

# **EFFECT AND USAGE OF CONTAMINATED WATER ON RURAL POPULATION**

**(A CASE STUDY OF GARA HAYAT, DISTRICT TANK)**



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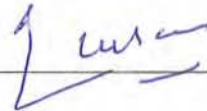
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## ABSTRACT

This study has been conducted to find out the effect of consumption and usage of contaminated water on the rural population in the village of *Gara Hayat District Tank* (KPK). The research explores three objectives. Firstly, it explores the effect of consumption and its effect. Secondly, it looks into the usage of contaminated water in the world generally and Pakistan particularly. Thirdly, it takes into account the sociopolitical reasons for sanitation in the rural population of *Gara Hayat District Tank*, Khyber Pakhtunkhwa to find the types of diseases spreading from it. The study not only points out the causes of contaminated water but also tries to suggest solutions for the problems. Contaminated water in this way not only affects human, physically but also have great bearings on the state economy. Physically, various diseases such as diarrhea, typhoid, hepatitis A and B gastrointestinal disease are born. When comes to economic problems, affect agriculture by creating an acute shortage of vegetables. It is because people give up cultivating their fields due to several issues they face. The story of the village *Gara Hayat District Tank*, Khyber Pakhtunkhwa is not different. Farmers living in this region face the same problems.

In this study, the Qualitative method as a tool is used for the collection of data. During field work, different techniques and tools are owned for the collection of abstract data. The research methodologies of the study provide a better framework and useful for the collection of the data in sequence. The most common method which is used in anthropology is quantitative. During research study used different types of techniques and tools for data collection such as repo building, focus group discussion (focus group discussion) sampling, purposive sampling, case studies, audio recording, and key informants. Mostly I used a daily diary in my field work because many people prohibited me from taking an audio recording and they have different views about the related issue.

Water consumption and usage of contaminated water have a lot of issues in the world generally and Pakistan specifically. There are lots of issues related to water. Water is scarce in Pakistan and the water available in Pakistan is not clean for drinking and another purpose. When it comes to drink their no proper management on the behalf of which it can make water able for drinking. In addition to it, there is no storage system.

I have conducted the research in the village of *Gara Hayat District Tank* Khyber Pakhtunkhwa where a lot of people are facing issues regarding water. There is hype due to water-created diseases. Unhygienic water makes people sick. Not only adults become vulnerable but children and aged as well. The responsible government needs to pay serious attention otherwise the situation will get worse and out of hand.

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# CHAPTER NO. 01

## 1. Introduction

Water is used every day in agriculture to help cultivate and develop plants. A key component in many industrial processes is water. As a result, the cost of water in our everyday life is increased by its usage in the industry (The scientific world, 2019).

Cholera, dysentery, diarrhea, hepatitis A, typhoid, and polio are just a few of the diseases that can spread tanks to contaminated water and poor sanitation. Unavailability, insufficiency, or bad Control of water and sanitation services exposes humans to preventable fitness risks. This is especially true in healthcare institutions where a lack of services for clean water, hygienic conditions, and cleanliness puts both patients and employees at higher risk of contracting illnesses and infections. 15% of hospitalized patients experience infections. The chemical elements hydrogen and oxygen make up the material known as water, which can be found in the gaseous, liquid, and solid states of matter. One of the most common and important compounds is it. It is a drab, odorless liquid at room temperature with the important property of dissolving several different compounds. Living things rely upon water's adaptability as a solvent. Living matters rely upon aqueous answers for organic processes which include the manufacturing of blood and digestive juices. It is idea that existence first appeared in the aqueous solutions of the arena's seas. Outside of the solar system, water can be found on other planets and on the moon. Water has an intrinsic blue color that is created by a tiny absorption of light at red wavelengths, even though it looks colorless in small amounts (Steven S. Zumdahl, 2022).

Water is one of the six essential nutrients (along with carbohydrates, protein, fat, vitamins, and minerals). We can only survive for three to five days without fluids because our bodies are about 60% water. Water is necessary for several key bodily processes, including digestion, waste removal, and temperature regulation. It is understandable why it is considered "essential." Plain water is the best option for hydrating the body. You are aware of the importance of water in daily life. In other words, water and other resources support our everyday life. Water is a natural resource that is always available, and we need it for a wide variety of purposes throughout the

world, with the percentage being substantially higher in low-income nations WHO, (world health organization, 2021)

In Pakistan, drinking polluted water that contains sewage, arsenic, diseased organisms, and industrial waste is thought to be the motive of forty% of all fatalities. Pakistan's water supply turned into previously secure to drink up until the past due Nineties, however these days, consuming something aside from filtered or bottled water put you in danger of becoming sick and even dying. According to one source, 53,000 Pakistani youngsters suffer from bacterial diarrhea brought on by tainted water every year. The primary substitute is bottled water, although a large portion of the population cannot afford it. Additionally, some well-known brands have been revealed to be tainted (fluence news team, 2019).

The current study has been conducted to document the effects and usage of contaminated water in rural areas of *Gara Hayat, District Tank, and Khyber Pakhtunkhwa (KPK)* Pakistan. The increasing population and industrial waste material runoff into the River, Lake, sea, and ponds, and this healthy existence is a prerequisite for having access to water, which is a basic human necessity. We cannot survive without water because it is connected to the most pressing problems including food security, health, economic growth, poverty reduction, and climate change. Water scarcity and contamination are severe problems in hospitals, schools, universities, and offices in Khyber Pakhtunkhwa (KPK), according to the department of public health engineering in that province. Waste material contaminates the water which is a very bad effect on human health and creates different types of diseases such as cholera, diarrhea, typhoid, hepatitis B and so many disease-related in humans and marine animals. Due to the inaccessibility of water, the people of the village of the Gara Hayat, District Tank use the ponds, tape, and store water from the Tank use which is contaminated water, and the life of the people is unsafe (The KPK water act, 2020).

### **1.1. Usages of water**

Water is used in two different ways one is the direct use of water and the other use of water is indirect. Direct use of water is the use we water including drinking, cooking,

bathing, and washing while indirect water while indirect purpose use of water in processing Industries, agriculture, electricity, and so many other uses. Most of the common water usage of water is included Households, agriculture and industries, and electricity.

Water is used for many purposes in the home. There are numerous other uses of water in the home than those mentioned above, such as drinking, cooking, cleaning, bathing, washing dishes, brushing teeth, and watering the garden.

The negative effect of industrial water The negative impact of industrial water is that when water is used in industries and after the usage the wastewater runoff into the river or canals and sea which the marine animal To cool the machinery needed to create their products, industries employ water during the manufacturing process. The United States Geological Survey states that industrial water is utilized for smelting operations as well as for the fabrication, processing, washing, dilution cooling, or transportation of goods. Chemical goods for food and paper are produced by companies and petroleum refineries. Most of the water used in manufacturing is used to create chemicals and food paper. and land animals are very affected.

In agriculture, the use of water to grow fresh produce and sustain livestock the use of agriculture water makes it possible to grow fruits and 11 vegetables and raise livestock which are the main parts of our diets. When pure water is given to the crops the output of the food is rich in vitamins and when impure water is given to the crops, they have poor growth and insufficient vitamins. If a minimum quantity of water is present the indirect effect on our agriculture and the second one of our economies will be low down.

## **1.2. Types of Water**

There are different types of water in the world but here I am discussing some types of water in the rural area of *Gara Hayat District Tank* (KPK).



### **1.2.1. Tap water**

Tap water, faucet water, running water, or municipal water is water supplied by a tap or a water distributor valve. Tap water is frequently used for drinking, washing, cooking, and toilet flushing.

### **1.2.2. Pond water**

Pond water is fetched through the Pipeline system but very rarely and most people using for fetching through donkey carts or overhead.

### **1.2.3. Tube well water**

Tube well water is a type of water well in which a long 100 to 200 millimeters wide stainless-steel tube or pipe is bordering an underground aquifer. The lower end is fitted with a strainer and a pump lifts water for irrigation and supplying the water through different homes. The depth of the water depends upon the availability of water throughout area. Different areas have different depths of water access, in the village of *Gara Hayat District Tank*, the depth of sweet water is inner. The water of the tub well the villager is less amount used because of the privatization and the Second one has no Pipelining system.

### **1.2.4. Rainwater**

Rainwater is a kind of easy water supply and with the important caution, it could even use for potable intake. It is a loose source of water and can be collected in a big quantities from roof catchments and different pavement areas which can be used for numerous purposes. Such as lawn watering, rest room flushing, laundry, cooling and heating, hygienic use, and drinking. Rainwater used for harvesting can play an important role in the rural area of *Gara Hayat*.

### **1.3. Statement of the problem**

Water is the most important source of life. Nobody can survive without water. Every human being can consume 7 liters of water per day. The effect of drinking and using contaminated water has several issues, one of which is a scarcity of water, and the other is that the available water is not pure for drinking, bathing, and washing.

