

## **Pakistan Council of Research in Water Resources (PCRWR) Islamabad**

### **Major Achievements and Upcoming Events**

#### **a. Major Achievements**

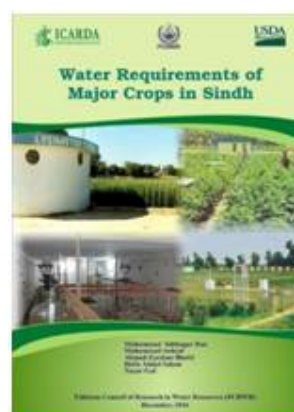
##### **National Water Research Agenda (2016-2025):**

PCRWR in collaboration with Mehran University of Engineering and Technology, Jamshoro and Higher Education Commission developed this document after series of consultative meetings at Islamabad, Lahore and Jamshoro. Purpose of this document is to avoid duplication of research work, prioritize key thematic areas aligned with SDGs and Pakistan Vision 2025 and relevant organizations.



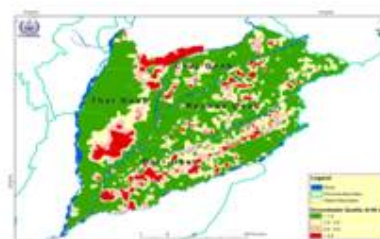
##### **Water Requirements of Major Crops in Sindh:**

Irrigation scheduling is the information about when to irrigate a crop and how much to irrigate. For proper irrigation scheduling, knowledge of crop water requirement is essential. PCRWR is the only organization in Pakistan that owns drainage type lysimeters at its regional offices located at Lahore, Tandojam, Quetta and Peshawar. PCRWR conducted studies on these lysimeters with major crops grown in the lower Indus basin and determined actual water requirements.



##### **Mapping of Groundwater Zones in the Upper Indus Basin:**

Over the last decade, PCRWR carried out various geo-physical activities to map groundwater quality of 4 Doabs (Thal, Bari, Rechna and Chaj) located in upper Indus plains. This information is available for different depths mainly from 0 to 300 meters.

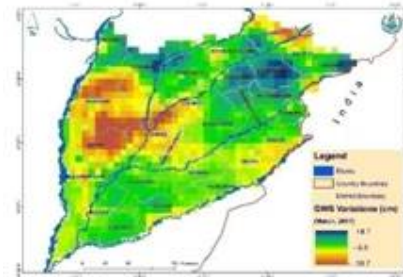


**Soil Hydraulic Properties of the Eastern Rivers:** - With the financial assistance of UNESCO, PCRWR has determined first ever complete soil hydraulic properties of the eastern rivers. This knowledge will be used as an input in IFAS flood forecasting model developed by ICHARM, Japan and is hosted at Flood Forecasting Division of PMD, Lahore. Earlier forecasting models were based only on weather data.

**Karez of Balochistanas World Cultural Heritage Site:** It is believed that in Balochistan until 1970, around 3000 karez systems were in use, providing water to towns for domestic use and for irrigated agriculture. Afterwards, with the availability of

electricity and tubewell technology, the karez systems started declining and currently only over one- third are functioning, constituting as one of the major water sources in Balochistan. A few decades ago, the agricultural economy was totally dependent upon the supply of karez water. The area irrigated by karez in Balochistan decreased from 14.2% in 1980 to 7.5% in 2000 and around 27,000 hectare in 2012. It is reported that out of 1328 karezes in Balochistan, 270 are non-functional whereas large number of others are partially functional. The rehabilitation of these systems in Balochistan is too difficult rather impossible due to continuous land use changes, urbanization & associated infrastructure developments. The importance to declare Karezes of Balochistan as World Heritage was highlighted at the relevant forums so as to protect centuries old marvelous structures and to preserve their social/cultural values. Accordingly, PCRWR in collaboration with the Government of Balochistan has successfully pleaded the case for “Karezes in Balochistan” for inclusion in the list of the sites in Pakistan suitable for inscription on World Heritage list of UNESCO in December 2015.

