Cash Movements		
Depreciation	324,980	424,485
Increase in Provisions to Gratuity	11,929	14,734
[Decrease] / Increase in payables	5,694	(17,264)
[Decrease] in Other Current Assets	12,391	7,450
Gain / [Losses] on sale of Property plant & Equipment's	-	(4,963)
[Decrease] / Increase in receivables	(3,109)	2,945
	<u>26,667</u>	<u>14,032</u>
Interest received for gratuity & bank Savings	(6,590)	(6,232)
Tax Paid	-	-
Net cash flows from operating activities	<u>20,077</u>	<u>7,800</u>
Cash Flows from Investing activities		
Proceeds from sale of Property Plant & Equipments	-	4,963
Purchase of Property Plant & Equipment's	(2,924)	(107)
Interest received for gratuity & Bank Savings	6,590	6,232
Payment of gratuity	(8,819)	(9,095)
Net cash flows from Investing activities	<u>(5,153)</u>	<u>1,993</u>
Cash Flows from financing activities		
Government Grants [Capital for Property Plant & Equipments]	-	-
Net cash flows from financing activities	-	-
Net Increase/[decrease] in cash & cash Equivalents	<u>14,924</u>	<u>- 9,793</u>
Cash & Cash Equivalents at beginning of Period	<u>84,143</u>	<u>74,350</u>
Cash & Cash Equivalents at end of Period	<u>99,067</u>	<u>84,143</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.

	2024 Rs'000	2023 Rs'000
Current Account Balances with Banks	73,842	60,753
Savings with National Savings Bank	25,225	23,390
	<u>99,067</u>	<u>84,143</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 2024

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	184,089	184,089	185,704
Vote: 166-01-02-4-1509			
Financial Performance	12,000	12,000	12,000
	<u>196,089</u>	<u>196,089</u>	<u>197,704</u>
02 CAPITAL GRANT			
Vote: 166-01-02-4-2201			
Financial Performance - Operational	12,520	12,520	15,000
Statement of Financial Position	<u>12,520</u>	<u>12,520</u>	<u>-</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 2024 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.

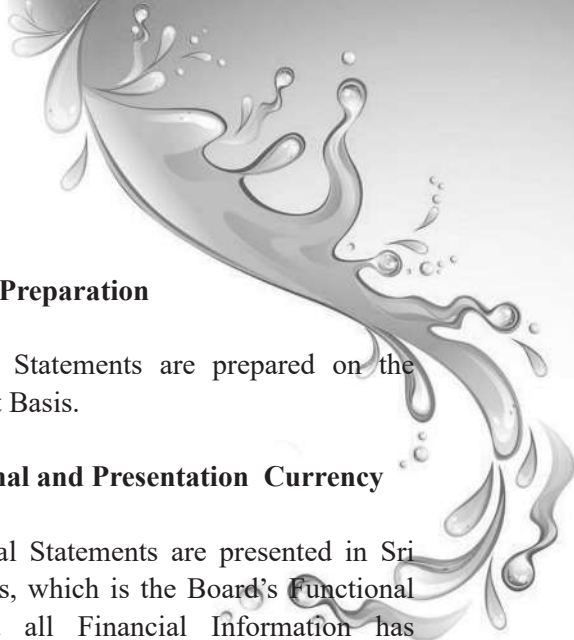
Buildings in Lease hold land

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.



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.
Interest Income

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.1,357,407/- included in Note No.4.1 Salaries & wages expense account. (Pl.see Page No. 34 for details)

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.

12. Foreign Funded Projects.

Establishment of Groundwater Monitoring Network - Pilot Project for Malwathu Oya,

NOTES TO THE FINANCIAL STATEMENTS & ACCOUNTING POLICIES

Maduru Oya & Kumbukkan Oya River Basins

The Project covers Malwathu Oya, Maduru Oya and Kumbukkan Oya basins where establishing of monitoring points increased upto 190 locations with addition of new pilot areas of Puttalam and Jaffna Peninsula. Groundwater 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 was to develop the 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 was set up at Water Resources Board(WRB), Colombo. In addition, grass root level community awareness was 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 & remaining consumables which was utilized during the project operations (2018-2022) has been transferred to WRB. In addition, the established real time groundwater monitoring Network systems in the Malwathu Oya, Kumbukkan Oya, Maduru Oya, Jaffna Peninsula & Puttalam region (altogether of 190 real-time groundwater monitoring stations)

including the setup data center was handed over to Water Resources Board at the project completion. Within this Data Center, the customary developed web portal as an online central system for data acquisition, accumulation, analysis & retrieval for advanced analysis works in separate platforms & for data sharing as well. Since, the WRB is the mandated regulatory agency on the groundwater resources regulations, these high resolution real time information is scheduled to utilize for regulatory operations within the groundwater resources management as a supportive base line information facilitating to act upon depending the monitored behavior in changes of groundwater level & water quality variations over the time.

Invoice value being used in Identifying the value of non-moveable assets receiving from establishment of Ground Water Monitoring Network Project. The committee appointed by Secretary, ministry of Irrigation has submitted a report including those invoice value with copy to Auditor General.

Water Resources Board had received two double cabs that had been converted to mobile laboratories by establishment of Ground Water Monitoring Network Project. The committee approved by secretary, Ministry of Irrigation has given a report on 18/04/2024 including the asset value of above assets. According to this committee Report value of two double cabs has been accounts as Motor vehicle & lab equipment value relevant to the mobile lab has been accounts as lab equipment in year 2024 & depreciated and adjust accordingly.

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

| Annual Report - 2024

NOTE NO:01

HYDRO: INVESTIGATIONS / EXPLORATION

	All Sectors	Sector no 01 Drilling	Sector no 02 Hydrology	Sector no 03 Lab	Sector no 04 General	2024 Rs'000	2023 Rs'000
Hydro Geological Surveys	15,988	-	15,988	-	-	16,000	15,932
Tube Well Constructions	32,877	32,877	-	-	-	32,500	44,836
Pumping Tests	24,695	-	24,695	-	-	24,000	31,283
Tube Well Cleaning	12,674	12,674	-	-	-	12,600	3,424
Water Sample Analysis	2,182	-	-	2,182	-	2,500	6,439
Sub Total	88,416	45,551	40,683	2,182	-	87,600	101,914

IMPLEMENTATION OF GROUNDWATER REGULATIONS

Registration of Drilling Machines	3,524	3,524	-	-	-	6,650	2,975
Registration of External Hydrogeologists	231	-	231	-	-	400	385
Hydrogeological Reports Income	614	-	614	-	-	600	532
Flow Meters Installation Income	-	-	-	-	-	-	43
Inspection Income Of Flow Meters	-	-	-	-	-	100	-
Training of External Drillers	-	-	-	-	-	-	-
Sub Total	4,369	3,524	845	-	-	7,750	3,935

GROUNDWATER DEVELOPMENT

Strengthening Groundwater Resources Management	13,263	-	13,263	-	16,500	141
Implementation of Manage Aquifer Recharge System on						
GW Resources	2,622	-	2,622	-	3,000	885
AFF Programme - Monash University Australia	2,712	-	2,712	-	-	-
Other Projects Income - {GWMNP, IWWRMP. etc. }	2,500,439	739,232	1,717,363	1,380	2,619,459	1,796,809
Sub Total	2,519,036	739,232	1,735,960	1,380	2,638,959	1,797,835
GRAND TOTAL	2,611,821	788,307	1,777,488	3,562	2,734,309	1,903,684

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

Long Term G. W. monitoring in most sensitive G.W. Terrains	4,856	-	4,856	-	4,500	3,340
Study on the direct & indirect impacts of climatic changes	865	-	865	-	1,000	966
Inspections relating to G. water depletion & pollutions	768	-	768	-	1,000	884
Human resources & Institutional Development	3,478	-	3,478	-	4,000	-
Research Study on natural springs - Maoya	-	-	-	-	-	916
Rehabilitation & Improvements works expenses	-	-	-	-	-	3,640
Development of Groundwater Atlas for Sri Lanka	-	-	-	-	-	20
Emergency use for disaster related to water sector	1,850	-	1,850	-	2,000	2,729
Staff Training	-	-	-	-	-	-
Development & Mgt of GW. Resources in Water Supply Scheme	224	-	224	-	1,000	1,663
Statistical Survey on the Groundwater Sources	99	-	99	-	1,500	-
GRAND TOTAL	12,140	-	12,140	-	15,000	14,158

NOTE NO:03

OTHER INCOME

Circuit Bungalow Reservation	195	-	-	195	200	267
Fines & Surcharges	2	-	-	2	5	23
Disposal Income	135	-	-	135	150	4,882
Interests on Loans & Bank Deposits	6,590	-	-	6,590	7,000	6,232
Staff Accommodation Income	-	-	-	-	-	229
Providing Data	194	-	194	-	200	204
Sundry Income	475	-	-	475	1,000	982
Solar Power Income	2,081	-	-	2,081	2,500	100
Land Rent Income	5,658	-	-	5,658	5,700	2,358
GRAND TOTAL	15,330	-	194	15,136	16,755	15,277

