NRSP
National Rural Support Programme

Formative Evaluation of
EveryWater Project

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Acronyms & Abbreviations

CRP	Community Resource Person
IP	Implementation Partner
ME	Margin of Error
MICS	Multiple Indicator Cluster Survey
NBP	National Bank of Pakistan
NRSP	National Rural Support Programme
NSDWQ	National Standards for Drinking Water Quality
NTU	Nephelometric Turbidity Units
PCRWR	Pakistan Council of Research in Water Resources
PKR	Pakistani Rupee
SDGs	Sustainable Development Goals
SODIS	Solar Water Disinfection
SUCCESS	Sindh Union Council and Community Economic Strengthening Support
TAY	Tando Allah Yar
TMK	Tando Muhammad Khan
UC	Union Council
UNDP	United National Development Programme
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WISE	Water Immunization Sanitation Education

Executive Summary

Pakistan faces severe water, sanitation, and hygiene challenges, particularly in rural areas. Over 16 million people lack clean water close to home, 25 million still practice open defecation, and 70% of households consume contaminated water, causing around 53,000 child deaths annually from diarrheal diseases[1]. The 2022 floods further damaged water systems, leaving over 10 million people without safe drinking water, deepening the crisis[2]. In rural Sindh, in particular, the quality of drinking water continues to pose a critical public health challenge, contributing to a high prevalence of waterborne diseases.

National Rural Support Programme (NRSP) in partnership with the National Bank of Pakistan (NBP) launched a safe water initiative in response to these prevailing WASH (Water Sanitation and Hygiene) related challenges, whereby technical assistance was provided by EveryWater. The main objective of this initiative is to test new technology for providing clean drinking water at the household level. As part of this effort, 2,472 EveryWater filtration kits installed on 16-liter water coolers were distributed to all households in Union Council Lakhat of district Tando Muhammad Khan. The EveryWater filters, based on hollow-fiber membrane technology, effectively remove bacterial and viral contaminants and can provide families with a reliable supply of safe drinking water for up to two years. Along with the kit's distribution, NRSP also conducted a study to assess the prevalence of waterborne diseases, with a particular focus on UC Lakhat of Tando Muhammad Khan as the treatment group and UC Naseer Khan Laghari of district Tando Allah Yar as the control group with the aim of gathering benchmark data for comparison of the results in a follow up survey(s) after 6 months of distribution.

This report seeks to document how unsafe water contributes to widespread waterborne diseases such as diarrhea, cholera, typhoid, hepatitis, and parasitic infections, while also highlighting the disproportionate impact on children under five, who are especially vulnerable to malnutrition and stunting due to recurrent illness.

The findings illustrate that diarrheal illnesses remain a major public health concern, with prevalence nearly equal in Tando Allah Yar (76%) and Tando Muhammad Khan (77%),

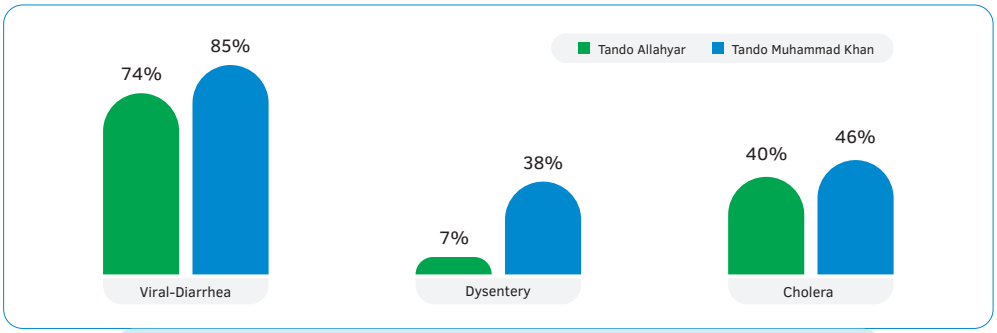

Figure 1: Waterborne diarrheal diseases

1 https://www.unicef.org/pakistan/wash-water-sanitation-and-hygiene-0?utm_source
2 https://www.unicef.org/press-releases/more-10-million-people-including-children-living-pakistans-flood-affected-areas?utm_source

showing no statistically significant difference overall. Within this, Viral Diarrhea was the most common form, affecting 74% in Tando Allah Yar compared to 85% in Tando Muhammad Khan, a statistically significant difference. Dysentery also showed a significant difference, with only 7% in Tando Allah Yar versus 38% in Tando Muhammad Khan. In contrast, Cholera was reported in 40% and 46% of cases respectively, a difference that was not statistically significant.

Waterborne diseases associated with stomach pain were reported with a statistically significant difference between districts, affecting 56% of the population in Tando Allah Yar compared to 62% in Tando Muhammad Khan. Among specific conditions, viral infections were predominant, with 46% in Tando Allah Yar versus 78% in Tando Muhammad Khan, reflecting a significant disparity. Bacterial infections (33% vs. 77%) and typhoid (33% vs. 76%) also demonstrated statistically significant differences, with consistently higher prevalence observed in Tando Muhammad Khan. These findings indicate a marked concentration of stomach-related waterborne diseases in Tando Muhammad Khan relative to Tando Allah Yar.

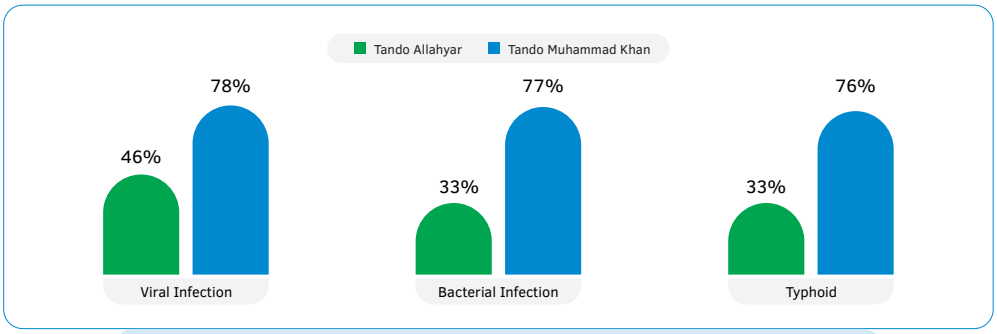

Figure 2: Waterborne Stomach-Related Infections

Figure 3 illustrates the prevalence of worm-related waterborne diseases, with 14% in Tando Muhammad Khan and 4% in Tando Allah Yar, which clearly highlights the overall disparity and indicates a substantially higher burden of worm-related infections in Tando Muhammad Khan. A district-specific analysis as presented in Figure 4 revealed that pinworm infections demonstrated the most striking difference, affecting 95% households in Tando Muhammad Khan followed by high levels of Giardia lamblia (reported by 89% HHs), while tapeworm

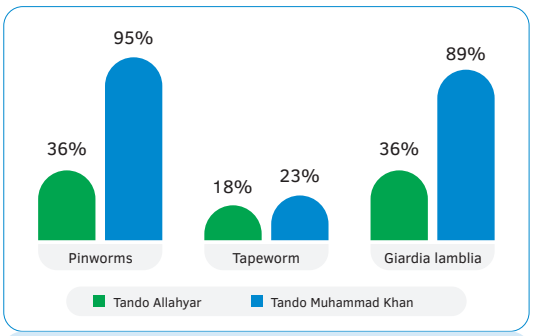

Figure 3: Distribution of Worm-Related Waterborne Diseases

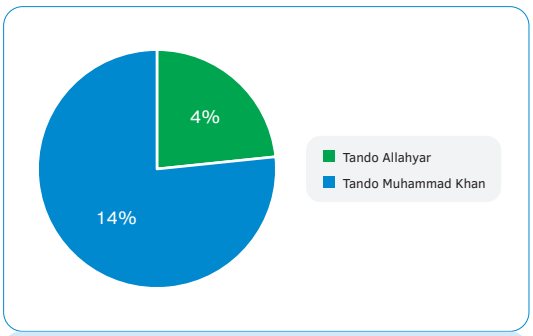

Figure 4: Waterborne Disease Worms

infections were comparatively low (18%). In contrast, households in Tando Allah Yar reported considerably lower levels of these infections.

The pattern differed for waterborne hepatitis, where overall prevalence was higher in Tando Allah Yar (34%) compared to Tando Muhammad Khan (15%) (Figure 5). By type, Hepatitis A was more common in Tando Muhammad Khan (72%), while Hepatitis C was higher in Tando Allah Yar (84%), both differences being statistically significant (Figure 6).

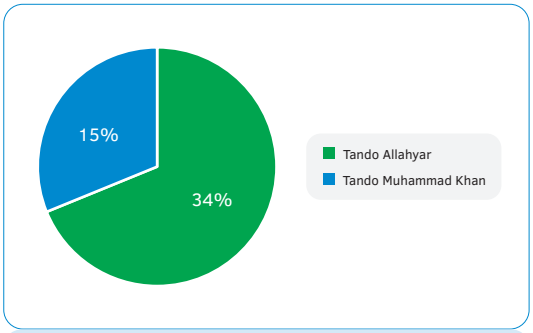

Figure 5: Waterborne Hepatitis

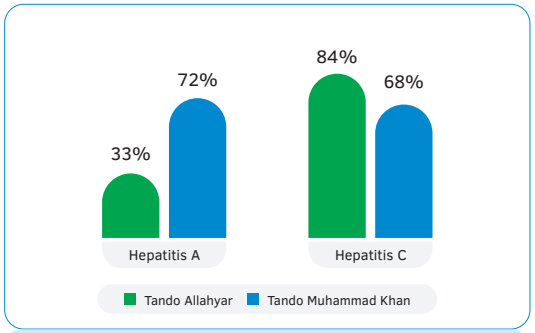

Figure 6: Prevalence of Hepatitis A and C

Across both districts, 1,787 children under the age of 5 were recorded. Within this group, signs of sluggishness and weight loss were reported in just over half the children (53% in Tando Allah Yar, 58% in Tando Muhammad Khan), while stunting affected nearly half (46% and 53% respectively). These findings suggest that the burden of undernutrition and growth issues is widespread across both districts without meaningful variation. (Figure 7).

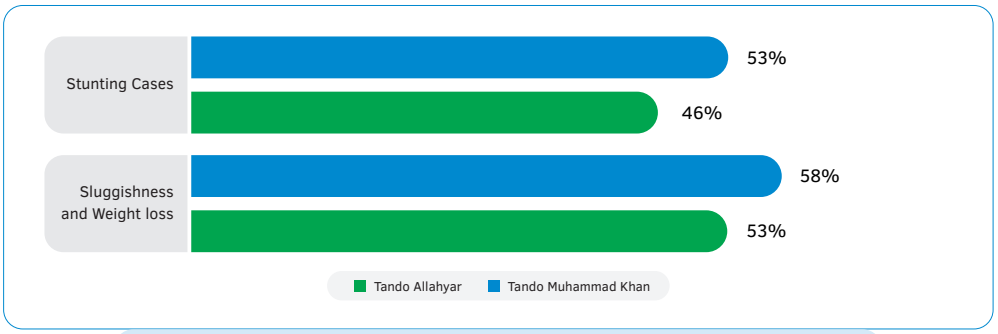

Figure 7: Sluggishness and Weight Loss, and Stunting Cases

These findings establish a clear benchmark for measuring the impact of the EveryWater filtration initiative. By documenting the health burden caused by unsafe water, the report emphasizes the urgent need for household-level water treatment solutions. The high prevalence of waterborne diseases and related health issues underscores the importance of such interventions. The EveryWater filtration system offers a promising solution to reduce these diseases, improve public health, and alleviate pressure on local healthcare systems. This data provides a foundation to assess the effectiveness of the initiative and its potential to improve water quality and health outcomes in the long term.

Background & Context

Pakistan faces significant challenges in providing safe water, adequate sanitation, and promoting hygiene practices, particularly in rural areas. Despite improvements, over 25 million people still practice open defecation, and approximately 70% of households consume bacterially contaminated water, contributing to widespread health risks. This situation leads to the death of around 53,000 children under five annually due to diarrheal diseases linked to poor water and sanitation[3]. In 2022, devastating floods exacerbated these issues, displacing millions and damaging water systems, leaving over 10 million people without access to safe drinking water[4]. According to WaterAid, 16 million people in Pakistan lack clean water close to home, and millions do not have access to decent sanitation facilities[5].

Rural Sindh in particular, including underserved districts like Tando Muhammad Khan and Tando Allah Yar, access to clean water and adequate sanitation remains a critical issue. According to the 2014-15 Sindh Multiple Indicator Cluster Survey (MICS), 90.5% of the population uses an improved drinking water source[6]. However, "improved" does not always mean safe: water quality testing in the same survey found over half of household water samples were contaminated with coliform bacteria (53.6%), leaving only 46.4% meeting microbiological safety standards[7]. The risk is heightened for those who still rely on unimproved sources (such as open wells or surface water) among these households, only 12.8% treat their water through boiling, filtering or other appropriate methods. This gap means many families consume water that may look clean but carries invisible pathogens or pollutants. Notably, around 3% of Sindh's population is exposed to drinking water with arsenic levels exceeding the WHO's 10 ppb safety threshold, reflecting geogenic contamination in certain groundwater sources. These statistics underscore that merely having a water source is not enough; water quality and handling practices are equally important for health[8].

Sanitation and hygiene access are similarly deficient, particularly in rural communities with only 64.6% of households in Sindh having sanitation facilities that are not shared with other households. This indicates that roughly one-third of family's province-wise lack basic latrines, and the shortfall is far worse in rural areas. In fact, the majority of rural households either practice open defecation or use unhygienic latrines. Alarmingly, MICS 2014, found that even in households with latrines, safe disposal of young children's waste is not guaranteed, as only 43.7% of children under age 2 had their last feces disposed of safely (e.g., put in a toilet or buried). The remainder often ends up in open areas or drains, compounding community exposure to disease. Hygiene practices, while better, still leave

3 https://www.unicef.org/pakistan/wash-water-sanitation-and-hygiene-0?utm_source
4 https://www.unicef.org/press-releases/more-10-million-people-including-children-living-pakistans-flood-affected-areas?utm_source
5 https://www.wateraid.org/pk/facts-and-statistics?utm_source
6 https://www.aidsdatahub.org/sites/default/files/resource/pakistan-mics-sindh-2014.pdf#:~:text=4,8
7 https://sindhsdgs.gov.pk/wp-content/uploads/2023/09/SDG-6-Localization-Study-Final-Report-UNDP-Sindh-2019_v6.pdf#:~:text=collected%20from%20Sindh%20Province,have%20low%20levels%20of%20contamination
8 Ibid, 7

room for improvement: about 66.5% of households have a designated handwashing place with water and soap (or other cleanser) available. This means one in three households lack a convenient setup to wash hands, despite soap being present in 82% of homes overall. Such gaps in WASH infrastructure and practices create fertile ground for the spread of waterborne and fecal-oral illnesses[9].

Waterborne Diseases and Health Impacts

Poor sanitation in rural communities, including inadequate disposal of human waste, low rates of safe infant feces disposal, handwashing practices, leads to the contamination of soil and water sources, facilitating the spread of pathogens into food and drinking water. As a result, communities like Tando Muhammad Khan and Tando Allah Yar face recurring outbreaks of gastroenteritis and other waterborne infections. These illnesses place a heavy strain on local healthcare systems and contribute significantly to under-five mortality. They also create a cycle of illness: a child weakened by one diarrheal episode is more susceptible to the next. Moreover, water quality issues such as arsenic and bacterial contamination pose additional longer-term health risks (e.g., skin lesions, growth impairments, and other chronic conditions from arsenic exposure). Improving water and sanitation is therefore not just about convenience or comfort, it is a fundamental public health intervention to reduce disease transmission and protect vulnerable populations. Simply put, when households lack toilets or clean water, children are more likely to get sick, and these illnesses can have lifelong consequences.