Water is a global crisis that is affecting the entire world. The fundamental issue with water around the world is that there has been no serious contribution to the safe management of water resources on the planet, resulting in a scarcity of water and impure water. Water scarcity and impure water are the main causes of carbon dioxide and greenhouse gases in the atmosphere, causing weather and water. The second reason for contaminated water is pollution, which can come from a variety of sources, including industrial waste, untreated human wastewater, and pesticides and fertilizers that have been washed off of farmland. When hazardous bacteria from human waste pollute water, making it unfit to drink or swim in, the effects are often rapid; in other situations, such as when toxic compounds from industrial processes are involved, the effects are sometimes delayed around the world as a result of the drought. Glaciers and snowpack's will disappear in some areas, reducing freshwater supplies in communities. Agriculture consumes 70% of the water but wastes 60% of the water due to mismanagement. Water waste is drying out rivers, lakes, and underground aquifers. Many countries that produce the most food, such as India, China, Spain, and the United States, are nearing the end of their water resources. Freshwater pollution is caused by fertilizer and pesticides, both of which affect humans and other species. The main cause of contaminated water is global.

However, in Pakistan, only a small percentage of the population has access to safe drinking water. As a result of poor water management, in Pakistan, the majority of cities and villages lack access to necessities such as water. Some cities and villages have scarcity; some have impure water use and no filtration, and another resource from the government and another institute that people use to protect themselves from the disease. However, due to government mismanagement and incapacity, water usage in the province of Khyber Pakhtunkhwa is increasing day by day. water scarcity is caused by ineffective management, unequal access, and unequal distribution throughout Pakistan.

Population growth, urbanization, advancing industrialization, a lack of storage space, and climate change has all influenced the difficult work. As a result of climate change, weather patterns have changed across the country, necessitating regional rather than national policies. The water crisis of the village *Gara Hayat District Tank* (Khyber Pakhtunkhwa) is one of the issues because water is scarce and the available water that people use is not pure, and the people are very affected by various types of diseases such as diarrhea, cholera, typhoid, Hepatitis A and Hepatitis B, and some other diseases that are caused by water. There is no safe management of water storage and filtering, which has resulted in a slew of diseases. The impact of my research on people at the regional and national levels will inform them about the consumption of water as well as different types of diseases caused by contaminated water, as well as the safe management of storing and filtering water in that area. The government did not work on that specific and basic need of the people's lives. Only a few non-government organizations work in the area.

#### **1.4. Objectives**

1. To find out the root causes of disease from the perspectives of local inhabitants.
2. To find out the water sanitation and health problems of the people of Gara Hayat (District Tank KPK).

#### **1.5. Significance of the study**

The current study focuses on the impact of contaminated water consumption and use on rural populations. Of course, my research will assist the government, interested bodies, and non-governmental organizations in highlighting and searching for related issues concerning the effect of contaminated water consumption and usage on rural populations who are related to water and the people who have been affected by various types of disease. The study will also assist the reader in understanding who manages water sanitation and hygiene, how it is managed, and what conditions people are concerned about. It will also go over how people suffer as a result of drinking contaminated water. At the national level, many non-governmental organizations are working on this issue.

This research will also be beneficial to them. This thesis also helps them in Khyber Pakhtunkhwa's civil society, which operates at the provincial level. Many political parties, as well as ordinary people, want to understand the problem of the effect of contaminated water consumption and usage on the rural population, as well as the condition of those who are affected by it. They will also easily comprehend the consumption and impact of water-related diseases. They will benefit greatly from the research as well.

## CHAPTER NO. 02

### 2. Literature Review

That water sanitation and hygiene diseases account for 4. Zero percentage of all fatalities and five.7 percentage of the entire sickness burden daily occurrence worldwide. This, together with an initial estimate of the global illness burden caused by water, sanitation, and hygiene, provides a foundational model that may be improved for national or regional evaluations. Because of the huge and preventable burden, public health policy should make it a priority the poor state of water sanitation and Hygiene (WASH) is associated with 6.6% of the global burden of disease and disability, and the consequences of malnutrition and clean water caused by diarrhea for 2.4 million people every year. Most of the ailment burden falls on Children in low-income nations. Some authors say that poor WASH causes up to 50% of pregnant women and children to be underweight, as well as diarrheal diseases and malnutrition, one of which increases the protection of the other. In Pakistan, 88% of these deaths can be attributed to unsafe water and insufficient sanitation and personal hygiene. Water-borne diseases are common in Pakistan, and 3 million people suffer every year. According to the *World Bank*, a lack of water services increases the risk of water-borne epidemics across Pakistan (Pelto, & Stoltzfus, 2014).

The water of enough purity must be available for life to exist. Individuals who must walk a long distance to collect water, usually women, may benefit from having supplies closer to home. However, for optimal benefit, water management must be done appropriately. Some examples of water management tasks are as follows, securing sources and supplies operating and maintaining water and sanitation facilities Drainage wastewater dumping. A greater supply of water for individuals who practice basic cleanliness and appreciate its value would have a greater impact on general health than a simple improvement in water quality. Technical Brief No. 52 will provide more information on the issue of water quality and quantity (Boot M.T. and Cairn cross, 3 January 2004).

According to the sector health company, millions of human beings lack fundamental drinking water. Millions of people are dependent on surface water-contaminated water.

Contaminated water has created a lot of issues physically Together with diarrhea, cholera, dysentery, typhoid, and polio. Contaminated ingesting water is envisioned to motivate 485000 diarrheal deaths each yr. By 2025 1/2 the world's population may be living in a water-strain vicinity. In the least developed countries, 22% of healthcare centers have no water service 21 no sanitation, and 22% haven't any waste management carrier within the world in step with the arena fitness enterprise (world health organization, 2019).

The link between *WASH*, (*water Sanitation and hygiene*) nutrition, and inspection waste is getting more and more attention from Pakistani government donors and NGOs (nongovernmental organizations). The World Bank says research has linked poor sanitation to oral-fecal contamination and diarrhea, which contributes to stunting and wasting. The *Khyber Pakhtunkhwa* Health Survey found that 85% of households across the province account for 8.4%, with urban households practicing open defecation compared to 10.9% of rural households in *Khyber Pakhtunkhwa* (*KP Government*, 2017 *Tank*, and *Mardan District* have the lowest percentage of practitioners of people Open defecation (0%). In cities, 3% of households use unimproved sanitary and hygienic facilities, compared to 8.2% in rural areas. We must include Early child development (ECD) interventions in early childhood development, such as the core development package developed by the childcare and protection organization and other tent owners, as well as development assistance developed by the *United Nations Children's Organization* (*UNCO*) and *World Health Organization* (*WHO*), recognizing the importance of preventing frequent illnesses. The promotion of clean water and good hygiene and sanitation practices. These programs, however, do not include a more page-oriented approach to preventing the microbial burden that young children face when playing and feeding. WASH interventions focused on improving sanitation and hygiene conditions in water treatment and handwashing by mothers. None of these interventions address the important vectors of soil, poultry feces, and infant formula highlighted in this analysis. We know even less about how to interrupt the intake of contaminated soil and animal feces. The handwashing intervention usually focuses on robot hand washing. Many of these key events for infant handwashing occur frequently and changeably. In addition to the lack of knowledge about environmental risks, children face the time constraints of

most caregivers and perform multiple tasks at the same time, limiting their ability to deal with such random handwashing incidents. The effect of consumption and usage of contaminated water in rural areas of the *Gara Hayat District Tank (KPK)* Water is an essential component of the life of human beings and animals. Without water, no life exists for human beings and animals (world health organization, 2017)

According to the world health organization, millions of people lack basic drinking water. Millions of people are dependent on surface water-contaminated water. Contaminated water has created a lot of issues physically such as diarrhea, cholera, dysentery, typhoid, and polio. Contaminated drinking water is estimated to cause 485000 diarrheal deaths each year. By 2025 half of the world's population will be living in a water-stress area. In the least developed countries, 22% of healthcare facilities have no water service 21 no sanitation, and 22% have no waste management service in the world according to the world health organization (world health organization, 2019)

In 2015, the Millennium Development Goals (MDGs) length (1990-2015) came to a stop. The MDG goal for water and sanitation was to halve the percentage of humans without sustainability to get admission to safe consuming water and basic sanitation turned into declared met in 2010 for consuming water, while the target for sanitation was not done. The new purpose of the United Nations (UN) General Assembly in September 2015, setting new decided desires and objectives for 2030, Sustainable Development Goal (SDG) Goal 6, to ensure accessibility and sustainable management of water and sanitation for all, displays in large part increase aimed toward enhancing access to the unserviceable. This is now the goal of the general get right of eye to, requiring the slow discount of inequalities and inclusive of hygiene in addition to water and sanitation. The emergence of those goals displays the recognition of the centrality of simple water sanitation and hygiene (WASH) to a wholesome and dignified life, in addition to the popularity of the Human right to ingest water, in addition to sanitation and hygiene (Roche, Bain, & Cumming, 2017).

The results of negative get right of entry to water sanitation and hygiene (WASH) continue to be noticeably insufficient WASH stays the largest contributor to the global burden of diarrheal ailment, with an estimated 842,000 diarrheal deaths related to this

cluster of threat factors in 2012. The results of diarrhea are most acute in youngsters under 5 years of age. And it stays the leading purpose of loss of life globally and can be a crucial determinant of toddler malnutrition and the transmission of numerous tropical sicknesses and respiratory infections. Insufficient get admission to WASH additionally has extreme monetary, environmental, and social results. Improving water quality plays a role in reducing gender inequalities and promoting economic growth for women, but the burden of collecting water has largely declined.

