PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES

PCRWR

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ANNUAL REPORT 2022-23

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(PCRWR), Khayaban-e-Johar, H-8/1, Islamabad

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ANNUAL REPORT 2022-23

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FOREWORD

Pakistan stands at a crucial juncture regarding water security. Our country, blessed with significant water resources, is now grappling with the impacts of climate change, increasing demand due to population growth, and the need for sustainable water management practices. The challenges are manifold – from depleting groundwater reserves to the reduction in the flow of our major rivers, all exacerbated by changing climate patterns. These issues are not just environmental but have far-reaching economic and social implications.

In response to these challenges, PCRWR has been at the forefront of research and implementation of innovative water management strategies. Our work this year has focused on several key areas: enhancing the efficiency of water use in agriculture, which consumes the majority of our water resources; improving water quality monitoring to ensure safe and clean water for all Pakistanis; and developing community-based approaches to water management that are both sustainable and equitable.

Our research initiatives have led to the development of new technologies and practices, such as the introduction of drought-resistant crops, low-cost water filtration systems, and efficient irrigation techniques. These efforts are critical in our aim to maximize the utility of every drop of water.Moreover, PCRWR has actively engaged in national and international collaborations, recognizing that water issues are not confined by borders. Through partnerships with various organizations, we have been able to leverage global expertise and resources, bringing the best practices in water resource management to Pakistan.

As we look to the future, our commitment remains unwavering. We understand the urgency of addressing Pakistan's water challenges, and we continue to work tirelessly towards ensuring a water-secure future for our nation. This report highlights our accomplishments, ongoing projects, and future initiatives, and I am confident that it will serve as a testament to PCRWR's dedication and resilience.

Dr. Muhammad Ashraf
Chairman, PCRWR

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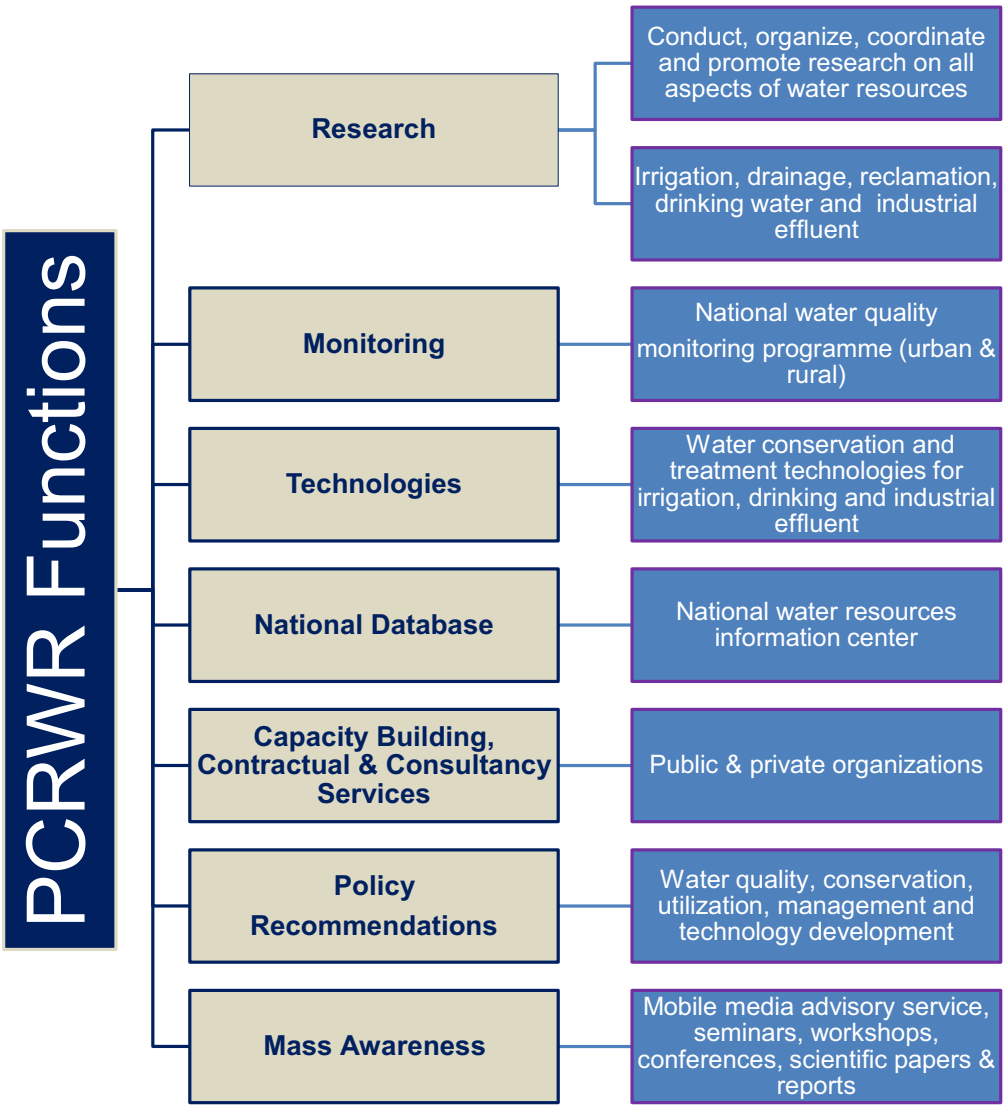
About PCRWR

Introduction

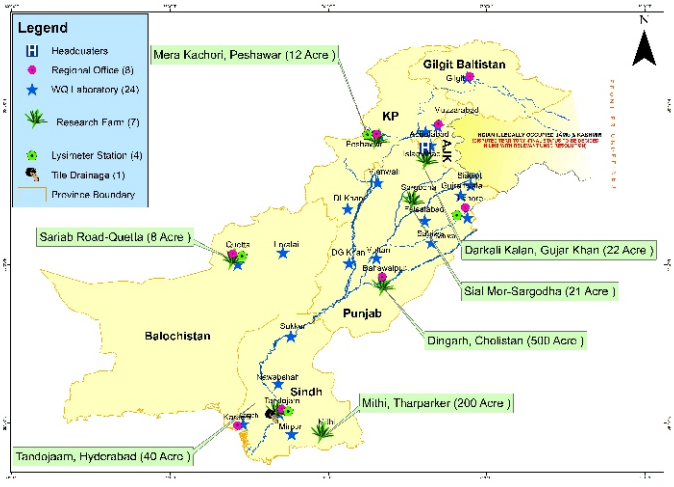
Pakistan Council of Research in Water Resources (PCRWR) was established in 1964 and is working as a body corporate vide PCRWR Act 2007. The council has been an apex body of ministry of science and technology till May, 2022 and was transferred under the administrative control ministry of water resources in May, 2022. It is mandated to conduct, organize, coordinate and promote research on all aspects of water resources. The functions assigned to PCRWR are given below:



Research Establishments

PCRWR has played its role, as a leading water sector research and development (R&D) organization through a well-established state of the art research and dissemination infrastructure:

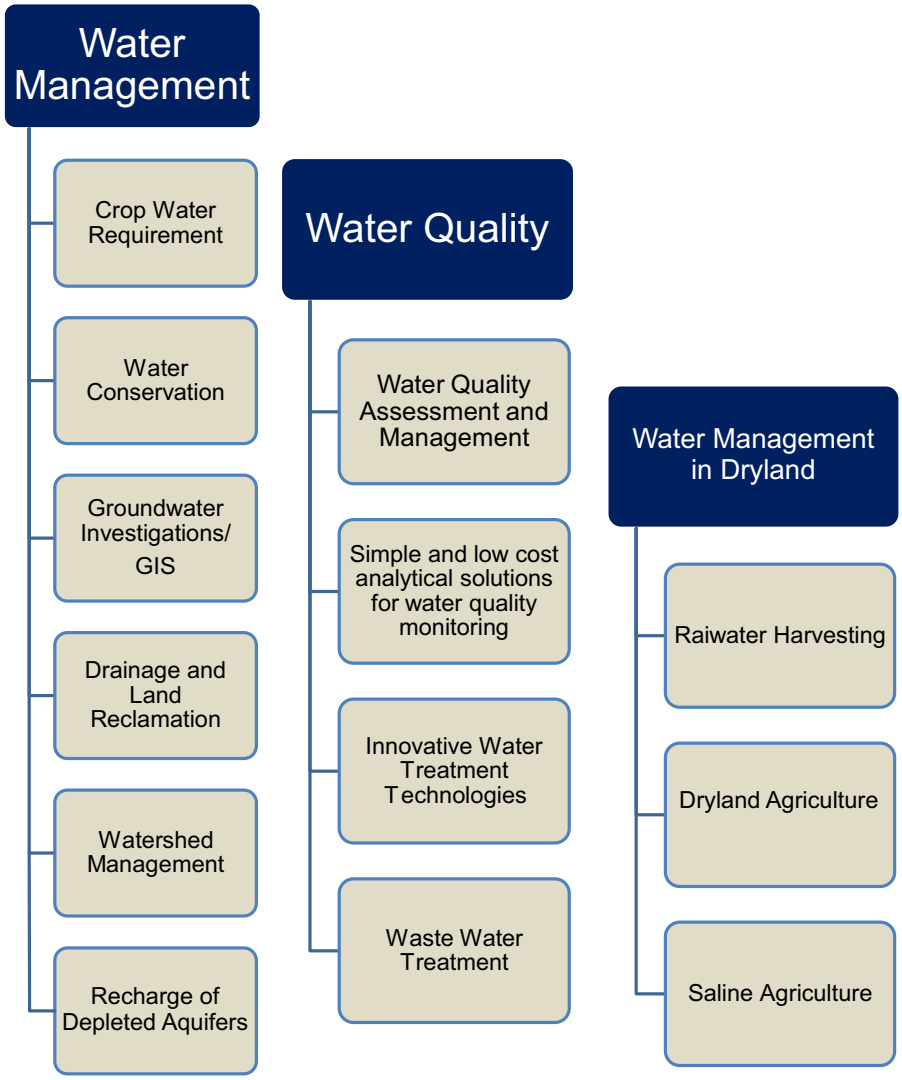
- Headquarters in Islamabad with eight regional offices at Tandojam, Quetta, Bahawalpur, Lahore, Peshawar, Karachi, Muzafarabad and Gilgit
- Water testing laboratories in 24 cities including; Islamabad, Lahore, Bahawalpur, Tandojam, Quetta, Peshawar, Faisalabad, Gujranwala, Mianwali, Sahiwal, Sargodha, Sialkot, DG Khan, Multan, Badin, Hyderabad, Karachi, Nawabshah, Sukkur, Loralai, Abbottabad, DI Khan, Muzaffarabad and Gilgit
- National Capacity Building Institute (NCBI) Islamabad
- A network of seven research and demonstration stations in different agro-climatic zones of the country.
- GIS and Geo-hydrological laboratory, Islamabad
- Information and documentation Centre, Islamabad
- Drainage type lysimeters located at Tandojam, Lahore, Quetta, and Peshawar to determine crop water requirements
- Soil Physics Laboratory, Islamabad



Major Research Areas

Mandate of PCRWR is broad in relation to the areas of different research in the country. However, the focused research areas are prioritized keeping in view the present resources and needs of the country.

PCRWR conducts its research keeping in view the needs of the country and in line with the Pakistan vision 2025, National Water Policy 2018, SDGs, PCRWR's research agenda and other related policies, such as Food Security Policy, Climate Change Policy, Drinking Water Policy etc.



Key Achievements/ Activities

Consultative Workshop on Water Governance Issues and Options in Pakistan

The International Water Management Institute (IWMI) in collaboration with Pakistan Council of Research in Water Resources (PCRWR) organized a workshop on the water governance - issues and options on 15th August 2022 in Islamabad. The objective of workshop was to discuss and debate on the issues related to water governance in Pakistan and chalk out an action plan for improved surface and groundwater governance in the country. The workshop was supported by USAID through Water Management for Enhanced Productivity (WMfEP) activity. The goal of this activity was to reduce the constraints being faced by Government of Pakistan in good water governance and water management.

Prof. Dr. Qamar Uz Zaman (Vice Chancellor – Pir Mehar Ali Shah Arid Agriculture University) was the chief guest on this occasion. Dr. Muhammad Ashraf, Chairman, PCRWR gave opening remarks and welcomed the participants. Dr. Tousif Bhatti, Researcher IWMI/Deputy Chief of Party (WMfEP) presented an overview of the Water Management for Enhanced Productivity. Mr. Muhammad Nawaz, Development Specialist, USAID, highlighted US Government and USAID's contribution in the water sector in Pakistan.

Dr. Andrew Bell, Boston University, USA delivered a presentation on Crafting Spaces for Better Water Governance in Pakistan. Dr. Naveed Iqbal, Director (Hydrology), PCRWR, spoke about institutionalizing groundwater governance in the country.

A panel discussion was held to discuss the vision for improved surface and groundwater governance in Pakistan.

The panelists included Mr. Muhammad Nawaz, USAID, Dr. Andrew Bell, Boston University, Dr. Rashid Aftab, Riphah International University, Dr. Shakeel Hayat, Assistant Prof. IM Sciences, and Dr. Arjumand Nizami – Helvetas. The session was moderated by Dr. Tousif Bhatti, IWMI. The workshop was attended by water professionals, research institutions, national and international experts from academia and international development sector professionals.

Group photo of the participants

Workshop on Upscaling Digital Irrigation and Climate Advisory Services

Pakistan Council of Research in Water Resources organized a consultative worskhop for “Scaling up PCRWR's Digital Irrigation and Climate Advisory Services (ICAS)” on 1st August 2022, which was being provided to 20,000 farmers. Dr. Muhammad Ashraf, Chairman, PCRWR welcomed the participants and briefed them about the ICAS initiated by PCRWR in collaboration with University of Washington and Asian Disaster Preparedness Center (ADPC). Dr. Kazim Niaz, Federal Secretary, Ministry of Water Resources was the chief guest. He remarked that access to regional and global weather data and its dissemination through digital technology for improved on farm water conservation could mitigate the losses and hydrological uncertainties caused by climate. He urged that there was need to develop a strong coordination among the organizations to share information and data as steered in the National Water Policy 2018 for increased awareness and better water management which was prerequisite for socio-economic development of the country. In his key note speech Dr. Arif Anwar, Water Resource Specialist, highlighted the prospects of integrated digital advisory services for water resources management. The workshop concluded with a way forward on how PCRWR's advisory services may complement the services being provided by the provincial governments and the private sector.