Additionally, waterborne diseases, including diarrheal illnesses, typhoid fever, cholera, and hepatitis A and C, are endemic in many parts of Sindh and disproportionately affect young children. National surveys indicate that diarrheal disease remains a leading cause of child morbidity. For instance, roughly 19% of Pakistani children under five experienced diarrhea in a given two-week period as of 2017-18[10], with Sindh being one of the provinces exhibiting the highest prevalence. Frequent bouts of diarrhea not only threaten child survival but also impede physical and cognitive development while repeated infections can lead to chronic malnutrition.

Economic Burden on Households

Beyond the direct health toll, inadequate water and sanitation inflict an economic burden on families and the wider community. When children or adults are frequently sick with waterborne diseases, households incur costs for medical treatment, medications, and transport to clinics. Many also lose income when breadwinners are ill or caring for sick dependents. A recent analysis estimated that Pakistani households spent over PKR 116 billion annually (in 2019 prices) on treating diseases linked to poor WASH, with diarrheal illness alone accounting for about PKR 21 billion of these costs. On average, each diarrheal

9 *Ibid, 7*
10 *https://pmc.ncbi.nlm.nih.gov/articles/PMC10153564/#:~:text=Risk%20factors%20for%20acute%20diarrhoea,of%20age%20to%20be%2019*

episode costs a household around PKR 1,757 in out-of-pocket expenses for care a substantial sum for low-income rural families. Such expenses can trap families in poverty, as money that could be used for food, education or investment is instead diverted to cope with preventable illnesses. The burden is heaviest on the poorest: according to the same study, the poorest quintile of households spends three times more of their income on WASH-related healthcare than the richest quintile[11].

Additionally, in communities lacking piped water or nearby safe sources, women and children often spend hours each day collecting water, reducing time available for productive activities or schooling. Likewise, in areas without latrines, people may have to walk distances to find secluded spots for defecation, which a study estimated costs rural Pakistani's millions of hours of lost time and associated productivity each year. These hidden costs along with frequent healthcare expenditures and lost wages from illness collectively undermine economic development in regions like rural Sindh. Therefore, investments in clean water and sanitation are not just health interventions but also economic empowerment strategies, freeing up time and income that families can use to improve their livelihoods.

Role of Water Filtration Interventions

Unsafe drinking water remains one of the greatest health threats in rural Sindh, where limited piped infrastructure and widespread contamination expose families to waterborne diseases. Conventional solutions such as centralized treatment plants, reverse osmosis systems, or even boiling water are prohibitively expensive, time-consuming, or unsustainable for low-income households. In this context, point-of-use water filtration offers a practical, affordable, and scalable alternative. The EveryWater hollow-fiber membrane filter, for instance, is a low-cost, gravity-operated unit that requires no electricity and can provide safe drinking water for up to two years. By physically straining out bacterial and viral contaminants from common non-brackish sources such as wells and hand pumps, these filters transform unsafe water into potable quality that meets drinking standards. This intervention directly targets the prevention of waterborne illness, studies in similar settings have shown that use of household water filters can reduce diarrheal disease incidence by roughly 60%[12]. In other words, families with access to effective filters get sick much less often than those without, as the infectious dose of germs in their water is dramatically lowered. This makes household water filtration not only a preventive health measure but also a highly cost-effective solution to improve resilience and quality of life in communities like Tando Muhammad Khan and Tando Allah Yar.

Importantly, water filtration at home yields health benefits quickly without waiting for large-scale infrastructure projects. It is a preventive approach that intercepts disease at its source (the drinking water) and is highly cost-effective. Each filtered jerrycan of water means a child is less likely to suffer from stomach cramps and dehydration, and a parent is less likely to

11 https://www.wateraid.org/pk/sites/g/files/jkxoof326/files/2024-02/Healthcare%20Revised%20File%20-%20January%2008%20%28FINAL%29_0.pdf#:~:text=production,a%20lion%E2%80%99s%20share%20of%20the

12 https://pubmed.ncbi.nlm.nih.gov/16222027/#:~:text=%28TTCs%29%20%28P%20,setting%20before%20implementing%20this%20intervention

miss work to care for an ill family member. Over time, widespread use of such filters could translate into significantly fewer clinic visits and hospitalizations for waterborne ailments in rural Sindh. There is also an economic ripple effect: households save money that would have been spent on fuel to boil water or on purchasing bottled water, and they avoid the medical costs associated with dirty water. Furthermore, community-level distribution of filters can be coupled with education on hygiene and sanitation (e.g., safe storage of filtered water, latrine use, handwashing), magnifying the impact on public health.

In conclusion, this household-level water filtration system addresses the water-sanitation-health challenges in rural Sindh by providing safe drinking water, reducing exposure to disease-causing microbes, and breaking the cycle of waterborne infections. Combined with improved sanitation and hygiene practices, it aims to lower diarrheal illness rates, reduce healthcare costs, and enhances quality of life and economic resilience in communities like Tando Muhammad Khan and Tando Allah Yar, thereby fostering long-term well-being.

Implementation of the EveryWater Intervention

EveryWater teamed up with two young engineers to launch an innovative initiative aimed at providing affordable water filtration solutions for underserved rural communities. With initial funding from NBP and NRSP as its Implementation Partner (IP), this collaboration allowed EveryWater to leverage the engineers' patented "Esoterik Resistive Membrane" technology to design a low-cost, sustainable water purification system. EveryWater took the lead in assembling and distributing the water filter coolers, while NRSP served as the on-the-ground IP. Together, they rolled out the project across rural Sindh, helping to prevent waterborne diseases and significantly improving public health outcomes.

Role of NRSP in EveryWater Initiative

The NRSP served as the on-ground IP for the EveryWater filtration project in rural Sindh, spearheading both the distribution of 2,472 water filtration kits and coolers to local households and the execution of a comprehensive formative evaluation study in Tando Muhammad Khan (treatment group) and Tando Allah Yar (control group). Leveraging its strong local presence and community mobilization capacity, NRSP effectively engaged village communities and applied its technical expertise in fieldwork, data collection, GIS-based mapping, and pilot testing to ensure that the intervention was well-targeted and evidence-driven.

The project followed a participatory approach: NRSP trained local enumerators and Community Resource Persons (CRPs) in the survey methodology and oriented them on the proper use of the filtration units. These trained CRPs then assisted in door-to-door data collection, helped identify beneficiary households, and educated families on operating and maintaining the water filter kits, a process that leveraged their local knowledge to ensure smooth implementation. In addition, NRSP organized community orientation sessions and conducted regular monitoring visits to both districts, working closely with local stakeholders

to ensure accountability and to refine the intervention in response to on-ground feedback. This inclusive, hands-on role capitalized on NRSP's local knowledge and technical acumen, ensuring the efficient rollout of the EveryWater pilot and laying the groundwork for measurable improvements in water quality and public health in the target communities.

Project Location

The EveryWater pilot was strategically implemented in two districts of Sindh, Tando Muhammad Khan (treatment site) and Tando Allah Yar (control site), selected on the basis of their comparable socio-economic profiles but differing water and sanitation conditions. Both districts are predominantly rural, with agriculture as the main livelihood, and households largely reliant on hand pumps or public taps for drinking water. However, the environmental and health profiles of the two sites provide important contrasts that strengthen the study design.

Tando Muhammad Khan, specifically UC Lakhat, was identified as the treatment area due to its acute exposure to unsafe water and high prevalence of waterborne disease. The district faces persistent challenges of contaminated water sources, inadequate sanitation, and limited access to reliable healthcare facilities. These vulnerabilities have resulted in frequent diarrheal outbreaks and high child morbidity. Importantly, communities in this area demonstrated a clear willingness to adopt new safe water interventions, making it a suitable site for introducing the EveryWater filtration coolers.

In contrast,UC Naseer Khan Laghari in Tando Allah Yar, was chosen as the control site. While it shares the same rural, agriculture-based socio-economic context. Findings of the

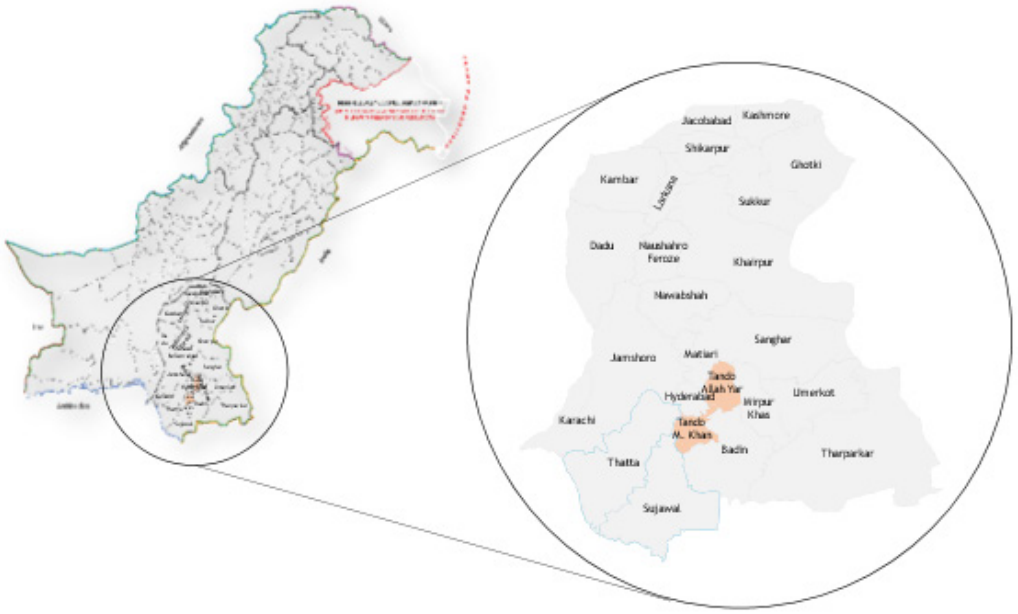

Figure 8: Map of Pakistan

study revealed that its residents generally exhibit stronger hygiene practices and somewhat better sanitation coverage. The prevalence of waterborne diseases is still significant, especially during seasonal peaks, but relatively lower than in Tando Muhammad Khan. By selecting a control site that mirrors the treatment area in demographic and environmental terms yet differs in hygiene behaviors and exposure intensity, the project enables a meaningful comparison of outcomes.

Objective of the Study

The main objective of this study is to collect the benchmark data for comparison of the results in a follow up survey(s). The survey is designed to evaluate the existing conditions of access to safe drinking water within the target communities of rural Sindh. The aim is to develop an understanding about the household level water sources, their quality, and the extent of reliance on untreated or unsafe water. The survey further aims to identify filtration needs and assess household-level behaviors related to water usage, storage, and hygiene practices.

In addition, the survey provides a foundation for evaluating the impact of the EveryWater filtration intervention implemented in Tando Muhammad Khan (UC Lakhat) and Tando Allah Yar (UC Naseer Khan Laghari). By documenting the pre-intervention situation, it establishes reference data for measuring improvements in access to safe drinking water, reductions in the prevalence of waterborne diseases, and positive changes in hygiene and sanitation practices over time. The findings will also inform implementation strategies and guide the potential replication of household water filtration initiatives in similar rural contexts.

Preparatory Phase

Survey Design and Questionnaire Development

The survey was carefully designed to capture household-level information on water sources, usage practices, and hygiene behaviors. To ensure accessibility and inclusiveness, the questionnaire was developed in a bilingual structure, with versions available in both English and Sindhi (Annexure 1). This approach reduced the risk of misinterpretation and improved the accuracy of responses by allowing community respondents to clearly understand the questions in their native language.

The survey was deployed using SurveyCTO, a digital data collection platform widely used for field research. It enabled real-time data entry on mobile devices, which minimized errors associated with manual recording and enhanced overall data quality. Built-in features such as skip patterns, validation checks, and programmed logic ensures consistency and reliability in responses. Furthermore, SurveyCTO provides secure data storage and efficient transfer of information, which supported timely monitoring and supervision during the fieldwork process.

Before field deployment, the tool underwent pre-deployment testing to check for clarity, translation accuracy, and user-friendliness. This testing phase was crucial in refining the questionnaire, ensuring that both English and Sindhi versions conveyed the intended meaning consistently, and reducing the likelihood of confusion during interviews. As a result, the finalized tool provided a strong foundation for high-quality data collection in the field.

Enumerator Training and CRP Orientation

The survey activities began with preparatory training in Tando Allah Yar on April 26, 2025. Prior to launch, enumerators were provided with the finalized questionnaire for review. The team held a follow-up meeting on April 28, 2025 to discuss any issues encountered during initial fieldwork and to address feedback. Enumerators were also introduced to SurveyCTO, an Android-based digital data collection tool, with login credentials shared to ensure smooth server access and readiness for field deployment.

Enumerator and CRP training sessions in Tando Muhammad Khan were conducted between April 29 and May 2, 2025. The first day focused on detailed orientation and digital data entry training via a Zoom session, while the second day (April 30, 2025) was dedicated to a pilot field test of the questionnaire. On May 2, 2025, a feedback session was held with enumerators and CRPs to reflect on challenges, refine the tool, and finalize necessary adjustments for the data collection rollout.

Pilot Testing and Field Adjustments

The pilot survey conducted during the training phase allowed the team to test the questionnaire in real field conditions. This exercise highlighted translation issues, contextual gaps, and minor technical difficulties. Feedback was systematically reviewed, leading to improvements in question flow, clarity of response options, and refinements in the SurveyCTO tool. These adjustments enhanced both usability and data reliability, ensuring smoother operations during the full-scale survey.

Orientation Sessions and Monitoring Visits

NRSP has established a strong social mobilization structure within the community, fostering active engagement and participation in development initiatives. Their well-established social networks, including CRPs, play a vital role in ensuring effective communication and community involvement. As part of the EveryWater Filtration Cooler Project, NRSP facilitated orientation sessions to familiarize CRPs and beneficiaries with the project. On May 6, 2025, an orientation session with CRPs was held, focusing on the installation, usage, and maintenance of the filtration coolers. The following day, on May 7, 2025, a similar session was conducted in Tando Muhammad Khan with both beneficiaries and CRPs. This collaborative approach, supported by NRSP's social structure, ensured smooth implementation and community understanding of the project.

To ensure accountability and assess implementation, monitoring visits were conducted by the NRSP team. The team visited Tando Allah Yar on May 8, 2025, and Tando Muhammad Khan on May 9, 2025. These visits provided valuable insights into community engagement and the initial application of the filtration kits.

Methodology

For the survey, a quantitative research methodology was employed, focusing on the systematic collection and analysis of numerical data. This methodology involved the creation and digitalization of tools, determination of sample size and sampling frame, as well as data collection and analysis. SUCCESS (Sindh Union Council and Community Economic Strengthening Support) data was used to identify individuals for the survey, and a pre-assessment step was conducted for verification, ensuring the accuracy and relevance of the data. The study was organized into two distinct groups; the treatment group in Tando Muhammad Khan, comprising all recipient households of water coolers. On the other hand, the control group, located in Tando Allah Yar, was selected using a simple random sampling technique, to ensure an unbiased and representative sample, thereby enabling comparison and helping assess the true impact of the intervention. Additionally, a door-to-door survey was conducted, during which individuals were first identified and then trained on the proper use of water filtration kits.

A technical validation phase was conducted, during which filtered water samples were collected from randomly selected treatment households. These samples were analyzed by the Pakistan Council of Research in Water Resources (PCRWR) to verify that the filtration kits met the microbiological and physical safety standards defined by the National Standards for Drinking Water Quality (NSDWQ) and the World Health Organization (WHO).

Sample Size Calculation:

The following parameters were used to calculate the sample size.