Sub-Saharan Africa (SSA) has one of the lowest levels of access to drinking water and sanitation and personal hygiene in the world. Sub-Saharan Africa (SSA) failed to meet the MDG drinking water targets. At the end of the Millennium development goal (MDG) period, an estimated 32% of the population had no access to improved water sources, and an estimated 102 million people were still using surface water. Sub – Saharan Africa (SSA)'s area improvement coverage is also the lowest, with an estimated 695 million people still using unimproved facilities. Although it is estimated that hygiene habits are challenging because of the prevalence of washing hands with soap or other materials at critical moments. It is estimated that Sub-Saharan Africa (SSA) accounts for only 14% (Roche, Bain, & Cumming, 2017).

As we all know, these regional data have huge and persistent differences in *water sanitation and Hygiene (WASH)* access between urban and rural populations and between rich and poor within the country. The fecal-oral transmission of diarrhea occurs through multiple interrelated routes, such as the five transmission routes of fecal-oral disease in liquid or water, fields (or soil), flies, fingers, and food. This framework combines *water sanitation and hygiene (WASH)* intervention that interrupts multiple channels. However, several revisions of the evidence regarding the effectiveness of *water sanitation and hygiene (WASH)* interventions in reducing the spread of diarrhea in the 2000s did not find any evidence that the combined interventions had additional effects. A subsequent systematic review conducted in 2010 highlighted the low quality and inaccurate descriptions of many existing studies, especially since all studies previously classified as sanitation interventions included interventions to improve water supply and/or sanitation. However, a recent analysis includes the additional impact of combining water



interventions with health education or sanitation improvements. The effect of interventions to promote handwashing with soap on diarrhea was consistently strong, although one observer who applied the standard correction for non-blindness had a minor effect on handwashing. But the point estimate was large (RR 0.77, 95% CI 0.32– 1.86) for the community. But the most recent systematic review found an episode rate of 0.72 (95% IC 0.62-0.83) for large-effect size community Interventions in developing countries in studies that used soap (0.66, 95% CI 0.56-0.78) (Roche R R. B., February 9, 2017).

Ineffective control is chargeable for Pakistan's water troubles. Water control is difficult because of unequal access, and distribution, expanding population, progressing urbanization, industrialization, a shortage of storage capacity, and climatic threat. Climate alternate has triggered modifications in weather styles in lots of sections of the United States of America, necessitating region-precise answers in preference to a blanket method. Domestic water supply and irrigation management have grown more participative and privatized since the reason that Eighties, with an emphasis on physical goals in preference to capability improvement. The financial and political elites have benefitted from this, at the same time as impoverished farmers were denied access to irrigated water. Pakistan can handiest shop 10% of the average annual go with the flow of its rivers, which is significantly much less than the worldwide average of 40%. But presently Pakistan has emerged as a water-harassed country with 1017 cubic meters according to capita (Salman, 2021)

In poor urban communities across the world, millions of children still die every day from unnecessary diseases related to poor provision of water and sanitation. Many more live with repeated diarrhea worm infestations, skin infections, and chronically challenged immune systems as a result of the unsanitary surrounding. Their effects may have long-term physical and mental effects. Significant progress has been made over recent decades but between one and two million children still die, each year from diseases directly related to inadequate water and sanitation. The disease especially when combined with undernutrition can so weaken the body and cause Dying as nicely which includes measles and pneumonia. Millions of youngsters as a result of negative provision are weakened by using infection pain and discomfort primarily from diarrheal illnesses however also from

other waterborne from heavy intestinal malicious program burdens and from diverse skin and eye sicknesses and infections inclusive of scabies (skin disease caused by itching and irritation) and trachoma (one of the eye diseases in which irritation. In the poorest countries and neighborhoods, unsanitary living conditions probably account for at least half the total health burden for children under the age of five in Africa for instance is up to 240 times higher than it is in the high-income nation (Bartlett, 2005).

Water sanitation and Hygiene (WSAH) health facilities are a fundamental prerequisite for achieving national health goals and sustainable development goals (SDGs) to promote healthy lives and promote well-being and ensure accessibility and sustainable management of water and sanitation. Access to safe water, availability of functioning handwashing facilities and toilets, Hygiene practices such as cutting nails per week, hand washing, washing in the hand washroom before and after, and daily bathing. Washing dishes before and after using them - all methods should be applied in homes and cities, and proper sorting and disposal of waste are especially important to improve the health outcomes related to maternal, newborn, and child health, as well as to perform basic actions necessary to prevent infection-related to health. To ensure that these factors are present, the *Ministry of Health (MOH)*, in collaboration with another ministry, has developed water sanitation and hygiene (WASH) and Environmental Health Packages. The package includes software and hardware components. Some of the equipment was aimed at improving the quality and quantity of WASH facilities in healthcare facilities by rehabilitating water points, toilets and wastewater collection systems, hand washing facilities, laundry facilities, and mortuary facilities. The programmatic part focused on improving and managing WASH facilities to avoid hospital-acquired infections among patients and the public, using hand hygiene practices, behavior change, and communication. These guidance documents include minimum recommended environmental health and WASH requirements for healthcare facilities in Pakistan and are in line with global standards. It was designed as part of early recovery and building a resilient health care system to move from response to improved quality of care within routine health services. The package includes the use of WASH (water sanitation and hygiene) safety plans that are aligned with the *World Health Organization (WHO)* WASH Improvement Tool, a risk-based WASH-based continuous improvement system

with a risk-based WASH implementation toolkit, a continuous improvement system with a WASH improvement toolkit within the wider quality improvement in healthcare facilities. The water is clear, colorless, and odorless and is found all over the Earth. Water is a liquid in rivers, streams on earth, and oceans the availability of clean water for people is a human right. About 60% of the human body is water, so it is important to drink plenty of water to stay healthy. Water is used to maintain body temperature, transport nutrients, and get rid of toxins (body poisons) (Udhayashankar Kanagasabai, 2021).

Overcrowding in many parts of the developing world has resulted in a situation where they are all too frequently unable to meet the most basic of human requirements, such as food, clean water, blankets and shelter, and basic health care. We would also add the inability to provide proper sanitation to this list. More effort needs to be done to provide these vulnerable Populations with adequately managed sanitation and hygiene, and this constitutes a serious sanitation and hygiene issue (Evans, 2017).

Water intervention reduces the risk of lessening gastrointestinal illnesses such as diarrhea, dysentery, and cholera by providing barriers to pathogens carried from feces into the body through fingers flies' disposable food, and unclean water. As implied in the figure multiple interventions comprising a mix of water sanitation and hygiene would have complementary effects. For example, drinking water can be easily re-contaminated between source and point of use in unhygienic environments in the process of transport and storage, or at the point of use, we are not arguing for a single solution intervention to improve access to water or sanitation for reducing diarrheal diseases. We are finding the right solution that fits the social, economic, and political context. Our discussion has emphasized the importance of behavioral mechanisms, particularly where they are likely to be of overriding importance to adoption and sustainability and therefore impacts (Snilstveit, 2009).

Pakistan's water issues are due to mismanagement. Unequal access and distribution growing population, urbanization, progressive industrialization lack of storage capacity, and climate risk make water management a difficult task. Climate change has been causing shifts in the weather pattern in different parts of the country, which requires area-

specific solutions, not a generic policy. Pakistan can only 10 percent of the average annual flow of its rivers which is far below the world's average storage capacity of 40 percent. Pakistan had been water abundant in the past almost 6000 cubic meters per in 1960. But now become a water-stressed country with 1017 cubic meters per capita. Water storage and management should be the focus of the government, along with transparent assessments undertaken in every province about water inflow and outflow. There must be a strong political will to stop Pakistan from entering a water crisis. Otherwise, Pakistan will face what we see in disaster movies and extinction-level events. (Salman, Pakistan's looming water crisis, 2021)

The increase in world commercial agriculture and the implementation of neoliberal water policies that seek to privatize this natural resource has gained increasing attention from an anthropologist who is interested in the study of water. Whiteford maintains that the commodification of water by policies that favor its privatization and its intensive use for commercial agriculture worsened social injustice and associated structural violence against the poor. Orlove and Canton propose the notion of injustice to examine different accesses to water along the class-based or gender-based unequal distribution of the basic resources in the era of neoliberalism. Groundwater for agriculture production recognizes as a key factor leading to water scarcity in different areas of the entire world. The notion of water is not just water scarcity not only justify but dynamic supply and demand also include the economic value and their different power of control distribution. The idea of water insecurity refers to inadequate and indeterminate associated water to meet individual or family needs and how people respond to such stress. The focus on the effects of responses to water scarcity and insecurity settlement reveals how the social struggle over the vital element materializes and how they shape people's ideas about water and water rights. The struggle for water should be in the context of the government's regional structure of political power. The term regime refers to the goals and institutional rules and practices used by the state to manage the water system and the regional local effects of such policies (Zolotniks, 2011).