Dr. Arif Anwar, Water Resource Specialist addressing the workshop participants

Group photo of participants with Dr. Kazim Niaz, Federal Secretary, Ministry of Water Resources

Workshop on Groundwater Investigations and Mapping in Sindh

Pakistan Council of Research in Water Resources (PCRWR) organized a groundwater workshop on 1st July, 2022 in Karachi. This workshop was organized under an ADP scheme titled, “Groundwater Investigations and Mapping in Sindh” funded by Sindh Irrigation Department (SID). The objective of this workshop was to share initial findings of the groundwater study being undertaken by PCRWR.

About 50 professionals representing various government departments, policy makers, academicians, representatives from United Nation departments and international experts participated in the workshop. Dr. Naveed Iqbal, Director PCRWR, gave a brief on the objectives as well as expected outcomes of the study. He stressed on the need for the establishment of real-time groundwater monitoring system in Sindh. This system will ultimately help to frame groundwater regulatory framework required for sustainable groundwater resource management.

Mr. Jai Ram, General Manager (Operation), Sindh Irrigation and Drainage Authority (SIDA) explained the importance of reliable data for effective management and hoped that this study would help to bridge data gaps. He appreciated PCRWR for completing physical targets in such a short time and anticipated to have a comprehensive report.

In his address the Chief Guest, Mr. Ayub Somroo, Additional Secretary (Technical), SID informed the audience that the department was making serious efforts to focus groundwater management, which was unfortunately remained a neglected subject in the past. He also highlighted various other initiatives and projects, which were being conducted with provincial as well as foreign funding to address prevailing water challenges in the province. He appreciated PCRWR for the successful completion of this study and hoped that the study would come up with some practical way forward for sustainable groundwater management in Sindh.

Group photo of the workshop participants

Media Briefing on Rainwater Harvesting to Address Groundwater Depletion and Flood Water Management

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with International Water Management Institute (IWMI) organized a briefing on rainwater harvesting for a group of journalists on 13th September 2022, at PCRWR Headquarters, Islamabad. The briefing was attended by journalists representing various news agencies.

Dr. Muhammad Ashraf, Chairman, PCRWR briefed the journalists about prevailing water challenges related to both surface and groundwater. He highlighted the causes of recent flooding event of 2022. He emphasized the importance for watershed management and adoption of nature-based solutions for sustainable water resource management and importance of rainwater harvesting for groundwater recharge. He added that it not only helped to address groundwater depletion but, also had the potential to mitigate flooding events at different stages of rainwater recharge.

This briefing was followed by demonstration of various models of rainwater harvesting. Dr. Naveed Iqbal, Director (Hydrology), PCRWR provided further insight about different models developed by PCRWR at its premises.

Dr. Hifza Rasheed, Secretary PCRWR, explained about the innovative and low-cost water treatment filters developed by PCRWR for flood-affected areas to meet drinking water requirements. Later on, an exposure visit of rainwater harvesting site at Kachnar Park, Sector I-8, Islamabad was managed.

Dr. Mohsin Hafeez, Country Director, IWMI-Pakistan briefed the group that this was a model groundwater recharge site, which was fully instrumented including; rain gauge, flow meter and CTD divers for automatic data collection and real-time monitoring.

Mr. Sardar Khan Zimri, Dy. Director General, CDA shared the success story of groundwater recharge project. He told that about 10 million gallons of water had been recharged into the aquifer through these 50 sites established so far during this year monsoon period.

Group photo of the workshop participants

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with International Water Management Institute (IWMI) Pakistan and other partners organized Pakistan Water Week 2022, from 24th to 28th October, 2022. The theme for this year's water week was “Role of Water-Food-Energy and Ecosystem Nexus for a Climate Resilient Pakistan”. A series of events were organized to achieve the intended objectives of the Week.

International Conference: A three-day international conference was organized from 24th to 26th October, 2022 which was inaugurated by the Federal Minister for Planning Development and Special Initiatives (PD&SI), Professor Dr. Ahsan Iqbal. Speaking on the occasion he said that he strongly believed that owing to the recent extreme climatic events in Pakistan, the second Pakistan Water Week would help the organizers, line departments and stakeholders in the formulation and shaping up of policies aiming at a climate resilient Pakistan. The minister further added that in the wake of imminent water crisis and prevailing climate change impacts, this International conference would lead to devise a workable, inclusive and comprehensive guidance for developing sustainable land and water solutions in the Indus Basin.

Mr. Hasan Nasir Jamy, Federal Secretary, Ministry of Water Resources appreciated the efforts of PCRWR and IWMI in organizing the Pakistan Water Week 2022. In his remarks, he stressed on the need of formulation of policies driven by contemporary issues and highlighted the importance of organizing such events that help in making informed decisions.

Dr. Ahsan Iqbal, and Mr. Hasan Nasir Jamy addressing at the occasion

Dr. Rachael Mcdonnell, Deputy Director General, IWMI, said that IWMI was transforming lives all over the world. She further added that in Pakistan, our projects were having a significant impact on the grass root level. The primary focus of the work carried out by IWMI was on water governance, reducing constraints to productivity, sustainable use of water for agricultural production and Integrated Water Resource Management in Balochistan.

National Events: The international conference was followed by the two-day national workshop organized at PCRWR, Islamabad on 27th -28th October, 2022. The workshop comprised ice breaker activities and energizers such as industrial exhibition, students' competitions (debate, poster, essay

writing, student board games, student final year projects, documentaries, urban sculpture and art) as well as mass awareness campaigns on social media. Technology show-casing exhibition was inaugurated by the Federal Minister for Water Resources, Syed Khursheed Ahmed Shah. The inaugural session was followed by a media interaction session focusing on "Optimal strategies for water conservation and sustainable water resource management". Competitions among students were held on 27th and 28th October, 2022. A closing ceremony of the event was organized to award the winners of the student competitions. Mr. Haile Gashaw, Chief WASH, UNICEF, Pakistan, Dr. Yousaf Filali-Meknassi, Country Director, UNESCO and Dr. Rachael McDonnell, Deputy Director General, IWMI were the guest of honors for the closing ceremony. The winners of the competitions were awarded with cash prizes, certificates and shields. The chief guest highly appreciated the activities during the national event.

Syed Khursheed Ahmed Shah, Federal Minister for Water Resources at the inauguration ceremony of the exhibition at PWW 2022

Dr. Yousaf Filali-Meknassi, Country Director, UNESCO addressing the closing ceremony of PWW 2022

World Habitat Day 'Mind the Gap. Leave No One and No Place Behind'

UN-Habitat, Pakistan in collaboration with PCRWR organized a seminar to kick start celebrations of World Habitat Day on 3rd October, 2022 with the theme “Mind the Gap Leave No One and No Place Behind”. The event commenced with a message from Antonio Guterres, UN Secretary General in which it was highlighted that urgent actions for innovative solutions to tackle the climate crisis and drive a green and inclusive pandemic recovery are needed. Ms. Maimunah Mohd Sharif, Executive Director, UN-Habitat in her video message emphasized on raising awareness about innovations inspiring all of us to push for immediate actions based on indigenous knowledge and techniques.

Speaking on the occasion, Dr. Muhammad Ashraf, Chairman, PCRWR remarked that habitat was the right of all living beings. Therefore, there is a need to bridge the gap through ecosystem preservation. Mr. Jawed Ali Khan, UN-Habitat Programme Manager, Pakistan reiterated the need on bridging the widening gap for leaving no place and no one behind. Ms. Almas Shakoor, Executive Director, Sheher-Saaz emphasized that the community engagement for bridging the gap was mandatory.

Dr. Hifza Rasheed, Secretary, PCRWR and Dr. Naveed Iqbal, Director, PCRWR explained the contribution of PCRWR by demonstrating water treatment technologies for provision of clean water in flood-affected areas as well as a presentation on nature-based solutions for flood management.

Group photo of the participants of the seminar

Workshop on Monitoring and Reporting of SDG 6.4 Target (Water use and Scarcity) in Pakistan at Food and Agriculture Organization, FAO NARC

A four days multi-stakeholder workshop was co-organized by PCRWR and the Food and Agriculture Organization (FAO) in Islamabad on Sustainable Development Goal 6.4 from 18th to 22nd November, 2022. The aim of the workshop was to monitor the progress of national institutions towards SDG 6.4 target and prepare the future work for SDG 6.4 monitoring, reporting and use. Ms.Patricia Mejias and Mr. Riccardo Biancalani, from FAO chaired different sessions and working group discussions on global and national monitoring process of SDG 6.4, data needs & disaggregation, dissemination and use of indicators at global, national and local levels. Dr. Hifza Rasheed, Secretary, PCRWR presented an overview of PCRWR's work on the SDG 6.4.

Group photo of the participants of the seminar

Virtual Event at COP 27, UNESCO's Pavilion "Indigenous Water Resources Management Technologies for Sustainable Livelihoods

PCRWR in partnership with the UNESCO Pakistan office organized a virtual event at COP 27, UNESCO's pavilion. The title of this event was "Indigenous water resources management technologies for sustainable livelihoods". The panelists presented global, regional, and local perspectives on the subject. The keynote talks were delivered by Dr. Youssef Filali- Meknassi, Director of the UNESCO Pakistan office, and Dr. Muhammad Ashraf, Chairman, PCRWR/ Convener National Committee on IHP. The panelists included Dr. Ayesha Pamela Rogers, International Cultural Heritage Expert, Dr. Majid Labbaf, Archaeo-Hydrologist from the University of Nizwa, Oman, Mr. Faizan ul Hasan, Water Resource Governance scholar from the University of Canberra, Australia and Dr. Syed Muhammad Khair, Regional Researcher at International Water Management Institute (IWMI). The key takeaway message from the discussion was that climate change is forcing the communities for more local solutions and the science-policy-practice interface may help in making these indigenous water systems a climate resilient and sustainable option.

A snapshot of the virtual event

Consultative Workshop on Draft National Water Conservation Strategy and Stock- taking assignment for the implementation of National Water Policy 2018

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with IWMI, Pakistan and Federal Flood Commission (FFC) organized a consultative Workshop on December 20, 2022 at PCRWR regional office, Peshawar and December 27, 2022 at PCRWR regional office, Lahore for the review of the draft National Water Conservation Strategy. Representatives from various Government departments, attended the workshop. Addressing the audience Dr. Muhammad Ashraf, Chairman, PCRWR stressed upon the need for water conservation in all sectors and the basic idea for developing the strategy. Mr. Ahmad Kamal, Chief Engineering Adviser/Chairman, FFC, briefed about the goal of national water policy and the need for the development of the strategy. Dr. Mohsin Hafeez, Country Representative, IWMI Pakistan briefed about the purpose and expected outcomes of the stocktaking initiative. Dr. Naveed Iqbal, Director, PCRWR delivered a detailed presentation on the salient features of the Draft National water conservation strategy. Muhammad Kashif Manzoor, Deputy Director, PCRWR, Islamabad presented the updated progress on the data for the stock-taking assignment.

Group photo of the participants at Lahore

Seminar on "Water Scarcity, a Non-Conventional Security Threat

Pakistan Council of Research in Water Resources (PCRWR) and Islamabad Policy Research Institute (IPRI) organized a one-day seminar on "Water Scarcity, a Non- Conventional Security Threat" at PCRWR Islamabad on 21st October, 2022. The objective of the seminar was to chalk out strategy for sustainable water resource management in Pakistan. Water professionals, experts, academicians and policy makers from various federal and provincial stakeholder organizations participated in the event.

In his opening remarks, Dr. Muhammad Ashraf, Chairman, PCRWR briefed about water resources situation in Pakistan. He emphasized that water security was directly connected with food security. He said that paradigm shift at policy level is paramount to secure water security. In his address, Brig. Rashid Wali Janjua, Director, Research, IPRI, stressed that water conservation strategies should be adopted to deal with water security challenges. Dr. Fayyaz ul Hasan (Pro Vice Chancellor), PMAS-Arid Agriculture University Rawalpindi, the Chief Guest of the event, appreciated the efforts of PCRWR and IPRI for taking this initiative of national importance and anticipated that this would bring experts' recommendations for the policy makers to overcome climate change issues in a more holistic way.

Glimpse of the inaugural session

The inaugural session was followed by a technical session in which, presentations were delivered by different provincial departments pertaining to water related challenges being faced in their respective provinces.

Youth Awareness Webinar Series 2022-23

A series of six webinars is planned to be organized by National Institute of Oceanography (NIO) and Pakistan Council of Research in Water Resources (PCRWR) to mainstream the researchers, future water champions and local communities for the sustainability of the Indus Delta. The first webinar of this series was organized on 28th December, 2022 on "Issue and challenges of the freshwater ecosystem of the Indus Delta and opportunities in view of changing climate". The keynote speaker of the webinar, Dr. Muhammad Ashraf, Chairman, PCRWR highlighted the issues being faced by the people of the Indus delta and also pointed out the potential opportunities to benefit from the existing resources of the delta. He also emphasized on building a strong relation between upstream and downstream users for more productive water resource management. More than 70 researchers and professionals participated in the webinar.


