

## Integrated Water Resource Management Practices in Greater and Lesser Cholistan, Pakistan (#497)



# Integrated Water Resource Management Practices in Greater and Lesser Cholistan, Pakistan

## Authors:

Ms. Paridhi Rustogi – Young Professional Development Initiative Intern: GWP-SAS  
Dr Pervaiz Amir – Regional Council Member, GWP-SAS/Pakistan Water Partnership (PWP)

## Editors:

Mr. Kenge James Gunya - Knowledge Management Officer: GWP Global Secretariat  
Mr. Lal Induruwage - Regional Coordinator (GWP-SAS): Regional Office, Colombo, Sri Lanka

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### About Global Water Partnership

The Global Water Partnership's vision is for a water secure world. Our mission is to advance governance and management of water resources for sustainable and equitable development.

GWP is an international network that was created in 1996 to foster the implementation of integrated water resources management: the coordinated development and management of water, land, and related resources in order to maximize economic and social welfare without compromising the sustainability of ecosystems and the environment.

The GWP Network is open to all organizations that recognize the principles of integrated water resources management endorsed by the Network. It includes states, government institutions (national, regional, and local), intergovernmental organizations, international and national non-governmental organizations, academic and research institutions, private sector companies, and service providers in the public sector.

The Network has 13 Regional Water Partnerships, 85 Country Water Partnerships, and more than 3,000 Partners located in 182 countries.

**Table of Contents**

1. Introduction.....4

2. Study Area .....4

3. Description of the Problem .....5

4. Decisions and Actions Taken.....6

5. Lessons Learned .....9

6. Recommendations.....9

7. Conclusion.....10

8. Contact Details.....10

9. Supporting References.....10

## 1. Introduction

Global Water Partnership's (GWP) Country Water Partnership (CWP) in Pakistan – The Pakistan Water Partnership (PWP) has worked in the field of Desert Development since its inception. With a population of over 210 million people, Pakistan's landscapes vary from plains to deserts, forests, hills, and plateaus. Of these, deserts are especially vulnerable to climate change and are affected by severe drought. In absence of water, industries, livelihoods and the health of the area's residents are compromised. To address these concerns, PWP decided to focus on on-ground interventions in Pakistan's Cholistan Desert area. PWP has in the past also worked extensively in the Tharparkar Desert region ([IWRM Practices to Alleviate Poverty - A Model of Desert Development in Tharparkar, Pakistan](#))

## 2. Case study Area

Cholistan desert, one of the largest desert in Pakistan is located in the South-West region of Punjab province. Locally known as Rohi, it sprawls thirty kilometers from Bahawalpur, Punjab, Pakistan and covers an area of 26,300 square kilometers (10,200 sq mi). It adjoins the Thar Desert, extending over Sindh into India. The people of Cholistan lead a semi-nomadic life moving frequently in search of water and fodder for their animals. The dry bed of the Hakra River runs through the area, along which many settlements of the Indus Valley civilization. The desert also has an annual Jeep rally, known as Cholistan Desert Jeep Rally. It is the biggest motor sports event in Pakistan.

In a harsh and barren land where rainfall is very sparse and unreliable, Cholistanis rely mainly on their livestock of sheep, goats, and camel. The backbone of Cholistan economy is cattle breeding. It has the major importance for satisfying the area's major needs for cottage industry as well as milk meat and fat. Because of the nomadic way of life the main wealth of the people are their cattle that are bred for sale, milked or shorn for their wool. Moreover, isolated as they were, they had to depend upon themselves for all their needs like food, clothing, and all the items of daily use. So all their crafts initially stemmed from necessity but later on, they started exporting their goods to other places as well. The estimated number of livestock in the desert areas is 1.6 million.

Based on material, topography, soil and vegetation the desert can be separated into two distinct regions: Lesser Cholistan and Greater Cholistan. The former in the northern region is bordered by canal irrigated areas and covers about 7,770 km<sup>2</sup> and extends northeast from the Hakra River to the end, along the bank of the Sutlej River. This part of Cholistan is arid apart from the presence of the intersecting perennial waters of the Sutlej and Beas rivers. Greater Cholistan or southern region is spread over 18,130 km<sup>2</sup>. Greater Cholistan lies to the Southwest of the most recent course of the defunct Hakra River, extends, and forms border with India. The region once received water from Hakra River, known as the Saravati in Vedic times. At one time, there were 400 forts in the area and archaeological finds around the Derawar Fort, the only place with a perennial waterhole, indicate that it was contemporaneous with the Indus Valley Civilization.