NOTE NO: 4.1

ADMINISTRATIVE COSTS

Salaries & Wages	162,145	43,779	50,266	14,593	53,507	163,000	158,600
Defined Contribution Plan (Cost - EPF & ETF)	21,008	6,512	5,672	1,891	6,933	21,500	19,169
Defined Benefit Plan Cost - Retiring Gratuity	11,929	-	-	-	11,929	9,300	14,734
Security Service Expenses	5,652	736	897	-	4,019	6,000	-
Overtime & Holiday Pay	5,904	782	2,709	7	2,406	6,000	4,965
Director's Fees	213	-	-	-	213	300	183
Other Allowances	526	-	-	-	526	700	363
Travelling - Local	1,551	192	976	-	383	2,000	1,651
Staff Package Expenses	6,037	3,119	2,918	-	-	7,000	4,746
Travelling - Overseas	116	-	-	-	116	150	50
Welfare & Sports facilities	160	-	-	-	160	200	230
Medical Scheme	607	-	-	-	607	670	685
Entertainment	1,140	39	523	44	534	1,300	1,216
Vacation Leave Encashment	-	-	-	-	-	-	14
Staff Insurance	244	-	-	-	244	300	251
GRAND TOTAL	217,232	55,159	63,961	16,535	81,577	218,420	206,857

NOTE NO: 4.2**SUPPLIES REQUISITES**

Fuel & Lubricants	26,824	15,265	7,858	-	3,701	28,000	28,678
Drilling Works Consumables	7,205	2,422	1	-	4,782	4,500	8,766
Laboratory Consumables & Others	4,009	-	-	2,964	1,045	4,500	3,308
Other Consumables	211	32	32	-	147	400	463
GRAND TOTAL	38,249	17,719	7,891	2,964	9,675	37,400	41,215

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

Postage & Telecommunication	1,825	5	210	26	1,584	2,200	1,922
Electricity	5,851	287	2,651	322	2,591	7,000	6,949
Building Rent & Leases	15,593	-	320	-	15,273	16,000	15,755
Rates & Taxes	491	-	88	-	403	600	454
Cash in Transit Insurance	13	-	-	-	13	15	12
Audit Fees	485	-	-	-	485	500	470
Printing	486	-	2	-	484	800	35
Workshop & Seminars	452	-	39	50	363	500	147
Water Bills	756	-	250	-	506	850	721
Accommodation Expenses	608	543	32	-	33	650	234
Consultancy Charges	266	-	-	-	266	300	454
Sundry Expenses	990	182	264	29	515	1,000	1,001
Maintenance of Motor Vehicles	6,703	1,021	655	-	5,027	7,000	6,290
Maintenance of Machinery	6,763	492	6	-	6,265	2,500	5,738
Maintenance of Office Equipments	3,613	77	563	84	2,889	4,000	3,941
Maintenance of Buildings	478	1	46	-	431	400	1,659
Depreciation	324,980	-	-	-	324,980	425,000	424,485
GRAND TOTAL	370,353	2,608	5,126	511	362,108	469,315	470,267

NOTE NO: 4.4**OTHER OPERATING EXPENSES**

Stationery & Office Requisites	1,083	3	75	6	999	1,500	1,249
Uniforms	164	-	-	-	164	400	894
Periodicals & Newspapers	-	-	-	-	-	1	1
Publicity & Advertising Expenses	257	-	-	-	257	750	541
Bank Charges	236	-	-	-	236	300	182
Medical Test Charges	-	-	-	-	-	10	5
Legal Expenses	463	-	-	-	463	500	101
Stamp Duty	16	-	-	-	16	100	14
Vehicle Service - Ratmalana	98	-	-	-	98	200	158
Hiring Charges	-	-	-	-	-	5	3
Fines & Surcharges	-	-	-	-	-	5	-
Operating Lease Rentals	-	-	-	-	-	-	-
Data Collection Expenses	-	-	-	-	-	-	2
Social Security Contribute Levy	2,465	-	-	-	2,465	2,500	2,811
GRAND TOTAL	4,782	3	75	6	4,698	6,271	5,961

NOTE NO: 4.5**OTHER PROJECT EXPENSES**

Strengthening Groundwater Resources Management	13,263	-	13,263	-	-	16,500	141
Implementation of Manage Aquifer Recharge System on GW Resources	2,294	-	2,294	-	-	3,000	661
AFF Programme - Monash University Australia	1,846	-	1,846	-	-	-	-
GRAND TOTAL	17,403	-	17,403	-	-	19,500	802

NOTE NO: 4.6

TREASURY GRANT - CAPITAL
(RESEARCH STUDIES - OPERATIONAL)

Long Term G. W. monitoring in most sensitive G.W. Terrains	4,856	-	-	4,856	-	-	4,500	3,340
Study on the direct & indirect impacts of climatic changes	865	-	-	865	-	-	1,000	966
Inspections relating to G. water depletion & pollutions	768	-	-	768	-	-	1,000	884
Human resources & Institutional Development	3,478	-	-	3,478	-	-	4,000	-
Research Study on natural springs - Maoya	-	-	-	-	-	-	-	-
Rehabilitation & Improvements works expenses	-	-	-	-	-	-	-	916
Development of Groundwater Atlas for Sri Lanka	-	-	-	-	-	-	-	3,640
Emergency use for disaster related to water sector	1,850	-	-	1,850	-	-	2,000	20
Staff Training	-	-	-	-	-	-	-	2,729
Development & Mgt of GW. Resources in Water Supply Scheme	224	-	-	224	-	-	1,000	-
Statistical Survey on the Groundwater Sources	99	-	-	99	-	-	1,500	1,663
GRAND TOTAL	12,140	-	-	12,140	-	-	15,000	14,158

NOTES TO THE FINANCIAL STATEMENTS CONTD.

NOTE NO:05

CASH & CASH EQUIVALENTS

- (1) Bank of Ceylon York Street Branch (0002026295)
- (2) Bank of Ceylon Torrington Branch (0002323267)
- (3) Bank of Ceylon Torrington Branch (0002323268)
- (4) Bank of Ceylon Torrington Branch (0005342839)

Sub Total

Actual
2024 2023
Rs.'000 Rs.'000

7,397	27
62,156	59,927
2,624	663
1,665	136
73,842	60,753

EMPLOYEE BENEFIT - PLAN ASSET

- (5) National Savings Bank - Bambalapitiya (100230211818)

GRAND TOTAL

25,225	23,390
99,067	84,143

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.

Bank Statement Balance '000

Bank of Ceylon Torrington Branch (00083141035)	63,106
Bank of Ceylon Torrington Branch (0002323267)	1,050
	64,156

2024 2023
Rs.'000 Rs.'000

NOTE NO:06

TRADE & OTHER RECEIVABLES

STAFF

- (01) Distress Loan
- (02) Festival Advance

Sub Total

27,993	25,199
13	11
28,006	25,210

OTHERS

- (03) Trade
- (04) Advance to Suppliers
- (05) Retention Receivable
- (06) V.A.T. Receivable (Refund)
- (07) Other Debtors
- (08) Staff Debtors
- (09) Withholding Tax Receivable
- (10) Other Receivables

Sub Total

6,195	4,368
-	-
-	1,978
-	-
50	250
56	80
1,081	393
1,000	1,000
-	-
8,382	8,069

TOTAL RECEIVABLES

36,388	33,279
---------------	---------------

NOTE NO: 07
INVENTORIES
MATERIALS & SPARES

	2024 Rs.'000	2023 Rs.'000
Vehicle Spares	2,661	2,550
Vehicle Spares (DSWRPP)	816	1,924
Fuel & Lubricants	759	1,189
Ground Water Consumables	1,061,310	23,879
Building Materials	332	539
Stationery	280	238
Machinery Spares (with 2 KR)	52,976	54,618
Machinery Spares (DSWRPP)	31,072	35,040
Machinery Spares (MINISTRY)	1,739	2,113
Laboratory Consumables	1,869	2,598
GRAND TOTAL	1,153,814	124,688

NOTE NO:08
PRE-PAYMENTS

License & Insurance	299	19
Cash In Transits	9	10
Maintenance of Office Equipments	368	-
Building Rent	4	4
GRAND TOTAL	680	33

NOTES TO THE FINANCIAL STATEMENTS CONTD.
PROPERTY, PLANT & EQUIPMENT
NOTE: 09

Cost	Balance as at 01.01.2024 Rs'000	Additions / Revaluation Rs'000	Disposal / Adjustments Rs'000	Balance as at 31.12.2024 Rs'000
Lands	1,987	-	-	1,987
Buildings	50,590	35,455	-	86,045
Motor Vehicles	171,197	22,984	(5,603)	188,578
Machinery	1,892,418	19	(336,522)	1,555,915
Laboratory Equipments	45,691	67,534	(13,501)	99,724
Furniture Fittings & Office Equipments	41,434	6,304	-	47,738
Computers & Accessories	17,256	3,610	(472)	20,394
Scientific Equipments	199,566	1,722,966	(66)	1,922,466
Buildings (Work in Progress)	1,823	-	-	1,823
GRAND TOTAL	2,421,962	1,858,872	(356,164)	3,924,670

	Balance as at 01.01.2024	Additions	Disposal / Adjustments	Balance as at 31.12.2024
	Rs'000	Rs'000	Rs'000	Rs'000
Buildings	6,947	2,529	-	9,476
Motor Vehicles	107,895	48,294	-	156,189
Machinery	737,527	237,459	(49)	974,937
Laboratory Equipments	26,086	9,812	(13,501)	22,397
Furniture Fittings & Office Equipments	13,867	4,639	-	18,506
Computers & Accessories	10,612	2,196	(472)	12,336
Scientific Equipments	89,444	20,051	(66)	109,429
GRAND TOTAL	992,378	324,980	(14,088)	1,303,270
NET BOOK VALUE	1,429,584			2,621,400