Glimpses of the webinar

Panel Discussion on, "Trans-boundary Water Sharing Issues

Pakistan Council of Research in Water resources (PCRWR) in collaboration with Islamabad Policy Research Institute (IPRI) organized a panel discussion on, "Trans- boundary Water Sharing Issues" on November 23, 2022. In his opening remarks, Dr. Muhammad Ashraf, Chairman, PCRWR highlighted that sustainable water management was the key challenge due to inadequate water management practices. Moreover, the situation is further aggravated in the form of flooding and prolonged droughts due to the trans-boundary nature of the Indus River. Brig. Rashid Wali Janjua, Director Research, IPRI shared objectives of the panel discussion and its importance to chalk out policy measurements and strategy for improved cooperation. The panel discussion session was moderated by Dr. Rashid Aftab, Director, Riphah Institute of Public Policy, Islamabad. Key panelists of the discussion were Mr. Ali Tauqeer Sheikh, Consultant, World Bank, Dr. Azeem Shah, International Researcher and Chief of Party, IWMI-Pakistan, Dr. Shakil Durani, Former Chief Secretary, KP/Sindh/AJ&K and Ex-Chairman-WAPDA, and Mr. Arshad H. Abbasi, Energy & Power Sector Specialist. Deliberations were made on various aspects of transboundary challenges faced by Pakistan. During the discussions it was urged that there was a need for strengthening of our national allied institutions to develop internal technical and legal capacity for better negotiations with India and Afghanistan. A number of water experts, professionals from stakeholder organizations and university students participated and interacted with the panelists.

group photo of the participants

National Consultative Workshop on "Opportunities for Brackish and Saline Aquaculture in Pakistan

PCRWR in collaboration with IWMI Pakistan organized a consultative workshop "opportunities for Brackish and Saline Aquaculture in Pakistan" on 2nd March, 2023. The purpose of the workshop was to promote saline aquaculture and disseminate alternate livelihood options to the communities of the areas of Sindh and Punjab. Dr. Mohsin Hafeez, Country Representative, International Water Management Institute (IWMI) highlighted that such initiatives would not only be beneficial in addressing the protein deficiency issues, which were affecting around 66% Pakistani population but would help generate economic opportunities for the communities in Badin and Thatta districts of Sindh Province and Muzaffargarh and Rahim Yar Khan Districts of Punjab Province.

Group photo of the participants of the workshop

Two days International Water Conference, 2022

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with Riphah International University, Islamabad, Centre for Climate Research and Development (CCRD), COMSATS, Water-Aid, Pakistan and Federal Flood Commission (FFC) organized 7th international Water Conference, 2022 at PCRWR, Headquarters, Islamabad from 29th to 30th December, 2022. The objective of the conference was to raise awareness among the youth on emerging water and climate-related issues in the country and provide a platform to the stakeholders to interact with each other. The conference was organized on four sub- themes. The sub-themes included Climate Change and Maritime Security, Glacial Lake Outburst Floods (GLOFs), Water Pollution & Waste Water Management and Islamic perspective on Climate Change, Water Pollution & Water Management.

Dr. Rashid Aftab, Director, Riphah University in his opening remarks described the objectives of the conference to the participants. Dr. Muhammad Ashraf, Chairman, PCRWR during his welcome address stressed that climate change was posing a serious threat to the water resources of the country. He also highlighted the importance of water in the light of the Holy Quran and Sunnah. Mr. Arif Jabbar Khan, Country Director, Water-Aid, emphasized the need for such events and added that awareness pertaining to water quality should be provided to the communities for a healthy life. Dr. Athar Hussain, Head, CCRD, COMSATS, presented a detailed overview of climate change in Pakistan's context. Mr. Ahmad Kamal, CEA/Chairman, FFC emphasized on the need of adding new water storage reservoirs in the country to combat the risk of climate change. He also suggested that academia may update its curriculum as per the requirements/issues prevalent in the society.

group photo of the participants

Declaration of Karez Cultural Landscape as National Heritage

PCRWR in collaboration with UNESCO, Pakistan office started national level initiative for the inclusion of the Karez system in the World Heritage list. In order to get first hand information about the socio-economic, livelihood, practices and legal perspectives of Karez cultural Heritage, comprehensive literature review was carried out. To supplement the ongoing series of activities for the declaration of Karez system in Balochistan as cultural heritage, multiple focus group discussion and sessions were held involving participants from relevant government organizations, Academia, NGOs and Beneficiary farmers from 17th to 21st October 2022 at PCRWR Regional Office, Quetta.

Glimpse of the focus group discussion

World Water Day, 2023 "Accelerating Change to Solve the Water and Sanitation Crisis"

PCRWR in collaboration with UNESCO, UNICEF, WaterAid, IWMI, Muslim Aid, CDA and ICIMOD organized the world water day event on 30th March, 2023. During his welcome remarks, Dr. Muhammad Ashraf, Chairman, PCRWR highlighted the situation of global WASH conditions and said that nearly 4.5 billion people lack facility for safe sanitation services. This situation calls for accelerated collective efforts to achieve the SDGs. In his keynote speech, Dr. Mohsin Hafeez, Country Representative, IWMI highlighted that water security was a big issue which is further accelerated due to climate extremities.

A Panel discussion was also organized inviting key water experts to shed light with reference to this year's theme “Accelerating Change to Solve the Water and Sanitation Crisis”. The panelists included Dr. Saima Hamid, Vice Chancellor, Fatima Jinnah Women University, Rawalpindi, Prof. Dr. Sher Muhammad, Chairman, Department of Agriculture Sciences, Allama Iqbal Open University, Islamabad, Mr. Sardar Khan Zimri, Deputy Director General, Water Supply, CDA and Mr. Muhammad Tanveer, Managing Director, WASA, Rawalpindi. The panelists emphasized the need of raising awareness among the communities about water scarcity, conservation and WASH facilities with collective and well-coordinated efforts.

Speaking on the occasion, Dr. Inoussa Kabore, UNICEF Deputy Representative, described that access to safe WASH facilities was a basic right of all human beings. The water demand had been exacerbated due to the rapid increase in population. The recent devastating floods posed a negative impact on the communities and had slowed down the achievements against WASH targets. Dr. Youssef Filali-Meknassi, Country Director, UNESCO, said that the purpose of world water day was to create awareness on water- related issues. Access to WASH facilities to the communities requires strong collaborative and holistic efforts. Taking benefit of this event, the United Nation's World Water Development Report 2023 on “Partnerships and Cooperation for Water” was also launched in Pakistan.

PCRWR Regional Offices in Lahore, Peshawar, Karachi, Quetta, Bahawalpur, Tandojam and its district water quality laboratories arranged walks, awareness sessions and seminars with academia and other stakeholders to highlight the importance of this day.

Glimpses of the World Water Day, 2023

Launching of UN World Water Development Report

Lahore

Tandojam

Sahiwal

Gujranwala

Sialkot

Muzaffarabad

Mianwali

Bahawalpur

Inauguration of Groundwater Recharge Site at Pakistan Meteorological Department (PMD) in Islamabad

Dr. Muhammad Ashraf, Chairman, PCRWR along with Captain (Retd) Muhammad Usman Younis, Chairman, Capital Development Authority (CDA), and Mr. Sahibzad Khan, Director General, PMD inaugurated the groundwater recharge site developed at PMD Office, H-8/2, Islamabad on Monday, January 10, 2023. This site is developed under CDA project "Rainwater Harvesting for Groundwater Recharge in Islamabad". Under this project, PCRWR is technically assisting in developing 100 groundwater recharge wells for the replenishment of the groundwater aquifer. The recharge site developed at PMD is one among 60 sites, which have been developed so far whereas; the remaining 40 are under construction.

On this occasion, Dr. Muhammad Ashraf, Chairman, PCRWR highlighted the importance of rainwater harvesting and its utilization for groundwater recharge as an effective mean to counter groundwater depletion as well as manage the issue of urban flooding. He informed that about 30 million gallons of water has been recharged in the aquifer through 41 sites developed by CDA during the monsoon period of 2022. He added that if only 50% of available rainwater was conserved, it could have helped to manage the existing demand and supply gap in Islamabad.

In his remarks, Captain (Retd) Muhammad Usman Younis, Chairman, CDA appreciated the project team consisting of professionals of CDA and PCRWR for the successful implementation of the project. He added that the project conceived by PCRWR and being implemented by CDA was the need of the hour and a start to a journey. He further added that this pilot project need to be upscaled to balance the levels of groundwater depletion and achieve the milestone of sustainable groundwater management. Mr. Sahibzad Khan, Director General, PMD highlighted the need to expedite the efforts and actions for reliable nature based solutions to overcome current water challenges. He appreciated the technical assistance being provided by PCRWR research team in the implementation of the project.

Glimpse of the event

Consultative Workshop on "Draft National Water Conservation Strategy, Stock-taking Assignment for the implementation of National Water Policy" and Launching of Water Quality Reports

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with International Water Management Institute (IWMI), Pakistan and Federal Flood Commission (FFC) organized series of consultative workshops across Pakistan for stock-taking assignment for the implementation of National Water Policy. Consultative workshop was organized on 6th January, 2023 at Karachi and on 23rd January, 2023 at Quetta. The National Level Consultation Workshop on Draft National Water Conservation Strategy and stock-taking assignment for the implementation of National Water Policy was organized at Islamabad along with the launching of water quality research outcomes in the form of four key reports on February 1, 2023. Representatives from various federal, provincial departments and UN agencies attended the workshop.

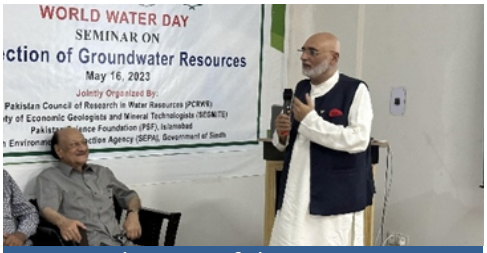
Addressing the audience, Mr. Ahmad Kamal, Chairman, FFC highlighted the salient features of National Water Policy and briefed about its goals and the need for the development of the strategy. Dr. Muhammad Ashraf, Chairman, PCRWR stressed the need for water conservation in all water use sectors and described the complete process of development of strategy document. Dr. Mohsin Hafeez, Country Representative, IWMI, Pakistan, briefed the audience about the expected outcomes of the stock-taking initiatives. He also highlighted that the data received from the stakeholders would be helpful in the development of a baseline for the effective implementation of the National Water Policy.

Dr. Hifza Rasheed, Secretary, PCRWR, elaborated on the outcomes and key findings of the PCRWR research reports and delivered a detailed presentation on the salient features of the Draft National Water Conservation Strategy. Mr. Haile Gashaw, Chief WASH UNICEF appreciated the efforts of the organizations involved in the development of National Water Conservation Strategy and ensured full support of UNICEF towards the practical implementation of National Water Policy in letter and spirit. Engr. Muhammad Kashif Manzoor, Deputy Director, PCRWR, Islamabad presented the updated progress on the data collection for the stock-taking assignment

Glimpses of the workshop

Seminar for the "Protection of Groundwater Resources", May 16, 2023, PCRWR, Karachi

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with Society of Economic Geologists and Mineral Technologists (SEGMITE), Sindh Environmental Protection Agency (SEPA), Pakistan Science Foundation (PSF) and Government of Sindh organized a seminar on the "Protection of Groundwater Resources" on 16th May, 2023 at PCRWR, Regional Office Karachi. The seminar centered on the theme of "Protection of Groundwater Resources," was a momentous event that brought together experts, stakeholders, and concerned individuals to shed light on the criticality of safeguarding groundwater reserves. The event showcased a range of presentations and discussions aimed at raising awareness and fostering actionable solutions by different departments. Representatives from Sindh Irrigation Department, Pakistan Meteorological Department, UN Habitat, Islamic Relief Pakistan, International Water Agency (IWA) and Department of Geology, University of Karachi attended the event.



Glimpses of the seminar

Consultative stakeholder meeting for "Automation and upscaling of Irrigation Advisory Services of PCRWR", May 18, 2023, PCRWR Headquarters

PCRWR launched Irrigation Advisory Service (IAS) for the farmers using remote sensing techniques and satellite data for the estimation of real-time ETo (evapotranspiration) coupled with water requirements of major crops estimated through drainage-type lysimeters in major agro-ecological zones of Pakistan for effective irrigation scheduling. This information is sent to 20,000 registered farmers through a weekly Urdu SMS in 43 districts. Pakistan Council of Research in Water Resources organized a consultative meeting for "Automation and upscaling of Irrigation Advisory Services of PCRWR" to share the progress of upscaling activities with the stakeholders as well as seek their input on effective communication with the farmers which will be upscaled from 20,000 farmers in 43 districts of Pakistan to 100,000 farmers. Dr. Muhammad Ashraf, Chairman, PCRWR welcomed the participants and briefed them about the advisory services being provided by PCRWR. He remarked that access to regional and global weather data and its dissemination using digital technology for improved irrigation scheduling can combat the losses and hydrological uncertainties posed by changing climate. The workshop was attended by representatives from Provincial Irrigation Departments, Academia, SAWiE and private Service providers. During the discussion, stakeholders provided different suggestions for communication strategy related to the data and irrigation scheduling information to multiple users.


Glimpses of the seminar

Capacity Development Workshop on Groundwater Monitoring, Data Acquisition and Instrumentation, May 22-23, 2023, PCRWR Headquarters, Islamabad

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with the International Water Management Institute (IWMI) organized a two days capacity development workshop on groundwater monitoring, data acquisition and instrumentation at Islamabad from 22nd-23rd May, 2023. This workshop was a part of the USAID-funded project titled, "Water Management for Enhanced Productivity (WMFEP) in Khyber Pakhtunkhwa. Dr. Azeem Ali Shah, Chief of Party, WMfEP, IWMI presented a detailed overview of the project and work executed under the project. He briefed about the primary objective of the project which was to help the Khyber Pakhtunkhwa government with better water management and governance to uplift the socio-economic status of the communities in the command area of the project.

During his remarks, Dr. Muhammad Ashraf, Chairman, PCRWR emphasized the need for maintaining a balance between groundwater abstraction and recharge. He also shared that groundwater was a precious hidden resource, which need to be used efficiently. Mr. Muhammad Nawaz, Development Specialist, USAID-Pakistan, highlighted that groundwater had not been given prime importance as surface water. No regulatory framework or policy related to groundwater existed in the country to encourage users to abstract this precious resource more carefully. He urged to create harmony among the policies related to water, climate change and groundwater regulation. Professionals from provincial department of agriculture, public health engineering (PHED), irrigation and academia participated in the workshop.