Population (N) 2,673
Margin of Error (ME) 5% or 0.05
Confidence level 90% or 0.90
For proportions P value assumed as 50%

Based on the above parameters the sample size was calculated using the following formula

n= [(z^2 *p * q) + ME^2]/ [ME^2 +z^2 * p * q/N]

Where, Alpha is equal to one minus the confidence level. Thus, alpha = 1 - 0.90 = 0.1 and the critical standard score (z) = 1.694

p value=0.5
q value = 0.5
Margin of Error (ME) = 0.05
Population (N) = 2,673

n = [(1.694) ^ 2 *0.5*0.5+0.05^ 2] / [0.05 ^ 2 + (1.694) ^ 2 * 0.5 *0.5/2,673]

n = (0.719909) / (0.002817)

Sample size (n) = 255

To ensure geographical representation and gather area-specific insights, the strategy was to survey approximately 5 households per village. To enhance statistical power and robustness, 5 additional households were included, bringing the final sample size to 260.

Each selected household was assigned a unique serial number to ensure precise data tracking. This sampling approach, grounded in random selection and complete enumeration where appropriate, strengthens both the representativeness and generalizability of the study's findings.

Data Collection and Visualization

The survey was conducted from April 26, 2025, to June 28, 2025. CRPs were actively engaged in the data collection process, assisting with door-to-door surveys, identifying households, and providing training on the use of water filtration kits. Their local knowledge and strong community connections ensured accurate data collection and smooth survey implementation.

For data visualization and monitoring, Microsoft Power BI was used to create dashboards displaying key indicators and enabling daily tracking of field activities. The integration of SurveyCTO and Power BI streamlined the data pipeline, allowing real-time monitoring, prompt issue resolution, and informed decision-making throughout the survey process. This approach enhanced the transparency and effectiveness of the study across both treatment and control groups.

Data Analysis and Key Findings

Participants' Profile

Understanding the profile of participant's is important to interpret survey findings and identify areas where future efforts can be strengthened. The survey covered both men and women across the two districts, capturing their experiences and awareness of waterborne diseases. It also helped assess how much prior knowledge or training communities had, which is key for planning effective awareness and prevention programs. Overall, 30 % of the respondents were female (31% in Tando Muhammad Khan and 21% in Tando Allah Yar). Prior training on waterborne diseases was also very uneven: 44% of participants' in Tando Muhammad Khan had prior training under the WISE (Water Immunization Sanitation Education) program and some other initiatives, compared to only 1% in Tando Allah Yar. While this shows that awareness-building efforts have reached some communities, it is equally important that those who had no prior exposure are now beginning to receive information through this intervention. This creates a foundation for better community knowledge and engagement in future health initiatives.

Table 1: Received Trainings on Waterborne Diseases

Received Training on Waterborne Diseases	TAY	TAY (%)	TMK	TMK (%)	Total
Yes	2	1%	1,092	44%	1,094
No	258	99%	1,380	56%	1,638
Total	260	100	2472	100	2,732

Water Sources, Reliability and Sufficiency

Main Water Source

The type and location of a household's main water source play a crucial role in shaping daily life. Whether water is accessed within the home or through shared public points, these sources determine how much time and effort families must invest to meet their basic needs.

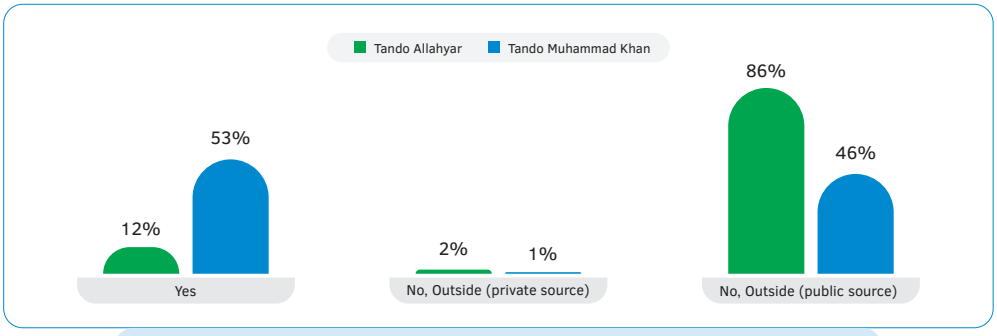

Figure 9: Main Water Source Location

For a better understanding of the survey findings, the water sources in both Tando Allah Yar and Tando Muhammad Khan were broadly classified into public and private sources. In Tando Muhammad Khan, more than half of households (53%) have their main water source inside the home, while 46% depend on outside public facilities, and 1% on private sources located outside. By contrast, in Tando Allah Yar, only 12% of households access water inside their dwelling, with the overwhelming majority (86%) relying on public sources outside, and a marginal 2% using private outside options. This clearly illustrates a stronger dependence on external and shared systems in Tando Allah Yar compared to Tando Muhammad Khan, where household-level access is more common.

Further distribution of sources shows that inside the house, the main source in Tando Muhammad Khan is the hand pump in the dwelling (53%), while in Tando Allah Yar it is also the hand pump (11%), though at a much lower share. For outside the house, reliance differs sharply. In Tando Allah Yar, the dominant source is the public tap/standpipe (71%), followed by public boreholes (11%). In Tando Muhammad Khan, the most common outside source is likewise the public tap/standpipe (46%), with all other options accounting for very small proportions as can be seen in Table 2.

Table 2: Main Water Source

Water Source		TAY	TAY (%)	TMK	TMK (%)	Total
Inside the House	Hand pump in the dwelling	29	11%	1,302	53%	1,331
	Piped water into dwelling	2	1%	8	-	10
Outside the house	Public tap/standpipe	183	71%	1,139	46%	1,322
	Public Borehole (with motor pump) / Tube well	28	11%	9	-	37
	Piped water into yard/plot	6	2%	11	1%	17
	Filtration Plant / Unit	6	2%	-	-	6
	Cart with small tank/drum	1	1%	-	-	1
	Private Borehole (with motor pump) / Tube well	3	1%	1	-	4
	Bottled water	1		-	-	1
	Surface water (river, dam, lake, pond, stream, canal, irrigation channels)	-	-	2		2
	Protected spring	1	-	-	-	1
Total		**260**	**100**	**2,472**	**100**	**2,732**

When considered alongside the duration of use, water source usage is a critical factor in understanding household exposure to waterborne diseases, water quality risks, and the sustainability of supply. In Tando Muhammad Khan, two-thirds of households (66%) reported using the same source for more than three years, 27% for one to three years, and

7% for less than a year. In Tando Allah Yar, the overwhelming majority of households (84%) reported using the same source for more than three years, while 14% had relied on their source for between one and three years, and only 2% for less than a year.

This consistency highlights that both private and public sources serve as enduring components of household water access. At the same time, it underscores a contrast: households in Tando Muhammad Khan benefit more from the security of private, household-level access, whereas families in Tando Allah Yar remain persistently exposed to the vulnerabilities of public systems. These statistics suggest that in both districts, households show a steady reliance on their existing water sources. Further details are presented in Figure 10.

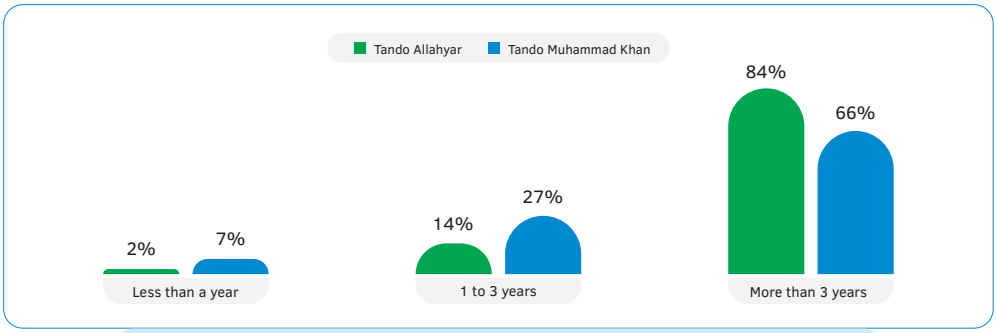

Figure 10: Water Source Duration

The responsibility for water collection is an important indicator of household burden, gender roles, and the risks faced by vulnerable groups. Overall, the majority of households accounting for 76% reported that this responsibility has been assigned to female adults. District-level variations, as presented in Figure 11, reveals that in Tando Muhammad Khan the highest proportion around 86% of water collectors are female adults, whereas in Tando Allah Yar it was more commonly undertaken by male adults (67%). These findings highlight a significant gender difference among the two districts.

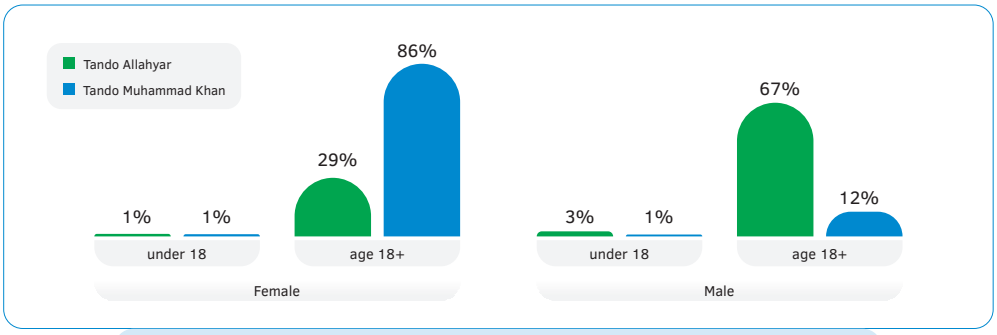

Figure 11: Water Collector

Water Accessibility and Reliability

Measuring the time households spend collecting water provides important insights into

the accessibility and reliability of available sources. Among households with water sources located outside their homes, overall, the average collection time is 44 minutes, with 54 minutes in Tando Allah Yar and 43 minutes in Tando Muhammad Khan. In terms of water sufficiency, Tando Muhammad Khan fares better, with 39% of households reporting that they always have enough water, and 38% stating that they have sufficient water most of the time. However, 23% still face occasional shortages. In Tando Allah Yar, only 31% of households have enough water always, with a significant 51% experiencing water insufficiency sometimes, and 18% having enough water most of the time.

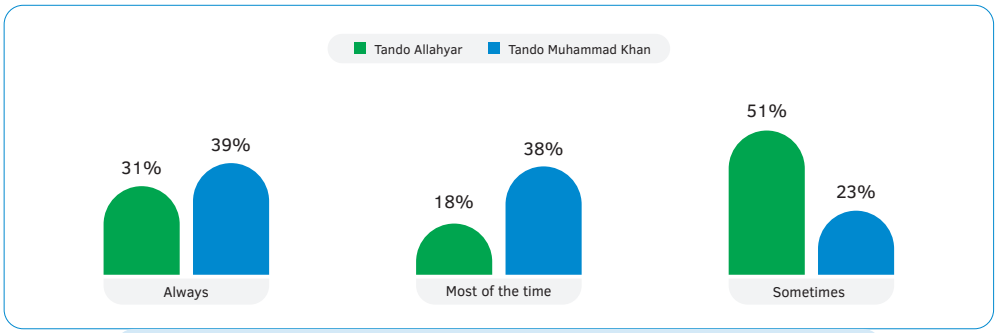

Figure 12: Water Sufficiency

Regarding water availability, Tando Muhammad Khan shows higher consistency, with 52% of households reporting that the water is available always, and 36% stating its availability most of the time. In contrast, 48% of households in Tando Allah Yar reported that water available is sometimes, while only 18% indicated it is available most of the time (Figure 13).

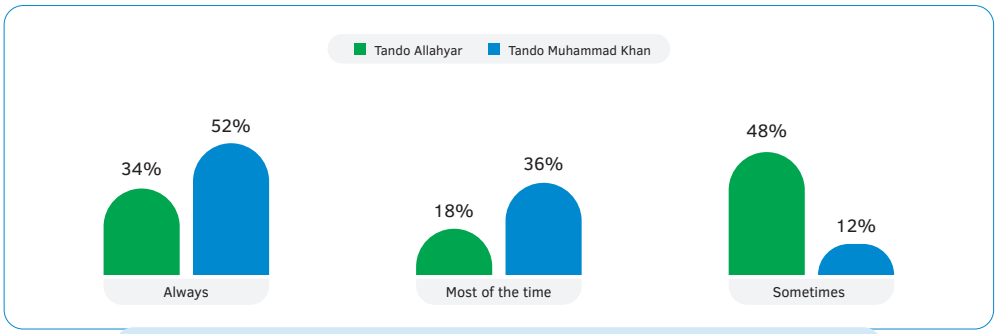

Figure 13: Water Availability

Among those reporting water availability as "most of the time" or "sometimes," the common reasons for water scarcity were source drying and irregular water supply. In Tando Allah Yar, 67% of households cited source drying, compared to just 4% in Tando Muhammad Khan. Additionally, 69% of households in Tando Allah Yar reported irregular water supply, while 67% of households in Tando Muhammad Khan shared the same concern.

When asked about coping strategies, overall, 88% of respondent households reported storing water in containers, pitchers, or coolers as their primary approach. District-level variations, as shown in Figure 14, reveal that around 97% households in Tando Muhammad

Khan reported storing water in containers, pitchers, or coolers, while a small proportion of approximately 2% reported borrowing water from neighbors and only 1% reported collecting water from alternative sources. These findings indicate a highly uniform approach to managing water scarcity. In contrast, households in Tando Allah Yar use a wider variety of coping strategies. Approximately 41% reported collecting water from alternative sources and 23% borrow from neighbors, 26% store water in containers or coolers. Additionally, 8% of households usually wait for the supply to return, and 2% use other methods i.e., buying water and reduce water usage. This diversity of approaches reflects more severe shortages and a higher reliance on community support and external sources in Tando Allah Yar (Figure 14).

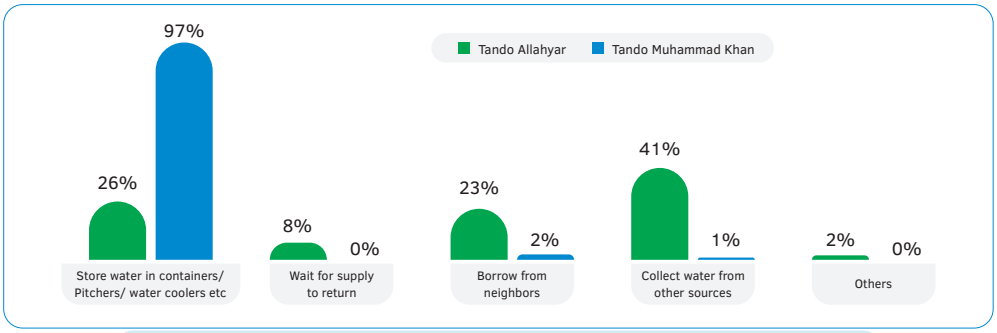

Figure 14: Water Shortage Actions

In both Tando Allah Yar and Tando Muhammad Khan, a significant number of people who reported water availability as "most of the time" or "sometimes" also stated that they experience long delays in accessing water. In Tando Allah Yar, 97% of households face long wait times, while in Tando Muhammad Khan, 85% report similar delays. These findings suggest that water access and reliability remain pressing challenges, especially in Tando Allah Yar where households face longer collection times, drying sources, and severe daily disruptions. Compared to this, Tando Muhammad Khan shows relatively better but still inconsistent access, highlighting the urgent need for reliable and sustainable water solutions.