**Image 1:** Dr. Pervaiz Amir discussing utility of Tobas with locals in Kokara Village

**Image 2:** Agricultural land under severe water stress

The climate of the study area is arid with scanty rainfall. Temperatures are high in summer (51°C) and mild in winter with no frost though temperatures may drop below freezing point. May and June are the hottest months with mean temperature of 34 °C. Average annual rainfall varies from 100 mm to 200 mm ~166 mm as per Pakistan's Meteorology Department (2013) Most of the rainfall is received during monsoon (July-September) but winter rains (January-March) are also often experienced. Due to scanty and unpredictable rainfall along with long spells of droughts, water is a limited resource in Cholistan desert. Aridity is the most striking characteristic of the area with dry and wet years occurring in clusters.

The major chunk of land comprises sandy and clay patches in Cholistan desert. The Lesser Cholistan consists of large saline impact areas called 'Dahars' alternating with low sandy ridges. Sand dunes are stabilized, semi-stabilized or shifting while valleys are mostly covered with sand. Desert soils are categorized as either saline or saline sodic with pH varying from 8.2-8.5 and 8.9-9.7 respectively.

### 3. Description of the Problem

The people of Cholistan desert depend upon rainwater because groundwater lies at a depth of 80-120 ft., which is extremely brackish and cannot be used even for livestock. Scarcity of water is one of the most severe constraints on human and ruminant populations; water is available to livestock only during the wet season in manmade ponds locally called 'tobas'.

Rainwater collected in these tobas play a key role in providing water to livestock in the wet season and it dictates the movement of livestock from one place to another. There were around 1500 water points (tobas) in the entire desert out of only 500 were in running condition. Most tobas are not constructed in proper places because their present localities have not been identified on scientific basis to receive maximum rainwater.

## Integrated Water Resource Management Practices in Greater and Lesser Cholistan, Pakistan

The water in tobas is wasted due to high temperature, high rate of infiltration rates and heavy storms in summer season. Siltation in tobas is another serious problem, which rapidly reduces their storage capacities, especially during the monsoon season.

Most of the area is scarcely populated due to unavailability of water and poor health services. About 155,000 people reside in the Cholistan desert. Majority of the inhabitants are nomadic and depend on livestock for their livelihood. With seasons, they move their cattle from one place to another in search of water and fodder. During a field visit, it was observed that the number of livestock in the region is greater than human population.



**Image 3, 4:** Cholistan's major livelihood – Cholistani Cattle

### 4. Decisions and Actions Taken

With the mission to provide communities dwelling in Cholistan safe and secure drinking water resources, PWP initiated the popularization of biosand water filters by demonstrations and training the community. PWP demonstrated 22 biosand water filters in interior Cholistan with the support of Bahawalpur Area Water Partnership (AWP) and trained community members to prepare filters at their home using locally available materials. Since target regions were so backward that transportation of raw material to the villages also proved to be difficult. PWP team visited most of the villages on tractor and transported the materials themselves.

Further, PWP visited various institutions and government organizations to discuss their initiatives. Cholistan Development Authority (CDA) was visited and basic information about the status of tobas was obtained. CDA provided data and maps of their ongoing project locations in the different regions of Cholistan. This was followed by a field visit of tobas led by Dr. Pervaiz Amir along with Mr. Muhammad Awais and Zakir Ullah Baig. Fourteen tobas were identified which were filled with rainwater, however they mostly remain dry due to low precipitation and high rate of evaporation.

From the field visit, it was observed that infants and children were more frequently suffering from diseases like diarrhea and other water related diseases. To counter this PWP distributed deworming, ORS and Aqua Tablets in 12 target villages. The most frequent diseases are cholera, diarrhea and kidney stones caused due to exposure to unsafe drinking water over time.

## Integrated Water Resource Management Practices in Greater and Lesser Cholistan, Pakistan

The Cholistan desert mission had the following activities:

1. Undertaking IWRM and drinking water interventions e.g. pond identification, bio sand water filter
2. Providing livestock technology demonstration like mineral mix, deworming and introduce rangeland grazing practices that promote sustainability
3. Distribution of ORS and Aqua tablets, infant deworming medicines, and promoting hygiene practices including soap making



**Image 5, 6:** Demonstration of Biosand Water Filters in Cholistani Villages

**Table 1:** Details of Villages Positively Affected by Desert Development Initiatives (2014-2016)

Date	No	Name of Village	Bio Sand Water Filter	Soap Making	Medicines	Mineral Mix
18 May 2015	1	Pathaney Wala	√			
	2	Sawab Toba	√			
	3	Kikreewala	√		√	√
	4	Kaniwala	√			
	5	Nadamwala	√		√	√
	6	Bachnal	√			
	7	Khokrawala	√			√
	8	Bhadiwala	√			

## Integrated Water Resource Management Practices in Greater and Lesser Cholistan, Pakistan

	9	Wijowala	√		√	√
	10	Nihalwala	√		√	√
	11	Muhmudwala Tanki	√			
	12	Wanaawala	√			
	13	Sher Khan	√			
	14	Kohwala	√		√	√
	15	Lakhan	√			
	16	Nasoowala	√			
	17	Gagadna	√			
14-21 May 2015	1	Allah Datha Butha	√		√	√
	2	Nursar Bolacha	√	√	√	√
	3	Kaem Sar	√		√	√
	4	Chalden Wala	√		√	√
	5	Sarain	√		√	√
	6	Lalan Jiyali Kohaoe		√	√	√
	7	Jamaldy			√	√