Consultative meeting on Environmental Flow Assessment of River Ravi at Pakistan Council of Research in Water Resources

Pakistan Council of Research in Water Resources (PCRWR) has initiated E-Flow assessment of critical sites of River Ravi. E- Flow assessment requires a comprehensive study of geomorphology, water quality, riparian vegetation, macro-invertebrates, fisheries, socio-economics, and hydraulic parameters. In this connection, PCRWR organized a consultative meeting to seek inputs from stakeholders to develop a holistic E-flow assessment methodology on June 13, 2023. Welcoming the participants, Chairman, PCRWR explained the conditions of rivers of Pakistan and the theme behind this E-flow study. Dr. Hifza Rasheed, Director General PCRWR presented methodology and initial results of E-flow survey study. Representatives from the Punjab Wild life, Pak EPA, Ravi Urban Development Authority (RUDA) Lahore, Punjab Forest Department and Pakistan Commissioner on Indus Waters (PCIW) participated in the event.

Glimpses of the consultative meeting

Stakeholder Consultation Workshop for "Impact Assessment of Indus Waters Treaty (IWT) on Command Areas of Eastern Rivers" and "Real-Time Groundwater Monitoring and Advisory System for Chaj Doab

PCRWR, Lahore organized a consultation workshop on 30th May, 2023 for the studies on "Impact Assessment of Indus Waters Treaty (IWT) on Command Areas of Eastern Rivers" and "Real-Time Groundwater Monitoring and Advisory System for Chaj Doab" to get stakeholders' feedback and insight on the research objectives, methodologies and expected outcomes of the research studies. The studies would be helpful for policymakers and other stakeholders to make informed decisions based on the research findings leading to improved water, environment and agriculture. The first study aims to assess the impacts of the IWT on the river's paths and bed, floodplains and quality of surface and groundwater resources in the command area of eastern rivers. This study also focuses to assess the IWT's impacts on cultivated areas, cropping patterns, crop productivity, and farmer's economic conditions, as well as understand its impacts on the ecosystem and aquatic life. The second study aims to develop accounting or budgeting through real-time monitoring of groundwater resource and monitoring groundwater levels and quality using automatic sensors. Besides this, an advisory service will be provided to the stakeholders/farmers on both the quantitative and qualitative changes on an annual basis, which will be useful for sustainable groundwater management. The stakeholders including farmers, public and private organizations and academia participated and gave their feedback and discussed the research objectives, methodologies and expected outcomes of the studies.

Joint Discharge Measurement at Selected Sites on Indus River to Resolve Interprovincial Water Issues

Ministry of Water Resources (MoWR) notified PCRWR as neutral expert to carry out joint discharge measurements. For this purpose, Indus River System Authority (IRSA) conveyed discharge measurement plan at downstream of Taunsa, Chachran, upstream Guddu, and at RD 109 of Pat Feeder Canal using Acoustic Doppler Current Profiler (ADCP) under the supervision of Committee headed by Chairman FFC, Ministry of Water Resources from May 26 to June 04, 2023. This activity was undertaken to review current water situation of the Country. Accordingly, PCRWR conducted reconnaissance survey for the selection of sites for discharge measurement and performed test runs. The actual discharge measurements were conducted in the presence of all relevant stakeholders i.e Punjab Irrigation Department (PID), Sindh Irrigation Department (SID) and Balochistan Irrigation Department (BID) under the supervision of the notified Committee to bridge the trust deficit using state of the art technology and expertise from PCRWR.

Highlights of the discharge measurement

Collaborations

SIGNING OF AGREEMENT OF COOPERATION BETWEEN

SWCD & PCRWR

Islamabad

An Agreement of Cooperation (AoC) was signed between the Pakistan Council of Research in Water Resources (PCRWR) and the Directorate General of Soil and Water Conservation Department (SWCD) Khyber Pakhtunkhwa on 26th July 2022. The agreement was intended to collaborate in sharing and exchange of knowledge, exposure visits, capacity building, practical solutions for water-related issues within the framework of Soil and Water Conservation Department. Dr. Muhammad Ashraf assured PCRWR's support to SWCD for their activities. Agreement of Cooperation was formally signed by Dr. Hifza Rasheed, Secretary, PCRWR and Mr. Yaseen Khan Wazir, District Officer SWCD.

A glimpse of the signing ceremony

SIGNING OF LOA BETWEEN

PCRWR and NRSP

Islamabad

A Letter of Assignment (LoA) was signed between PCRWR and National Rural Support Program (NRSP) on 21st September 2022 at Islamabad. The purpose of this LoA was to facilitate NRSP in flood relief activities by provision of indigenously developed safe drinking water treatment systems. These systems would be used in treatment of flood water as immediate solution and to mitigate possible outbreak of water-borne diseases in flood-affected areas.

A briefing on the hand operated water filtration unit developed by PCRWR

AGREEMENT BETWEEN

PCRWR and PRMSC

PCRWR and Punjab Rural Municipal Service Company (PRMSC) entered into an agreement on 13th June, 2023 for carrying out monitoring of water quality in the rural areas of Punjab under the project "Water Quality Testing of Punjab Rural Sustainable Water Supply and Sanitation". PCRWR will be responsible for monitoring the drinking and wastewater quality of 16 districts/Tehsils of Rural Punjab.

Memorandum of Cooperation (MoC) between

PCRWR and the National Academy of Sciences (NAST), Tajikistan

Islamabad

A Memorandum of Cooperation (MoC) in the field of basic research in water resources was signed between PCRWR and the NAST in a ceremony held at Prime Minister's house, in Islamabad on 14th December, 2022 during visit of the President of the Republic of Tajikistan H.E. Emomali Rahmon. Under the MoC, PCRWR and NAST will conduct research in the areas of Integrated Water Resources Management, Basin Water Management, Water and Food Security and Sustainable Water Management.

Signing ceremony of MoC held at Prime Minister House, Islamabad

Program of Cooperation (PoC) between

PCRWR AND KFUEIT

Islamabad

The main objective of the PoC was to establish a close cooperation in the field of Water Management and Conservation. The institutions agreed to collaborate on different projects and initiatives aimed at creating awareness related to water management, rainwater harvesting, WASH, water quality and water security. Dr. Muhammad Suleman Tahir, Vice Chancellor, KFUEIT, appreciated the work of PCRWR in the field of water management and water quality. He showed keen interest in different interventions of PCRWR. He also emphasized on developing strong linkages among industry, research organizations and academia. Dr. Muhammad Ashraf, Chairman PCRWR, said that this cooperation would be fruitful for the stakeholders and country to understand the non-traditional security threats like water security, food security and climate change.

PoC signing ceremony between PCRWR and KFUEIT

Research and Development Activities

Monitoring the Sea Water Intrusion, Sea Level Rise, Coastal Erosion & Land Subsidence along Sindh and Baluchistan Coast

The PCRWR in collaboration with the National Institute of Oceanography (NIO) funded by the government of Pakistan (GoP) is working under its objective of plan, design, and installation of 100 multi-level observation wells in Indus Delta. Following are the project activities conducted during 2022-2023.

Table 1: Number of Piezometers installed in the districts

Sr. No	District	Installed
1	Badin	22
2	Sajawal	24
3	Thatta	27
4	T.M. Khan	07
5	Hyderabad	03
6	Karachi	16
Total		**100**

Table 2: Number of Piezometers repaired and newly bored in the districts

Sr. No.	District	R&M Works	New Borw
1	Badin	04	01
2	Sujawal	08	01
3	Thatta	02	-
4	T.M.Khan	04	-
Total		**18**	**02**

Table 3: Details of water samples collected and analyzed during 2022-2023

Time Period	Water Samples Collected	Remarks
July – September 2022	282	Analyzed for cations & Anions
October- December 2022	457	
January – March 2023	447	
April – June 2023	475	
Total	**1661**	

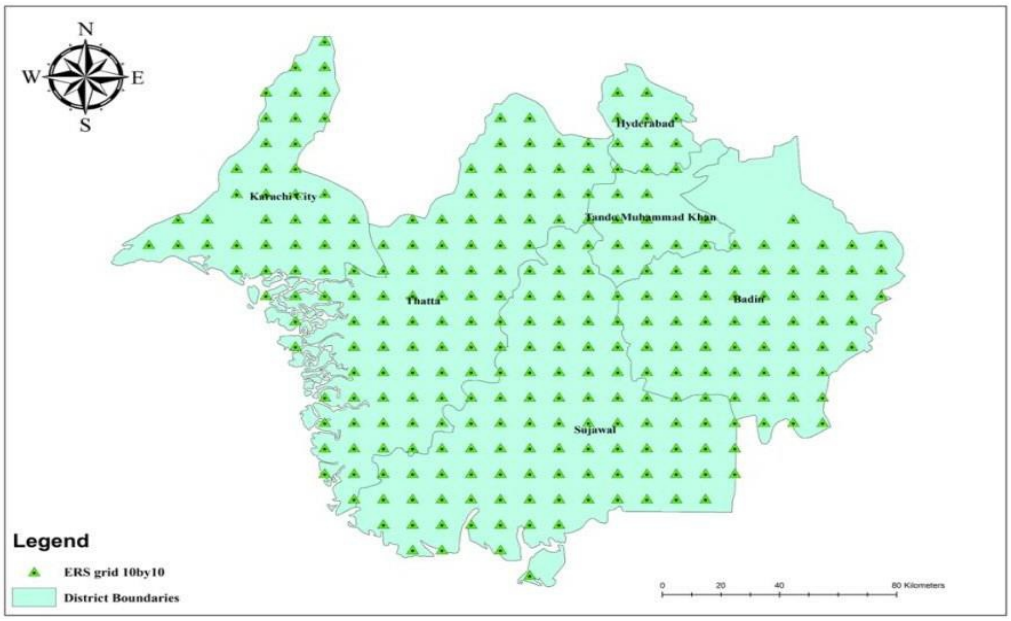


Figure 1: ERS survey grid map under sea water intrusion project

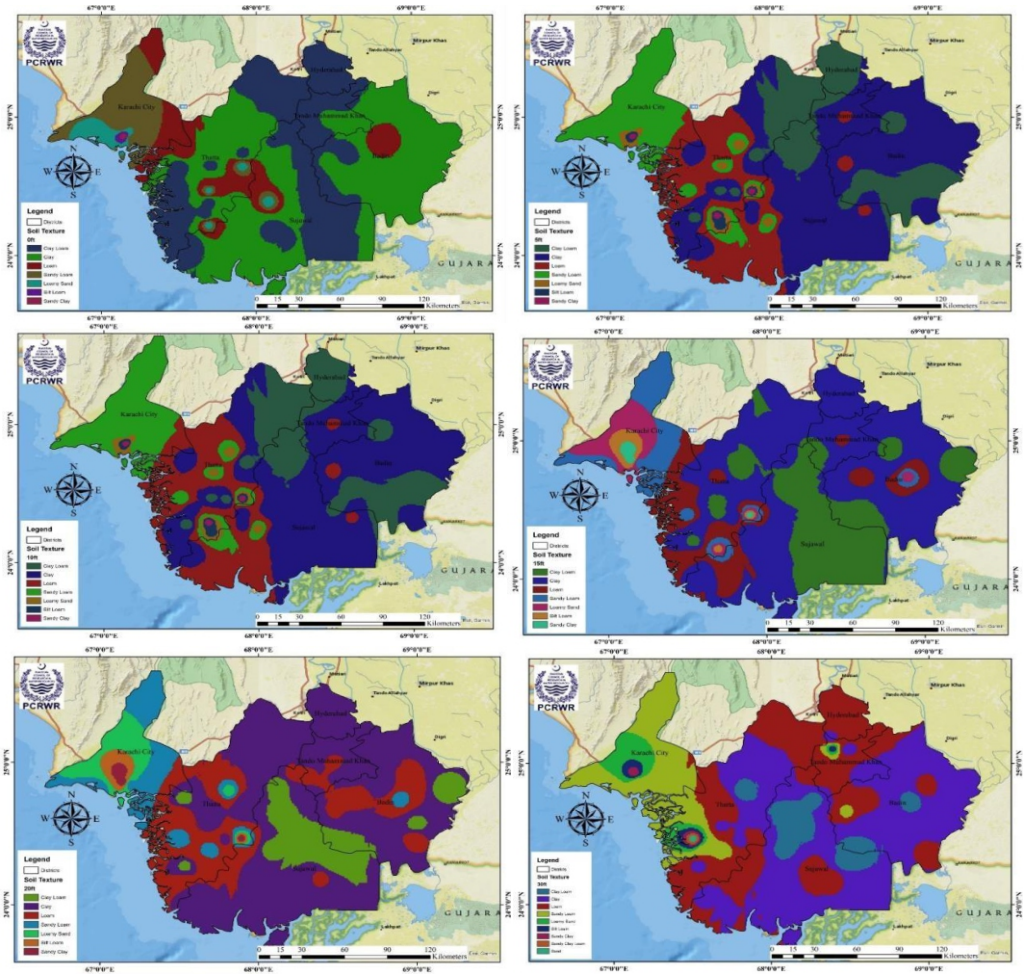


Figure 2: Soil lithology maps for 0ft, 5ft, 10ft, 15ft, 20ft, 30ft depth

Water Quality Monitoring & Treatment In Karachi City: Possible Cholera Outbreak Response In Collaboration With UNICEF

Karachi City faces different types of water-borne diseases including cholera mainly due to supply of contaminated and non-chlorinated water in the city. Cholera affects both children and adults and can kill within hours if untreated. Pakistan has an increase statistics of cholera cases during emergencies. Recently, Director General, health Government of Sindh confirmed the Cholera outbreak in three districts of Karachi i.e. Karachi central, Karachi East and Karachi with 150 approximately lab-confirmed cases of cholera. PCRWR Karachi office initiated a study in collaboration with UNICEF to detect the presence of Vibrio cholerae, E. coli and total coliforms in tap-water from households and to control / kill these bacteria by chlorination.