Water shortage in San Quintin can be interpreted as a form of what whiteford and Cortes Lara call a manufactured scarcity situation where the combination of global agriculture

and regional ecological situation creates water scarcity at the local level. The flow utilized in the production of fresh crops allows transactional companies to externalize the costs of water supplies. Externalization increases the social distance between the transitional agricultural business as a global player and the people. Water minimizes the production inputs where growers are insensitive to the needs of the local citizen. The resulting water flow inequalities are worsened at the local level. The unreachability of water is linked to the regional structure of power. Thus, the exploitation of water for export agriculture in San Quintin has further enhanced regional power disparities along class and ethnic lines. A powerful grower has used capital market as well as political connection in the region to increase their power base and therefore gain privileged access to water. This occurred at the expense of small producers and locals who suffer from insufficient access to water most of the people who lived in the colonies provided the majority of labor for the agriculture sector most negatively affected by water scarcity. Neo-liberal water policies indigenous people development bears the problem of insufficient access to water (ZLONISKI, November 2011).

U.S. residents live far beyond the means of the earth's carrying capacity. The population largely also increased wealth smaller households improved sanitation more meat-heavy diet irrigated agriculture and other lifestyle changes have led to increased usage and a decrease in the groundwater around the globe. Reduction of groundwater is largely impossible from the earth's surface. Climate change is probable to increase water through long-term shortages like what was experienced recently southwestern region of the United States. Inside the United States daily use average 300- 380L person U.S survey. Probable shortage and the decreasing of groundwater will force the creation of additional infrastructure to bring fresh water to urban areas. This will increase the cost of delivery. Even without the extra infrastructure demand, Mack and Wrasse (2011) estimate that by 2020 one in three U.S households will have difficulty paying their water bill and currently they are continuing. The rising cost of water in Mack and Wrasse's (2011) study is mainly caused by enforcing water infrastructure that essential huge investment to sustain the operation. Infrastructure needs have led municipalities to privatize control of their water systems a trend seen globally in recent decades (Marco A, December 2018)

A one-off case study was conducted in America on the unsustainable consumption of bottled water. In the American market bottled water consumption exiles bottled water. In the American market, bottled water sold in single-serve plastic containers has taken off in the past 20 years and become one of the big issues. Water bottled in ready-to-drink plastic containers is associated with environmental problems and health risks in all stages of its life cycle. Production of plastic releases chemical toxins such as benzene and chloride in all stages of its life cycle benzene and vinyl which lead to cancer. Because both bottles slowly disintegrates into small particles rather than decompose these plastic bits notoriously clutter not only dump but also the ocean. Then the plastic decomposes in water and becomes a food chain. Another issue is that intensive energy consumes about 32 to 54 million barrels per year (Gallick and Cooley 2009).

Lakes and rivers are the finest areas for water activities because of their unique characteristics, and midstream is the optimum place to develop for all types of projects. However, because water sports might produce some environmental contamination, we should pay special attention if a motorboat's gasoline engine is present. Gasoline and lubricant that does not burn completely drain the engine and run to the water's surface. Furthermore, the oil is present in the playing field's water. All of this suggests that the competition will harm the water quality in some way. The water is polluted because of lubricant from the incident and when it naturally degrades. Because of the massive scale of the event, at some point Water contamination will occur at some point as a result of the event's large-scale impact on the water. Some tourists litter, (material bad for the animals) causing contamination in aquatic bodies, which must be gently degraded over time to return to their prior state. It is contaminated by the engine combustion oil of motorboats and other projects, which is immediately drained to the surface of the water body and contains exhaust fumes in enormous quantities. Natural deterioration also takes a long time to recover to normal. The potassium permanganate level of the water increased considerably during water sports activities. It is the source of organic materials. Race roaming and other forms of equipment require fuel and lubricant, and a huge quantity of detergent is also drained into the water, resulting in a rise in organic matter in the aquatic environment, which has a severe influence on ecology. Because the number of participants visitors increased because of the increased number of participants' visitors,

a big amount of excreta in the water resulted in a considerable increase in ammonia nitrogen content following the event. The PH of the water is also directly reduced by fuel-burning exhaust fumes. Some discordant variables in water sports events should be addressed, particularly the promotion of the existing paradigm of water sports (Zhang, Fall 2020).

There are different reports on the consequences of poisoned water in different countries. Each country has a different groundwater concentration of arsenic water, and consequently effects. But in Pakistan 49 groundwater samples were collected from the *Muzaffargarh district of southwestern Punjab, central Punjab*, and central Pakistan concentration of arsenic water is high reaching up to 906 Ug/L (micrograms per liter). The distribution of arsenic-wealthy shallow groundwater suggests either direct contamination with business or agricultural chemical compounds or a few different anthropologic have an impact. Arsenic water contamination of groundwater around the world emphasizes the recent occurrences in Asian countries where the problem remains to be recognized. Therefore, the priority should be recognition of the crisis. While the next step Should be the early identification of the affected resources and the next step must be to offer arsenic-secure water to the affected loads. Alternative resources of water must be encouraged such as dug well arsenic safe deep tub well, rainwater harvesting, and treated surface water. These assets are appropriate for a particular location and won't be generalized for others affected due to geographical and geomorphological versions and differing socioeconomic and literacy conditions of human beings (Amitav Mukherjee, June 2006).

The influence of expanded water sanitation and hygiene on human fitness has resurfaced within the ultimate decade water sanitation and hygiene (WASH). The WASH indicator made big development at some point of the Millennium Development Goals generation, with over 2 billion humans gaining access to higher water and sanitation. However, 7 million humans do no longer have get right of entry to to secure ingesting water. 2.Five million Individuals do not have get entry to to proper sanitation, and 1 million of those continue to exercise open defecation, according to WHO (World Health Organization & UNICEF 2014).

This is a serious public health issue. Human feces serve as a reservoir for a variety of pathogenic bacteria and soil transmission helminths (STH), which can cause diarrhea and other environmental enteric disorders. In young children, trachoma and associated morbidities are common. In early *childhood, diarrhea* and (EED) are regarded to be major factors of malnutrition. Furthermore, many of these morbidities, when combined with inadequate nutrition, can be lethal if not treated adequately. Poor WASH conditions might be a major undelaying risk factor for child mortality if not addressed (Derek Headey, 28 February 2019).

Before this, it was unclear which factors were most important in improving various child health outcomes. Some of the previously listed work has concluded that more advanced WASH (water sanitation and hygiene) technologies have a greater impact, while others have maintained that the adoption of simple WASH technologies can provide considerable benefits. compiled and compared several drinking glasses of water and sanitation definitions, including private or public, technologies-based definitions, and Implied that the health advantages of shifting from open defecation to any form of lavatory use are the maximum essential step at the sanitation ladder because of the primary significance of poor externalities throughout households. Importantly our use of subnational facts captures each family-level consequences and network-degree externalities. In our predominant specification, we first targeted on using any bathroom and any advanced water with the latter following the definition of the World Health Organization (WHO). United Nation International Emergency Fund (UNICEF) joint Monitoring program. However, inside the electricity take a look at, we disaggregate those measures any toilet is split into the advanced class flush pour lavatory pit latrines with a slab or ventilated composting bathroom and unimproved category consisting primarily of fundamental pit latrine with a slab or ventilated composting and an unimproved category such as primary pit latrines. Any progressed water is disaggregated based totally on a modification of the technological category which distinguished piped to home piped to other and different advanced third categories comprising tub nicely boreholes protected wells spring (Giordano, 28 February 2019).



Pakistan has seen two big socio-demographic changes in the last 20 years. To begin with, poverty dropped significantly in the 1980s as a result of great economic growth, particularly in the agriculture sector, and in the 1990s, the massive inflow of transfers from the Middle East rose. Poverty increased mostly as a result of the slowdown of economic development in the 1990s, variations in agricultural output, a decline in imported commodities, drought economic sanctions, Pakistan's nuclear explosion in 1998, and likely frequent political changes. In the 1990s, no effective strategy could be created and executed to safeguard the real income of the poor and vulnerable against the growing price of essential food and non-food goods. Second, throughout the previous 20 years, Pakistan has gone through health and facility transformations. In comparison to the rest of Asia, the demographic transition has been accelerated, with fertility fall continuing at an extraordinary rate in the 1990s. Child mortality has also decreased gradually but slowly. According to the World Bank, the child mortality rate and nutritional condition of children have slowed in the last 20 years, with no improvement in child malnutrition. Only the World Bank (2002) has looked at the link between the two in recent research. Using the Pakistan rural Household survey, researchers were able to find a link between poverty and child malnutrition. It discovered a favorable association between household income and children's nutritional quality, despite the presence of a large externality impact on child well-being within communities. These findings must be supported because they are based solely on a rural sample where the analysis was hampered by a lack of identifiers and reliable information on children's height and weight (World Bank 2002). Schlichting and Ahmadi – Esfahan (2004) are currently focusing on northern Pakistan to investigate the link between food security and income, as well as their total estimate of nutritional demand. The research by Schlichting and Ahmadi Esfahani, on the other hand, is based on household data rather than individual kid data. According to Haddad et al. (1996), child malnutrition is connected to food security and inequities in numerous developing countries, including Pakistan. He stated that the increase in preschoolers Z- Scores weight for age while relating poverty to child morbidity and health-seeking behaviors, while Mahmood and Ali (2004) stated that the most common illness among children from poor families is an intestinal infection, which includes diarrhea, fever, and viral disease (the disease which spread). The inability to

finance medical treatment was the primary cause of the child's absence from health facilities during his sickness (Arif, Autumn 2004, p. 3).