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	2,529
Motor Vehicles	48,294
Machinery	237,459
Laboratory Equipments	9,812
Furniture Fittings & Office Equipments	4,639
Computers & Accessories	2,196
Scientific Equipments	20,051
GRAND TOTAL	324,980

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	(Approx.)
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

	2024 Rs'000	2023 Rs'000
(1) Provision for Audit Fees	474	469
(2) Accrued Expenses (Pl. see Page No.21 for details)	6,837	4,300
(3) Other Payables (with grativity)	130	1,723
(4) Retention Payable	-	-
(4) VAT Payable	945	570
(4) Bid Bond & Refundable Deposit	140	-
(4) WHT Payable	-	-
(4) APIT Payable	-	-
(4) VAT Cash	-	-
GRAND TOTAL	8,526	7,062

NOTE NO:11

DEFERRED INCOME

Flow Meter Advance	-	-
Service Advance (Pl.see Page No. 32 to 33 for details)	8,309	4,051
Survey Reports Advance (Pl. See Page No. 33 for details)	-	28
GRAND TOTAL	8,309	4,079

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%	16,806	15,335
Employees' Contribution - 10%	14,005	12,779
	-	-
Employee Trust Fund - 3%	4,202	3,834

12.2 Defined Benefit Plan

Defined Benefit obligation as at beginning of the Year	56,129	60,783
Interest cost for the Period	7,297	10,941
Current Service cost	4,632	3,793
Past Service cost	-	-
Actuarial (Gain)/Loss	16,313	(8,699)
Benefit paid during the year	(8,819)	(9,095)
Benefit Payable	-	(1,594)
	75,552	56,129

12.2.1 Expense recognized during the year in Income Statement

Current Service Cost	4,632	3,793
Interest cost for the Period	7,297	10,941
	<u>11,929</u>	<u>14,734</u>

Equity Statement - (Please see page No.03)

Actuarial Gain / (Loss) on Retirement benefit obligation	16,313	(8,699)
---	---------------	----------------

12.2.2. An actuarial valuation for gratuity liability was carried out as at 31.12.2024 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.

	2024	2023
Discount rate	11%	13%
Salary Increment rate	10%	10%
Staff Turnover Rate	5%	6%

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.

	2024	
	Increase by +1% Rs. '000'	Decrease by -1% Rs. '000'
Discount rate	70,353	81,501
Salary increment rate	81,574	70,195

NOTE NO:13

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

NOTE NO:14**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.

Integrated Water Resources & Watershed Management Project (IWRMP)

Under Irrigation Ministry, Water Resource Board is Implementing water Resource Management Project funded by world bank. Rs. 13.2 Mn advance has received for above & it was fully utilized as expenditure. Strengthening of Groundwater Resources Management: Component 1.3.2 of the Integrated Water Resources and Watershed Management Project (IWRMP) implemented under Ministry of Irrigation is designed to support the development and implementation of a fully integrated and conjunctive groundwater management program for the River Basins. The main objectives of the Integrated Water Resources & Watershed Management Project (IWRMP) to develop the institutional setup and enhance the capacity by acquire and install the necessary technology and infrastructure and establish a strategic groundwater management plan for sustainable groundwater use and management of the country.

Implementation of Manage Aquifer Recharge System on GW Resources (UNICEF)

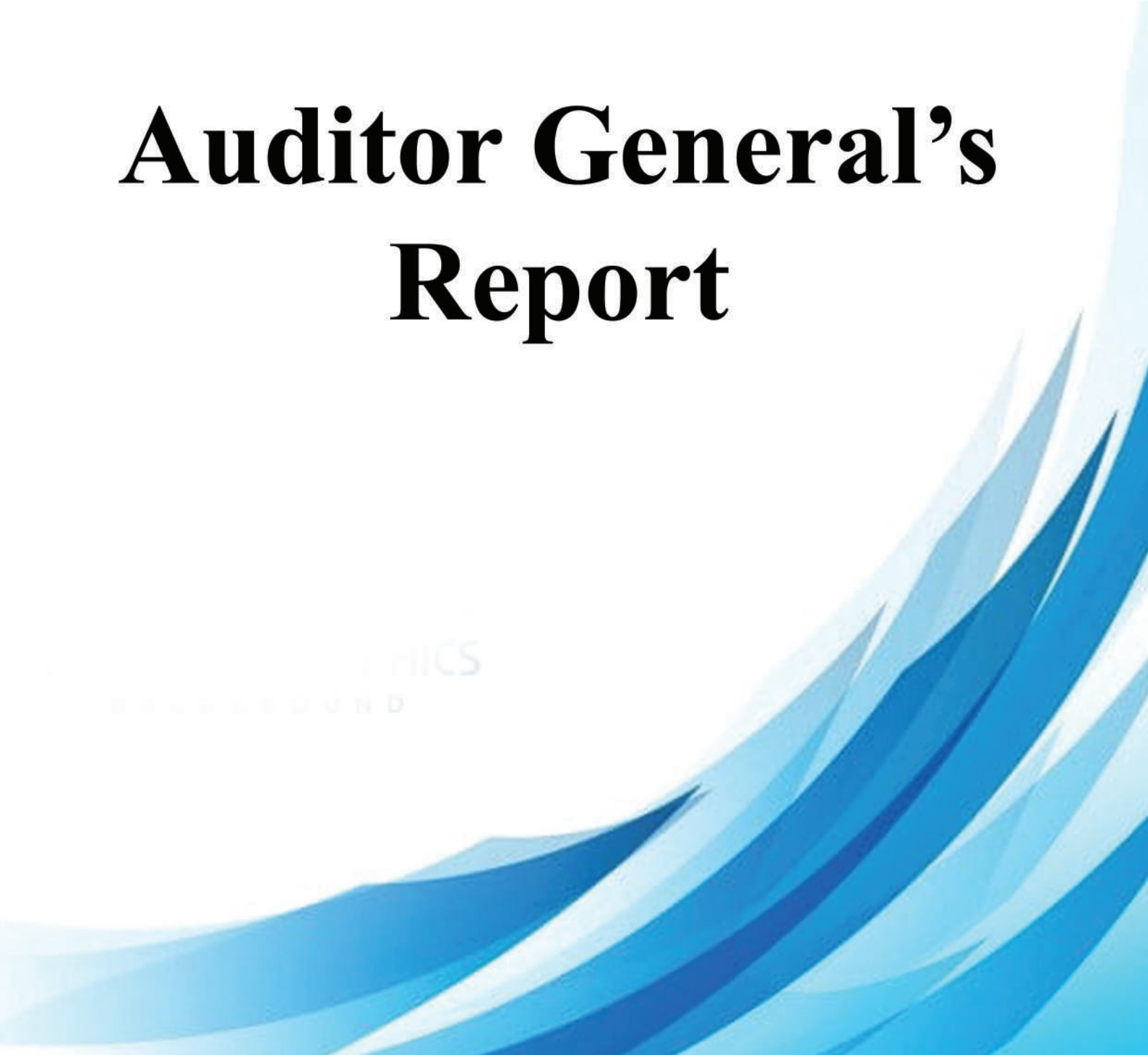
Two aquifer recharge systems have been setup at a.) Nildiyawara CBO rural water scheme at Sirimapura, Rajanganaya, Anuradhapura and b.) Akiriyankumbura Puranagama water supply project Ridimaliyadda as an pilot studies in Sri Lanka to enhance the groundwater storage and quality improvement where indicated continuous depletion of groundwater level due to excessive pumping for the drinking water supply to the community. This was funded by the UNICEF in year 2024. These two systems are monitored by Water Resources Board for its effectiveness in long term basis and it is scheduled to expand the artificial recharge systems in other parts of the country depending the requirement and priority based on these pilot study outputs.

AFF Programee - Monash University Australia

As a part of the post – DFAT activities for the Australian Awards Fellowship (AAF) Program a team of Monash University faculty members arrived in Sri Lanka in an around 15 May 2024 to attend the workshop to organized by Water resources Board and to join the tour also to organized by WRB to physically attend to inspect the project implementation and outcomes to the respective communities. Water Resources Board organized the workshop on 16th May 2024 and the tour to inspect the projects start from 17-20 May 2024 located in Kurunegala, Polonnaruwa, Anuradhapura kilinochchi and Jaffna.



Auditor General's Report



PHICS
RESEARCH



ජාතික විගණන කාර්යාලය
தேசிய கணக்காய்வு அலுவலகம்
NATIONAL AUDIT OFFICE



මගේ අංකය
எனது இல. }
My No. }

PSE/D/WRB/FA/05/2024/01

ඔබේ අංකය
உமது இல. }
Your No. }

දිනය
திகதி }
Date }

2025 May 30

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 2024 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 2024 comprising the statement of financial position as at 31 December 2024 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. My report will be tabled at the Parliament in due course as per Article 154(1) of the Constitution.