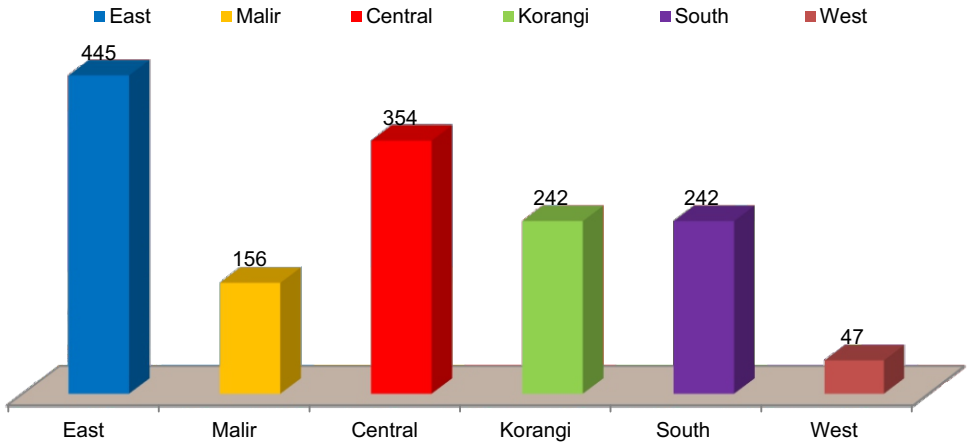


Figure 1: Detail of water samples collected under Cholera response Activities

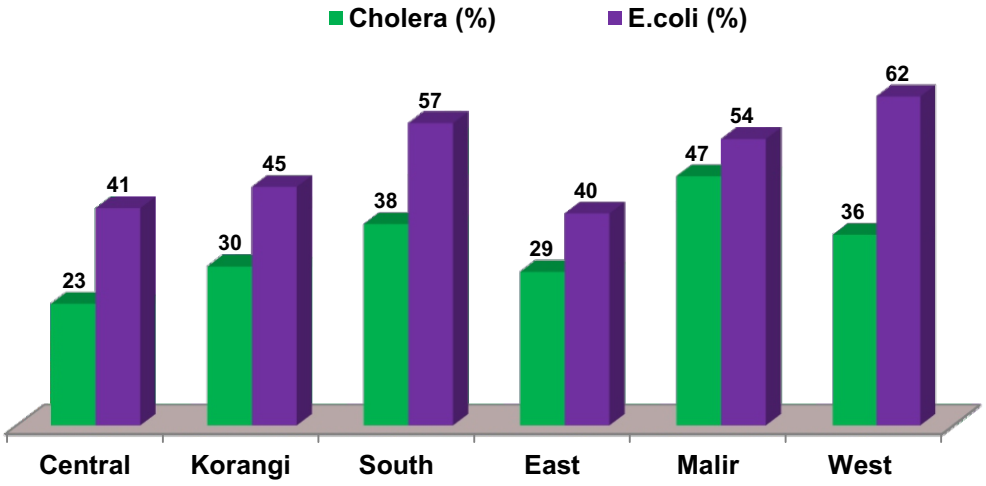


Figure 2: Showing district-wise bacteriological contamination (%age) in Karachi

Water Quality Monitoring & Treatment in Baluchistan: Possible Cholera Outbreak Response In Collaboration With UNICEF

To minimize the risk of Cholera and Gastroenteritis outbreak, Water Quality Monitoring & Treatment in district Hernai, Chaman, Loralai, Dera Bugti, Jaffarabad, Nasirabad and Quetta, Baluchistan was carried out as Possible Cholera Outbreak Response in collaboration with UNICEF. Water Quality and monitoring was carried out in Naseerabad, Jafarabad, Dera Bugti, Hernai, Loralai and Quetta districts of Baluchistan in collaboration of UNICEF. Total 998 water samples were collected from these districts and analyzed for Vibrio cholerae, E.coli and Total coliforms during the reported period as shown in below figure.

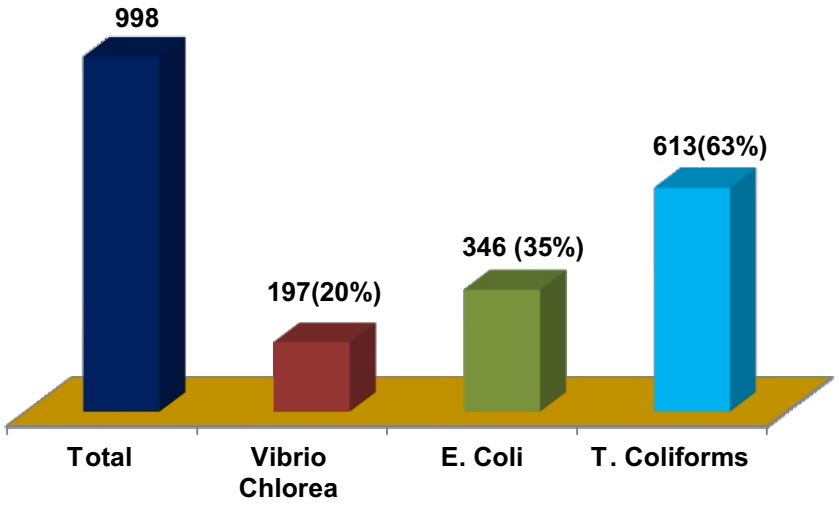


Figure: District-wise percentage contamination of vibrio cholerae, E.coil and Total Coliforms

Flood Relief Activities by PCRWR in Balochistan

PCRWR respond to flash flood situation in Balochistan by carrying out below relief activities;

1. Chlorination of Drinking Water Sources in Naseerabad, Jaffarabad and Sohbatpur, Districts, Balochistan

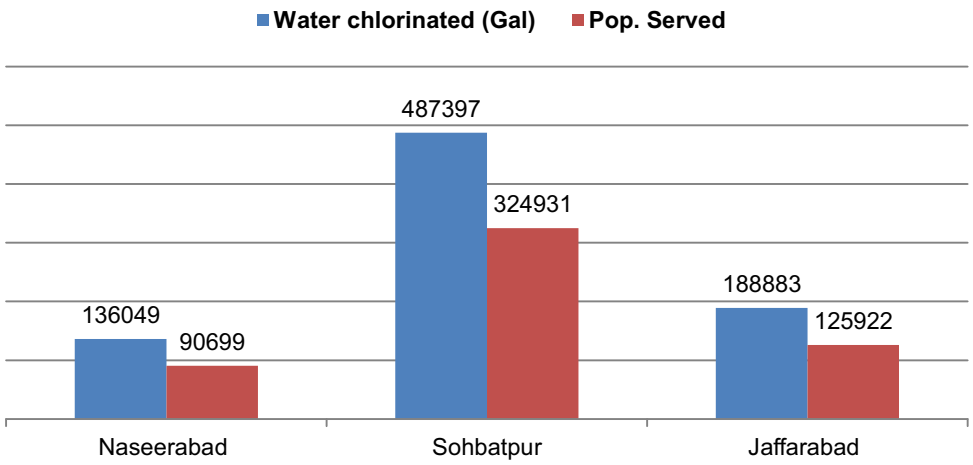


Figure: Detail of water chlorinated & population served in flood affected Areas of Naseerabad Division, Baluchistan

1. Capacity building of PHED/NGOs staff by providing necessary training on site on water quality monitoring, proper chlorination and post chlorination testing in Lasbella, Jaffarbad, Naseerabad and Suhbatpur Districts of Balochistan.
2. Provision of Safe Drinking Water In District Lasbella, Balochistan

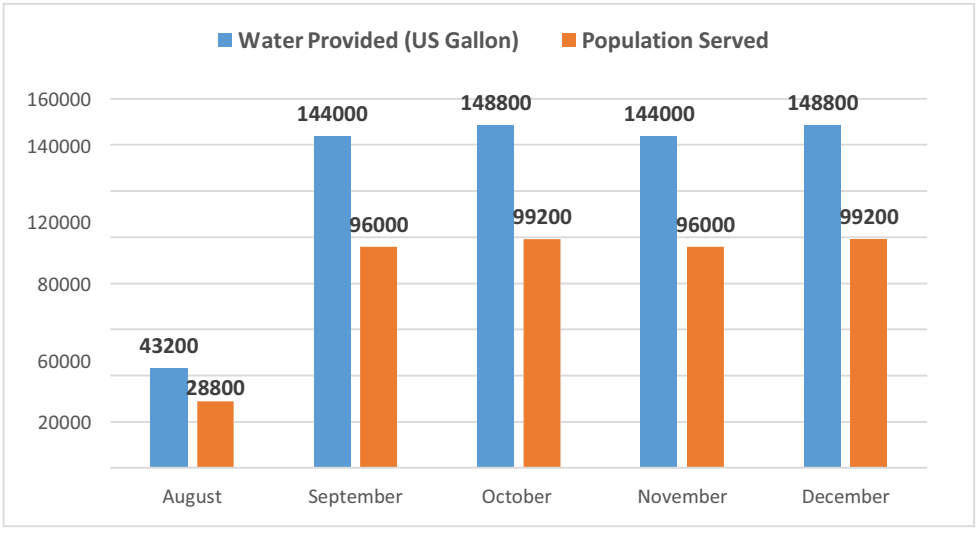


Figure: Water filtration and populating served with safe drinking water at Lakhra, Balochistan

Post Flood Water Quality Monitoring in Flood Affected Districts of Sindh in Collaboration of UNICEF

PCRWR regional office Karachi in collaboration with the UNICEF has initiated a post flood water quality monitoring in flood affected districts of Sindh namely Umerkot, Mirpurkhas, Sanghar, Shaheed Benazirabad, Thatta, Larkana, Dadu, Qamber Shehdadkot, Naushero-feroze, Kahirpur, Shikarpur, Jacobabad, Kashmore and Jamshoro. In this regard total 768 water sources were monitored, collected water samples and analyzed for different physico-chemical& microbiological parameters.

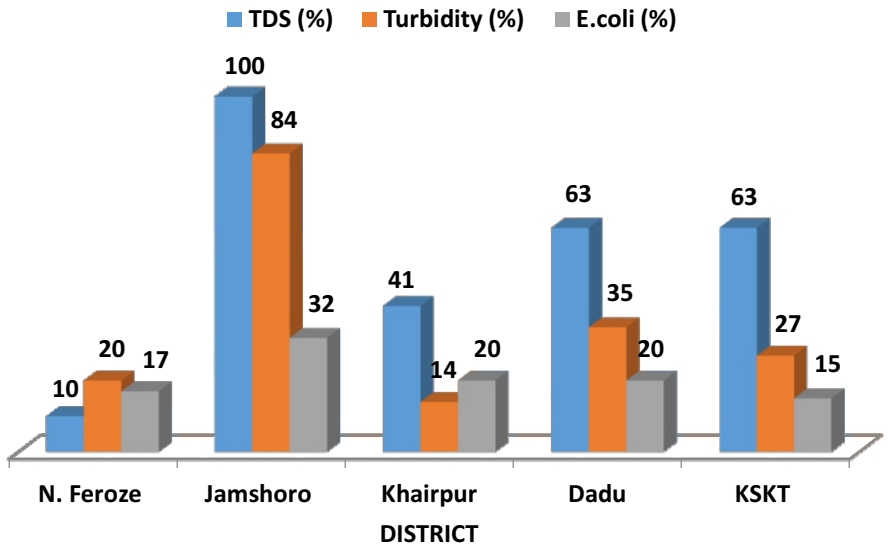


Figure: Percentage contaminations (%age) in districts of Sindh

Technical Assessment Survey for Installation of Filtration Plants at Government Hospitals in Sindh:

PCRWR Karachi has conducted Technical Assessment Survey for Installation of Filtration Plants at Sindh Government Hospitals (n=40) in Sindh Province in collaboration with INDUS Hospital. The objectives of the study were:

- Present situation analysis regarding availability and access to safe drinking water in the Government Hospitals.
- Suggestion for type of Filtration Plant (Reverse Osmosis/ Ultra Filtration) as per requirement.
- Development & provision of BOQs, drawings for the proposed filtration plants

The technical assessment survey of 40 hospitals throughout the Sindh province has been completed and report submitted to the quarter concerned with the recommendation for installation of filtration plants for the provision of Safe drinking water in the hospitals.

Few glimpses of water filtration plants in hospitals of Sindh

Evaluation of Water Productivity of Wheat, Maize & Rice Crops on Bed Plantation

PCRWR Lahore has established a Research & Demonstration (R&D) Centre on 21 acres of agricultural land near Sialmore, district Sargodha. The soil type is sandy loom and source of irrigation is groundwater with good quality. On this centre, research studies on various water management strategies have been conducted systematically. Different water conservation techniques like bed & furrow irrigation, LASER land leveling, zero tillage and proper layout have proved more than 30 percent saving in water. Results are as below;

Rice (Kharif 2022)

In Kharif (2022) season, rice grown by different irrigation methods, that is Direct Seeded Rice (DSR) on fresh beds 0.38 ha, flat 0.12 ha, rice on beds 0.51 ha and conventional on 02 ha. Applied @1359,1520, 1878 & 2780 mm irrigation water in 20, 21, 30 and 35 number of irrigations to DSR, bed & furrow and conventional (flood) irrigation methods respectively.Whereas farmers applied 2665 to 3261 mm irrigation in 35 to 40 number of irrigations in conventional rice growing method.

Maize (Kharif 2022)

The Maize seed hybrid (Syngenta) transplanted onbeds and ridges 0.53 and 1.11 ha respectively. Applied @ 505 and 442 mm irrigation water in 07 and 06 number of irrigations to beds and ridges respectively. Whereas farmers applied 530 to 607 mm irrigation depth in 6 to 7 number of irrigation intervals. Maize crop harvested on entire plot basis (biomass + Corn) and the total weight of maize crop from four acres obtained 996 monds. The average weight is 615 monds/ha.