Barriers to Access

Beyond physical availability, households in Tando Allah Yar and Tando Muhammad Khan face financial and social barriers to accessing water as well. High costs and security concerns

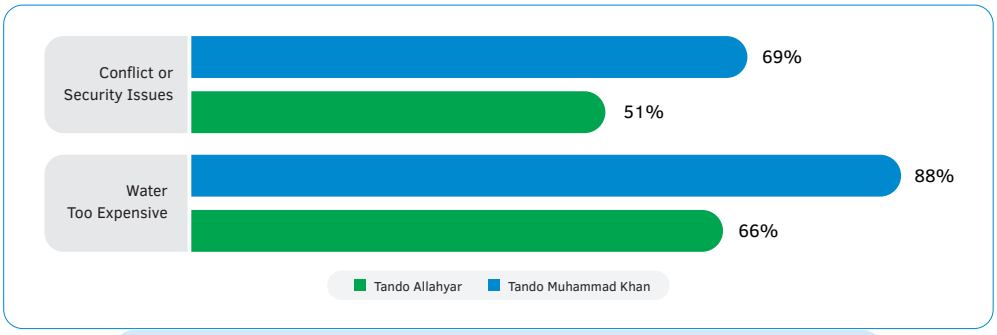

Figure 15: Access to Barriers

add to the burden, reducing reliability and limiting equitable access, especially for vulnerable families. Water costs are a major issue, reported by 1,161 households overall. In Tando Muhammad Khan, 88% of households reported water as too expensive, while in Tando Allah Yar, 66% of households faced the same challenge. Additionally, conflict and security issues affected 69% of households in Tando Muhammad Khan and 51% in Tando Allah Yar, with 909 households reporting these concerns (Figure 15). These barriers; cost and security, are especially severe in Tando Muhammad Khan, highlighting the need for both financial relief and improved safety measures to ensure equitable access to water.

Water Quality and Treatment Practices

Water quality is a critical factor in ensuring safe consumption, as even available water can be unsafe if contaminated. In Tando Allah Yar, households were more divided in their perceptions: 41% rated the water as fair, 25% as good, 7% as poor, and 27% as very poor. In contrast, the households in Tando Muhammad Khan showed a more consistent view, with 81% rating the water as fair, 16% as good, and only 3% as poor, with no households considering the water to be very poor. These findings highlight the more negative perception of water quality in Tando Allah Yar, where a significant portion of households rate their water as poor or very poor. Conversely, in Tando Muhammad Khan, where 88% of households rely on public external sources, over a third (34%) of households rated their water as "poor" or "very poor." This direct correlation underscores that reliance on shared, communal points which are more susceptible to environmental contamination and mismanagement, not only presents practical access challenges but also erodes community trust in water safety, a key factor influencing health-seeking and water-treatment behaviors.

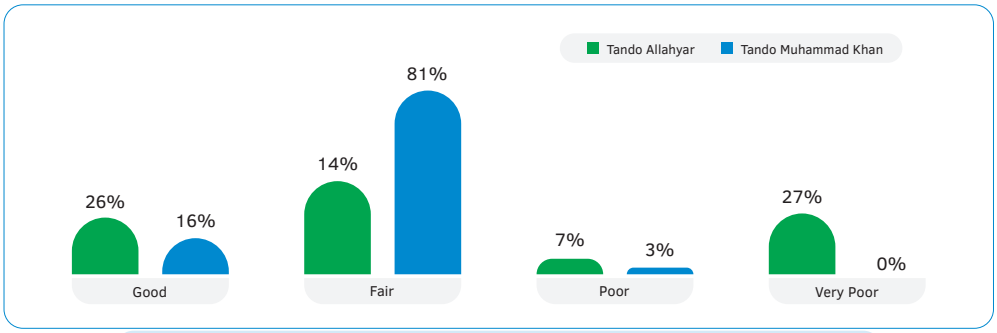

Figure 16: Water Quality Opinion

Overall, in the past three months, 69% of households reported changes in the taste of their drinking water, 39% observed changes in color, and 33% noticed changes in smell. At the district level, the most common concern was taste, reported by 70% of households in Tando Muhammad Khan compared to 58% in Tando Allah Yar. Changes in smell were more prevalent in Tando Allah Yar, where 40% of households raised this issue, compared to 32% in Tando Muhammad Khan. Similarly, 40% of households in Tando Muhammad Khan and 34% in Tando Allah Yar reported changes in water color. These findings underscore widespread water quality challenges across both districts, with Tando Muhammad Khan more affected by taste-related concerns and Tando Allah Yar showing greater concern over smell.

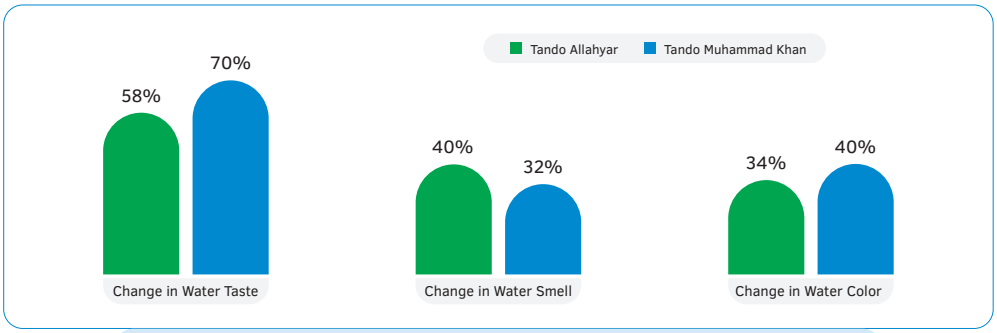

Figure 17: Change in Water Quality

In addition to concerns about changes in taste, smell, and color, water safety remains a pressing issue in both districts. Despite widespread concerns, overall, only a small percentage of households (5%) tested their water for germs. District specific variations revealed that 9% of households in Tando Allah Yar and 4% in Tando Muhammad Khan tested water for germs. Furthermore, when asked about water treatment practices, only 36 households reported treating water at home using various methods. Of these, 24 were from Tando Muhammad Khan, while 12 in Tando Allah Yar reported taking similar steps. Among those who treated their water, the choice of method varied between districts and is presented in Figure 18. The most common water treatment method in Tando Muhammad Khan is boiling, reported by 44% of households, whereas in Tando Allah Yar, settling is the most used method, with 23% of households adopting it. Both SODIS and Filtration are most prevalent water treatment techniques in Tando Allah Yar, together accounting for 28% of households (14% each). These results indicates that while many households notice changes in water quality, only a small proportion are actively addressing the issue, underscoring the need for increased awareness, better access to water testing, and affordable treatment solutions.

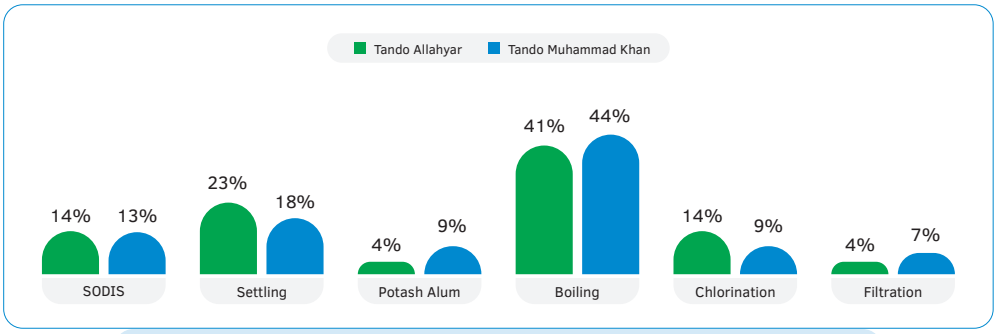

Figure 18: Water Treatment Methods

Willingness to Adopt Safe Water Practices

While current household practices show limited adoption of water treatment methods, it is equally important to understand the potential for change. To explore this, respondents were asked whether they would be willing to adopt safe practices, such as using filters, if made accessible and affordable. The findings revealed that overall, 96% of households

expressed willingness to adopt safe practices if provided, 2% reported maybe and remaining proportion of households were not interested in doing so. District-specific variations as shown in Figure 19 indicate that highest proportion of households 99% in Tando Muhammad Khan and 63% in Tando Allah Yar stated that they would definitely adopt such practices if provided and Around 19% in Tando Allah Yar were uncertain. These results highlight the need for greater awareness as well as practical, affordable, and scalable alternative for safe water treatment practices.

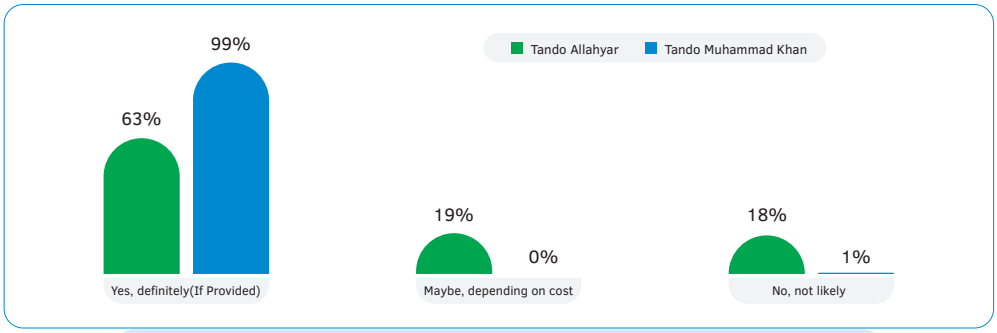

Figure 19: Likely to Adopt Safe Practices (like using filters)

Hygiene Practices

Hygiene practices are essential for disease prevention and ensuring the safe use of water. Proper sanitation, including regular handwashing and adopting safe water-handling practices, reduces the spread of waterborne diseases. Overall, 99% households reported washing their hands with water, 97% reported washing hands with soap and a total of 43% reported that they do wash their hands before taking meal and 43% after using toilet. District specific variations as shown in Figure 20 reveals that in Tando Muhammad Khan all respondent households reported washing their hands with water only and with water and soap, 38% reported washing hands before taking meal and after using toilet (38% each). Whereas in Tando Allah Yar around 72% households reported washing hands with water and soap, 89% reported washing hands before meals and 90% after using toilet. These results highlight both opportunities and challenges, underlining the need for tailored awareness programs to reinforce good hygiene and address specific behavioral gaps in each district.

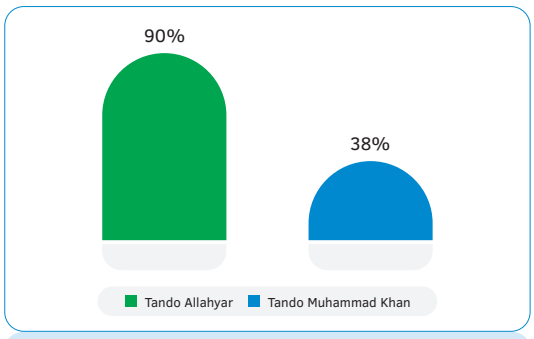

Figure 20: Handwashing with Water after Toilet Use

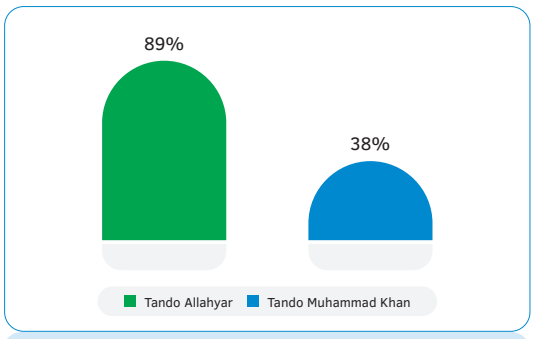

Figure 21: Handwashing with Water Before Meal

Sanitation

Sanitation is a key factor in public health, directly influencing hygiene, water safety, and the spread of disease. The analysis of household sanitation facilities across s highlights notable disparities in access and quality. Overall, 64% households reported that they have a toilet facility in their households, among them 1016 (56%) reported that the toilet that they have is cleaned and well maintained. Similarly, of those reporting not having toilet facility 668 (68%) practice open defecation while the remaining 320 (32%) households uses shared or public toilets. District-wise variation shows that highest proportion of respondent households (38%) reported have clean and well-maintained toilet whereas statistics of Tando Allah yar reveal highest proportion of households practice open defecation (48%). These results shows that both districts still face significant sanitation challenges, particularly with open defecation and reliance on shared facilities.

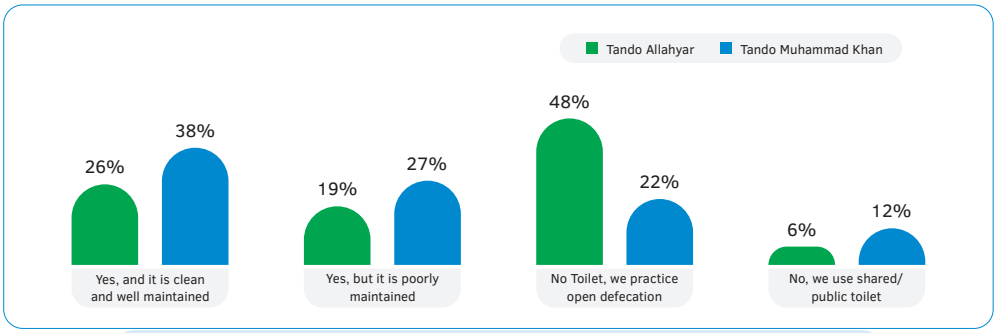

Figure 22: Types of Toilets by District

Waterborne Disease Prevalence by District

Diarrhea Cases

Diarrhea, a common waterborne disease, was reported in 2,108 (77%) total cases across both districts. District-specific analysis revealed a significantly higher burden of diarrheal cases in Tando Muhammad Khan where a total of 1,911 cases (91%) were reported, on the contrary 197 cases were reported in Tando Allah Yar (76%). Figure 23 presents a clear picture of most prevalent diarrheal diseases in the targeted districts. District-wise analysis shows that,

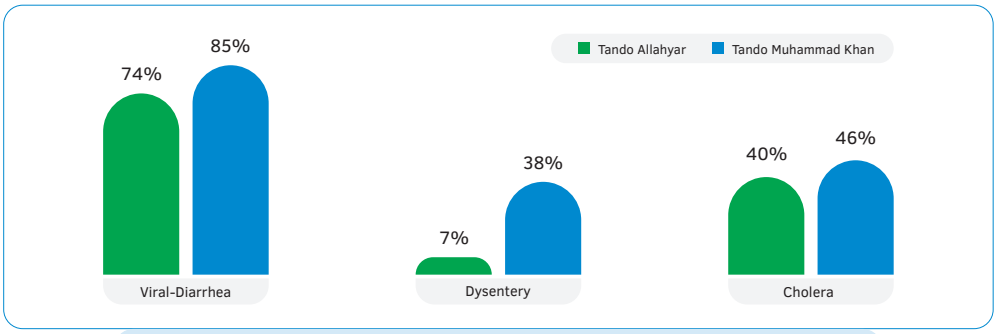

Figure 23: Diarrhea

viral diarrhea was reported as the most common illness, affecting 85% of households in Tando Muhammad Khan, followed by cholera at 46% and dysentery at 38%. Similarly, in Tando Allah Yar, viral diarrhea was the most reported illness, affecting 74% of households, followed by cholera at 40% and dysentery at 7%.

Open defecation directly fuels diarrheal disease by contaminating the environment and water sources. This is starkly clear in Tando Muhammad Khan, which reported 85% of all diarrhea cases despite a lower open defecation rate (22%) than Tando Allah Yar (48%). This paradox suggests that factors like flooding in Tando Muhammad Khan more effectively wash pathogens into the water supply, demonstrating that eliminating open defecation is crucial to breaking the cycle of infection.

Stomach Pain (Waterborne Diseased)

Stomach pain emerged as another major health concern in the targeted districts, with a notably higher prevalence in Tando Muhammad Khan 1,544 cases (62%) compared to Tando Allah Yar 145 cases (56%). Looking at the underlying causes, viral infections emerged as the most common, with 1,274 cases overall, affecting 78% of children in Tando Muhammad Khan and 46% in Tando Allah Yar. Bacterial infections were also widespread, with 1,244 cases reported, including 77% in Tando Muhammad Khan and 33% in Tando Allah Yar. In addition, typhoid was identified in 1,214 cases, impacting 76% of children in Tando Muhammad Khan and 33% in Tando Allah Yar.

The data reveals a critical insight: good hygiene practices alone are insufficient if the underlying water source is contaminated. This is starkly demonstrated by the high prevalence of stomach pain (62%), viral infections (78%), and bacterial infections (77%) in Tando Muhammad Khan. These rates persist despite most households there having a water source inside their dwelling (53%), because that water is likely contaminated. This health burden is exacerbated by poorer hygiene; only 38% of households in Tando Muhammad Khan reported washing hands with water after using toilet. The situation suggests that the use of contaminated water for both drinking and hygiene creates a cycle of infection that overwhelms any partial protective measures.