In my opinion, the accompanying financial statements give a true and fair view of the financial position of the Board as at 31 December 2024, 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) Even though, the book value of the items of 04 asset classes revalued by the Board as Rs. 295,178,532 during the period from 2016-2018 had been nil due to the end of useful life of the items, they were in use. It had not been disclosed, as per Para. 92 (a) of Sri Lanka Public Sector Accounting Standards No: 7.
- (b) Only 151 out of 1005 items belonging to 3 categories of assets namely laboratory equipment, geological instruments, computer and accessories owned by the Board have been revalued as Rs. 80,734,510 at the revaluation of property, plant and equipment and accounted as per Para. 49 of Sri Lanka Public Sector Accounting Standard No: 7, even though all the asset categories to which the said asset belong are required to be revaluated.
- (c) The assets should be depreciated from the date of utilizing the assets as per para. 69 of Sri Lanka Public Sector Accounting Standard No: 7. Since, 21 items purchased by the Board within year 2024 have been depreciated for the entire year disregarding the dates of purchasing them, they had been depreciated by Rs. 272,322 more than the actual amount to be depreciated.
- (d) As per para. 15 of Sri Lanka Public Sector Accounting Standard No: 7, in an instance where the entity intends to use main spare parts and standby equipment during more than one period and in case where spare parts and service equipment can be used only in respect of property, plant and equipment they should be accounted as property, plant and equipment. However, the Board had not recognized the spare parts with an estimated value/ cost of Rs. 1,147,913,000, which have a useful life of over one year and can be used for certain special machines and were received from projects and purchased by the Board, as property, plant and equipment and had been included in the final stock.
- (e) Even though, the value of the assets handed over to the Water Resource Board by the project of establishing a Ground water monitoring network which was completed on the 31st of December 2022 was Rs. 4,200,560,660 as per the report of the Committee for revaluating, the value of the assets included in the financial statements by the Board had been Rs. 4,076,781,551 in accordance with the information submitted for the audit. Accordingly, the assets with the values of Rs. 123,779,109 had been understated in the financial statements and the relevant reasons had not been mentioned. Further, it was observed at the physical inspection that the 02 Benz drilling machines received from the said project to the cost of Rs. 159,222,580 are parked without being used due to the huge maintenance cost and their big size.

- (f) The expired stock with the value Rs. 126,484,062 had been included in the final stock in the financial statements and the stock with the value of Rs. 110,565,524 was returned due to expiration and it was observed that it was not physically available.
- (g) The accounting policies used when measuring the stocks including the cost formula used in respect of the stocks in financial statements, total carrying value of the stocks, carrying amount in accordance with the classification suitable for the entity and stocks recognized as an expense relevant to the period had not been disclosed as per Para. 47 of Sri Lanka Public Sector Accounting Standard No: 09.

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 – 2024

The other information comprises the information included in the Board's 2024 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.

If I conclude that the other information is materially misstated based on the other information I have obtained before the date of this Audit Report and the tasks I have performed, I am required to report the same. I have nothing to report in this regard.

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 (i) (d) (iv) of the National Audit Act, No. 19 of 2018 except the observations in sections (a) and (b) 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 to make the following statements.

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 -----	Non-compliance -----
(a) 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 41 institutions were registered by the end of the year under review. 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. • A report including the data of all the deep and shallow tube wells newly built by the registered institutions should be submitted to the Board once in every 03 months. Accordingly, only one institution out of the 41 registered institutions have submitted only the technical details of 15 tubewells constructed for year 2024. However, action had not been taken to obtain the reports

	from the other 40 institutions, which were registered.
(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 to the Board for the approval. However, only 06 out of 25 institutions registered with the Board as at the 31st of December 2024 have submitted the above report.
(iii) Order 06	When using natural springs or deep or shallow ground water for agricultural and commercial agricultural purposes, the projects should be implemented as per the orders made by the Board and under its supervision as per Order I of Section 16 of the Act. All the institutions which are engaged in the construction of tube wells as indicated in Order 2 and 3, institutions engaged in the bottled water business and production of soft drinks should be registered in the Board. The quality reports in respect of the water source should be obtained from the Water Resource Board for commercial agriculture as per Order No: 4 and the Board has the power to do site inspections in this regard. Even though, legal action could have been taken against the public or provincial institutions or non-governmental organizations or persons as per Section 20 of the Water Resource Board Act No: 29 of 1964 revised by Act No: 42 of 1999, Board

	had not taken action in this manner in the year under review.
(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) Guideline 2.2.1 of the Guidelines for Corporate Governance of Public Enterprises introduced by the Public Enterprises Circular No: PED/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 Board accordingly.

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.

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) Approval had been granted by the Cabinet decision No: අමප15/1087/644/005 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. Secretary, Ministry of Irrigation had signed an agreement with an institution in Netherland on 03rd of October 2017 and the project had been completed on the 31st of December 2022. The Government of Sri Lanka has obtained a loan from a bank in Netherland to the value of 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%. The government had agreed to repay the balance 15% obtained by from the Hatton National bank of Sri Lanka after a concessionary period of 3 years

starting from the second half of year 2025 in 15 years. Even though, the project had been completed in 2022, construction of a data center, which was a main task of the project, had not been done. It was observed that the data center has been maintained inside the site office belonging to the Board.

- (b) Divisional Secretary, Thimbirigasyaya has informed the Board to pay the tax amount of Rs. 12,772,000 annually from year 2013 and obtain a annual tax permit for the land where the Head 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. 42,511,722 has been paid as the rental for the buildings from 2021 to 31st of December 2024.
- (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. Rs. 27,972,592 has been paid by the Board to the Authority as the rental for the period from year 2016 to 31st December 2024 without signing a lease agreement. 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. However, this land had been given on lease to the Bureau of Foreign Employment for a monthly rental of Rs. 460,000 from 1st of August 2023.
- (d) It was observed when examining the Action Plan of the Board for 2024 and its progress as at 31st of December 2024 that the physical and financial progress of the activity of ground water management and development of the Water Supply Scheme under the Ground Water Examination and Infrastructure Development Project implemented under the Treasury allocations are 68% and 22% respectively and the physical and financial progress of the activity of Strengthening the

ground water management of IWWRMP project implemented on the foreign grants under the Ministry of Irrigation are 34% and 13% respectively.

- (e) The entire approved cadre of the Board as at 31st December of the year under review was 414 and the actual cadre was 217. Accordingly, a deficiency of 197 officers/ employees of the staff of the Board (48% from the approved cadre) was observed that. 10 out of 12 posts of top management of the institution out of the posts included in the senior management level above remained vacant and 03 posts of General Manager and Deputy General Manager included in the same remained vacant. 18 out of 28 posts in the tertiary level remained vacant and 06 posts of Engineering Assistant remained vacant. Further, 105 out of 236 posts at primary level remained vacant.

Even though, 24, 26, 40 and 23 officers were attached to North Central Province, Puttalam, Moneragala and Jaffna respectively when considering the number of employees attached to the divisional offices, cadre for the said offices had not been identified separately.

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 2024 in terms of Section 12 of the National Audit Act No: 19 of 2018

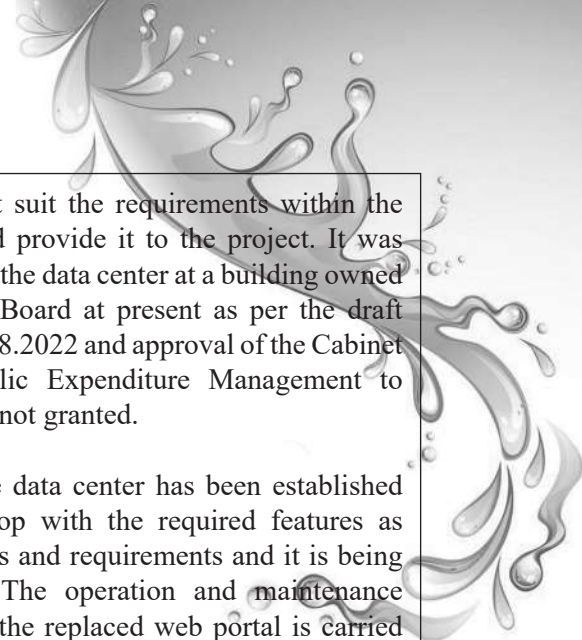
Audit Observations	Statement of the Management
ii Since the useful life of items belonging to 4 asset categories, which have been revalued as Rs. 295,178,532 within the period from 2016– 2018 by the Board and are still in use, has been over, the book value was nil as at 31st of December 2024 and the said assets have not been revealed as per Para. 92 of Sri Lanka Public Sector Accounting Standard No: 7 (b).	There are 197 vacancies in the staff of the Water Resources Board and the Water Resources Board has found it practically difficult to get employees to perform other work in addition to their daily duties due to the minimal number of officers with technical knowledge. Furthermore, the Water Resources Board possesses a large amount of assets which is found in provincial offices and drilling sites. Although the Water Resources Board attempted to conduct the revaluation in the previous years, it was impossible due to the above reasons and the difficulty in engaging external parties. However, action will be taken to work to do these revaluations step by step by engaging external parties and to make the necessary disclosures in the financial statements in future. (Accounts Division)
(b) Although, in accordance with paragraph 49 of Sri Lanka Public Sector Accounting Standards 7, the entire asset class to which the assets belong should be revalued when revaluation of property, plant and equipment, out of 1,005 items belonging to the three asset classes of laboratory equipment, geological equipment, computers and accessories owned by the Board, only 151 items had been revalued at Rs. 80,734,510 as at 30th October 2023.	During year 2023, assets at the Provincial Offices of Puttalam, Monaragala and Anuradhapura of which the useful life time had ended, were revalued. Although the Water Resources Board attempted to revalue assets in Jaffna, Ratmalana and the head offices, it was not possible to carry out the task due to the staff shortages and difficulties in engaging external parties. However, action will be taken to do the revaluation step by step engaging external parties in future. (Accounts Division)
(c) Although an asset should be depreciated from the date of use as per paragraph 69 of Sri Lanka Public Sector Accounting Standard 7, the Board had depreciated 21 assets purchased during the year 2024, Rs. 272,322 more due to depreciation for the year itself, irrespective of the dates of purchase.	I accept it. It has been noted to make the rectifications when preparing the financial statements for the year 2025. (Accounts Division)
(d) Although an asset should be depreciated from the date of use as per paragraph 69 of Sri Lanka Public Sector Accounting Standard 7, depreciation has been calculated in relation to 21 assets purchased during the year 2024, Rs. 272,322 more due to depreciation for the year itself, irrespective of the dates of purchase. Details are as follows;	The basis of accounting the full depreciation relevant to the year in which the assets were acquired was used to calculate depreciation when preparing the financial statements for the year 2024. It is kindly informed that an appropriate depreciation policy will be prepared for the assets of the Water Resources Board in terms with S.L.P.S.A.S. 7 and implemented with the approval of the Board of Directors in future. (Accounts Division)