Wheat (2022-23)

In current Rabi (2022-23) season, wheat seed (Akbar 19) has sown on 0.51, 0.38, 0.53, 0.33, 1.54, 0.41 and 0.65 ha by Bed & Furrow,permanent raised beds, ridge, Zero Tillage, Pak seeder, Rabi drill and broad cost methods respectively. The wheat crop was harvested with combine harvester and wheat grains were weighted. The grain yield of 41, 38, 40, 39, 42, 35 and 39 mond/ac. were obtained from Bed & Furrow, ridge, Zero Tillage, pak seeder, rabi drill on permanent raised beds and broad cost methods respectively. Total irrigation applied in bed & furrow, PRB, ridge, ZT, Pak seeder, rabi drill and BC plots are 268, 267, 299, 280, 315, 308 and 417 respectively.

Water Requirement of Sugarcane in Central Punjab.

Pakistan Council of Research in Water Resources (PCRWR) initiated lysimeter schemes in Punjab and Sindh to study the effect of shallow water table depths on evapotranspiration (ET) and related parameters. The studies on wheat, rice, maize, sugarcane, berseem, sunflower, cotton, mustered, chilli started in 1975 and 1985 in Punjab and Sindh respectively.

Table 1: Water requirement of sugarcane in Central Punjab

cropping Season	Crop	Water Applied	Rainfall	Cons. Use	Crop Coefficient (Oct - May)	Yield	WUE*
		(cm)	(cm)	(cm)	(Kc)	(T/ha)	(Kg/m3)
Year 2022-23 (Oct – May)	Sugarcane	79	17	48	0.63	-	-

**Water use efficiency (WUE) calculated yield to consumptive use*

Determination of Water Requirements of Sugarcane under Different Water table Depths

PCRWR is conducting regular research study to determine the water requirements (WR) of sugarcane and groundwater contribution to WR under different water table depths and to determine the crop coefficient, yield and water productivity of sugarcane under different water table depths. Another objective of the study is to assess the soil salinity appraisal pre sowing and after harvesting of the sugarcane under different water table depths.

Sugarcane was cultivated in November 2021 and harvested in November 2022 (Table 1). The data related to sugarcane water requirement, groundwater contribution, yield, water use efficiency and agronomic parameters is given in Table 1. The water table found optimum for sugarcane is 2.00 m where, highest yield (18-21%) and WUE (4-23%) achieved.

The agronomic parameters of sugarcane are also found best at 2.00 m water table than other conditions. After harvesting of sugarcane in November 2022, sugarcane stalks were transplanted in February, 2023 for the next crop. The data collection is in progress and crop will be ready to harvest by February 2024.

Table 1: Water requirements of sugarcane under different water table depths

Parameters	**1.75 m WTD**	**2.00 m WTD**	**Free Drainage**
ET (mm)	2246	2195	1883
S (mm)	293	172	-
Yield (Ton/ha)	132	168	138
WUE (kg/m3)	5.88	7.65	7.33
Cane length (m)	2.57	2.73	2.50
Dry Biomass (Ton/ha)	37	42	41
Green Biomass (Ton/ha)	27	31	28

Cultivation of Various Sugarcane Varieties under Different Irrigation Methods

A regular research study is being conducted by DRIP Tandojam to determine the yield, agronomic parameters and water productivity of sugarcane varieties grown on ring-pit, raised bed and ridge irrigation and to assess the soil salinity behavior, water saving and economic viability of sugarcane varieties grown on ring-pit, raised bed and ridge irrigation.

The data related to water used, yield, water use efficiency and agronomic parameters of different varieties of sugarcane (Figure 2) under different irrigation methods is given in Table 2.

In general, performance of raised-bed planting is better in terms of producing highest yield. However, water saving is highest in ring planting as compare to other methods. The yield of NIA-2012 found to be highest in all irrigation methods. Planting NIA-2012 on raised-beds produced 21-23% highest yield over ring plantation and ridges. Water use efficiency of NIA-2012 is almost same compared to ring method and 36% highest than ridges.

Table 2: Response of yield and other parameters under different irrigation methods

parameters	Ring-Pit			Raised-Bed			Ridges		
	CPF-251	NIA-2012	Thatta-10	CPF-251	NIA-2012	Thatta-10	CPF-251	NIA-2012	Thatta-10
Water applied (mm)	800			1228			1576		
Rainfall (mm)	698								
Effective rainfall (mm)	330								
Total water used (mm)	1130			1558			1906		
Yield (Ton/ha)	113	113	100	99	146	127	108	115	100
WUE (kg/m^3)	9.99	9.99	8.89	6.37	9.37	8.15	5.67	6.01	5.26

Assessing the Potential of Salt Tolerant Crops to Different Levels of Saline Water under the Desert Conditions

A regular research study is being conducted by DRIP Tandojam to determine the yield, agronomic parameters and water productivity of wheat, barley and canola crops irrigated with different water qualities and to assess any change in soil salinity under different water qualities and economic viability for cultivation of wheat, barley and canola crops irrigated with different water qualities.

Salt tolerant varieties of wheat (NIA-Zarkhaiz), canola (Surhan-2013) and barley (Sindhu) (Table 3) were grown at DRIP-PCRWR R&D farm, Mithi, Thar Desert using highly saline water (4000-8000 µS/cm) and saline water (4000-4500 µS/cm).

Overall performance of saline water was better in terms of producing high yield and water use efficiency of wheat (1568 kg/ha and 0.27 kg/m3) and barley (1172 kg/ha and 0.20 kg/m3), while canola did not performed well in both type of water qualities. Comparatively, wheat produced highest yield (476-1568 kg/ha) compared to barley (789-1172 kg/ha) and canola (148-201 kg/ha).

Table 3: Water used and other parameters of salt tolerant crops with different irrigation water qualities

Parameters	Wheat		Barley		Canola	
	Highly saline	Saline	Highly saline	Saline	Highly saline	Saline
Water used (m^3)	5870	5870	5870	5870	5870	5870
Yield (kg/ha)	476	1568	789	1172	148	201
Water Use Efficiency (kg/m^3)	0.08	0.27	0.13	0.20	0.03	0.03

Highly saline: 7500-8000 µS/cm; Saline: 4000-4500 µS/cm

Piloting Climate Smart Aquaculture in Tharparkar for Local Food Security

PCRWR DRIP, Tandojam has initiated a pilot study with the objectives for identifying the potential fish variety with high tolerance to highly saline water and deplorable Desert climate conditions and exploring the ways to utilize productively and economically unexploited highly saline groundwater and land resources of the Thar Desert for local food security.

Highly saline water could be used successfully for saline aquaculture in the arid environment of the Thar Desert. All fish species stocked can comfortable live in 8500-9000 µS/cm salinity waters. However, to get highest yield along with egg production, silver carp is a good choice. It has good potential to produce the eggs and fingerlings. This variety has high tolerance against the high salty water and hot weather environment. Hence, for the massive fingerling development, silver carp is recommended for saline aquaculture. For the meal production and high economic return, grass carp should be selected for saline aqua-culturing.

There exists tremendous scope for further expansion of different fish species in highly saline water in the Thar Desert environment by managing levels of inputs and monitoring water quality. Consequently, this will give more yield and better returns.

Table: Comparison of growth of fish varieties under saline aqua culture

Parameters	**Fish varieties**			
	Rahu Labeo	**Silver carp**	**Mrigal Carp**	**Grass carp**
Total number of fish	01	02	06	03
Single Fish weight (gm)	610	1275	965	1093
Egg weight (gm)	-	330	-	-
Fish meal weight (gm)	610	945	965	1093
Fish yield (kg/ha)	1525	2363	2413	2733
Fish length (cm)	38	47	42	48
Fish girth (cm)	13	28	21	25
Water used	923094 US Gallon (3494 m3)			

Scenario Study of Existing Water Facilities for Sustainable Ground Water Resources Management at Fauji Fertilizer Company Limited (FFC) Goth Machhi

FFC has installed 68 tube well in the area of about 305 acres. Keeping into consideration the gravity of water issues the FFC is interested to evaluate groundwater scenario of the area and proposed measures for sustainable groundwater management. The representative of the FFC has approached Regional Office PCRWR to submit the study proposal and estimated cost as per the scope of study mentioned below.

Electric Resistivity Survey was conducted at Ahmed Pur for groundwater exploration and its analysis was performed. Pumping test was also performed at 5 piezometers installed between two wells of FFC Well area to analyze the drawdown and uprise rate of groundwater according to strata and these results will be consider for all wells having same space and strata in FFC Well area.

Real-Time Groundwater Monitoring and Advisory System for Chaj Doab

The development of groundwater resource accounting or budgeting requires real-time monitoring system. Such system is imperative for the automatic measurement of fluctuations in water table along with qualitative variations at a very high temporal frequency (hourly basis). Moreover, these automatic measurement systems such as, data loggers are very robust, accurate, reliable and help in easy data sharing among stakeholders. Besides this, it will be a model for initiation of advisory service covering both quantitative and qualitative changes on monthly basis, which will be useful for upscaling in other parts of the Country leading towards sustainable groundwater management.

PCRWR has carried out a reconnaissance survey for understanding the hydrological characteristics of study area have been performed. Review of previous groundwater studies, Punjab Water Act 2019, etc for study for evaluation and analysis for the comparison of current study. Preparation of GIS based grid for sites identification of CTDs installation to identify the locations in Chaj Doab Geophysical investigations for sites evaluations for CTDs have been performed. Collection of secondary information pertaining to depth to water table, quality, etc from relevant provincial departments along with farmer's survey in selected locations of Chaj Doab have been collected along with the GPS Coordinates and water samples of deep and shallow have also been collected for isotopic analysis.

Impact Assessment of Indus Waters Treaty on Command Areas of Eastern Rivers

The Indus Waters Treaty was signed in 1960 between India and Pakistan over the water division mechanism of rivers of the Indus River System. After signing the treaty, India gradually stopped almost all the waters of eastern rivers and they have only the flows generated from rainfall within Pakistan's boundary (Ashraf, 2019). To deal with the reduced flow from eastern rivers, Pakistan had to build an infrastructure of link canals, irrigation systems, water diversions, and storage reservoirs to transfer water from western rivers to eastern rivers to serve their command areas. During flood events, India releases its excess waters in these rivers, creating havoc downstream. In addition, the Indian states along with the Pakistani border are over-abstracting the groundwater, which might affect the aquifers of Pakistan. The pollutants carried by transboundary drains and excessive groundwater pumping on the Indian side are posing an additional threat to the downstream water quality, groundwater aquifer, and the ecosystem. In this regard PCRWR is conducting a study with following objectives;

I. Assessment of IWT impacts on the river's paths and bed, flood plains, availability and quality of surface and groundwater resources in command areas of eastern rivers in Pakistan.
II. Study the impacts of treaty on cultivated areas, cropping patterns, crop productivity and farmer's economic conditions.
III. Understanding the impacts on the ecosystem, marine life, and flora/ fauna in the study area.

During the reporting period farmer's interview from selected points of Head, Middle and Tail of each river from left and right have been conducted through performas and secondary data from relevant department are being collected which will be utilized in study for analysis and water samples of deep and shallow and River water samples have also been collected during survey and being analyzed for the its results which will be address in the study during the later period.

Water Quality Monitoring and Mitigation in Flood Affected Areas of South Punjab in Collaboration with UNICEF

The quality of drinking water has been deteriorated in flood affected areas of South Punjab due to damage of water supply systems, sewage disposal systems, disruption of underground piping; dislodgment of storage tanks, overflow of toxic waste, release of chemicals, disruption of petrol storage tanks. To overcome the situation especially dihedral cases and water borne diseases comprehensive base line data and chlorination was required. PCRWR and UNICEF immediately launched project in the most affected districts of South Punjab. PCRWR has performed following activities in collaboration with United Nations Children Funds UNICEF and with the consultation with Public Health Engineering Department PHED, Punjab Aab-i-Pak Authority PAPA as per the requirement of flood victims.

- Water Quality Monitoring of Local Sources and WSS Water
- Chlorination of water sources
- Distribution of chlorine tablets and plastic canes
- Disinfection of Hand Pump.
- Capacity Building Training of PHED & TMA
- Monitoring of Water Quality Status in Flood Affected Areas of Southern Punjab

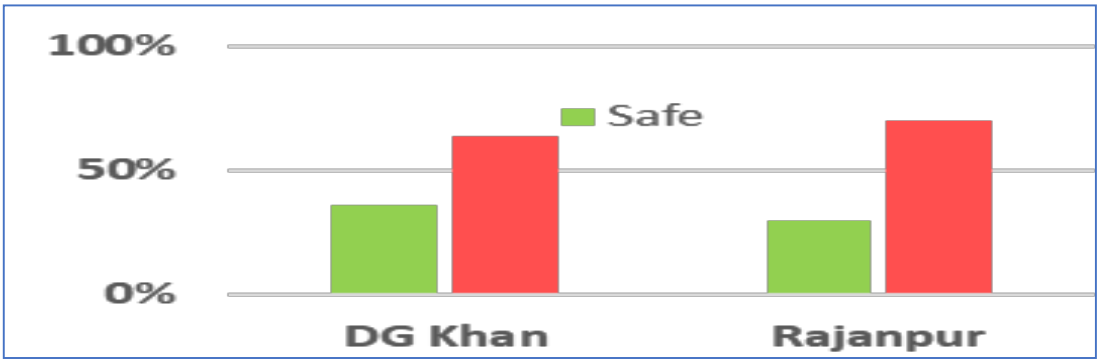


Figure: Water Quality Status of districts Dera Ghazi Khan and Rajanpur

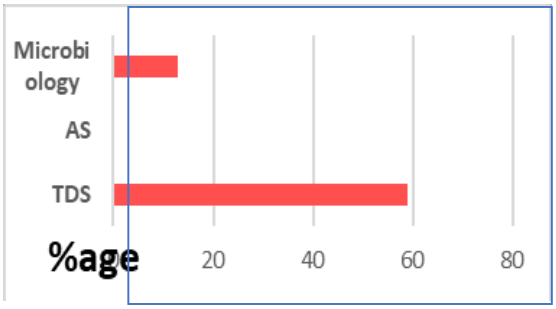


Figure: Parameter wise water quality status of DG. Khan

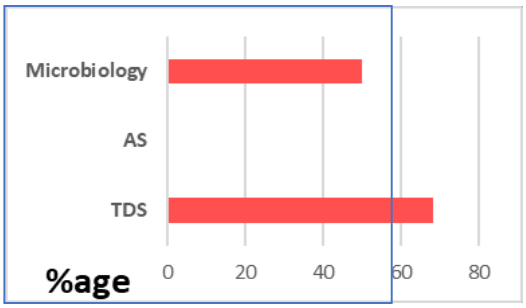


Figure: Parameter wise water quality of Rajanpur

Water Quality Monitoring of the Existing Water Filtration Plants for the Provision of Safe Drinking Water in Southern Punjab

PCRWR, Regional office Bahawalpur conducted a survey in 11 districts of South Punjab i.e Bahawalpur, Multan, Dera Ghazi Khan, Bahawalnagar, Lodhran, Vehari, Rhaim Yar khan, Layyah, Khanewal, Muzaffar Garh and Rajan Pur to assess the water quality status of already installed filtration plants with the financial assistance of UNICEF under the project entitled "Water Quality Monitoring of Filtration Plant of South Punjab". The present report is based on water quality results of filtration plants of eleven districts of south Punjab. It provides an insight to the up-to-date situations of all functional filtration plants, highlighted the issues and will also suggest the possible solutions to solve that issues.