### Proceedings:

The Pakistan Water Partnership participated in the 16th Cholistan Peace Mela. And following a detailed meeting by the management of Cholistan Development Council (CDC) in PWP Office, Islamabad on 17 August 2014. The CDC organized the launch of Bahawalpur AWP with the active participation of civil society, government, private and public sectors from Bahawalpur at the Peace Mela. Several distinguished speakers from public society were present at the event.

The mela provided an opportunity for the Cholistan and Bahawalpur local communities to interact with the local administration members in an informal setting. Promotional materials like display booths educated participants about organizations' mandates and services available to the public. Several international NGOs including OXFAM-Novib had provided financial assistance in support of the event.



**Image 9:** Meeting with Assistant Director Administration Cholistan Development Authority

**Image 10:** Launch Ceremony of the Bahawalpur Area Water Partnership at Peace Mela

### 6. Lessons Learned

- Each household owned more than 100 cattle, mainly cows and goats. According to the availability of water and fodder, families seasonally migrate from one area to other. However, unavailability of clean water and dry conditions result in many diseases in camels and cows. PWP distributed medicines and mineral mix in 13 villages to enhance the animals' milk production.
- Majority land is state owned and agriculture is not allowed to avoid illegal land grabbing. Absence of land distribution among landless people or not allowing them territorial rights leads to land degradation and marginalization as large amount of land is left uncultivated.
- Large cattle and goat population interspersed with other species like camel and sheep. Livestock carrying capacity of Cholistan is far exceeded by the high population of Cholistan breed of cattle.
- Cholistani cattle heads as a main source of livelihood. The situation with respect to milk price has marginally improved but communities complain that they are still exploited by the middleman and the government's investments in dairy development e.g. chillers, refrigerators, storage vans and veterinary cover are lacking. Dairying and ranching are mainstay activities but require modern up-gradation. No emergency feed banks found to cater for emergency relief.
- There are both Pakka (permanent) and Kacha (temporary) water ponds and scattered investments in deep water turbines but this infrastructure is grossly inadequate to meet the water requirements. The present state of the ponds was extremely poor and requires community based interventions.
- There are no public-run facilities for drinking water supply during drought periods along with lack of relief initiatives. The quality of water in many cases is unfit for human consumption consequently resulting in high prevalence of water borne diseases and infant mortality.
- Tree and grass cover is thin and of extremely low quality. The situation has potential for improvement through technical innovations with consequent improvement in livestock health and family incomes.

### 7. Recommendations

1. In line with these development observation and goals of the WACREP project, PWP in association with the newly formed Bahawalpur AWP, can rapidly undertake development interventions in water and livestock that can serve as a model for improving the livelihood of Cholistani people.

The following activities were identified:

- Demonstration and provision of bio-sand filters
- Demonstration of soap making to be undertaken jointly by PWP and local partners.

## Integrated Water Resource Management Practices in Greater and Lesser Cholistan, Pakistan

- Provision of cuttings of Napier sorghum grass and seeds for growth near water ponds.
  - Demonstration of in-house kitchen gardening and distribution of gardening-kits amongst female farmers who participate in the desert vegetable growing sessions.
2. PWP should further study government planned investment in Cholistan. Water is the dominant constraint. Alternative community filtration solution in addition to bio sand should be explored.
  3. Engage media to promote green journalism to highlight issues of Cholistan.
  4. Micro finance with focus on livestock and handicraft industry have potential
  5. Eco tourism can provide employment for educated Cholistani youth provided they are trained.
  6. There is good potential or expanding mobile technology and using it for livestock extension and marketing information. DRR satellite center could be placed in Cholistan
  7. Future activities should focus on policy dialogue and development strategy for Cholistan in collaboration with AWP.

## 8. Conclusion

Given the state of affairs, Cholistan requires intensive rebuilding to fortify its villages against persistent drought and climate change. PWP's learnings from on-ground activities will help inform future interventions and consider ground realities. Implementation of these interventions on high priority basis will be carried out in joint consultation with the Bahawalpur AWP.

## 9. Contact Details

1. Dr Pervaiz Amir, Regional Council Member, GWP-SAS/Pakistan Water Partnership (PWP), 00903005055560, [p.amir2010@yahoo.com](mailto:p.amir2010@yahoo.com)

## 10. Supporting References

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2. [Report on Activities Undertaken during the Field Visit to Cholistan](#) (11-14 November 2014)
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4. [IWRM Practices in Lesser and Greater Cholistan Bahawalpur](#) (14-21 May 2015)
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