(e) According to the report of the committee for revaluation of the assets handed over to the Water Resources Board by the project of establishing a Ground water monitoring network that was completed on the 31st of December 2022 was Rs. 4,200,560,660, but according to the information submitted for audit, the value of the assets included in the financial statements by the Board was only Rs. 4,076,781,551. Accordingly, assets amounting to Rs. 123,779,109 were understated in the financial statements and the reasons for this had not been presented to the audit. Further, it was observed during the physical inspection that 02 Benz excavators received from the above project which cost Rs. 159,222,580, had been parked unused and underutilized due to high maintenance costs and the size of the 02 machines.	I accept it. You are kindly informed that the spare parts that can be used for the special machinery of the Water Resources Board will be removed from the stock and included in the relevant assets in accordance with Section 15 of the S.L.P.S.A.S. 7 in the future. (Accounts Division)
(f) The closing stock included in the financial statements included expired stock worth of Rs. 126,484,062 and stock worth of Rs. 110,565,524 out of this had been returned due to expiration and it was observed that it did not exist physically.	You are kindly informed that the expired goods that have been returned to the agency will be formally removed from the books under the approval of the Board of Directors.
(g) In accordance with paragraph 47 of Sri Lanka Public Sector Accounting Standard No. 09, the financial statements had not disclosed the accounting policies used in measuring inventories, including the cost formula used for inventories, the total carrying amount of inventories, the carrying amount according to classifications appropriate to the volatility and the value of inventories recognized as an expense for the period.	I accept it. You are informed that action will be taken by the Water Resources Board in future to prepare a policy with regard to appropriate stock administration activities in accordance with S.L.P.S.A.S. 9 and accordingly make necessary disclosures when preparing the financial statements. (Accounts Division)
2.2. 2 (a) Orders published by the Minister through Gazette Extraordinary No. 2010/23 dated 16th March 2017 as per Section 16 of the Water Resources Board Act No. 29 of 1964. (1) Order 02 1. Although all the institutions engaged in the construction of tube wells should be registered with the board, only 41	All drilling companies registered with the Water Resources Board up-to-date were notified in writing on 14.12.2023 to renew the registration of their drilling machines for the year 2024. Subsequently, the 1st reminder was sent by letter

institutions had been registered by the end of the year under review. The board did not have a proper process to ensure that the institutions which were not registered / not renewed the registration are not constructing tube wells and to identify the institutions which are not registered with the board. 2. A report should be submitted to the Board by the registered institutions every 3 months containing data on all the newly constructed deep or shallow tube wells. Accordingly, out of the 41 registered institutions mentioned above, only one institution had submitted the technical details of 15 tube wells constructed for the year 2024 to the Water Resources Board. However, no action had been taken to obtain the reports that were required from the other 40 registered institutions.	dated 11.03.2024 to the drilling companies that had not registered by the end of February 2024. Accordingly, 41 drilling companies and 50 drilling machines belonging to them were registered for the year 2024. Since the existing Water Resources Board Act does not contain sufficient provisions to take relevant legal action against unregistered drilling companies, efforts were made to include relevant matters in the amendment of the Water Resources Board Act. In addition, all Provincial Chief Secretaries, District Secretaries and all the Heads of Departments including the Inspector General of Police have been informed through Water Resources Board Circular 2024-01 that when constructing a tube well, the relevant drilling work should be carried out using a drilling machine registered with the Water Resources Board and steps have been taken to systematize tube well drilling work.
(II) Order 03 If a government or local government institution or non-governmental organization or institution or individual engaged in the water bottling industry and beverage production utilizes a natural water source or groundwater for its production activities, it is required to have a water sample from that water source tested by a government-recognized laboratory every 6 months and submit the relevant analysis report to the Board for approval. However, only 6 institutions were registered with the Board as at the 31st of December 2024.	A reminder has been sent in writing to the relevant institutions on 01.02.2024 and 21.06.2024 to submit analytical reports on the quality of the water sources used by any state or local government institution or any other institution engaged in water bottling and beverage production to the Water Resources Board. Accordingly, laboratory analysis reports of water have been submitted by 36 institutions engaged in bottling water and production of beverages to date. Further, steps have been taken to identify the defects of the Water Resources Board Act and make amendments to the same in order to take legal action against institutions or individuals who do not take action in accordance with Order 03.
(III) Order 06 In terms of Order 1 relevant to Section 16 of the Act, projects utilizing natural water sources or deep or shallow groundwater for agricultural and commercial agricultural purposes must be implemented under the supervision of the Board and in accordance with the orders made by the Board. All establishments engaged in the construction of tube wells,	Since there is no Legal Officer in the Water Resources Board at present, we have not received any instruction regarding the letter we sent to the Attorney General on 06.09.2024 seeking advice on the action that can be taken as per Order 06 against those who do not comply with the above orders indicated in the Gazette Extraordinary No. 2010/23. However, steps have been taken to recruit a legal officer to the Board and to amend the Water Resources Board Act by identifying the defects in the same. (Ground Water Regulatory Division)

water bottling industry and production of beverages included in orders 2 and 3 must be registered with the Board. According to Order No. 4, quality reports related to water sources for commercial agricultural industry must be obtained from the Water Resources Board and according to Order No. 5, the Board has the right to inspect those locations. Although legal action can be taken against state or local government institutions, non-governmental organizations or individuals who act against the said orders in terms of Section 20 of the Water Resources Board Act No. 29 of 1964 amended by Act No. 42 of 1999, the Board had not taken action in the said manner in the year under review. (b) Sections 10 and 11 of the Employees' Provident Fund (Amendment) Act No. 26 of 1981 Employer contribution to the fund should be 12 percent and employee contribution should be 8 percent and a higher rate 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.	Steps have been taken to send the O forms to the Employees' Provident Fund and the Department of Labor has informed that the employer-employee contribution ratio should be 2:3. The Water Resources Board has requested information from the Department of Labor with regard to the provisions of the Employees' Provident Fund Act for this purpose. After receiving answers in this regard, further steps will be taken based on the instructions of the Board of Directors. (Administrative Division)
(c) Guideline 2.2.1 in Guidelines on Corporate Governance for State-Owned Enterprises introduced by Public Enterprise Circular No. PED/ 01/2021 dated 16th November 2021 Action had not been taken to determine the key performance indicators or prepare a corporate plan for the Board or guide the Board accordingly.	An Organizational Result Framework (ORF) was prepared for the period from 2022-2027, with 2022 as the base year and accordingly, annual action plans are prepared and activities are carried out in accordance with the performance indicators and long-term goals included therein.
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.	As stated in the Gazette Extraordinary No. 2016/23 issued by the Water Resources Board dated 16th March 2017, "The construction of tube wells should be carried out in accordance with the instructions given by the Water Resources Board and the relevant approval should be obtained after accurately assessing the amount of water that can be extracted from it under the supervision of the Water Resources Board so as not to harm the environment". At the time of issuing this Gazette, groundwater surveys