Table: Summary of filtration plants

Sr No.	District	Samples collected from filtration plants (Functional)	Samples collected from other sources (Non-Functional FP)	Total
1	Bahawalpur	113	46	159
2	Bahawalnagar	66	17	83
3	Khanewal	91	15	106
4	Lodhran	51	17	68
5	Layyah	10	2	12
6	Muzaffar Garh	23	39	62
7	Rajanpur	11	33	44
8	Rahim Yar Khan	115	26	141
9	Vehari	89	43	132
10	Multan	277	110	387
11	DG Khan	74	46	120
Total		920	394	1314

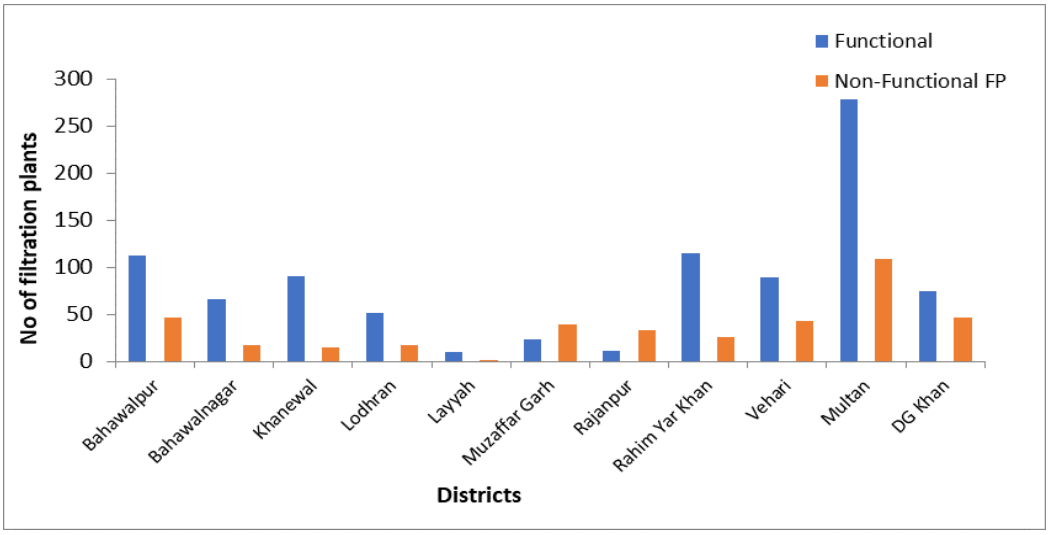


Figure: Status of filtration plants

Meetings and Visits

Meeting on National Conservation Strategy

A meeting to discuss draft National Water Conservation Strategy (NWCS) was held in PCRWR on 30th August 2022, drafted by PCRWR under the chairmanship of the Secretary Ministry of Water Resources. The Chairman PCRWR gave a presentation on the draft strategy and different aspects of the strategy were discussed. A number of valuable suggestions were made by the participants and were incorporated in the draft strategy.

Meeting with Secretary, MoWR

Meeting with World Bank Delegation

A delegation of water resources experts from World Bank had a meeting in PCRWR Regional Office, Lahore on 22nd August 2022. Mr. Faakhar Raza, Regional Director briefed the World Bank team about ongoing research and development activities. Detailed discussions were made on water management, water quality related issues of the area and potential collaboration of both the organizations for solutions to water- related issues. World Bank team also shared their experiences on similar issues in other countries of the region. The technologies and gadgets i.e., CTD divers, water quality testing and recharge well installed at Regional Office were demonstrated to the participants.

The World Bank delegation visiting PCRWR Lab.

Visit of Director UNESCO at PCRWR

Dr. Youssef Filali-Meknassi, Director UNESCO Pakistan, visited PCRWR, Islamabad on 4th July 2022. The Chairman PCRWR gave a briefing on the current and planned activities of PCRWR as well as joint activities with UNESCO. During the meeting possible areas of future collaborations were explored and discussed. The Director UNESCO also visited the demonstration models of various interventions in the premises of PCRWR after the meeting.

Chairman PCRWR giving briefing on groundwater recharge well

Visit of CDC–USA Delegation to PCRWR

A three member delegation of Global WASH Epidemiology Team, Center for Disease Control and Prevention (CDC), Atlanta (USA) visited PCRWR on 15th September 2022. The delegation comprised Dr. David Berendes, Team Lead, Dr. Kristen Heitzinger, Epidemiologist and Ms Molly Cantrell, Health Scientist. They had a meeting with Chairman, PCRWR to discuss the overall water, sanitation and hygiene (WASH) situation in the country and the role of PCRWR in improving WASH.

Glimpse of the meeting

Visit of World Bank and AquAffirm Delegate

Dr. Lucy Lytton, Senior Water Resources Management Specialist, World Bank and Dr. David Sarphie, CEO AquAffirm Ltd. visited Pind Dadan Khan for the field demonstration of AquAffirm sensor based field testing kits for arsenic on 10th August 2022. The field team of PCRWR demonstrated the arsenic testing in water supply of Haranpura and Kasili villages. Whereas the process of the AquAffirm tool comprising AquAffirm-As™ arsenic sensor and AquAffirm™ cloud-based software platform and principal behind was explained by Dr. David Sarphie.

The next day on 11th August 2022, the delegate met Dr. Muhammad Ashraf at PCRWR Headquarters, Islamabad. The Chairman PCRWR highlighted the groundwater issues in Pakistan and PCRWR's efforts to find research based solutions. The meeting was intended to discuss prospect of collaboration activities with AquAffirm and further future collaboration with the World Bank.

Glimpses of the field visits by World Bank

Visit of delegation from JICA to PCRWR

PCRWR and FFC jointly hosted a team of advisors from the Japanese International Cooperation Agency (JICA) led by Mr. Toshihiro Goto. The Chairman, PCRWR gave a detailed briefing of PCRWR's research and development activities particularly related to flood response and flood risk reduction research. It was agreed that areas of mutual cooperation will be identified for future collaboration.

Group photo with JICA delegation

Visit of Water experts of KOICA to PCRWR

Water experts from KOICA visited PCRWR headquarters, Islamabad on 1st December, 2022 to discuss flood prevention, mitigation, and preparedness in districts Multan and Muzaffargarh. Dr. Muhammad Ashraf, Chairman, PCRWR welcomed the delegation and briefly presented the mandate, functions and different Research and Demonstration projects of PCRWR in different areas of the country. Korean experts took a keen interest in the different interventions introduced by PCRWR.

Meeting with Water Experts from KOICA

BIDR-China and Warm Waters Advisory Group Visit to PCRWR R&D Farm, Sialmore

A delegation from BIDR, China and Warm Waters Advisory Group comprising of Mr. Ma Zhiwei and Dr. Shah Fahad Rahim from BIDR, China and Mr. Zubair Warraich from the Warm Water Advisory Group visited PCRWR's R&D farm, Sialmore on 12th December, 2022. The objective of this visit was to identify and finalize pilot site for design and installation of IoT based smart irrigation and fertigation system. The participants were given a detailed presentation and were briefed about the current irrigation practices, irrigation scheduling and use of the moisture sensors installed at the farm. The farm data was also shared with the delegation for system designing. The delegation also visited the PCRWR headquarters on 14th December, 2022 at Islamabad.

Visit to PCRWR R&D farm Sialmore

Meeting and Field Visit along with Judicial Water Commission, Lahore

A delegation from Judicial Water Commission, Lahore visited Regional Office, Lahore to discuss arsenic contamination issues of groundwater in Kasur and Sahiwal. Mr. Faakhar Raza, Regional Director, Lahore briefed the Commission about the high arsenic rates in these areas, The Judicial Commission also visited the areas of high contamination in Kasur identified by PCRWR team and also met with the locals to get a first hand feedback on the contamination issue.

Visit of the commission to arsenic contaminated areas of Kasur

Visit of the Federal Secretary, Ministry of Water Resources (MoWR) to PCRWR

The Federal Secretary, Ministry of Water Resources, Mr. Hassan Nasir Jamy visited PCRWR on 13th January 2023 alongwith Mr. Imran Jameel Shami, Joint Secretary (Admn), Ministry of Water Resources and Mr. Ahmad Kamal, Chairman, Federal Flood Commission (FFC). Dr. Muhammad Ashraf, Chairman, PCRWR delivered a detailed presentation on PCRWR's mandate, functions and research activities. The Chairman also briefed the Secretary about the different research initiatives of PCRWR to address the issues in water sector, including emergency response activities during the floods of 2022. The Secretary was also briefed about different ongoing projects to tackle water scarcity in the wake of climate change.

The Secretary MoWR also visited the research facilities of PCRWR and demonstration models like; rooftop rainwater harvesting, groundwater recharge and wastewater treatment plant. The Federal Secretary, MoWR showed keen interest in the initiatives taken up by the organization and appreciated the activities of PCRWR for their alignment to the National Water Policy 2018

Meeting with Secretary, MoWR

Visit of delegation of Isfahan Chamber of Commerce, Industries, Mines and Agriculture (ICCIMA) to PCRWR

A delegation from Isfahan Chamber of Commerce, Industries, Mines and Agriculture (ICCIMA) visited PCRWR, Islamabad on 2nd February, 2023. The delegation comprised of Mr. Mohammad Sadeghi, Member of Board of ICCIMA and Director of Isfahan Agriculture and Water Strategic Research Center, (ICCIMA), Dr. Zahra Zamani Nokabadi, Director of the Economic Research Department, (ICCIMA) and Coordinator of Isfahan Agriculture and Water Strategic Research Center, (ICCIMA) and Dr. Roja Kianpour, Head of Agriculture Department, National Agriculture and Water Strategic Research Center, Iran Chamber of Commerce, Industries, Mines and Agriculture (ICCIMA). Prof. Dr. Seyed Komail Tayebi, President, ECO-SF alongwith Mr. Ghulam Abbas Rahar,Assistant Director, ECO-SF accompanied the delegation.

Dr. Muhammad Ashraf, Chairman, PCRWR welcomed the guests and presented a detailed overview of R&D activities and initiatives taken up by the Council to address the water issues of Pakistan. The delegation appreciated the efforts of PCRWR in the water sector showed keen interest in extending the co-operation in the fields of water quality, hydrology and agricultural water management.

Meeting with delegation of Isfahan

Meeting with Water Management Expert from World Bank

A meeting with Water Management Specialist from World Bank was held at PCRWR Regional Office, Lahore on 18th February, 2023 regarding drought management in Cholistan desert. Engr. Faakhar Raza, Regional Director, briefed about the PCRWR activities for drought management in Cholistan. Experts from World Bank emphasized the importance of data for hydro-informatics for drought management and to enable the communities for drought preparedness.

Regional Director, Lahore meeting with World Bank water expert

Meeting with Delegation from University of Tokyo, Japan

Professor Akiyuki Kawasaki from the University of Tokyo, Japan visited PCRWR, Islamabad on 28th February, 2023. The Secretary, PCRWR Dr. Hifza Rasheed welcomed the guests and gave a detailed presentation on key functions, major achievements and ongoing research of PCRWR. She explained that Pakistan has suffered accumulated losses of 30 billion US$ due to the floods of 2022. Prof. Akiyuki Kawasaki appreciated the activities and various interventions of PCRWR for flood- affected communities across Pakistan. He explained that a team of researchers under his supervision was carrying out research work on the causes of recent devastating floods in Pakistan for rapid rehabilitation of affected communities and their livelihoods.

Group photo with University of Tokyo delegation

Meeting with Delegation from Mott Macdonald

A meeting was held in PCRWR on Thursday 16th March, 2023 with the Mott Macdonald's delegation which is responsible to support and collaborate in antimicrobial resistance (AMR) in Pakistan through the Fleming Fund. The first phase of the grant is coming to an end in June 2023 and the next phase is expected to begin in July 2023. The visit of Mott Macdonald's team was to explore avenues of collaboration with PCRWR in the 2nd phase to strengthen laboratory capacity for AMR detection and diagnosis.

Dr. Hifza Rasheed, Secretary, presented PCRWR activities as well as the importance of AMR in Pakistan.

Group photo with Mott Macdonald's delegation

Visit of the Ambassador of Kyrgyzstan to PCRWR

His Excellency Mr. Totuiaev Ulanbek Asankulovich, Ambassador of Kyrgyzstan to Pakistan and Professor Dr. Manzoor Soomro visited PCRWR on 1st June, 2023. Welcoming the delegates, Dr. Muhammad Ashraf, Chairman, PCRWR extended his warmest welcome to his Excellency the Ambassador. The Chairman, PCRWR gave a detailed presentation regarding the core strengths of the Council. In his concluding remarks Mr. Totuiaev Ulanbek Asankulovich agreed upon mutual cooperation to enhance resilience for controlling the adverse impacts of climate change on water resources of Pakistan.