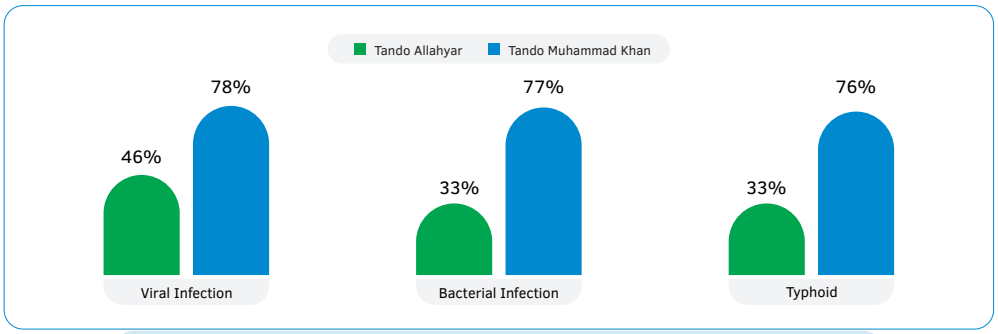

Figure 24: Stomach Pain

Worm Infections

Alongside the above-mentioned waterborne diseases, worm infections also pose a significant health challenge in the targeted districts with 354 cases (13%) overall. Of these, 343 (14%) cases were reported in Tando Muhammad Khan, compared to 11 cases (4%) in Tando Allah Yar. Looking more closely at the types of worm infections (Figure 25), three major categories were identified: pinworms, Giardia lamblia, and tapeworms. In Tando Muhammad Khan, 327 cases of pinworms were reported, along with 305 cases of Giardia lamblia and 80 cases of tapeworms. In Tando Allah Yar, the reported cases were much fewer, with only 4 cases each of Giardia lamblia and pinworms, and 2 cases of tapeworms.

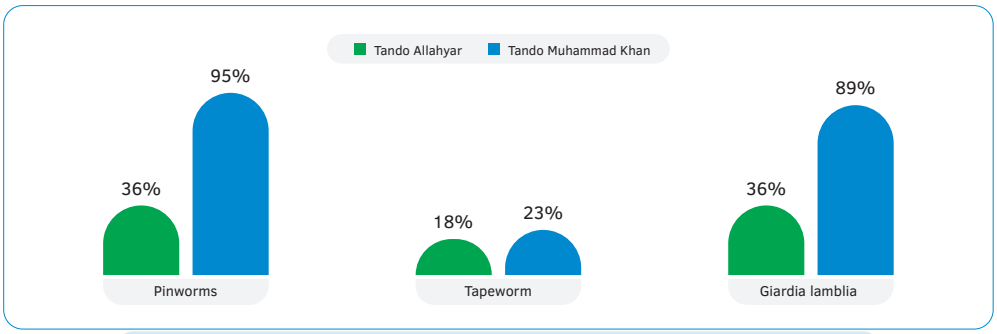

Figure 25: Worms Infections

The correlation between sanitation practices and worm infections is clear, as open defecation is more common in Tando Allah Yar (48% vs. 22% in Tando Muhammad Khan). Despite this, the significantly higher rates of worm infections in Tando Muhammad Khan suggest that environmental factors such as flooding, soil type, and poorer hygiene practices are amplifying the transmission of parasites, making improved sanitation interventions crucial in both areas.

Hepatitis Prevalence

Hepatitis continues to pose a health challenge in both districts, with 467 cases recorded in total. The majority of cases were found in Tando Muhammad Khan (379 cases), while Tando Allah Yar reported 88 cases. Patterns of Hepatitis A and C vary notably between the two districts. Hepatitis A is concentrated in Tando Muhammad Khan, with 271 cases (72%)

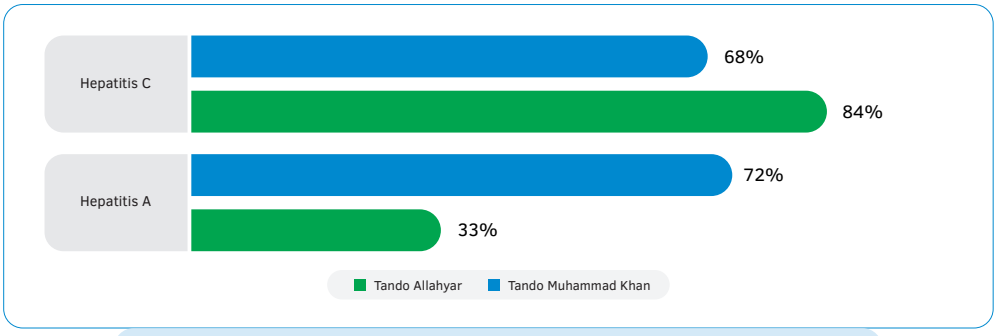

Figure 26: Hepatitis Prevalence

compared to 29 cases (33%) in Tando Allah Yar, making a total of 300 cases (overall). On the other hand, Hepatitis C is more prevalent in Tando Allah Yar, where 84% were recorded, while 68% occurred in Tando Muhammad Khan, totaling 333 cases (Figure 26). This contrast suggests that Hepatitis A is a greater concern in Tando Muhammad Khan, while Hepatitis C poses a comparatively higher burden in Tando Allah Yar.

Child Health Status

Children Under Age 5

The study identified a total of 1,787 children under five across both districts. Of these, 1,611 children (65% of households) were from Tando Muhammad Khan and 176 children (68% of households) were from Tando Allah Yar. Among these children, caregivers reported a considerable burden of health concerns. In Tando Muhammad Khan, 938 children (58%) were reported as experiencing sluggishness and weight loss, while in Tando Allah Yar, 93 children (53%) were described with the same conditions, for a combined total of 1,031 affected children. Similarly, stunting was reported for 853 children (53%) in Tando Muhammad Khan and 81 children (46%) in Tando Allah Yar, totaling 934 children (Figure 27). These findings highlight the initial scale of child health vulnerabilities in the surveyed districts, providing a reference point for monitoring and future interventions.

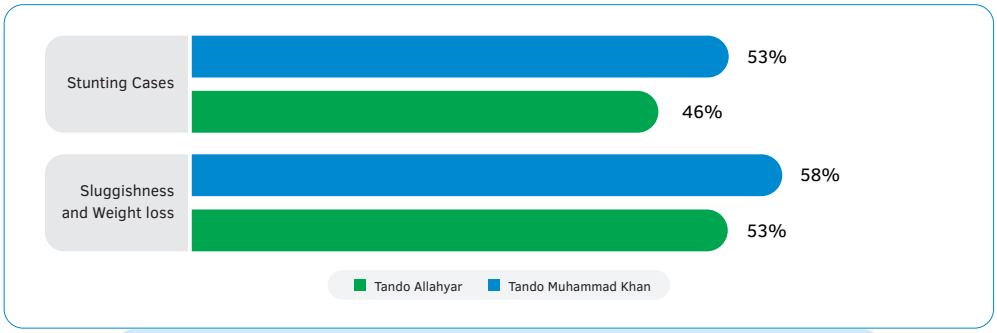

Figure 27: Stunting Cases and Sluggishness and Weight loss

This chi-square analysis examines the statistical differences in the prevalence of waterborne and infectious diseases between Tando Allah Yar and Tando Muhammad Khan. The results show that several diseases, including bacterial infection, dysentery, hepatitis A, pinworms, typhoid, viral infection, waterborne diseases (hepatitis and worms), giardia lamblia, viral diarrhea, hepatitis C, and stomach pain, demonstrate statistically significant differences ($p < 0.05$), indicating that their distribution is not uniform across the two districts and may be influenced by factors such as water quality, sanitation practices, and public health interventions. In contrast, conditions such as tapeworm, waterborne disease (diarrhea), sluggishness and weight loss, stunting cases, and cholera did not show statistically significant differences ($p > 0.05$), suggesting they are more uniformly prevalent in both districts. These findings highlight that while both areas share a heavy burden of waterborne diseases, certain infections are disproportionately concentrated in one district, emphasizing the importance of targeted interventions alongside broader improvements in water and sanitation infrastructure.

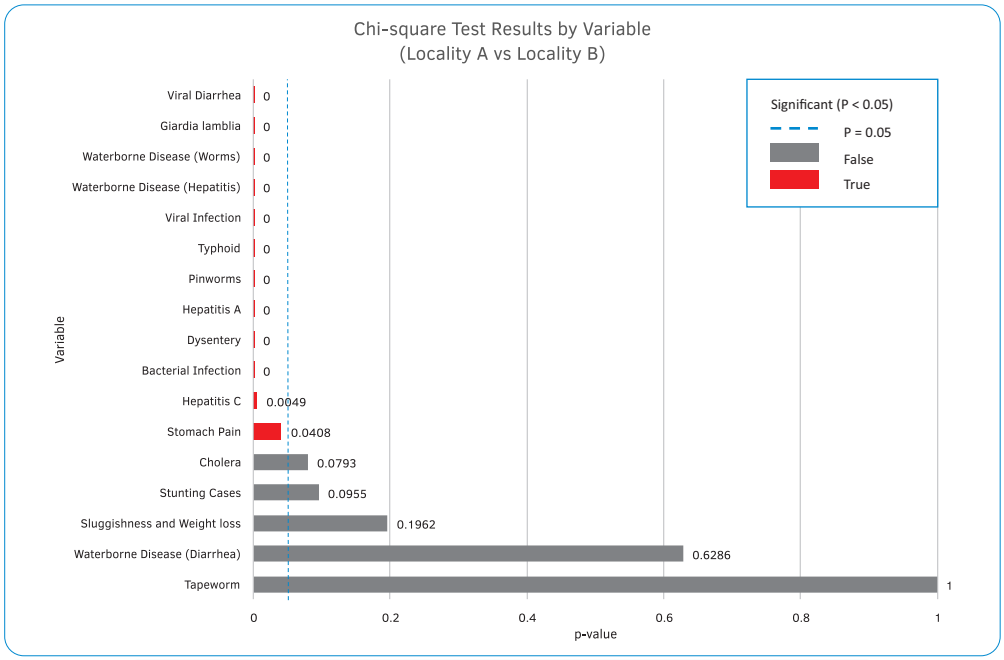

Figure 28: Chi Square Test

Seasonal Patterns and Outbreak Awareness

Waterborne diseases often exhibit seasonal patterns, which are influenced by climate, rainfall, and water supply conditions. Understanding the timing of these illnesses and how communities perceive outbreaks is essential for developing effective prevention and response strategies. The level of household awareness and recognition of such outbreaks also serves as an indicator of the effectiveness of local health communication systems. Overall, more than half of households (55%) associated a higher prevalence of waterborne diseases with the monsoon or summer seasons. At the district level, diseases were reported as more prevalent in Tando Muhammad Khan the peak was during the monsoon and rainy season (62%) and in Tando Allah Yar during the summer months (68%). These findings highlight that while both districts face seasonal risks, the timing of vulnerability differs between them.

In Tando Muhammad Khan, awareness of waterborne disease outbreaks was notably higher, 34% of households reported knowledge of a recent outbreak, and 7% were aware of a past outbreak, while 59% had no awareness. In contrast, Tando Allah Yar showed much

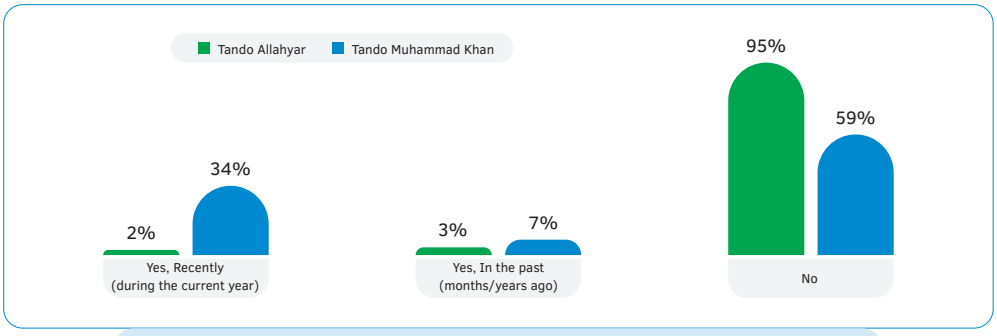

Figure 29: Waterborne disease outbreaks

lower awareness, with almost 95% of households reporting no knowledge of recent or past outbreaks. Only 2% recalled a recent outbreak, and 3% were aware of one from the past

The frequency of illness and access to healthcare reveal how communities respond to waterborne diseases. Patterns of occurrence, treatment-seeking behavior, and preferred healthcare providers highlight both the health risks faced by households and the systems they rely on for care. The frequency of illness highlights clear differences between the two districts. In Tando Muhammad Khan, 35% of households reported experiencing illness on a monthly basis, whereas in Tando Allah Yar, 38% of households reported illness only once a year. This shows that households in Tando Muhammad Khan face a more frequent and persistent burden of disease, while in Tando Allah Yar illness is more occasional and seasonal. Further details on other frequency patterns can be seen in figure 31.

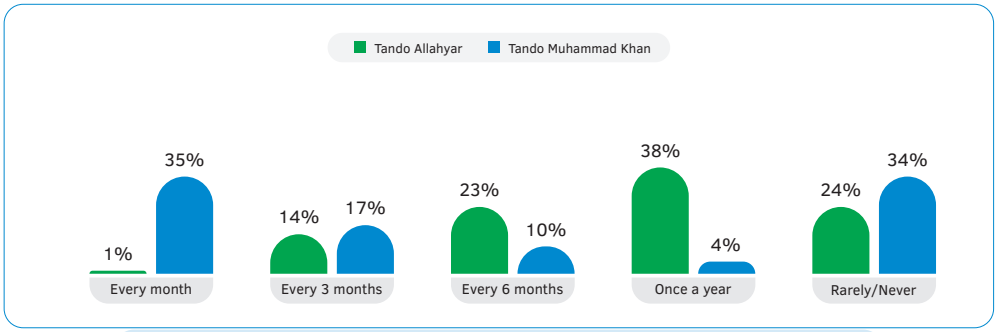

Figure 30: Frequency of illness

A large percentage of households in both districts sought medical attention for waterborne diseases, with 92% of households in Tando Allah Yar and 96% in Tando Muhammad Khan reporting medical visits. This reflects strong awareness and a proactive response to the health impacts of waterborne diseases in both regions. Following this, the expenditure on treatment reveals varying financial burdens on household. In Tando Muhammad Khan, most households (32%) reported spending between PKR 1,000–5,000 on treatment, indicating relatively lower costs for some. At the same time, 22% of households incurred expenses of more than PKR 10,000, highlighting the substantial financial strain faced during severe outbreaks. Additionally, 17% of households were unable to estimate their expenditure, suggesting gaps in both health awareness and financial literacy regarding treatment costs. In contrast, in Tando Allah Yar, a higher proportion of households reported spending between

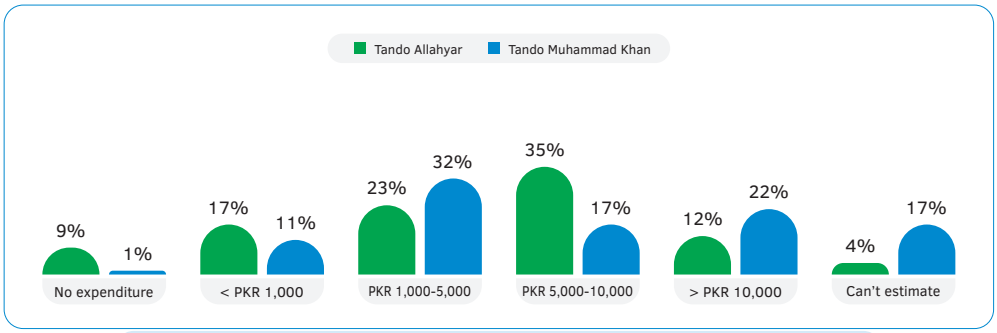

Figure 31: Expenditure on treatment

PKR 5,000–10,000 (35%), pointing to a moderate but significant economic impact on families in the district.