Drinking water pollution from various heavy metals and chemicals emitted from anthropogenic sources is becoming a major problem worldwide. Drinking the burden is increased by a relatively recent issue called water contamination. Urbanization, the effect of tremendous population rise during the 1990s, and industrialization. The tainted water resources have significant health effects on people and the environment Drinking water with various anions and heavy metals typically. Pakistan must handle a wide range of issues relating to water availability, quality, use, and death brought on by water-borne illnesses since it is a developing nation. In Pakistan, the use of drinkable groundwater through tube wells, hand pumps, and other methods has increased the availability of the resource overall. The Pakistani government has been pleased by the growing private sector interest in ground-water development. Relating to the handover of management duties for public sector boreholes to the commercial sector. In Khyber Pakhtunkhwa more than half of the 6 million residents in the districts of Peshawar, Mardan, *CharSadda*, and *Now-Shera* lack access to clean drinking water. While many of the wells are tube wells, the remaining half of the population obtains its drinking water from these (Dauda, M.K., 2017)

A variety of sources, including hand pumps, dug wells, and tube wells, were used to gather water samples. In the sampling location, two distinct clean samples were taken from plastic containers. Various sampling techniques were used. For various types of water sources and all safety measures were taken. The water from the hand pump and tube well was permitted to flow for a few minutes before filling the bottles, then decreased there is a hand Water was let to stream for approximately five minutes before being collected Sampling data. Chemical and biological samples were gathered separately in biological analyses with the essential sample storage and sampling safety measures. At each moment, one bottle was filled with water that was acid-free and bubble-free while the other bottle was filled with water from the same location that had been made slightly more acidic by adding a few drops of acid. Drips of HNO<sub>3</sub> at a concentration of 5% to halt microbial activity after being transported to the lab, the nonacidified samples were examined. For the measurement of physical variables and

anions, acidified samples were utilized to measure heavy metals (Sardar khan, Maria Shahnaz, 2013).

Depending on catchment geochemistry, source, and availability, the concentration of in freshwaters, including rivers, lakes, and streams, ranges from 0.15 to 0.45 g L<sup>-1</sup> (Singh et al., 2015). Groundwater pollution and evaporation are the primary natural sources of contamination in river waters. Research on rivers The Lao River's (Northern Chile) water shows an increase in pollution. Due to the geothermal inputs and natural processes, reaching 21,000 g L<sup>-1</sup>). Evaporation of several human-made practices, including. Moreover, mining can support the establishment of high-quality. Water from the Mole River was contaminated to a maximum of 13,900 g L<sup>-1</sup>. As levels in lake waters are generally lower than levels in ocean waters. Global concentrations are found in river waters. As concentrations in lake waters have been proven through research. There were variations between 0.2 and 0.4 in Canada and British Columbia. 2.08 g L<sup>-1</sup> (glucometer) and as were discharged from the Gold Quartz mine tailing. Deep sediments of various lake catchments rose in that area and reached 1104 g l. Geothermal energy mining operations both directly and indirectly have improved levels increase. Health consequences of arsenic poisoning have been linked with drinking water polluted with arsenic (As) at a level of N 10 g L<sup>-1</sup>. Impacts on human health of many sorts due to exposure illustrate how throughout the world. Chronic toxicity from drinking water contaminated with as or long-term exposure malignancies of the lungs, skin, and kidneys, changes in skin color, neurological issues, hyperkeratosis (thickening of the skin), loss of appetite, and muscle nausea and weakness. However, vomiting, esophageal and stomach discomfort, and other symptoms of acute poisoning both diarrheas. As levels in drinking water can also increase the number of spontaneous and miscarriages abortions (Shakoor, M. B., Nawaz, R., Hussain, 2017).

The terms "water crisis" and "water-short world" are commonly used today, but the fact is that we live in a "water-desperate" world. Many of us in developed countries are "water wealthy," yet millions of people in developing countries are "water poor" or "water desperate." the end of 2000, approximately 1.1 billion people (or 18% of the

world's population) lacked access to safe drinking water and 2.4 billion to achieve the objective of universal access to water and sanitation by the end of 2025, 2.9 billion people would require improved water supplies, and an almost unthinkable 4.2 billion people would require improved sanitation. 1 These figures amount to 310,000 people in need of improved water supply and 460,000 people in need of improved sanitation in the 25 years running up to 2025. Despite having fared better in the 1980s, we should be able to meet the water target. However, we have almost little chance of meeting the sanitation objective. 4 (or 40%) lacked sufficient sanitation. One of the Millennium Goals calls for reducing the proportion of people without access to adequate water sources by the end of 2015, and the Johannesburg Earth Summit recently established the same goal for sanitation. 3 The *World Health Organization and UNICEF*, however, favor making water the goal (Jury, W. A., & Vaux Jr, H. J. 2007)

The availability of clean water and sanitation are also problems, and this has an impact on personal and household hygiene. But we have a lot of expertise. However, there is a significant issue: too few specialists in tropical public health engineering and tropical public health medicine possess (and even fewer implement) this expertise. Four significant "milestones" in our comprehension of the link between water, sanitation, and hygiene on the one hand, and health on the other, are covered in this eclectic historical assessment of pertinent information. Who flourished in the fifth and fourth century BC, is credited with the following statement on the first milestone. a description of both healthy and disease-causing waters, as well as the negative and good environmental consequences of water Because water is extremely beneficial to health,<sup>5</sup> (emphasis added). Simple sociology is considerably more complex than simple engineering when it comes to rural water supply and sanitation, so there needs to be a good, long-lasting program of hygiene education to ensure that those who have access to better water supplies and sanitation systems know how to use them to their health's fullest potential. The technologies, such as hand pump supplies (about which we now know much more thanks to the hand pump testing program undertaken by the Consumers' Association for the World Bank<sup>15</sup>) and gravity piped supplies (the best model for which was developed, with UK support), are very simple (at least in comparison to those industrialized countries and even in urban areas of developing countries. The government of Malawi

helps Improvements in water supply, availability, dependability, and (most importantly) quality is required to limit the water-washed transmission of fecal-oral illnesses. However, from a purely public health aspect, it is not required to have a "Western" water supply or an abundance of very high-quality water that is continually and dependably supplied to people. What is necessary is a greater quantity of more consistently available, higher-quality (certainly not lower-quality) water. 17

Remember Voltaire's adage that "the best is the enemy of the good"<sup>18</sup> (or "half a loaf is better than no bread"). Collecting water should take no longer than 30 minutes. If there is more than that, the volume of water soon decreases. It will take one hour.<sup>19</sup> As a result; the water should be supplied within this collection's journey time, even though if women are spending many hours every day gathering water, they will welcome any assistance. Decrease the availability of tricycle carts promotes men to fetch water in general, leaving their mothers more time to focus on other useful applications. The latter is very effective when using water for anal cleansing. Both can be built for either sitting or squatting, depending on the chosen position for feces in the area. Additional possibilities include ventilated upgraded pit latrines and pour-flush toilets (Mara, 2002)

The Journal has published various papers and committee reports on cross-connections. Many state and local health authorities have noted the possibility of contamination to household water systems due to cross-connections. The establishment or maintenance of any cross-connection between a residential water supply and any private source of supply that is not under laboratory supervision has been severely limited or declared unlawful by state legislation and local ordinances. Before going through the likelihood of such contamination generally, I'd want to mention a few cases of contamination that I've personally witnessed. We once got a report that the water in a small region had too much lime in it. Following an inquiry, we discovered that the problem was with the water softening facility, where water was prepared for use as boiler feed. This substantial amount of lime was kept in an elevated tank at a pressure that was often significantly lower than that of the public water supply. A check valve on this line malfunctioned during an emergency shut-off of the water main, allowing the lime water in this tank to be sucked into the distribution system. If the water pressure drops or the pipe becomes submerged, dirty water may be pulled back into the water system, and a vacuum may be

formed on the piping if the pool is fed in this manner. Do analogous threats occur in the bathroom, laundry basket, or bathtub? These are difficulties that the city's construction and plumbing inspection agency, as well as the waterworks operator, should jointly study and consider. In general, we all keep our water supply sources under strict laboratory oversight. As a result of consumer water use, water systems may become polluted. I've presented various examples of pollution and inadequately designed publicly available equipment. Allow each waterman to think about this topic, become acquainted with his structure, and participate in section service in his community. Such hazards should be reduced by collaborative efforts (Morris, S. B., 1930).

Many additional toxins in drinking water might endanger individuals. Because the majority of chemicals have no beneficial biological value, their discharge into the environment should be prohibited. An American preliminary assessment on potential carcinogens in drinking water is worth mentioning as an example of the vast spectrum of contaminants that must be evaluated (10). This paper contains a list of 187 organic compounds discovered in purified drinking water. Water containing inorganic chemicals may potentially provide a health danger. Asbestos fibers, most likely from a mining complex on Lake Superior, were recently discovered in an American town's tap water, causing widespread worry and prompting legal action. Most of the organic pollutants are most likely of industrial origin. However, most of the many chlorinated organic compounds identified in drinking water are most likely produced during the chlorination of drinking water and sewage effluent (10). Some of these compounds may also be found in paper and pulp industry effluents, as chlorine or chlorine compounds are widely utilized for bleaching the pulp used in paper manufacture. This technique produces many chlorinated organic compounds. Mutagenicity has been demonstrated for these chlorinated effluents (Arrhenius, E., 1977).