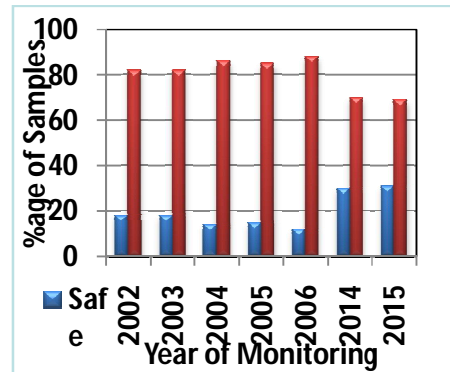
**Satellite Based Water Resources Management through GRACE (Gravity Recovery and Climate Experiment):** Previously, PCRWR has been carrying out groundwater monitoring through physical methods which is not only time consuming but expensive as well. For the last 2 years, PCRWR has gained skills with the assistance of University of Washington in using GRACE satellite data for groundwater monitoring.



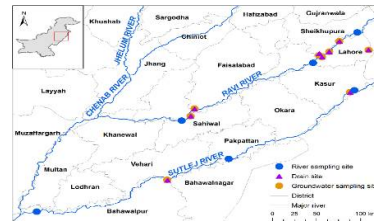
**Indus Telemetry:** International Water Management Institute (IWMI) has installed this instrument to measure flow/depth continuously at one large canal in Punjab i.e. Lower Bari Doab Canal. The flow data is displayed remotely using advanced communication technology. PCRWR is not only partnering this initiative but calibrating the results as well.



**National Water Quality Monitoring:** PCRWR initiated this program in 2002 covering 21 urban cities of the country. This monitoring could not be done from 2007 to 2013. Now, this program has been revived and monitoring has been done for 25 urban cities including freshwater bodies. Overall, 30% samples are found safe for drinking purpose.



**Transboundary Water Quality Monitoring:** One of the main reasons for contaminated water is the untreated disposal of domestic, industrial and hospital wastes into freshwater bodies. Unfortunately, there was no systematic scientific study conducted earlier to understand the spatial and temporal trend in water quality of freshwater bodies in Pakistan. This project envisaged monitoring the quality of Sutlej and Ravi rivers of Pakistan through a joint collaboration between CSIRO and PCRWR with main objective to assess the physical health of the river waters at strategic locations.



**Environmental Degradation Assessment of Manchar Lake:** Manchar Lake is the biggest natural lake of Pakistan which is famous for its flora and fauna. The Lake has been substantially supporting various economic activities like; livelihood for a half million anglers, irrigation water for various crops and aquatic plants including lotus. PCRWR with the financial support of US-Pak Center for Advanced Studies in Water of MUET carried out this study which is first of its kind. The main objectives of the study were;



evaluation of temporal water quality pollution level in water body of the Manchar lake; evaluation of anthropogenic activities causing pollution in the Lake; and pinpoint management strategies as remedial measures.

**Quarterly Monitoring of Bottled Water Brands:** PCRWR monitors quality of commercially available bottled water brands across the country on quarterly basis. Results are shared with different stakeholders for taking corrective measures. Reports are available at [www.pcrwr.gov.pk](http://www.pcrwr.gov.pk).

**Low Cost-effective Techniques for Groundwater Recharge in Balochistan:** Groundwater is the major source of water in Balochistan which is declining day by day. In order to recharge this precious resource, PCRWR is testing various cost effective techniques including leaky dams, recharge structures, inverted wells, watershed management, etc.



**Artificial Groundwater Recharge in Urban Areas:** About 90% of drinking water comes from the groundwater resources. Due to rapid growth in population and various urban activities, this precious resource is at threat. Therefore, there is need to recharge the depleting groundwater aquifers. Since last 2 years, PCRWR has started experimentation to promote rainwater harvesting coupled with artificial groundwater recharge methods like; soakway and inverted well in urban areas.