Long-term impacts of waterborne diseases vary across the two districts. In Tando Muhammad Khan, ongoing weakness or fatigue was the most commonly reported issue (41%). Importantly, half of the households (51%) in this district reported no long-term effects at all. In contrast, in Tando Allah Yar, households were more affected by missed work or school (45%) and increased medical expenses (49%), while only 10% reported no lasting impacts.

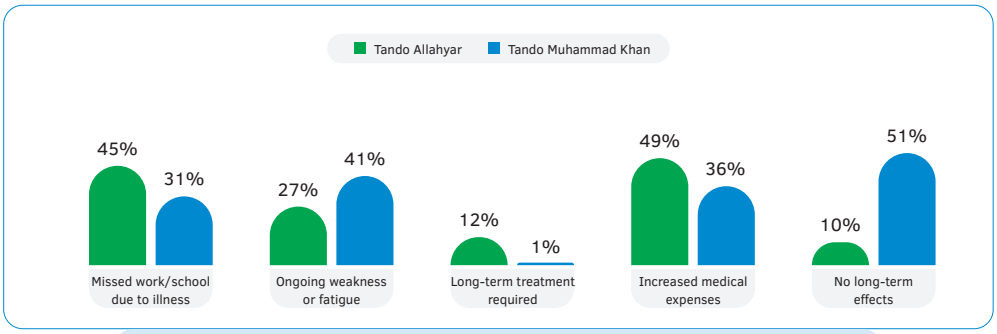

Figure 32: Long-term impacts of Waterborne Diseases

Households in both districts relied most heavily on government hospitals and private clinics for the treatment of waterborne diseases. The highest reported access was in Tando Muhammad Khan, where 93% of households used government hospitals and 92% relied on private clinics. Similarly, in Tando Allah Yar, 84% of households used government hospitals and 66% accessed private clinics, though at lower proportions than in Tando Muhammad Khan. At the other end of the spectrum, pharmacies and medical stores showed the greatest disparity between the two districts: 76% of households in Tando Muhammad Khan used them compared to just 31% in Tando Allah Yar. The lowest reliance overall was on local healers, with only 2% of households in Tando Muhammad Khan turning to them, while in Tando Allah Yar this figure was notably higher at 26%.

Table 3: Sources of Medical Treatment

Sources of Medical Treatment	TAY	TAY(%)	TMK	TMK(%)	Total
Government Hospital Access	201	84%	2,205	93%	2,406
Private Clinic Access	158	66%	2,184	92%	2,342
Local Healer Access	63	26%	45	2%	108
Pharmacy/Medical Store Access	74	31%	1,799	76%	1,873

Validation of Filter Efficacy and Water Safety

Following the distribution of the EveryWater filtration kits, water samples were collected from multiple households across the project area to verify the effectiveness of the filtration technology. These samples were independently analyzed by the Pakistan Council of Research in Water Resources (PCRWR), a national laboratory operating under the Ministry of Water Resources.

All laboratory testing was conducted in accordance with the National Standards for Drinking Water Quality (NSDWQ) 2010[13], which are aligned with the World Health Organization (WHO) Guidelines for Drinking-water Quality. According to WHO standards[14], safe drinking water should contain no detectable Escherichia coli (E. coli) in any 100 mL sample, while turbidity levels should ideally remain below 1 NTU and not exceed 5 NTU for potable water.

Laboratory Analysis Results

The following table summarizes the independent laboratory results for filtered water samples collected from households in Union Council Lakhat and surrounding areas in District Tando Muhammad Khan. The complete laboratory reports provided by PCRWR are included in the Annexure.

Table 4. Water testing reports

Sample Code	Household / Location	Date of Analysis	Turbidity (NTU)	E. coli (CFU/1ml)	Laboratory Remarks
PCWR/WQR/ Hyd/4102/2026	Aijaz Ali (Lakhat)	05.03.2026	0.2	0	Safe for drinking
PCWR/WQR/ Hyd/4103/2026	Parago (Lakhat)	05.03.2026	0.2	0	Safe for drinking
PCWR/WQR/ Hyd/4104/2026	Amei Ratno (Gohram)	05.03.2026	0.2	0	Safe for drinking
PCWR/WQR/ Hyd/4105/2026	Abid Ali (Sultan Mallah)	05.03.2026	0.1	0	Safe for drinking
PCWR/WQR/ Hyd/4106/2026	Jamal Pandhi (Sultan Mallah)	05.03.2026	0.1	0	Safe for drinking
PCWR/WQR/ Hyd/4107/2026	Jaimal Maseh (Jamo Maseh)	05.03.2026	0.2	0	Safe for drinking
PCWR/WQR/ Hyd/4093/2026	Rustam Khan (Bachal Lanjwani)	02.03.2026	1.0	0	Safe for drinking
PCWR/WQR/ Hyd/4094/2026	Khuda Bux (Bachal Lanjwani)	02.03.2026	0.1	0	Safe for drinking

13 *National Standards for Drinking Water Quality (NSDWQ). Pakistan Environmental Protection Agency. Microsoft Word - DWQ re-finalized may 2007.doc*

14 *World Health Organization. (2017). Guidelines for Drinking-water Quality (4th ed.). Geneva: WHO. Government of Pakistan. (2010). content*

Sample Code	Household / Location	Date of Analysis	Turbidity (NTU)	E. coli (CFU/1ml)	Laboratory Remarks
PCWR/WQR/ Hyd/4092/2026	Lala Kolhi (Jamo Maseh)	02.03.2026	0.1	0	Safe for drinking
PCWR/WQR/ Hyd/4085/2026	Ali Hassan (Lakhat)	02.03.2026	0.2	0	Safe for drinking
PCWR/WQR/ Hyd/3910/2025	Muhammad Hassan (TMK)	13.01.2026	0.2	0	Safe for drinking

Key Evidence Supporting the Project Claim

- Complete Microbiological Clearance: While the survey indicated that 70% of households consumed contaminated water, 100% of the tested samples passing through EveryWater filters showed zero (0) E. coli colonies.
- High Aesthetic Quality: The turbidity levels in all samples ranged from 0.1 to 1.0 NTU, significantly lower than the permissible National Standard for Drinking Water Quality (NSDWQ) limit of 5 NTU.
- Official Certification: Every sample tested was officially certified by PCRWR as "Safe for drinking purposes" regarding the analyzed parameters.

This data confirms that the hollow-fiber membrane technology used in the EveryWater kits effectively removes bacterial contaminants, directly addressing the high prevalence of waterborne diseases such as diarrhea and typhoid identified in the report. The results also verify the project's claim that EveryWater provides a cost-effective and accessible alternative source of clean and safe drinking water for households in the project area.

Lessons Learned and Way Forward

During the study, the team faced a number of operational challenges. One key issue was the difficulty in gathering the community within the short distribution period. Alongside distributions, the team also conducted awareness sessions, which made the activity time-intensive and, in some cases, diverted focus from the planned work schedule.

Another challenge was related to survey participation. While participation rates were very high in Tando Muhammad Khan (99%, with 2,459 out of 2,472 individuals participating), 13 individuals refused to take part. Since this is the first survey in a series of bi-annual surveys planned over the next year, these refusals present a long-term challenge. Households that declined once may be more resistant to participate in future rounds, making it more difficult and resource-intensive to re-engage them. This could potentially affect data completeness and the consistency of monitoring over time.

Additionally, the study showed that community trust and clear communication are key to achieving high participation. The very strong response rate in Tando Muhammad Khan highlights the value of engaging with households directly and explaining the purpose of the survey clearly. At the same time, the small number of refusals reminds us that participation cannot be taken for granted, and efforts are needed to build ongoing relationships with the community.

Conclusion & Recommendations

The formative evaluation of EveryWater project provided crucial insights into the prevalence of waterborne diseases and associated health issues in Tando Allah Yar and Tando Muhammad Khan. The findings revealed alarmingly high rates of diarrhea, viral and bacterial infections, typhoid, hepatitis, and worm infestations, with children under five years of age being particularly vulnerable. These health concerns are strongly linked to unsafe drinking water, inadequate sanitation, and limited community awareness, which are the primary contributing factors.

The survey also highlighted a significant connection between malnutrition and child health problems such as sluggishness, weight loss, and stunting, and waterborne diseases. While both districts face these challenges, Tando Muhammad Khan experiences a higher overall burden of disease. However, Hepatitis C was found to be more prevalent in Tando Allah Yar.

The findings suggest that the health challenges in these districts stem from a complex network of interconnected factors. Poor sanitation facilities, especially the widespread practice of open defecation, were directly linked to extremely high rates of parasitic worm infections. Additionally, the economic burden of accessing water and healthcare creates a vicious cycle, trapping families in poverty and limiting their ability to invest in preventive measures like water filters or improved sanitation.

Crucially, the study found that even reported hygiene practices, such as handwashing with water alone are insufficient to break the transmission chain when the underlying water source remains contaminated. This highlights the need for a comprehensive approach that tackles not only point-of-use water filtration but also the improvement of sanitation infrastructure, the promotion of proper hygiene behaviors using soap, and the strengthening of community health awareness and economic resilience.

Overall, the survey underscores the urgent need for continued monitoring, awareness campaigns, and enhanced access to safe drinking water and sanitation facilities. As this was the first survey, repeating it every six months will enable the tracking of changes over time, help identify progress, and inform corrective actions. Through strong community participation and addressing operational challenges, future surveys will bolster data reliability and contribute to improved health outcomes in both districts. A key achievement from this survey was the successful distribution of 2,472 EveryWater filtration kits in Tando Muhammad Khan, providing households with immediate access to safe drinking water and setting the stage for measurable health improvements in the months ahead.

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Annexes

Annex 1: Questionnaire (English)

EveryWater Survey

SECTION-I: INTRODUCTION

A. Enumerator Details

A1. Enumerator: _____ A2. Designation: _____ A4: Date: _____

B. Geographical Location

B1. Sample ID: _____ B2. Province/Region: _____
B3. District: _____ B4. Tehsil/Taluka: _____
B5. Union Council: _____ B6. Revenue Village: _____

C. Contact Details

C1. Name of Head of Household: _____
C3. Religion: _____ C4. Respondent's Name: _____ C5. Age: _____
C6. Gender: 1. Male 2. Female 3. Transgender
C7. Total Number of Members in HH: _____
C8. Water Cooler Received By: _____

SECTION A: WATER SOURCE AND USE

A1. What is your household's main source of drinking water?

1. Piped water into dwelling (inside the house)
2. Piped water into yard/plot (not inside)
3. Hand pump in the dwelling
4. Public tap/standpipe
5. Private Borehole (with motor pump) / Tubewell
6. Public Borehole (with motor pump) / Tubewell
7. Protected well (include dugwells)
8. Unprotected well (include dugwells)
9. Protected spring
10. Unprotected spring
11. Rainwater collection
12. Bottled water
13. Cart with small tank/drum
14. Surface water(river, dam, lake, pond, stream, canal, irrigation channels)
15. Filtration Plant / unit
16. Tanker Truck

A2. Is the main source of drinking water inside your household or on your property?

1. Yes 2. No, Outside but a private source. 3. No, Outside but a public source.

A3. How long have you been using this source of Water?

1. Less than 6 months
2. 6 months to 1 year
3. 1 to 3 years
4. More than 3 years

A4. Who usually collects drinking water for your household?

1. No need to collect as it is supplied to the house / source within the house / piped into to the house
2. Adult female (age 18 or above)
3. Adult male (age 18 or above)
4. Female child (under 18)
5. Male child (under 18)

A5. How long does it take to go to your main water source, collect water, and return home?
1. Less than 15 minutes 2. 15 minutes to 30 minutes
3. 30 minutes to 1 hour 4. More than 1 hour

A6. Is drinking water usually available for your household's needs?
1. Always 2. Sometimes 3. Most of the time

A7. Is drinking water usually enough for your household's needs?
1. Always 2. Sometimes 3. Most of the time

A8. What are the main reasons for insufficient water availability?
1. Is the source drying up or is there not enough water? (Yes/No)
2. Is the water supply irregular? (Yes/No)
3. Do you face long wait times at the water source? (Yes/No)
4. Is water too expensive to afford regularly? (Yes/No)
5. Are there conflict or security concerns that make water access difficult? (Yes/No)
6. Is the source too far from your home? (Yes/No)

A9. How does the water unavailability affect your daily life?
1. No effect 2. Some difficulty 3. Big problems in daily life

A10. What do you and your family members do when there is not enough drinking water or the supply is irregular?
1. Store water in containers / Pitchers / water coolers etc
2. Collect water from other sources 3. Buy water 4. Borrow from neighbors
5. Reduce water use 6. Wait for supply to return 7. No specific way to manage

A11. How do you feel about the quality of drinking water in your area?
1. Good 2. Fair 3. Poor 4. Very poor

A12. In the last 3 months, have you noticed any change in the smell of your drinking water?
1. Yes 2. No

A13. In the last 3 months, have you noticed any change in the taste of your drinking water?
1. Yes 2. No

A14. In the last 3 months, have you noticed any change in the color of your drinking water?
1. Yes 2. No

SECTION B: WATER TREATMENT AND SAFETY PRACTICES

B1. Has your drinking water ever been tested for germs? 1. Yes 2. No

B1a. If Yes, when was your drinking water last tested? 1. Year 2. Month

B1b. What were the results of the water test? 1. Was safe 2. Not safe 3. Don't know

B2. In the last 3 months, have you or any of your family members treated your drinking water at home? 1. Yes 2. No

B2a. Does your household treat your drinking water by boiling it? 1. Yes 2. No

B2b. Does your household use bleach (chlorination) to treat drinking water? 1. Yes 2. No

B2c. Does your household filter drinking water using ceramic, sand, cloth, or other filters?
1. Yes 2. No

B2d. Does your household use solar disinfection (SODIS) to treat drinking water? 1. Yes 2. No

B2e. Does your household let water stand and settle before drinking? 1. Yes 2. No

B2f. Does your household use Potash Alum (Phatkari) to clean the water? 1. Yes 2. No

B3. Do you and your family think your water treatment method is appropriate and safe?
1. Yes 2. No

B4. Are you likely to adopt safe practices (like using filters)?
1. Yes, definitely (If Provided) 2. Maybe, depending on the cost 3. No, not likely
B5. Do all members of the household wash their hands regularly? 1. Yes 2. No
B6. Do all members of the household wash their hands with soap and water? 1. Yes 2. No
B7. Do all members of the household wash their hands only before meals? 1. Yes 2. No
B8. Do all members of the household wash their hands only after using the toilet? 1. Yes 2. No
B9. Do you have a properly maintained latrine or toilet in your household?
1. Yes, and it is clean and well maintained 2. Yes, but it is poorly maintained
3. No, we use shared/public toilet 4. No Toilet, we practice open defecation

SECTION C: WATERBORNE DISEASE INCIDENCE

C1. In the last 3 months, have you or any of your family members suffered from diarrhea? 1. Yes 2. No
C1a(i). Have you or your family members experienced diarrhea accompanied by vomiting? 1. Yes 2. No
C1a(ii). Have you or your family members experienced diarrhea with a foul smell or blood? 1. Yes 2. No
C1a(iii). Have you or your family members experienced watery stools that led to fainting or dizziness? 1. Yes 2. No
C1b. In the last 3 months, have you or any of your family members experienced frequent stomach pain? 1. Yes 2. No
C1b(i). In the last 3 months, did you or any of your family members experience sudden and severe stomach pain along with vomiting? 1. Yes 2. No
C1b(ii). Did the stomach pain occur with fever, followed by vomiting and diarrhea? 1. Yes 2. No
C1b(iii). Have you or any of your family members experienced stomach pain with an on-and-off fever lasting several days? 1. Yes 2. No
C1c. In the last 3 months, have you or any of your family members noticed worms in the stool? 1. Yes 2. No
C1c(i). Does any child in your family eat mud and complain of itchiness at the bottom at night? 1. Yes 2. No
C1c(ii). Have you or any of your family members seen a long worm in the stool? 1. Yes 2. No
C1c(iii). Have you or any of your family members experienced a loss of appetite after observing worms? 1. Yes 2. No
C1d. In the last 3 months, have you or any of your family members noticed a change in the color of the white part of the eye? 1. Yes 2. No
C1d(i). Is it accompanied by fever? (Hepatitis A) 1. Yes 2. No
C1d(ii). Is it of longer duration with weight loss? (Hepatitis C) 1. Yes 2. No
C2. Are there any children of less than five years age in the household? 1. Yes 2. No
C2a. In the past 3 months, have you noticed sluggishness and weight loss in any of these children/child? 1. Yes 2. No
C2b. Was it accompanied by loose diarrhoea? 1. Yes 2. No

C3. How often have you or your family members experienced waterborne diseases, such as diarrhea, stomach pain, worms, or hepatitis etc?