In 1898, the author established the United States Geological Survey to explore groundwater concerns in Southern California. By 1904, it was evident that most locations had exhausted their resources. The existence of a vast underground body of water facilitated the rapid growth of Southern California. Previously, it looked that enough high-quality water could be provided for everyone at a fair cost. More than 90% of the

water in this region came from wells (State Engineering Bulletin 45. p,18.) Because it comes from the subterranean gravels of the San Fernando Valley, the Los Angeles River has an extraordinarily consistent supply of streams. Before the construction of the Owens Valley Aqueduct, it served as the city's major water supply source. The town was experiencing a water deficit in 1905 as a result of a string of very dry years. The river, together with a few wells totaling 71.5-second feet (Ann. W. D. Report, 1907), had previously been enough to meet the demands of the city. According to an analysis of the upcoming needs, more water was required. The town was experiencing a water deficit in 1905 as a result of a string of very dry years. The river was enough to meet the city's previous demands, and it was supplemented by a few wells totaling 71.5-second feet (Ann. W. D. Report, 1907). A review of the necessary developments revealed His future requirements demonstrated that more water was necessary for the growing town. The notion that such addition could be gotten temporarily from wells in the San Gabriel Valley or the Coastal Plain was recognized, but it was also understood that considerable extractions from such wells would deplete the supply required for commercially reliant populations. The Metropolis Water Board wisely decided to import more water from a faraway location where it would inflict the least amount of harm to the city (Lippincott, J. B.,1936).

During the summer months, an abnormally significant number of outbreaks impacted tourists, campers, visitors to recreational areas, and restaurant clients, and implicated no municipal water systems that rely mostly on groundwater supplies. This suggested either increased contamination of these water sources during the summer or, if the sources are believed to be always tainted, usage by a greater number of vulnerable persons during the summer.

The last aquatic outbreak of typhoid fever in the United Kingdom happened in Croydon in 1937, and it was caused by a contagious disease. Poisoning of the well by a chronic typhoid carrier, one of several waste water employees aiding with well repairs 3 despite the contamination, effective chlorination would have averted the epidemic, and small waterborne outbreaks that have occurred in recent years have been caused by ingestion of untreated or badly treated, dirty water. The most critical variables in providing safe

drinking water were reported to be effective water treatment and preserving the integrity of the distribution infrastructure. In 1974, the National Water Council issued a revised code of sanitary practice that addressed cleanliness, the separation of persons and plants employed in the water supply and wastewater disposal divisions, the protection of supply sources, and the treatment, testing, and distribution of water supplies. Previously independent water supply and wastewater disposal services in the United Kingdom were merged under the new water authority. Staff was no longer routinely screened using compound and Vi aspirate tests for typhoid and paratyphoid infections. A water quality investigation of rural water sources in South Carolina revealed the risk of outbreaks in such areas. 4 This random sample included approximately 10% of the residents of three counties that were neither incorporated into municipalities nor served by municipal water. Individually drilled and excavated wells were most of the water sources investigated. Total coliforms were found in 93% of the water sources, while *E. Coli* was found in 43%. *E. coli* contamination was associated with well depth and isolation from septic systems tanks. It was unable to collect information on the amount of care given during the installation and operation of each type of supply to assess how this influenced contamination, even though the fundamental well design had little impact on the extent of bacteriology contamination (Blackburn, B. G., Craun, G. F, 2002).



## CHAPTER NO . 3

### 3. Research Methodology

#### 3.1. Rapport building

Rapport building with the participants is the most crucial component of qualitative research to completely understand the process and gain insight from them. Interacting with people and forming relationships can be difficult for researchers; to achieve this, they must get along with individuals. The generation of high-quality data and the promotion of successful dialogue between the researcher and participant are the main objectives of rapport-building.

To build rapport and overcome the challenges that researchers have while attempting to access and gain the trust of participants, the researcher tried to get to know the participants better. Knowing the local language and traditions was advantageous for the researcher. The researcher initially booked a room close to the main Bazaar so that they could be present and spend time in their environment. For a better understanding of the effects of the usage of contaminated water, the researcher spent time with the people, engaged in informal discussions with them, and saw them in action. The researcher talked about the local issues and listened to the participant's ideas to establish trust and understanding.

The researcher introduced himself and gave a summary of the research's objectives and an overview of the study after establishing a friendly rapport and feeling comfortable.

The researcher then committed to not using any personal information.

#### 3.2. Participant observation

A researcher must participate in routine activities in the environment, develop relationships with participants, and keep an eye on all routine activities to conduct participant observation. It is regularly used in a wide range of social science investigations. To collect reliable data through observation, the researcher spent a certain period at the research location. Its objective is to get to know a group of individuals very

well. Participant observation requires writing field notes and daily diaries that give a written record of what has been observed in addition to participating and building rapport.

While conducting fieldwork, the researcher first observes people's attitudes and behavior towards the root causes of the diseases, locals attitude toward the contaminated water which causes so many diseases, whether government cooperate with the locals or not, the researcher also observe the sanitation system of the locals.

The researcher also attended various seminars regarding cleanliness drive campaigns held at the neighborhood school and other adjacent private schools in addition to volunteering at the event "*safai nisf-e-emaan hai.*" I took part in religious events like the "*jummah namaz*" to get to know the locals and observe how they behaved. I used to get up early to watch how the women would carry water from the ponds nearby. To interact with the residents I met, the researcher used to go to restaurants late at night. Additionally, the researcher observed the everyday activities of the participants while interviewing them in several locations, such as their homes, schools, tourist attractions, and other public areas.

The participant observation method was used continuously during the fieldwork since it was a good tool for examining how people think of the root causes of the diseases. Because so many of the participants didn't have enough resources to buy clean drinking water.

### **3.3. Key informants**

Key informants are those who can quickly acquire complete information about the area. These are people who routinely participate in their communities and are well-informed. The main informants are communicative and approachable, and they are aware of the interviewer's objectives. On the other hand, some informants develop become key informants because of their exceptional and close relationship with the interviewer and their aptitude for comprehending what the researcher is trying to find out (Bernard, 2005)

During the fieldwork, the researcher formed close bonds with two key informants. One of the key informants is *Sharif Ullah* was 32 years old and Graduated from the department

of Urdu. He had married two Sons and one is *Daughter*. First of all *Sharif Ullah* is my old *Cricket* friend. *Sharif Ullah* is an informative person and he worked and worked in different organizations such as *NGOs (Non-governmental Organization)* polo workers, Teachers in private schools, and other different community events Participants in the village. The other is *Misbah Uddin* is my class fellow. His age was 29, he was married he had two sons. *Misbah Uddin* Graduated and now he is a government servant in the department of the village Secretary of *Gara Hayat*. He is well informed about the water problem Sanitation and other problem of the village; therefore, I have chosen both of them.

### **3.4. In-depth interviews**

Another qualitative research method applied in the study was in-depth interviewing. This interview's objective is to find out more about the respondent's ideas, programs, worldview, or circumstances. For this, a select few responders are chosen for lengthy one-on-one interviews. Using the method of "in-depth interviews," one can see how people exchange opinions about a certain problem (Kvale, 1996).

The researcher interviewed people while he was out in the field. The researcher used interviews to gather trustworthy and accurate data. At the beginning of my fieldwork, the researcher asked respondents open-ended or unstructured questions to help them get comfortable and build rapport. They were generally questioned by the researcher about their feelings, behaviors, and different kind of diseases they experience. The broad and exploratory structure of the interview brought to the surface several other problems that were significant to the subject. The researcher then used an interviewing guide to conduct in-depth interviews with the research subjects. 32 respondents all participated in in-depth interviews. Based on their availability, suitability, readiness, and consent. Additionally, individuals who contracted various illnesses as a result of the contaminated water, and most significantly, people who are having problems with water sanitation and their health.

### **3.5. Sampling**

Selecting sorts of individuals, events and instances from a vast population for research in the Social Sciences. Depending on the type of study a researcher is conducting, a certain sampling technique is used. Simple purposive or random sampling techniques were employed for this study. The purpose of using this simple random sampling strategy is to identify cases that are highly revealing in nature when conducting research with very small populations. This method of collecting data will be used universally for this investigation. Due to the population size of each universal data collection and the lack of variety among them, this sampling technique was chosen (Bernard, 2006).

### **3.6. Purposive Sampling technique**

In qualitative research, the approach of "purposive sampling" is employed to identify and choose participants who are appropriate to the researcher's field of study. Even though there are many distinct sample techniques, purposeful sampling is a common strategy. It is a type of non-probability-based judgmental sampling technique. During the responder identification step, the researcher selects individuals who satisfy the requirements of the study questions (Palinkas, et al., 2015).

Purposive sampling was utilized by the researcher since the study's objectives and questions were based on participants' experiences with various illnesses and issues with water sanitation.