	have been carried out by the Water Resources Board, the Groundwater Division of the Water Supply and Drainage Board and external Geologists. Before constructing a tube well, a groundwater survey has been conducted first and a report has been submitted to identify the appropriate location and method for constructing the tube well. Since the Gazette states that the instructions given by the Water Resources Board for the construction of tube wells should be followed, the reports issued in the above manner have been obtained from the Water Resources Board and steps have been taken to prepare the relevant methodology for the construction of tube wells in accordance with the relevant recommendations and instructions. Under this system, steps have been taken to identify a group of Geo-hydrologists who can provide groundwater survey reports and to adapt the regulatory system, taking the situation existing at that time in to consideration. Accordingly, necessary steps were taken to register external Geohydrologists, other than those in the Water Resources Board strictly to select a suitable location for constructing a tube well and submit the relevant reports to the Water Resources Board for approval. Further, the relevant application form has been introduced and action is being taken accordingly in order to properly regulate the construction of tube wells, Further, the Water Resources Board Act has been amended to include the necessary provisions for the regulation of external Hydrologists and action is being taken to send the same to the Ministry for approval. (Ground Water Regulatory Division)
2.3 Approval had been granted by the Cabinet decision No: අම/15/1087/644/005 dated 29th July 2015 to implement the pilot project of establishing a Ground Water Monitoring Network in 4 selected districts of Anuradhapura, Polonnaruwa, Monaragala and Puttalam, where kidney disease is prevalent. The Secretary, Ministry of Irrigation had entered into an agreement with an institution in Netherlands on 3rd October 2017 to implement the project and the project had been completed on the 31st of December 2022. 85 percent from the cost of this project, which was EUR 20,629,921.18 or Rs. 5,521,329,000, was to be repaid in 20 equal installments over 10 years from a bank in the Netherlands at a concessional interest rate of 1.45 percent per annum, while the government had agreed to pay the remaining 15 percent from the Hatton National Bank of Sri Lanka over 15 years	When the contract for this project was signed between the main contractor and the Ministry of Irrigation in 2017, a building in extent of 6000 sqft was to be constructed at Hector Kobbekaduwa Mawatha, where the office of the Water Resources Board office is located, to establish a data center, which was one of the sub-activities of the project. Even though, there was no issue in this regard in 2018 when the project commenced, the Water Resources Board lost a permanent head office in 2021 due to the acquisition of the said land by the Urban Development Authority. As a result it was planned to construct the data center in extent of 24,000 sqft including the head office, in a land in Battaramulla that the Urban Development Authority had agreed in writing as a policy decision. Construction could not begin until the project was nearing completion (December 2022) since the Urban Development Authority did not submit a proper lease agreement even by July 2022. 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 Eijkelpkamp Institute, Netherland, the project contractor, to



starting from the second half of year 2025 after a concessionary period of 03 years. Even though, the project had been completed in 2022, the construction of the building for the data center, which was a key function, had not been completed and it was observed that the data center was being maintained in a part of the workshop belonging to the Board.	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 was not granted. 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. The operation and maintenance of this data system and the replaced web portal is carried out by the contracting company in Netherlands from 31.12.2022 to 30.12. 2027 with the Water Resources Board central to the established data centers of the Board as per the project contract. The real-time data on the fluctuations in the groundwater aquifers measured by 190 automatic groundwater monitoring systems installed in the Maduru Oya, Kumbukkan Oya, Malwathu Oya river basins and in the Puttalam and Jaffna peninsula are automatically measured once an hour, including groundwater level, salinity (electrical conductivity), groundwater temperature and other technical data and are filed at data centers through a web portal designed for this purpose. Further, data collected once an hour by rainfall instruments installed taking the climatic conditions in each area into consideration, is transmitted to the data system established by the Water Resources Board in order to measure rainfall, which is the main factor affecting the existence of groundwater in Sri Lanka. The main long-term objective was to analyze these groundwater levels and chemical changes through a centralized operational unit and use them as baseline information for the management, regulation and sustainable development of the groundwater in country as well as for national water policies and regulations. Based on the said data and information, the analyses and forecasts carried out in this regard have led to the Water Resources Board compiling future programs into plans according to national and regional needs for the development of groundwater resources in the country and sustainable management strategies as short-term and long-term plans. Several programs have already been implemented by the Water Resources Board and more programs are currently being implemented concurrently to the same. Under this, plans have also been made to use the research and studies carried out by the Water Resources Board regarding groundwater for its activities. The officers of Water Resources Board is currently carrying out the operational and management activities with the
---	---

technological and maintenance support of the experts in technology from Netherlands as per the contract along with the training sessions on the operational processes and features of this web portal based on the information obtained from the online web portal at the data center established at Ratmalana premises.

Several groundwater recharge systems have already been implemented under UNICEF grants in coordination with the Department of National Community Water and the National Water Supply and Drainage Board in connection with major drinking water projects, based on real-time information received from the project. Further, the Water Resources Board is currently planning to provide recommendations based on this information to other major drinking water projects, which are heavily extracting groundwater, for sustainable management of groundwater resources.

Similarly, the Ministry of Irrigation, under the Integrated Watershed and Water Resources Management Project (IWWRMP) funded by the World Bank, has initiated plans to implement this real-time information system in seven river basins, including the districts where it is being implemented, for groundwater resource development (groundwater recharge methods-MAR) and management strategies. Accordingly, these analyses of information are also used to establish recharge systems in water schemes that heavily extract groundwater resources in those regions. Further, these groundwater levels and chemical changes/behavior are mainly used by the Water Resources Board, as a groundwater regulatory body, for the regulation of groundwater resources in those regions and in future planning. The preparation of the Groundwater Atlas of Sri Lanka, a national summary of the groundwater resources of the country, has been completed and this real-time information was used to prepare the country's hydrogeological maps for this purpose.

As an institution working for the management, regulation and sustainable development of groundwater resources, the Water Resources Board is currently formulating a National Groundwater Policy for Sri Lanka with the involvement of the Ministry of Water Supply. The data obtained through these real-time groundwater monitoring systems is very useful for the basic information on the groundwater resources of the country required for this purpose.

Furthermore, this real-time information is also used in the environmental assessments and processes of making recommendations related to groundwater carried out by the Water Resources Board regarding development activities or water resources which are important at national level

	and a secondary function is to provide data for decision makers, researchers, stakeholders and the general public in appropriate ways to make them aware in this regard. A brief summary of the project and a dashboard of real-time data related to the groundwater monitoring network have been prepared for initial reference (observation) for any study or other party under the GWMNP tab on the website of the Water Resources Board and more details can be obtained through the email address according to the Water Resources Board data provision methodology. Further, external parties can access the public dashboard and observe this data within a limited range, in order to gain a proper understanding of the data maintained at Water Resources Board and the data that needs to be requested, through the link https://grondwater.webscada.nl/gwmn/.
(b) Even though, the Board had been informed by the Divisional Secretary, Thimbirigasaya to pay an annual tax of Rs. 12,772,000 from year 2013 and obtain tax license for the land at Hector Kobbekaduwa 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 mainlined for around 45 years had been handed over 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. 42,511,722.00 had been paid as the rental for the building from year 2021 to 31st of December 2024.	Instructions have been given to obtain a tax license annually by paying an annual lease amount of Rs. 12,772,000/- from year 2013 for the land located at Hector Kobbekaduwa Mawatha, Colombo - 07, where the Head Office of the Water Resources Board has been maintained and Divisional Secretary, Thimbirigasaya has informed to pay the tax for the period from 27.06.2013 to 31.12.2017. The Ministry of Megapolis and Western Development has submitted a Cabinet Memorandum to take over the said land under the Urban Development Authority in accordance with the City of Colombo Development Plan and to provide a land at Denzil Kobbekaduwa Mawatha under Section 6 (1) of the Land Ordinance. The approval of the Cabinet of Minister has been granted for the said Cabinet Memorandum. Accordingly, no tax payment has been made for the said land after 31.12.2017 and the Head Office of the Water Resources Board has been maintained on the said land until a building was constructed at Denzil Kobbekaduwa Mawatha. Meanwhile, they were forced to vacate the land on the instructions of the Prime Minister's Office. Further, Divisional Secretary, Thimbirigasaya has issued a quit notice on 09.05.2019. Accordingly, a complaint has been filed under the eviction order in accordance with the summons dated 26.11.2019 with regard to Case No. 18935/5/19 of of Divisional Secretary, Thimbirigasaya.
(c) It had been decided to provide a land in extent of 40 perches located at Denzil Kobbekaduwa Mawatha, Battaramulla, which belongs to the Urban Development Authority, to the Water Resource Board for a period 30 years by the Cabinet decision No:අමප/16/2500/724/099 dated	Even though, the physical possession of the 40-perches of land located at Denzil Kobbekaduwa Mawatha, Battaramulla had been handed over to the Water Resources Board from 10.10.2016, the said land had been transferred to the Urban Development Authority through a certificate of transfer of authority under Section 44 of the Land Acquisition Act and the relevant lease agreement has been delayed until the

06th of December 2016. An annual tax amount of Rs. 2,700,000 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. 27,972,592 as the rental to the Urban Development Authority from 2016 to 31st December 2024 without signing a lease agreement with the Urban Development Authority for the said land. Event though, allocations had been made since 2018 for the construction of the Head Office building on this land under the pilot project for the establishment of a ground water monitoring network, it had not been possible to use it due to the failure to enter into a formal lease agreement. However, this land had been sub-leased to the Sri Lanka Bureau of Foreign Employment from 01st of August 2023 for a monthly rental of Rs. 460,000.

transfer of the land to the Urban Development Authority is completed in accordance with the law under Section 6 (1) of the Government Lands Ordinance.

Since the Urban Development Authority pays annual rental for that land based on physical possession, an annual agreement has been signed with the Sri Lanka Bureau of Foreign Employment for a parking lot based on the decision of the Board of Directors. (Administrative Division)

(d) It was observed when examining the Action Plan of the Board for year 2024 and its progress as at 31st of December 2024 that the physical and financial progress of the groundwater management and development activity of the Water Planning Scheme under the Groundwater Study and Infrastructure Development Project implemented under Treasury allocations is 68 percent and 22 percent respectively from the expected level and the physical and financial progress of the activity of strengthening the groundwater resources management of the Integrated Watershed and Water Resources Management Project implemented under the Ministry of Irrigation under foreign grants is 34 percent and 13 percent respectively.