1. Every month 2. Every 3 months (quarterly) 3. Every 6 months
4. Once a year 5. Rarely/Never

C4. Do you or anyone in your family seek medical attention for these illnesses? 1. Yes 2. No

C4i. If yes, where do you go?

1. Government hospital or clinic (Yes/No) 2. Private clinic or hospital (Yes/No)
3. Local healer or traditional practitioner(Yes/No) 4. Pharmacy or medical store (Yes/No)

C5. During the last 3 months, what was your household's expenditure on the treatment of waterborne diseases or illnesses such as diarrhea, stomach pain, worms, sluggishness, and weight loss in children, etc.?

1. No expenditure 2. Less than PKR 1,000 3. PKR 1,000 – 5,000
4. PKR 5,000 – 10,000 5. More than PKR 10,000 6. Can't estimate

C6. In the past 3 months, have you or any of your family members experienced any long-term health effects from waterborne illnesses (e.g., absence from work or other difficulties)?

a. Missed work/school due to illness b. Ongoing weakness or fatigue
c. Long-term treatment required d. Increased medical expenses
e. No long-term effects

C7. Have you or your family members noticed that waterborne diseases happen more often in certain seasons?" 1. Yes 2. No

C8. If Yes, During which time(s) of the year are waterborne diseases most common in your community? 1. Summer 2. Monsoon/Rainy season
3. Winter 4. All year round 5 No specific time

C9. In the last 3 months, have you or your family members been aware of any waterborne disease outbreaks in your community?

1. Yes, Recently (during the last one year) 2. Yes, In the past (more than a year ago) 3. No

C10. Have you or any of your family members received any training or education on preventing waterborne diseases? 1. Yes 2. No

C11. Are you or your family members involved in or aware of any community-led initiatives to improve water quality or prevent waterborne diseases? 1. Yes 2. No

SECTION D: PARTICIPATION IN MONITORING AND FOLLOW-UP

D1. Would you take part in a quarterly survey to monitor the impact of the initiative? 1. Yes 2. No

D1a. If Yes, Please Provide your Contact Number. _____

SECTION - E: CONSENT FOR PICTURE

SECTION - F: REMARKS BY THE ENUMERATOR

SECTION - G: GEO POINTS

Annex 2: Questionnaire (Sindhi)

سيڪشن :I-تعارف

الف: انٽرويو ونندڙ جي تفصيل

A1. انٽرويو ونندڙ جو نالو:_____ A2. عهدو:_____ A4. تاريخ:_____

ب: جاگرافيائي مقام

B1. نمونو جو سڃاڻپ نمبر:_____ B2. صوبو / علائقو:_____

B3. ضلعو:_____ B4. تحصيل / تعلقو:_____

B5. يونين ڪائونسل:_____ B6. روينيو ڳوٺ:_____

ج: رابطي جا تفصيل

C1. گهر جي سربراهه جو نالو:_____

C3. مذهب:_____ C4. جواب ڏيندڙ جو نالو:_____ C5. عمر:_____

C6. جنس: مرد عورت خواجه سرا / ٽرانسجينڈر

C7. گهر جي ڪل ميمبرن جو تعداد:_____

C8. واٽر ڪولر وصول ڪندڙ:

سيڪشن :A پاڻي جو ذريعو ۽ استعمال

A1 توهان جي گهر جو پيئڻ جي پاڻي جو مکيه ذريعو ڪهڙو آهي؟

a. گهر جي اندر پائپ سان آيل پاڻي
b. صحن/اڳڻ تائين پائپ سان آيل پاڻي (گهر اندر نه)
c. گهر اندر نلڪو
d. عوامي نلڪو/اسٽينڈ پائپ
e. نجي جر/بور هول (موٽر پمپ سان) / ٽيوب ويل
f. عوامي / سرڪاري بور هول (موٽر پمپ سان) / ٽيوب ويل
g. محفوظ ڪوهه (ڪوٽيل ڪوهن سميت)
h. غير محفوظ ڪوهه (ڪوٽيل ڪوهن سميت)
i. محفوظ چشمو
j. غير محفوظ چشمو
k. مينهن جو پاڻي گڏ ڪرڻ
l. بوتل وارو پاڻي
m. نندي ٽانڪي يا ڊرم وارو ريڙهو
n. مٽاڇري جو پاڻي (درياءُ، بند، ڍنڍ، ڍنڍيون، نالا، واهه، آبپاشي وارا چينل)
o. فلٽريشن پلانٽ / يونٽ
p. ٽئنڪر

A2 ڇا اوهان جي پيئڻ جي پاڻي جو مکيه ذريعو گهر جي اندر يا اوهان جي زمين تي آهي؟

a. ها
b. نه، ٻاهر آهي پر نجي وسيلو آهي
c. نه، ٻاهر آهي پر عوامي / سرڪاري وسيلو آهي

A3 اوهان هِن پاڻيءَ جي ذريعي کي ڪيتري عرصي کان استعمال ڪري رهيا آهيو؟

a. 6 مهينن کان گهٽ
b. 6 مهينا کان 1 سال تائين
c. 1 کان 3 سال تائين
d. 3 سالن کان وڌيڪ

A4 عام طور تي اوهان جي گهر لاءِ پيئڻ جو پاڻي ڪير کڻي ايندو آهي؟

a. پاڻي کڻڻ جي ضرورت ناهي، ڇو ته اهو سڌو گهر تائين فراهم ڪيو ويو آهي
b. بالغ عورت (عمر 18 يا وڌيڪ)
c. بالغ مرد (عمر 18 يا وڌيڪ)
d. نابالغ ڇوڪري (18 سال کان گهٽ)
e. نابالغ ڇوڪرو (18 سال کان گهٽ)

A5 پاڻيءَ جي مکيه ذريعي تي وڃڻ، پاڻي پرڻ ۽ واپس گهر اچڻ ۾ ڪيترو وقت لڳي ٿو؟

a. 15 منٽن کان گهٽ
b. 15 منٽ کان 30 منٽ تائين
c. 30 منٽ کان 1 ڪلاڪ تائين
d. 1 ڪلاڪ کان وڌيڪ

A6 ڇا توهانجي گهر ۾ پيئڻ جو پاڻي عام طور تي توهان جي گهر جي ضرورتن لاءِ دستياب هوندو آهي؟

a. هميشه
b. ڪڏهن ڪڏهن
c. گهٽو وقت

A7 چا توهانجي گهر ۾ پيئڻ جو پاڻي عام طور تي توهان جي گهر جي ضرورتن لاءِ ڪافي هوندو آهي؟

a. هميشہ
b. ڪڏهن ڪڏهن
c. گهٽو ڪري

A8 پاڻي جي ڪوٽ جا مکيہ سبب ڪهڙا آهن؟

a. چا پاڻي جو ذريعو سڪي رهيو آهي يا ڪافي پاڻي نہ آهي؟
b. چا پاڻي جي فراهمي بي قاعدي آهي؟
c. چا توهان کي پاڻي جي ذريعي تي دٻگهو انتظارڪرڻو ٿو پوي ؟
d. چا پاڻي باقاعدي طور تي خريد ڪرڻ تمام مهانگو آهي؟
e. چا اهڙا تکرار يا سيڪيورٽي خدشا آهن جيڪي پاڻي تائين پهچ کي ڏکيو بڻائين ٿا؟
f. چا پاڻي جو ذريعو توهان جي گهر کان تمام پري آهي؟

A9 پاڻي جي غير موجودگي اوهان جي روزاني زندگي تي ڪيئن اثر انداز ٿئي ٿي؟

a. ڪو اثر ناهي
b. ڪجهھ ڏکايون ٿيون
c. روزاني زندگي ۾ وڏا مسئلا ٿين ٿ

A10 جڏهن پيئڻ جو پاڻي ڪافي مقدار ۾ نہ هجي يا فراهمي بي قاعدي هجي، تہ اوهين ۽ اوهان جا گهر پاتي چا ڪندا آهيو؟

a. پاڻي ڪنٽينرن، ، ٽانون, برتنن, صراحين، واٽر ڪولرن وغيره ۾ گڏ ڪريو ٿا
b. ٻين ذريعن مان پاڻي گڏ ڪريون ٿا
c. پاڻي خريد ڪريون ٿا
d. پاڙيسرين کان پاڻي وٺون ٿا
e. پاڻي جو استعمال گهٽايون ٿا
f. پاڻي جي فراهمي جو انتظار ڪريون ٿا
g. انتظام ڪرڻ جو ڪو خاص طريقو ناهي

A11 اوهان جي علائقي ۾ پيئڻ جي پاڻي جي معيار بابت اوهان جي راءِ چا آهي؟

a. س ٺيڪ آهي
b. خرا"
c. تمام خراب

A12 چا اوهان گذريل 3 مهينن ۾ پنهنجي پيئڻ جي پاڻي جي بُو ۾ ڪا تبديلي محسوس ڪئي آهي؟

a. ها
b. نہ

A12(i) چا اوهان گذريل 3 مهينن ۾ پنهنجي پيئڻ جي پاڻي جي ذائقي ۾ ڪا تبديلي محسوس ڪئي آهي؟

a. ها
b. نہ

A12(ii) چا اوهان گذريل 3 مهينن ۾ پنهنجي پيئڻ جي پاڻي جي رنگ ۾ ڪا تبديلي محسوس ڪئي آهي؟

a. ها
b. نہ

سيڪشن B: پاڻي جي صفائي ۽ حفاظتي طريقا

B1 چا توهان جي پيئڻ جو پاڻي ڪڏهن جراثيم لاءِ ٽيسٽ ڪيو ويو آهي؟

a. ها
b. نہ

B1a جيڪڏهن ها، تہ توهان جي پيئڻ جي پاڻي جي آخري جانچ/ٽيسٽ ڪڏهن ڪئي وئي هئي؟

a. سال
b. مهينو

B1b پاڻي جي جاچ جا نتيجا ڪهڙا هئا؟

a. محفوظ هو
b. محفوظ ناهي
c. خبر ناهي

B2 چا گذريل ٽن مهينن دوران اوهان يا اوهان جي گهر ياتين مان ڪنهن گهر ۾ پيئڻ جو پاڻي صاف ڪيو آهي؟

a. ها
b. نہ

B2a چا اوهان جو گهر اُبالڻ ذريعي پيئڻ جو پاڻي صاف ڪري ٿو؟

a. ها
b. نہ

B2b چا اوهان جو گهر پيئڻ جو پاڻي صاف ڪرڻ لاءِ بليچ (ڪلورينيشن) استعمال ڪري ٿو؟

a. ها
b. نہ

B2c چا اوهان جو گهر سيرامڪ، واري، ڪپڙي يا ڪنهن ٻئي فلٽر سان پيئڻ جو پاڻي صاف ڪري ٿو؟

a. ها b. نہ

B2d چا اوهان جو گهر پيئڻ جو پاڻي صاف ڪرڻ لاءِ سج جي روشني جو طريقو استعمال ڪري ٿو؟

a. ها b. نہ

B2e چا اوهان جو گهرپاڻي صاف ڪرڻ لاء پيئڻ کان اڳ پاڻي کي ٻيهاري ڇڏيندو آهي ته جيئن تهہ ۾ ويهي؟

a. ها b. نہ

B2f چا اوهان جو گهر پاڻي صاف ڪرڻ لاءِ ڦٽڪڙي (پٽاش ايلومر) استعمال ڪري ٿو؟

a. ها b. نہ

B3 چا اوهين ۽ اوهان جي گهر پاتين جو خيال آهي ته اوهان جو پاڻي صاف ڪرڻ جو طريقو مناسب ۽ محفوظ آهي؟

a. ها b. نہ

B4 چا اوهين ۽ اوهين جي گهر پاڻي صاف ڪرڻ لاء محفوظ طريقا اختيار ڪرڻ لاءِ تيار آهيو؟ (جهڙوڪ فلٽر استعمال ڪرڻ

a. ها، ضرور (جيڪڏهن فراهم ڪيو ويو) c. نہ، امڪان گهٽ آهي

b. ممڪن آهي، خرچ تي دارومدار

B5 چا گهر جا سيئي ماڻهو باقاعدگي سان هٿ ڌوئين ٿا؟

a. ها b. نہ

B6 چا گهر جا سيئي ماڻهو صابڻ ۽ پاڻي سان هٿ ڌوئين ٿا؟

a. ها b. نہ

B7 چا گهر جا سيئي ماڻهو صرف ماني کان اڳ هٿ ڌوئين ٿا؟"

a. ها b. نہ

B8 چا گهر جا سيئي ماڻهو صرف پاخاني وڃڻ کان پوءِ هٿ ڌوئين ٿا؟"

a. ها b. نہ

B9 چا اوهان جي گهر ۾ صاف ۽ صحيح حالت ۾ باٿروم يا ٽائليٽ آهي؟

a. ها، اهو صاف ستڙو ۽ سڻو سنيالیل آهي c. نہ، اسان گڏيل/عوامي ٽائليٽ استعمال ڪندا آهيون

b. ها، پر اهو صحيح نموني سان سنيالیل ناهي d. ڪابہ ٽائليٽ ناهي، اسين ڪليل ڪاڪوس استعمال ڪندا آهيون.