### **3.7. Sample units and size**

32 people made up the study's sample size. Each of these respondents undertook in-depth interviews to acquire information. The sample size was divided up into a variety of sample units to achieve the research objectives. The people who have diseases and the locals who have water sanitation and health issues were the key factors used to separate the sample. A total of 6 respondents were women, with 14 among them being men. Eight of the respondents had health difficulties, and four of them were nurses working in private clinics.

### **3.8. Field notes and jotting**

To record the experience and events on a personal level during the research field visit, the researcher wrote down field notes. Field jotting was also done to ensure that no knowledge was lost during the research process. The participant's everyday activities, their specific performance concerning a position, and activities that took place in the study area were all carefully observed by the researcher. By employing these techniques, the researcher was able to collect useful and reliable data from participants while carrying out the study. All of the study's data and participants were recorded in a notebook.

### **3.9. Audio recording**

Because there was not enough time to write down every detail, the researcher used the audio recording technique while conducting interviews with participants in the field. As a result, to reduce time and collect data during the fieldwork, audio recording was utilized. Additionally, the audio recording helped to capture all the participants' statements and information during the interviews.

### **3.10. Photography**

Photography is one of the most important methods in research for gathering data on the spot during fieldwork. The researcher used images while conducting fieldwork to record specific information about ponds, streets, and open water tanks.

### **3.11. Confidentiality in the research process**

While conducting research or fieldwork, the researcher must keep several ethical factors in social research in mind. The primary ethical rule is to protect the privacy of respondents' data, and all information acquired from respondents will be inadequately classified and only utilized for scholarly or research purposes. Informed permission of respondents, deceit, privacy (including privacy and anonymity), physical or mental discomfort, sponsored research issues, academic wrongdoing or fraud, and scientific

advocacy are the seven main ethical concerns or issues that arise during the social science research process.

In this situation, the respondents have been advised by the researcher that the information will be kept confidential and used only for academic purposes. Second, the data has been stored securely by the researcher to prevent its illegal use.

### **3.12. Ethical considerations**

Any study project must include ethical concerns. During the study process, you must keep these ethical considerations in mind. In the present investigation, informed consent was confirmed before any participants were questioned in the field. The scope and goals of the study, as well as the objective of gathering data, have been assessed by the researcher. All participants have received guarantees from the researcher that the data they share will be kept fully private and used only for the objectives of the current study project. Additionally, the specific character won't be made public, and the data will be carefully established after the research hurdle so that the wasted data may be underestimated in the future. Second, the researcher has not invited any issues that are sensitive to them personally or that could undermine their faith, culture, or social norms. Each person spoke according to their preferences, and they were free to leave the discussion at any time (Paraskos's & Jang, 2015).

## CHAPTER NO. 4

### 4. Area profile

#### 4.1. District Tank

*District Tank* is a district in *Pakistan's Khyber Pakhtunkhwa* province's *Dera Ismail Khan* Division. There are 16 Union councils in district *Tank*, the capital of that's the city of *Tank*, that's made from Union Council City I and Union Council City II. The districts of *Lakki Marwat* to the northeast, *Dera Ismail Khan* to the east and southeast, *FR Tank* to the north, and the *South Waziristan Agency* to the west surround *Tank*. The *Tank* became a tehsil within *Dera Ismail Khan* District till 1992. In the *Tank*, the temperature reaches one hundred ten–a hundred and twenty °F. However, people journey to *Tank* to revel in a lovely visit and then go back within the sumer time all through the severe, hard winters in the mountains to the west.



Source: google map

Figure 1 : map of the locale

#### **4.2. Village**

The Village of *Gara Hayat (District Tank)* is Northwest one the Wana Road 4 kilometers away from *district Tank*. The population of Gara Hayat is three thousand. Of the people of *Tank (Gara Hayat)* about 60 percent are illiterate. Along with farming, most of the people of Gara Hayat keep pet animals in their homes, and their living patterns are so simple.

#### **4.3. Language**

The Language which is spoken in the village of Gara Hayat (District Tank) is Saraiki and Pashto. But most people speak *Saraiki*.

#### **4.4. Demography Structure**

Hundreds of homes in Gara Hayat village are made of mud. Its population is about three thousand. Most of the people of *Gara Hayat Gara village District Tank* are laborers.

Their favorite meal is popular “*Dahsi*” food. The people of District Tank (Gara Hayat) during their wedding ceremony invite all the people of their village and the people also have attained their ceremonies. As well as when someone is dead all the people of the village men and women gather and share condolences with the family. People of the village help each other in the same manner in every joy and unfavorable moment.

#### **4.5. Map**

The village Gara Hayat is a locality in Northwest of district Tank. Gara Hayat is situated north of Mito and west of the Muhammad Yaqub colony.





Source: google map

**Figure 2 : map of the village Gara Hayat district tank**

#### **4.6. Climate**

In Tank, the temperature reaches 110–120 °F. However, people travel to Tank to enjoy a lovely visit and then return in the summer during the severe, difficult winters in the mountains to the west. The seasons of the District Tank (KPK) are winter and summer. Winter starts from April till September and then summer starts in April. The climate in the Tank reaches 110 to 120 F. In summer most of the people go to the mountainous areas and Waziristan where they live there until when the harsh hot days of the summer pass then most of the people back to the district Tank Khyber Pakhtunkhwa (KPK).

#### **4.7. History Of District Tank (Gara Hayat Village)**

The history of *Gara Hayat (District Tank)*, as well as first they are inhabited in 1957, are *Chandee Baloch* cast which they are came from Dare Ismail khan and the land which

they have purchased from the *Nawab of District Tank* 1957. There are so many other casts living like Baloch, Shori, Bhatti, Mochi, Gandapur, and Mahsud living there. The languages which are spoken are *Saraiki* and *Pushto*.

#### **4.8. Water Sanitation And Hygiene**

There is no sanitation and hygiene practice. Because the people of *district Tank (Gara Hayat)* drink pool and tap water the pool water is coming from 100 kilometers in the dirty canals and that water had for many months been standing and the people are drinking them. When the people use that water, they are not filtration of that water. First, they have no access to water filtration machines and the other they have not been informed about the dangerous form of bacteria which are very dangerous for the life of human beings. The Government could not focus on this serious issue that the people are facing.

#### **4.9. School**

There are two primary Schools in the village of Gara Hayat (District Tank). One of them is for boys and the other is for girls.



*Source: picture taken by the researcher*

**Figure 3 : government primary school Gara Hayat**

#### 4.10. Mosque

There are total of six Masques one of them is *Jami Masjid* and one is *Madrassa*. Including *Madrassa* every *Masjid* the *Mulwi Sahab* recites the *Holy Quran* to children in *Masjid* The Imam is the leader of the Mosque and offers five times given prayer and also given Friday and 'Eid prayer too and this too the *Moulvi sahib* also takes part in other activities such as burial service, praying for the dead bodies, and alliance.



*Source: picture taken by Researcher*

**Figure 4 : masjid e Arafat Gara Hayat**

#### **4.11. Religion**

The religion of the village is Islam and most of the people are Muslim. But in Muslim, there are three sects. One is *Bravali*, one is *Deobandi* and one of them is the *Panjpir* sects also they are conflicting with each other in the society, and the people of the society contrast with each other. *Deobandi* can't accept the religion and *Baravali* can't accept the *Deobandi* as well as *Panjpir* sects.

#### **4.12. Marriages**

In the village of *Gara Hayat District Tank*, Marriage is conducted by parents' decision and that is called arranged mirage. First of all, the family members are went to the conduct of the female home to sight the female and also to family member role. When the liked the female then also the same female parent is going to the male home and sight them and their status and their attitude and behavior than the conducted marriage. There is a very rare chance of a love marriage.

#### **4.13. Graveyard**

There is one graveyard in the whole village, which is at the center of the village and touches the Road. Very few of the Graveyards are cemented and most of them are mud made. According to religious belief leaving the grave with mud gives God happiness and cementing the grave is a sin. There is no grill around the graveyard; the whole graveyard is open with no fence around them. When someone goes or comes on the road, they are *Salam* and pray for the Soul of the Dead body.



*Source: picture taken by Researcher*

**Figure 5 : graveyard of Gara Hayat**

#### **4.14. Village Facilities**

In the village of *Gara Hayat (District Tank KPK)* very fewer facilities are available but the most necessary facility is not available such as pure drinking water, a serious medical facility system, and so many others.

#### **4.15. Education**

In village *Gara Hayat (District Tank)* there are 2 primary schools. After completing primary education most students leave further study because they do not afford of proceeding with study due to low income and not the availability of Higher education to go outside the village there the village needs a middle school to continue the young villager's future savings.