The clients who obtain estimates for the services of the Water Resources Board deposit money directly into the bank account of the Water Resources Board and it has not been possible to issue receipts since they have not submitted the deposit slips to the Water Resources Board. The client who has deposited the amount of Rs. 87,637 in the bank in December 2024 has made the relevant clarifications and settled the matter. (Accounts Division)

(i) Field inspections have been carried out at the relevant locations after identifying the locations, where there are currently hazardous or problematic conditions regarding the quantity and quality of groundwater obtained for the water supply schemes. The high water requirement in many locations during the measurement of well efficiency and safe water capacity for sustainability made it difficult to use those water sources for testing purposes. Since the community water supply had to be continued, the relevant water sources could not be used for water capacity testing. Therefore, financial progress and physical progress remained at 22% and 68% respectively.

- The total physical progress of the Groundwater Resources Management Strengthening Project of the Integrated Watershed and Water Resources Management Project implemented on foreign grants under the Ministry of Irrigation was 34% and the total financial progress was Rs. 13.3 million as at 31.12.2024. The Board has achieved a physical progress of 63% and financial progress of Rs. 13.3 million in relation to the field activities carried out.

(e) The total approved staff of the Board was 414 and the actual staff was 217 as at 31st of December of the year under review. Accordingly, a shortage of 197 officers/employees, i.e. 48 percent of the approved number of posts, was observed in the staff of the institution. Out of the posts included in the above senior level, 10 out of 12 top management posts in the institution had been vacant. 18 out of 27 posts at tertiary level had been vacant and all the 06 posts of Engineering Assistant remained vacant. Further, 105 out of 236 posts at primary level remained vacant. In considering the number of employees attached to each divisional office, 24 were attached to the North Central Province, 26 to Puttalam, 40 to Moneragala and 23 to Jaffna, but the cadre had not been identified separately for the said offices.	Since the project procurement process is carried out by the Project Management Unit (PMU), the delay in the procurement of chemical materials that should have been obtained through it, the delay in carrying out the related chemical analyses and delays in other procurement processes resulted in the overall physical progress being reported as 34% and the overall financial progress as Rs. 13.3 million (No financial progress was made in the year 2024 related to the procurement process.) Further, in a situation where the Water Resources Board had to focus more on field inspections related to study projects, activities of groundwater resource regulation and environmental issues, the need to engage more Geohydrologists for the said activities made it difficult to achieve the desired field work goals of this project.
	This table (from (e) i to (e) iii) provides details on the approved and actual cadre of the Water Resources Board as at 01.04.2025. Even though, a large number of posts had been vacant due to various reasons such as retirement, resignation, no-pay leave of officers etc, recruitment had not been made so far as per the National Budget Circular No. 03/2022 issued on 26.04.2022 under Public Expenditure Management. Even though, requests have been made to the Committee for Reviewing Recruitments from time to time to make recruitments for essential posts, approval has not been granted for recruitment yet. Employees have been attached to each divisional office based on the service requirement arising when performing the tasks of the Water Resources Board. The officers, drivers and labourers required for the activities in the divisions of drilling, groundwater and laboratories cannot be permanently attached to a particular place of work and the number of employees working at the provincial office in this regard is determined based on the service requirement. It is kindly informed that necessary action will be taken in the future to specifically identify the employees who are essential to be present.

Progress of the year 2024 and Action plan for the year 2025 -Water Resources Board

The Water Resources Board is the mandated regulatory agency and responsible institute for management of groundwater resources of the country. According to the Water Resources Board Act No. 29 of 1964 and the Amended Act No. 42 of 1999, the legal power has granted to carry out the necessary activities to protect, develop and sustainable management the groundwater resources for future generations. Also, the extraordinary gazette no: 2010/23 published on March 16, 2017 has empowered the Water Resources Board to regulate groundwater conservation and prevent misuse of groundwater. Accordingly, at present the necessary activities are being carried out to regulate the groundwater resources in the country.

Hydrogeological investigations & inspections are carried out for mining projects such as rocks, soil/gravel, sand and other minerals including gems to assess the possible impact on the existing groundwater resources in the relevant mining areas and giving necessary recommendations to minimize the impacts where Water Resources Board is jointly worked together with Geological Surveys & Mines Bureau, Central Environment Authority and other relevant stakeholder institutions. In year 2024, Water Resources Board has delivered the necessary recommendations for conservation or minimizing the impacts on groundwater resources at 216 nos. of such mining projects within the country. To ensure the security of the groundwater resources as per the scope of the Institution, this program is scheduled in year 2025 as well, expecting to involve in 300 nos of such incidents with an budgetary estimate of Rs. Mn. 1.5.

Depending the necessity of information on groundwater resources of the country for its management & regulations, several monitoring & research oriented projects are being carried out with the assistance of Treasury, World Bank and UNICEF. These projects include of studying and mapping the hydrogeological conditions of the various regions of the country and to studying the quantitative and qualitative variations of groundwater resources in the existing groundwater aquifers. The groundwater resources regulation, management, development and other strategic actions are implemented with these base information & data obtained through research and monitoring projects.

At present, a long-term monitoring system with 952 monitoring stations covering 40% of country has been established to study groundwater quality and groundwater level variations with in the major aquifer formations. Through these long-term monitoring systems, information on groundwater resources quality & groundwater level variation is obtained twice a year (Biannual) with necessary field activities and laboratory analysis. There were 1200 water samples were analyzed during the year 2024, on two occasions and the hydrogeological conditions of the area were studied with the variation in groundwater levels.

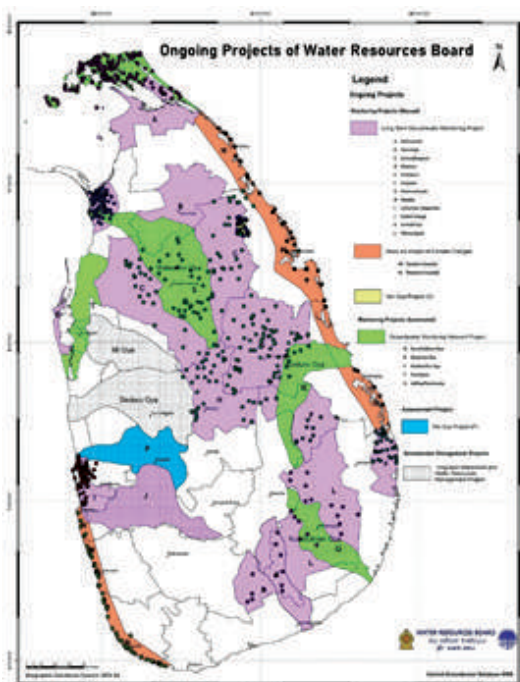


Figure 1: Long-term groundwater monitoring network

It is expected to expand this monitoring system to the extent of 50% (by land coverage) by the end of 2025 to study the behavior and trends of groundwater resources and the necessary remediation measures are taken to increase the efficiency of regulation and management of the groundwater resources for ensuring the resources sustainability in long term basis. Since water is the most important factor in the national development projects expected to be carried out in the country, this research & monitoring information on groundwater is vital in the management decision prior to the implementation for appropriate planning of such projects to avoid the waste of both resources & financing. (Estimated cost in Rs. Mn. 6.00)

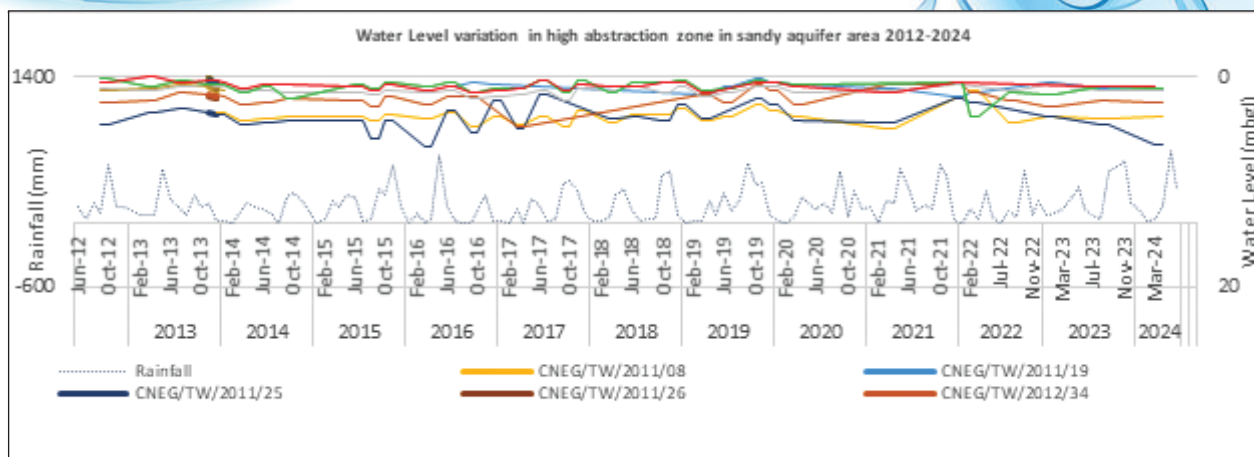


Figure 2: Groundwater level variation in high abstraction zone (Katunayake Export Processing Zone) within the western coastal sandy aquifers of the country (2012-2024)

The acquisition of real-time groundwater level and quality data collection through the established real-time monitoring networks was set up at 190 monitoring stations covering 03 river basins and 02 groundwater sensitive areas (Malwathu oya, Maduru oya, Kumbukkan Oya, Jaffna & Puttalam) in Sri Lanka. The groundwater level, groundwater electrical conductivity and rainfall data is monitored on hourly basis (High resolution data). The detail & comprehensive analysis based on this high resolution data is supported to assess the aquifer behavior in close for its changes & variations. This enables for development of implementation strategies & planning under the main scope of the groundwater resources management & regulations by the Institution. Further, these information supported for in-depth research analysis for the researchers and policy development related to water sector or developing of a national groundwater policy for the country.