A Glimpse of the Meeting

Visit of delegation from The World Wildlife Fund (WWF) to PCRWR

A senior delegation of the World Wildlife Fund (WWF) visited PCRWR, Islamabad on 8th June, 2023. The WWF delegation consisted of Mr. Sohail Ali Naqvi, Director, Freshwater Programme, WWF-Pakistan, Mr. David Kuhn, Lead Corporate Climate Resilience & Risk Management, WWF-US, Mr. Gyan De Silva, Senior Program Officer, WWF-US and Ms. Laura Brush, Senior Program Officer, Corporate Resilience Partnership, WWF-US. Dr. Muhammad Ashraf, Chairman, PCRWR welcomed the delegation and explained about the climate smart technologies and interventions for conservation of water and protection of ecosystems through nature-based solutions introduced by PCRWR.

Chairman Presenting Souvenir to the delegation

Visit of delegates of World Bank to Regional Office, Lahore

A delegation from World Bank visited PCRWR, Lahore on 31st May, 2023. The delegation was welcomed and briefed by Mr. Faakhar Raza, Regional Director about the ongoing research activities. World Bank representatives showed keen interest to collaborate in an upcoming project in Punjab titled "Improved Water Management and Irrigation Systems" for water sampling and analysis along with its effect to long term agriculture practices. It was further deliberated that how, under the said project, PCRWR can support Punjab Irrigation and Agriculture department in surface and groundwater monitoring and building the capacity of these departments.

Group photo with Mott Macdonald's delegation

Human Resource Development

Technical Training Program on Integrated Rainwater Harvesting Techniques to Mitigate Urban Flooding

Pakistan Council of Research in Water Resources (PCRWR) is providing training to the staff members of different public sector authorities to enhance their technical capacity. Four technical training programs on "Integrated Rainwater Harvesting Techniques to Mitigate Urban Flooding" was successfully organized on 5th – 9th and 20th to 23rd December, 2022 for first and second batch respectively. Trainings of third and fourth batch were held on 3rd-6th and 17th-20th January, 2023 respectively Technical staff from Water and Sanitation Agency (WASA) Rawalpindi, Tehsil Municipal Administration (TMA), Nowshera, NDMA, Sheher-Saaz and UN-Habitat, Pakistan actively participated in the training sessions.

The closing and certificate distribution ceremony for the first batch was organized on 9th December, 2022 while for the second batch the ceremony was organized on 23rd December, 2022. The closing and certificate distribution ceremony of final workshop was organized on 20th January 2023. The Managing Director WASA Rawalpindi, Mr. Muhammad Tanveer, and Chairman PCRWR, Dr. Muhammad Ashraf distributed certificates to the trainees and appreciated their group presentations. Speaking on the occasion, Mr. Muhammad Tanveer admired the efforts of PCRWR for organizing such a knowledge-based and skill-oriented training program.

Group photo of the participants of the training program

Three day Training Workshop on "Improving the Tricycle Protocol

A three days training workshop on the technical components under the project "Improving the Tricycle Protocol: Upscaling to National Monitoring, Detection of CPE for One Health Surveillance (TRIuMPH)" was organized at National Institute of Health (NIH), Islamabad from 22nd to 24th August, 2022. The training workshop was comprised of sampling strategy, new research methods and protocols covering the instructive sessions as well as the detailed microbiology laboratory training. At the end of the training session, concluding remarks were given by the Project Director and Head of Public Health Department, NIH Dr. Muhammad Salman, Secretary PCRWR, Dr. Hifza Rasheed and NARC representative Dr. Abu Bakr.

A glimpse of the training session at NIH

Training Workshop on Identification of Potential Sites for Managed Aquifer Recharge (MAR) in Peshawar Valley

Pakistan Council of Research in Water Resources (PCRWR) in collaboration with Asian Development Bank (ADB) organized a training workshop on, Identification of Potential Sites for Managed Aquifer Recharge (MAR) in Peshawar Valley (Khyber Pakhtunkhwa) at PCRWR Headquarters, Islamabad on March 7, 2023. The main objective of the workshop was to enhance the capacity of stakeholders for sustainable groundwater resource management in Khyber Pakhtunkhwa.

During his welcome remarks, Dr. Muhammad Ashraf, Chairman, PCRWR emphasized the need for maintaining a balance between groundwater abstraction and recharge. He also highlighted that there is an urgent need to focus on rainwater harvesting and groundwater recharge particularly in urban areas. Dr. Naveed Iqbal, Director (Hydrology), PCRWR delivered a detailed presentation on the methodology developed by PCRWR for establishing groundwater recharge sites in Islamabad.

Dr. S.A. Parthapar, Consultant, Asian Development Bank (ADB) gave a detailed presentation on the data requirements for MAR. He also explained different GIS-based tools for data acquisition pertaining to MAR. The workshop was attended by professionals representing different departments of Khyber Pakhtunkhwa.

Glimpses of the training workshop

Consultative Session with Experts from AquAffirm (UK)

AquAffirm team (UK) has visited PCRWR Lahore along with officials from PCRWR Headquarters, Islamabad for demonstration of Arsenic testing sensors. The incharges of Water Quality Laboratories at Lahore, Gujranwala, Faisalabad also visited tube-wells in Kasur and Lahore with AquAffirm team (UK) for validation of Arsenic testing sensors in the field conditions.

A consultative session with AquAffirm

Capacity Building of PHED/NGOs Staff

PCRWR teams provided necessary onsite training in the field for capacity building of PHED, UNICEF implementing partners (IPs) and INGOs staff on water quality monitoring, proper chlorination and post chlorination testing in Lasbella, Jaffarbad, Naseerabad and Suhbatpur Districts of Balochistan.

A glimpse of the training session

Capacity Building Training of PHED & TMA Staff in Flood Affected Areas, Bahawalpur

PCRWR has provided training to the staff of Public Health Engineering Department (PHED) and Tehsil Municipal Administration (TMA) for water quality monitoring, chlorination and the use of safe water. The training also included the practical demonstration for the measurement of chlorine demand, calculation of chlorine dosing requirement and free chlorine testing.

Group photo of the participants

Training of Master Trainers

PCRWR Regional Office Bahawalpur in collaboration with National Rural Support Program (NRSP) organized a one day training of Master Trainers including teachers and staff of HELP IN NEED. The training session included demonstration on water sample collection for water quality monitoring, installation of hand pumps and cleaning of overhead tank to ensure safe drinking water. The training was deliberated to train teachers and staff to collect water sample after the installation of hand pumps.

Farmers' Day and Rice Harvest at R&D Center, Sialmore

A Farmers' day was organized at R&D Center, Sialmore. Progressive farmers of the area were demonstrated rice crop grown using different technologies including Raised Bed Plantation and Direct Seeded Rice. The farmers were briefed about the said technologies. An Interactive Q&A session was arranged as well. The farmers and agriculture experts appreciated the efforts of PCRWR to introduce new and efficient technologies through demonstrations.

Glimpses of farmer's day

Training Workshop on “Geophysical Investigation for Ground Water Studies Using Resistivity Survey”,

PCRWR in collaboration with the Islamia University of Bahawalpur (UIB) organized a training workshop on “Geophysical Investigation for Ground Water Studies Using Resistivity Survey” at UIB on 3rd May, 2023. The purpose of the workshop was to provide participants with an understanding of the principles and techniques involved in using resistivity survey for groundwater studies. The workshop aimed to familiarize participants with the importance of geophysical investigations for groundwater studies, introduce them to resistivity survey techniques, and demonstrate the apparatus and procedure involved.

Group photo of the participants

NAVTTC Training Course under Prime Minister's “Skills for All" (Batch-III)

A six month diploma course on “Water Quality Testing and Treatment”, under Prime Minister's “Skills for All” Hunermand Pakistan (Kamyab Jawan Initiative) in collaboration with NAVTTC and PCRWR has been organized in water quality labs at Lahore, Sargodha and Sahiwal. Monitoring team from NAVTTC also inspected the training course in Lahore via video call on 28th July, 2022 and interviewed the students regarding their learning.

Participants of the training under NAVTTC

Training Workshop on “Sun Satellite Model" at Nawazabad Model Farm, Tandojam

PCRWR in collaboration with Mehran University of Engineering and Technology, International Union for Conservation of Nature (IUCN), U.S Pakistan Center for Advanced Studies in Water (USPCAS-W) and SOFT organized a 2 day workshop from 12th to 13th July, 2023 at DRIP Tandojam and Nawazabad model farm. The workshop was organized under ACIAR project for developing resilience to salinity. The aim of the workshop was to demonstrate to the farmers of the Malwa farming community, the model site established by PCRWR at Nawazabad farm and to disseminate the outcomes of the project.

A glimpse of training workshop

Participation in Capacity Building Training Workshop on "Enhancing Water Quality System in Pakistan" South Korea

Mr. Akram Aziz, Research Officer, PCRWR has participated in capacity building program on Enhancing Water Quality System in Pakistan (for Working-level officials) on 18th August to 6th September 2022 in South Korea. In this training, Mr. Akram Aziz presented the country report on water resources management in Pakistan to highlight the water scarcity and climate change issue. The training course was focused on overall water resources management and development, Korean water resources management policy, water supply, and wastewater treatment etc.

Group photo of the workshop participants

Participation in International Housing Expo, Islamabad

PCRWR participated in the International Housing Expo, in Islamabad from 8th to 10th December, 2022 for sensitizing the Real state builders, property dealers, construction companies and public regarding climate resilient activities and importance of rain water harvesting in commercial buildings and at house hold level. Models from various research activities were also displayed.

PCRWR pavilion at the International Housing Expo, 2022

Online training on "Enhancing Water Quality System in Pakistan for Master Trainers" from May 1-June 9, 2023

PCRWR Officials Ms. Saiqa Imran, Senior Research Officer, Dr. Ghulam Murtaza, Senior Research Officer and Mr. Shakeel Badshah, Research Officer attended an online training program on "Enhancing Water Quality System in Pakistan" from 1st May to 9th June, 2023. The training was organized by Korean International Cooperation Agency (KOICA) along with Ministry of Climate Change and K-Water Academy for building capacity of master trainers on water quality monitoring under the project titled "Capacity Building on Water Quality Monitoring and SGD 6 (6.1) Reporting.

Screen shot of the online training

Summer School on Remote Sensing & GIS

Five officials of PCRWR Ms. Farah Naz, Ms. Raheela Nourine, Ms. Irum Gul. Mr Akram Aziz, Mr. Sohail Anjum attended five days (June 19-23, 2023) training workshop on Remote Sensing and Geographic Information Science (RS &GISC) organized by The National Center of GIS and Space Applications (NCGSA), at Institute of Space Technology (IST), Islamabad. The summer school covered a diverse range of topics, including the principles of remote sensing, digital image classification, spatial analysis, geodatabases, cartographic design and mapping. The workshop helped enhance the capabilities of PCRWR officials regarding use of remote sensing and GIS and their application in the field for monitoring and mapping.

Participants attending the training session

Services

Water Quality Testing and Analysis

National Water Quality Laboratory of PCRWR is one of the state of the art Laboratories of Pakistan with high tech water testing equipment and well trained professional. It is ISO- 17025:2017 accredited Laboratory. The provision of water and wastewater testing and advisory services to the general public and public and private organizations is a continue activity. NWQL is also executing the ground water, surface water as well as wastewater assessment and monitoring projects of government and or with collaboration of national and international organizations.

Water Quality Analysis

Groundwater Investigations

PCRWR has a fully trained team equipped with latest tools and equipment for groundwater investigations. Usually, Electrical resistivity surveying methods have been widely used to determine the thickness and resistivity of layered media for the purpose of assessing groundwater potential and drilling boreholes in fractured unconfined aquifers.

Groundwater Investigation

Laser Land Leveling

Laser Land Leveling is a process of smoothening the land surface from its average elevation with a certain degree of desired slope using a guided laser beam through-out the field. Laser leveling of agricultural land is a recent resource-conservation technology. The Research and Demonstration Farms of PCRWR are equipped with the latest Laser Land Levelers and the services are provided to the farmers on their request.

Laser Land Levelling

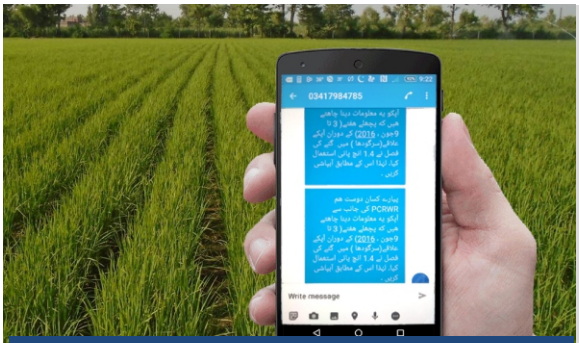
Soil Testing Service

PCRWR has maintained a state of the art soil physics laboratory at its headquarters. Soil testing is an important diagnostic tool for determining the nutrient needs of plants and for environmental assessments. The major laboratory testing includes soil moisture percentage, organic matters in soil, soil moisture retention curves, soil moisture extraction for chemical analysis. PCRWR soil physics laboratory is unique in Pakistan providing all above mentioned tests under one roof.

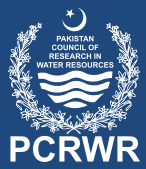
Pressure plate appratus

Irrigation Advisory Services

PCRWR launched the service on April, 2016, which is an outcome of international collaboration extended by the University of Washington (UW) and NASA. The SMS based Irrigation Advisory Services of PCRWR are being provided free of cost to about 20,000 farmers on weekly basis in 41 districts of Pakistan. However, PCRWR envisions extending the service to all farmers of irrigated areas, through international and national coordination.



Irrigation Advisory Text Message



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