سيڪشن C: پاڻي سان لاڳاپيل بيمارين جا واقعا

C1 گذريل ڏن مهينن دوران، چا اوهان يا اوهان جي گهر پاتين مان ڪو دستن جو شڪار ٿيو آهي؟

a. ها b. نہ

C1a(i) چا اوهان يا اوهان جي گهر پاتين مان ڪنهن کي دستن سان گڏ الٽي پڻ ٿي؟

a. ها b. نہ

C1a(ii) چا اوهان يا اوهان جي گهر پاتين مان ڪنهن کي دستن ۾ بديبوءِ يا رت آئي؟

a. ها b. نہ

C1a(iii) چا اوهان يا اوهان جي گهر پاتين مان ڪنهن کي پاڻي جهڙا دست اچي وڃڻ سبب بيهوشي يا چڪر محسوس ٿيا آهن؟

a. ها b. نہ

C1b گذريل ڏن مهينن دوران، چا اوهان يا اوهان جي گهر پاتين مان ڪنهن کي بار بار پيٽ ۾ سور ٿيو آهي؟

a. ها b. نہ

C1b(i) گذريل ڏن مهينن دوران، چا اوهان يا اوهان جي گهر پاتين مان ڪنهن کي اچانڪ ۽ شديد پيٽ ۾ سور محسوس ٿيو، جنهن سان گڏ الٽي پڻ ٿي؟

a. ها b. نہ

C1b(ii) چا پيٽ ۾ درد بخار سان گڏ ٿيو ۽ ان کانپوءِ الٽي ۽ دستن جو ساموهو ٿيو؟

a. ها b. نہ

C1b(iii) چا اوهان يا اوهان جي گهر ياتين مان ڪنهن کي پيٽ ۾ درد سان گڏ وقف وارين بخار جو ساموهو ٿيو، جيڪو الاهي/گهٽن ڏينهن تائين رهيو؟

a. ها b. نہ

C1c گذريل 3 مهينن ۾، چا اوهان يا اوهان جي گهر ياتين پخاني ۾ ڪي ڪيڙا ڏٺا آهن؟

a. ها b. نہ

C1c(i) چا اوهان جي گهر ۾ ڪنهن بار کي مٽي کائڻ ۽ رات جو هينئين پاسي/ڪاکوس واري جاء ۾ خارش جو شڪايت آهي؟

a. ها b. نہ

C1c(ii) چا اوهان يا اوهان جي گهر ياتين مان ڪنهن پخاني ۾ ڊگهو ڪيڙو ڏٺو آهي؟"

a. ها b. نہ

C1c(iii) چا اوهان يا اوهان جي گهر ياتين مان ڪنهن کي پخاني ۾ ڪيڙن ڏسڻ کانپوءِ بک ۾ گهٽتائي محسوس ٿي آهي؟

a. ها b. نہ

C1d گذريل 3 مهينن ۾، چا اوهان يا اوهان جي گهر گهر ياتين کي اکين جي سفيد حصي ۾ رنگ ۾ ڪا تبديلي محسوس ٿي آهي؟

a. ها b. نہ

C1d(i) چا ان سان گڏ بخار آهي؟

a. ها b. نہ

C1d(ii) چا اهو ڊگهي عرصي تائين جاري رهيو آهي ۽ وزن گهٽڻ سان گڏ آهي؟

a. ها b. نہ

C2 چا توهان جي گهر ۾ پنجن سالن کان گهٽ عمر جا بار آهن؟

a. ها b. نہ

C2a گذريل 3 مهينن ۾، چا اوهان کي انهن بارڻن/بار ۾ سستائي ۽ وزن گهٽڻ محسوس ٿيو آهي؟

a. ها b. نہ

C2b چا ان سان گڏ پاڻي وارا دست هئا؟

a. ها b. نہ

C3 توهان يا توهان جي گهر ياتين کي پاڻيءَ سان جڙيل بيماريون، جهڙوڪ اسهال، پيٽ ۾ سور، دست، يا هيپاٽائٽس، ڪيترا پيرا ٿي چڪيون آهن؟

a. هر مهيني d. سال ۾ هڪ دفعو

b. هر 3 مهيني (رُبعي) e. ڪڏهن ڪڏهن/ڪڏهن نہ

c. هر 6 مهيني

C4 چا اوهان يا اوهان جي گهر ياتين مان ڪو انهن بيمارين لاءِ طبي علاج ونڊي ٿو؟

a. ها b. نہ

C4i جيڪڏهن ها، تہ اوهان عام طور علاج لاءِ ڪٿي وڃو ٿا؟

a. سرڪاري اسپتال يا ڪلينڪ c. مقامي حڪيم يا روايتي طبيب

b. خانگي ڪلينڪ يا اسپتال d. فارميسي يا ميڊيڪل اسٽور

C5 گذريل 3 مهينن ۾، اوهان جي گهر جو پاڻيءَ سان جڙيل بيمارين يا بيمارين جهڙوڪ اسهال، پيٽ ۾ سور، دست، بارن ۾ سستائي ۽ وزن گهٽڻ وغيره جي علاج تي ڪيترو خرچ ٿيو؟

a. ڪو خرچ ناهي d. PKR 5,000 — 10,000

b. 1,000 کان گهٽ e. 10,000 کان وڌيڪ

c. 5,000 — 1,000 f. اندازو نٿو لڳائي سگهي

C6 چا گذريل ٽن مهينن دوران اوهان يا اوهان جي ڪنهن ٻ گهر پاتي پاڻي سان پيدا ٿيندڙ بيمارين سبب ڪا ڏگهي عرصي واري صحت جي تڪليف جهڙوڪ نوڪري تان غير حاضري يا ٻي ڪا ڏکيائي محسوس ڪئي آهي؟

a. بيماري جي ڪري ڪم/اسڪول کان غير حاضر رهيو
b. مسلسل ڪمزوري يا ٿڪاوٽ
c. ڏگهي مدي جو علاج گهربل
d. طبي خرچن ۾ واڌ
e. ڪو ڏگهو اثر ناهي

C7 چا اوهان يا اوهان جي گهر پاتين محسوس ڪيو آهي ته پاڻي سان پيدا ٿيندڙ بيماريون ڪجهه مخصوص موسم ۾ وڌيڪ ٿين ٿيون؟

a. ها
b. نہ

C8 جيڪڏهن ها، ته اوهان جي ڳوٺ ۾ سال جي ڪهڙي وقت دوران پاڻي سان پيدا ٿيندڙ بيماريون سڀ کان وڌيڪ عام آهن؟

a. اونهار
b. مينهنن وارو موسم
c. سيار
d. سڄو سال
e. ڪو مخصوص وقت ناهي

C9 گذريل 3 مهينن ۾، چا توهان يا توهان جي گهر پاتين کي پنهنجي ڳوٺ/برادري ۾ ڪنهن پاڻيءَ سان جڙيل بيماري جي وبا جي خبر آهي؟

a. ها، تازو (گذريل هڪ سال دوران)
b. ها، گذريل (هڪ سال کان وڌيڪ اڳ)
c. نہ

C10 چا اوهان يا اوهان جي ڪنهن ٻ گهر پاتين پاڻي سان پيدا ٿيندڙ بيمارين جي روڪٿام بابت ڪنهن تربيت يا تعليم حاصل ڪئي آهي؟

a. ها
b. نہ

C11 چا اوهان يا اوهان جا گهر پاتي پاڻي جي معيار کي بهتر بڻائڻ يا پاڻي سان پيدا ٿيندڙ بيمارين جي روڪٿام لاءِ ڪنهن ٻ برادري طرفان هلندڙ ڪم ۾ شامل آهيو يا انهن کان واقف آهيو؟

a. ها
b. نہ

سيڪشن D: نگراني ۽ فالو اپ ۾ شرڪت

D1 چا اوهان هر ٽن مهينن ۾ ٿيندڙ سروي ۾ شرڪت ڪندا ته جيئن ان منصوبي جي اثر جو جائزو ورتو وڃي؟

a. ها
b. نہ

D1a جيڪڏهن ها، ته مهرباني ڪري پنهنجو رابطو نمبر فراهم ڪريو

سيڪشن E: تصوير ونڻ لاءِ رضامندي

سيڪشن F: انٽرويو ونندڙ جا نوٽ / رايا

سيڪشن G: جغرافيائي پوائنٽس (جيو پوائنٽس)

Government of Pakistan
Ministry of Water Resources
Pakistan Council of Research in Water Resources
Water Quality Laboratory Hyderabad

PCRWR

WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Aijaz Ali-0009. Lakhat Mir Walan Talpur .District Tando Muhammad Khan		
Sample Provided/Collected by	Client	**Sample Collection Date**	03.03.2026
Sample Source	Filtered Water	**Sample Receiving Date**	03.03.2026
Client Code	Water Sample	**Reporting Date**	05.03.2026
Sample Code	PCRWR/WQL/Hyd /4102/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.2
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

Note: The sample is provided by the client and this report is valid only for the sample provided.

Remarks: Water sample found **Safe** for drinking purposes for highlighted analyzed parameters only under prescribed standards.

Terms and Conditions

Results in this report relate only to the test items/sample submitted and tested.
Analysis report is not valid for court use or business publicity.
PCRWR does not accept any responsibility regarding accuracy of sample collection procedures if collected by the client.
Water Quality Parameters exceeding the WHO (2004)/NEQS-1999/NSDWQ-2010 guideline values are highlighted

Analyzed by		Research Officer/ Incharge Lab	

RESEARCH OFFICER
INCHARGE
PCRWR Water Quality Laboratory
Hyderabad

Address: Near New Filtration Plant, Jam Shoro Road Hyderabad

Government of Pakistan
Ministry of Water Resources
Pakistan Council of Research in Water Resources
Water Quality Laboratory Hyderabad

PCRWR

WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Parago-0133. Lakhat Gohram Wasan Lakhat .District Tando Muhammad Khan		
Sample Provided/Collected by	Client	**Sample Collection Date**	03.03.2026
Sample Source	Filtered Water	**Sample Receiving Date**	03.03.2026
Client Code	Water Sample	**Reporting Date**	05.03.2026
Sample Code	PCRWR/WQL/Hyd /4103/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.2
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

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PCRWR Water Quality Laboratory
Hyderabad

Address: Near New Filtration Plant, Jam Shoro Road Hyderabad

Government of Pakistan
Ministry of Water Resources
Pakistan Council of Research in Water Resources
Water Quality Laboratory Hyderabad

PCRWR

WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Amei- Ratno-1756.Gohram Wasan Lakhat.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	**Sample Collection Date**	03.03.2026
Sample Source	Filtered Water	**Sample Receiving Date**	03.03.2026
Client Code	Water Sample	**Reporting Date**	05.03.2026
Sample Code	PCRWR/WQL/Hyd /4104/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.2
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

Note: The sample is provided by the client and this report is valid only for the sample provided.
Remarks: Water sample found **Safe** for drinking purposes for highlighted analyzed parameters only under prescribed standards.

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PCRWR does not accept any responsibility regarding accuracy of sample collection procedures if collected by the client.
Water Quality Parameters exceeding the WHO (2004)/NEQS-1999/NSDWQ-2010 guideline values are highlighted

Analyzed by		Research Officer/ Incharge Lab	

RESEARCH OFFICER
INCHARGE
PCRWR Water Quality Laboratory
Hyderabad

Address: Near New Filtration Plant, Jam Shoro Road Hyderabad

Government of Pakistan
Ministry of Water Resources
Pakistan Council of Research in Water Resources
Water Quality Laboratory Hyderabad

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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Abid Ali -0399 Sultan Mallah.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	**Sample Collection Date**	03.03.2026
Sample Source	Filtered Water	**Sample Receiving Date**	03.03.2026
Client Code	Water Sample	**Reporting Date**	05.03.2026
Sample Code	PCRWR/WQL/Hyd /4105/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.1
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

Note: The sample is provided by the client and this report is valid only for the sample provided.
Remarks: Water sample found **Safe** for drinking purposes for highlighted analyzed parameters only under prescribed standards.

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Water Quality Parameters exceeding the WHO (2004)/NEQS-1999/NSDWQ-2010 guideline values are highlighted

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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Jamal Pandhi-0397 Sultan Mallah.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	Sample Collection Date	03.03.2026
Sample Source	Filtered Water	Sample Receiving Date	03.03.2026
Client Code	Water Sample	Reporting Date	05.03.2026
Sample Code	PCRWR/WQL/Hyd /4106/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.1
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Jaimal Maseh-0081 Jamo Maseh.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	Sample Collection Date	03.03.2026
Sample Source	Filtered Water	Sample Receiving Date	03.03.2026
Client Code	Water Sample	Reporting Date	05.03.2026
Sample Code	PCRWR/WQL/Hyd /4107/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.2
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Rustam Khan-0459 Bachal Lanjwani.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	Sample Collection Date	27.02.2026
Sample Source	Filtered Water	Sample Receiving Date	27.02.2026
Client Code	Water Sample	Reporting Date	02.03.2026
Sample Code	PCRWR/WQL/Hyd /4093/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.1
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Khuda Bux-460 Bachal Lanjwani.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	Sample Collection Date	27.02.2026
Sample Source	Filtered Water	Sample Receiving Date	27.02.2026
Client Code	Water Sample	Reporting Date	02.03.2026
Sample Code	PCRWR/WQL/Hyd /4094/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.1
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Lala Kolhi-0094 Jamo Maseh District Tando Muhammad Khan		
Sample Provided/Collected by	Client	Sample Collection Date	27.02.2026
Sample Source	Filtered Water	Sample Receiving Date	27.02.2026
Client Code	Water Sample	Reporting Date	02.03.2026
Sample Code	PCRWR/WQL/Hyd /4092/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA 22nd Edition	05	0.1
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010
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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Ali Hassan-0016.Lakhat Mir Walan Talpur.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	Sample Collection Date	27.02.2026
Sample Source	Filtered Water	Sample Receiving Date	27.02.2026
Client Code	Water Sample	Reporting Date	02.03.2026
Sample Code	PCRWR/WQL/Hyd /4085/2026		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.2
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010
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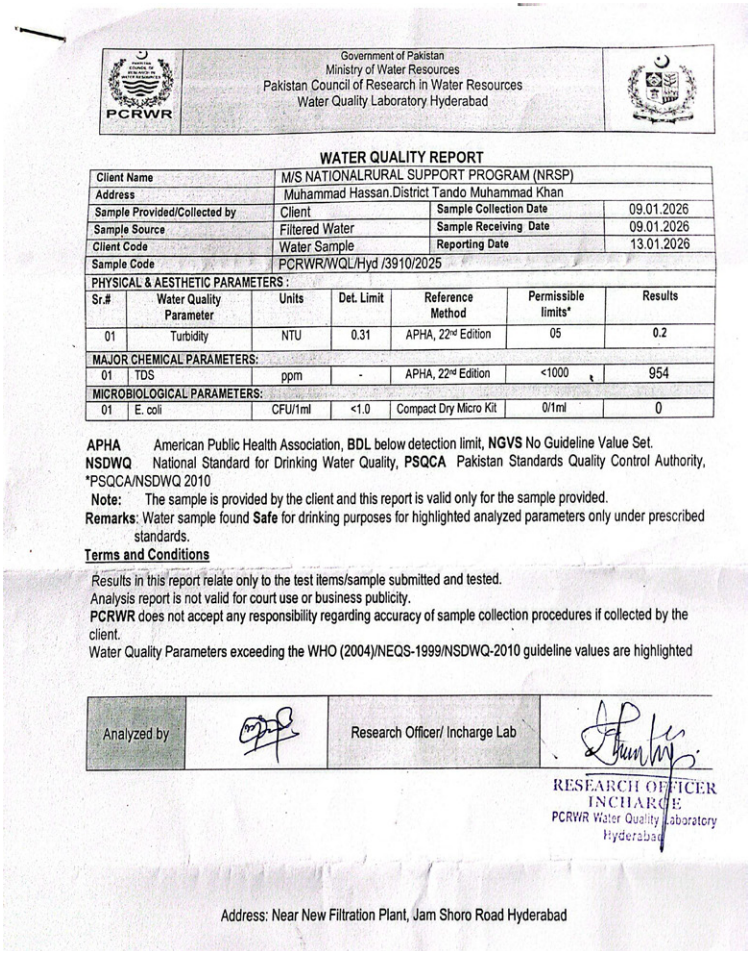

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WATER QUALITY REPORT

Client Name	M/S NATIONALRURAL SUPPORT PROGRAM (NRSP)		
Address	Muhammad Hassan.District Tando Muhammad Khan		
Sample Provided/Collected by	Client	**Sample Collection Date**	09.01.2026
Sample Source	Filtered Water	**Sample Receiving Date**	09.01.2026
Client Code	Water Sample	**Reporting Date**	13.01.2026
Sample Code	PCRWR/WQL/Hyd /3910/2025		

PHYSICAL & AESTHETIC PARAMETERS :

Sr.#	Water Quality Parameter	Units	Det. Limit	Reference Method	Permissible limits*	Results
01	Turbidity	NTU	0.31	APHA, 22nd Edition	05	0.2
MAJOR CHEMICAL PARAMETERS:						
01	TDS	ppm	-	APHA, 22nd Edition	<1000	954
MICROBIOLOGICAL PARAMETERS:						
01	E. coli	CFU/1ml	<1.0	Compact Dry Micro Kit	0/1ml	0

APHA American Public Health Association, **BDL** below detection limit, **NGVS** No Guideline Value Set.
NSDWQ National Standard for Drinking Water Quality, **PSQCA** Pakistan Standards Quality Control Authority, *PSQCA/NSDWQ 2010

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