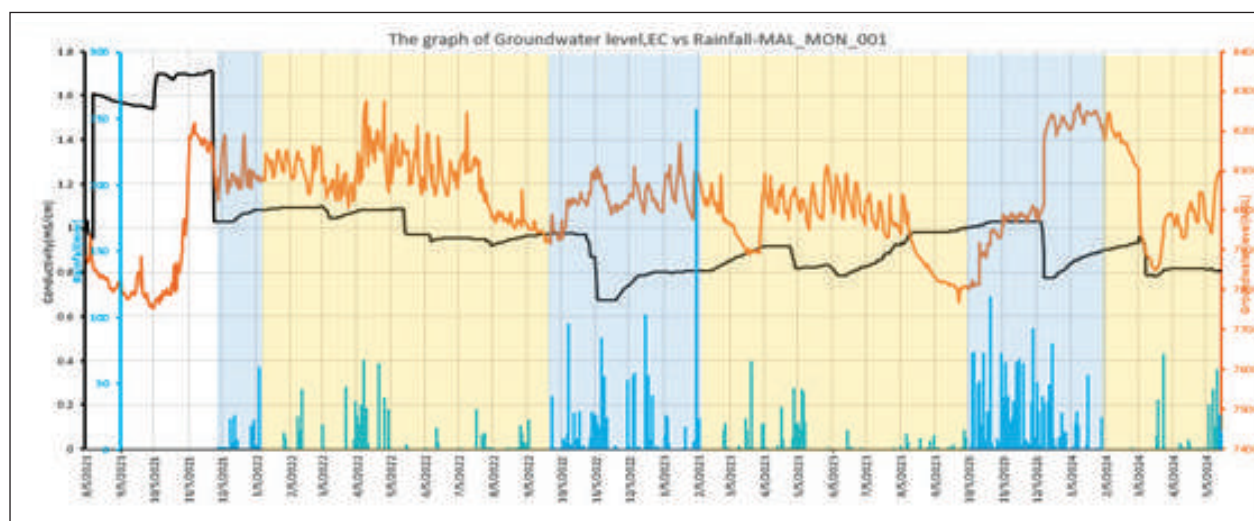


Figure 3: Real-time information of Groundwater level, electrical conductivity & rainfall variation of a monitoring station established near to the aquifer system where heavily utilized by community water supply scheme in Malwathu Oya river basin.

The adverse impact by climate changes on the coastal aquifers of the country is at the highest vulnerable level since Sri Lanka is identified as the most vulnerable country by the climate changes in the global context. As a readiness program, the coastal aquifer system along coastal line of the country is monitored qualitatively & quantitatively for assess its variation and trend patterns. These findings are directed for the regulation of groundwater abstraction and salinity control for its sustained management to conserve the groundwater resources while preventing contamination. This is scheduled to be continued by the year 2025, with an estimated cost of Rs. 2.00 million.

A project was launched in 2024 with the aim of identifying appropriate mechanisms and management plans for the qualitative and quantitative improvement and management of groundwater resources, which have been recognized as potential risk factors in water supply schemes operating through groundwater. The project is being implemented in the Anuradhapura, Puttalam, and Monaragala regions during its initial phase. It is scheduled to continue its operations in 2025, with an estimated cost of Rs. 1.00 million.

It is crucial to have frequent statistical data on existing groundwater resources for their proper management and mapping. To collect such data regionally, a program has been initiated, which is being implemented primarily in the Western and North Western Provinces, areas that are extensively involved in commercial groundwater extractions. This program is also scheduled to continue in 2025, with an estimated cost of Rs. 8.4 million.

In 2024, as part of emergency response measures related to the water sector (such as drought, flooding, and groundwater contamination), groundwater exploration, construction of wells, and water capacity testing were carried out based on the needs of communities in identified disaster-affected areas. Additionally, as a phase of this project, a study on water quality and the identification of sensitive sources is planned to continue in 2025. This will allow for the identification of sensitive sources as needed during local development processes, enabling the formulation of a management plan for the conservation of these resources in the respective regions. The estimated cost for this in 2025 is Rs. 4.00 million.

There has been insufficient study conducted so far on the water springs, which play a crucial role in meeting the environmental and social water needs of the country, and no systematic mapping of these springs has been carried out. Therefore, an allocation of Rs. 1.4 million has been made for the mapping of natural water springs in Sri Lanka in 2025. This will facilitate the long-term planning for the conservation and management of these groundwater resources.

Under the study of all water resources in Sri Lanka, a phased research project is planned to assess the water quality of surface water bodies in the country and identify sensitive water sources. This will allow for the development of proper management plans for the conservation of these resources in the respective regions as needed, particularly in local communities and development processes. Additionally, it will be important to plan appropriate solutions and methods for addressing challenges faced by water sources in emergency situations. The estimated cost for this project in 2025 is Rs. 4.00 million.

For the year 2025, Rs. 170 million has been allocated under the World Bank funds to regulate, control, and manage groundwater extraction, ensuring sustainable development while preserving the country's environmental balance. This funding will support field operations, geological equipment, and the enhancement of institutional infrastructure. The primary objectives include collecting essential information for groundwater regulation and management, identifying groundwater sources to meet national drinking water, agricultural, industrial, and other needs, and addressing water shortage-related disasters. Additionally, the initiative involves conducting surveys and mapping of natural springs, recharging groundwater extraction points, providing recommendations for drilling and other projects that may impact groundwater, and strengthening groundwater resource management through research and studies.

In addition, during the year 2024, groundwater regulation activities and related services were carried out, including hydrogeological surveys, providing study reports on potential impacts on groundwater, conducting water capacity tests, and constructing tube wells. These activities generated Rs. 93.22 million in revenue. For the year 2025, the estimated revenue from these activities is projected to be around Rs. 90 million.

The budgetary provision for the research studies from the treasury funds was 15 Mn for the year 2024 and utilized 12.97 Mn. The groundwater resources recharge pilot study and strengthening activities for groundwater management in selected river basins were funded by UNICEF (through Ministry of Water Supply) and World Bank where financially achieved 100% and 22.6 % from the estimated of 2.5 Mn and 60.21Mn respectively. The annual income generated by the regulations and regulation related service activities were 93.22 Mn achieving 85% of the set target 109.28 Mn for the year 2024.

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

1. Accounting the assets and inventory items, which have been provided by various projects to the Water Resources Board, in accordance with Sri Lanka Public Sector Accounting Standards.
2. Making arrangements to revalue the assets of the Water Resources Board that are still in use and have zero value.
3. Making arrangements to further regularize inventory management activities and to include spare parts related to specific asset category in the same in accordance with the Sri Lanka Public Sector Accounting Standards.
4. Other accounting deficiencies pointed out in the report of the Auditor General have been rectified in accordance with the Sri Lanka Public Sector Accounting Standards.

Action taken in 2024 to increase the performance of the Water Resources Board

1. Taking action to identify the shortcomings in the existing Water Resources Board Act and make necessary amendments in regulating all the parties involved in the extraction of groundwater and working towards the protection of groundwater.
2. Issuing a circular (Water Resources Board Circular 01/2024) on the methodology to be followed in constructing a deep tube well and obtaining water from it in terms of the Water Resources Board (Amendment) Act No. 42 of 1999 and the Gazette Extra Ordinary No: 2010/23 to the Secretaries of Ministries, District Secretaries, Provincial Chief Secretaries, Heads of other relevant government institutions and Inspector General of Police with the aim of informing public institutions on activities of regulating groundwater.
3. Following up and obtaining data on the institutions registered with the Water Resources Board and the amount of water abstracted from the water sources in 2024 in order to monitor whether water is abstracted in accordance with the recommendations given by the Water Resources Board for water sources in places where groundwater is abstracted for commercial purposes.
4. Long-term assessment of the quality and quantity of groundwater sources in Sri Lanka, selecting coastal areas that are sensitive in relation to groundwater and where climate change may have an impact on groundwater quality.
5. Preparing two groundwater recharge systems under UNICEF funds for two water sources identified through data analysis with the aim of recharging the aquifers of the water sources that draw water for the rural water supply schemes in Sri Lanka by extracting groundwater and following up on their effectiveness.
6. Making necessary recommendations for the development of groundwater management plans to be adopted to ensure the long-term sustainability of the water sources from where the water is extracted for the rural water supply schemes.