**Table 1 : literacy rate in Gara Hayat**

S. No	Education level	No of Male	No of Female
1	Illiterate	50%	70%
2	Primary	30%	15%
3	Middle	10%	10%
4	Matric	5%	5%
5	F.A	3%	1%
6	B.A	1%	1%
7	M.A	1%	0%
8	Total	100%	100%

*Source: data collected by Researcher*

#### **4.16. Occupation Of The Villagers**

**Table 2 : occupation rate of the inhabitants of the village Gara Hayat**

S. No	Occupation	Percentage
3	Male Educated	30%
4	Female Educated	10%
5	Jobless	90%
6	Jobs	10%
1	Agriculture	50%
2	Labor	30%

*Source: data collected by Researcher*

#### **4.17. Medical Facility**

There is no dispensary or clinic in the village except a medical store. The villager must go to the nearby *Warna* village where one of the dispensaries or go to the city *hospital*

where the doctor treats the patient and each patient charges fifty rupees. Serious patients refer to Dera Ismail Khan because of the unavailability of treatment facilities for the patient.

#### **4.18. Electric City Facilities**

The Electricity facilities all over the district are in very bad condition. Especially in the *Village of Gara Hayat (District Tank KPK)* up to 16 hours of loads are shading in the village due to a lack of government capability. 40 percent of people boycott electricity and use alternative resources such as the Solar system because the solar system has no bill and is always available 24 hours as compared to electricity.

#### **4.19. Gas Facility**

There is no Gas facility in the village. People use woods and cow dung for cooking and other purposes and very few people use gas cylinders who can afford to have it.

#### **4.20. Livestock**

There are no homes without the domestication of animals. Keeping domesticated animals has various benefits. Keeping livestock serves them as one of their means of income. The livestock which has been kept in the village are buffaloes, cows, goats, Ox, donkeys, and poultry. Many of the houses have dogs in their houses to ensure their security. The great number of cows is a matter of prestige for the villagers. This livestock provides them pure butter, ghee, and mild along with eggs. They also sell these if abundant in quantity. Animal dung is a source of fertilizer and fuel. It is mainly the responsibility of females to take care of livestock.

#### **4.21. Transport Facility**

In the transport facility in the village of Gara Hayat (District Tank) the people use Ching chai and Bike for transport. Most people have their Bikes and some of them use Chingchi to go from one place to another place. And the hiring depends upon the distance and price of oil.

#### 4.22. Dress Pattern

In District Tank (village Gara Hayat) the people wear traditional dress *salwar kameez* with *Dupatta*. The old women wear the *Gan khat* (dress pattern) which is the old fashion of salwar kameez of the local area. Men wear shawls while the young generation wears the *salwar kameez* which is designed in different styles as well as a young girl wears the salwar kameez.

#### 4.23. Family System

Family is the basic unit related by blood or affinal ties. Family is an elementary institution of social organization in any community. The whole family unit contributes to the economic function of the house. There are three family types.

#### 4.24. Family Types

**Table 3 : Family system in Gara Hayat**

S. No	Family type	Households	Percentage
1	Nuclear	45	15%
2	Joint	180	60%
3	Extended	75	25%
	Totally	300	100%

*Source: data collected by the researcher*

##### 4.24.1. Nuclear Family

The nuclear family is the type of family that just involves parents, and their children called the nuclear family. In the village of *Gara Hayat District Tank KPK*, there are 15 percent family are nuclear. They have their own home, and economically support the family such as their brother and father cannot support them.



#### **4.24.2. Joint Family**

The joint family is an extension of the nuclear circle of relatives wherein dad and mom and their youngsters, and it normally grows whilst children of 1 sex do not leave their mother and father' domestic at marriage but convey their spouses to live with them. In the village of *Gara Hayat District Tank*, there are 60 cents are joint Families in which brother and their children are lives together and cooperate themselves. Males cooperate expenses of the home and females cooperated in the work of the home with each other and that's why the whole family lives.

#### **4.24.3. Extended Family**

That is the kin-based totally cohesion observed in the village. In the prolonged family, three generations stay collectively underneath the identical roof. Several married couples, their spouse's offspring, and the grandparents together shape a residential, and schooling unit. This kind of own family become 25 percent are observed inside the village.

#### **4.25. Food Pattern**

The people of district Tank (Village of Gara Hayat) ate dairy food mostly daily routine such as milk, curd, and butter because one of the reasons is that most of the people of *village Gara Hayat* Kept pet animals. Dairy food is very better for health because they maintain health.

#### **4.26. Settlement Pattern**

The housing pattern of any society depicts a lot about living style following the culture and values of that social setup. Mainly there are three types of housing patterns in the village of *Gara Hayat District Tank*.

**Table 4 : settlement pattern in Village Gara Hayat**

S. No	Types of Houses	Number houses of	Percentage
1	<i>Kacha</i>	225	75%
2	<i>Pukka</i>	60	20%
3	<i>Semi Pukka</i>	15	5%
	Total	300	100%

*Source: data collected by Researcher*

#### **4.26.1. Kacha House**

*Kacha house* is made of mud with no cement or backed bricks. This house has two or sometimes about six rooms in a row having a big courtyard. The floors of these houses are leveled with mud or clay. About 40 percent of the villager lives in *Kacha House*. A paste called Gara which is a mixture of clay and hay level the wall of the rooms and courtyard. The garage is given every year to the house for protection from the rain as well as for decoration. And one room is specific for the cattle and other pet animals which are on one side of the corner of the house. The cooking area is open in these houses and very rarely some have shade made of the hatch. In some of the houses, there are open bathrooms with no roof and open from one side.

#### **4.26.2. Pukka House**

Only 15 percent of the villager lives in *the pukka* house. These houses are newly built; those who are economically strong built their house with a new style. These homes are built with the influence of the city. These houses are built with backed bricks all the walls and rooms are cemented mostly. The floors are cemented with the roof. The pukka house is that benefits one is to see beautiful and the other their no decoration on every month as well as *Kacha* house decoration or reconstruction.

### **4.26.3. Semi Pukka House**

Semi pukka House is consisting of two kinds of material one is mud bricks or mud and second one is cemented brick or a mixture of cement. The semi-pukka house is there for made in the village of *Gara Hayat (District Tank)* especially room was built up semi *pukka* in which outside is *pukka*, and the inner side is Kacha. Because these houses have two benefits one is that they are in the summer season are cold and in winter they are hot. And the outer side has the benefits are that they have the protection from the rain and not given every year *Gara* to the house and the outer side remain to maintain always.

### **4.27. Occupation**

People living within the village of *Gara Hayat District Tank* are divided based on occupations and work. Then within their works, they have categorized and segregated works for males and females. Females inside the home distribute their work among their other female partners.

### **4.28. Agriculture Practice**

In the village, people cultivate their fields of wheat, maize, and Gram according to the season. Mostly cultivated wheat and Gram are in the winter season, and maize and beryl are cultivated in the summer season. They are firstly preparing their land with help of a tractor better plow and plan then the cultivated the land. Then the crops were better produced, and grown-up and very rare water reserves due to the plan of land.

### **4.29. Crops**

Major crops cultivated are wheat and gram and of some, the others are cultivated as well as corn and barley also cultivated. But due to the rare of water, most people cultivated the gram, wheat.

### **4.30. Traditional Foods**

The favorite food of the village of *Gara Hayat District Tank* Khyber Pakhtunkhwa (KPK) is the *Dahsi ghee*, milk, and curd and most of the village people prefer to eat that

food instead of the other food. *Desai* food is pure from different types of chemical substances.

#### 4.31. Sports

*Village of Gara Hayat District Tank (KPK)* people are played mostly are cricket, football, and volleyball are played but unfortunately, there is no permanent playground for the young villagers.



*Source: picture taken by Researcher*

**Figure 6 : team Atish club of Gara Hayat winning moment**

## **CHAPTER NO. 05**

### **5. Root Causes Of Disease From The Perspectives Of Local Inhabitants**

#### **5.1. The Factors Of Contamination Of Water**

Water collection from the pond and hand pump is a very living job and there is much difficulty in collecting water. Different things pollute the water and some of them have a human activity that pollutes human activity. Usually, when the villager fetches the water, they use tin or other plastic material. When they drop into the water that tin or plastic bottle other things that have a lot of dirty and all the dirty material mix in the water. When they take out that tin or plastic drum from the water they again keep on the muddy ground and they again get dirty and when they put it again into well or pool a lot of material mix with water and the process continues which is very harmful to the people of the village.

There are mostly no ponds and wells are protected, bushes and shopped pieces of clothing are to be found in the pool. Like pet animals, goats, buffalo, and other animals are to be found in the pool or on one side of the pool. There are some villages which have the proper lavatory system but most of the homes in the village have no proper drainage system and when it rains then all the dirty water from the homes falls into the pool and that water is very poisonous for the people of the village. Due to insufficient water protection when the water is so less in the pool, we have seen two snakes, and so many frogs and insects in the drinking water of the pool and then he said that we have dug out from the pool but have not the proper way to clean the pool because the pool is just one of the pits in the land.

#### **5.2. The Hand Pump Is Old And Rustic.**

When they draw out water from the hand pump the watercolor and taste change due to the rust of the hand pump which proves that it is very harmful to the village people.

The homes of the village have a wide area of *Kacha* courtyard when they sweep their home then the open utensils of water are polluted and when they have to use that water for drinking or another purpose they have already contaminated, and it is not pure for

drinking because they have a very side effect on the human and it create many types of disease.



*Source: picture taken by Researcher*

**Figure 7 : rustic tape water system in village Gara Hayat**

### **5.2.1. Case Study**

My first interview was conducted with Sharif Khan Baloch. He was a 28 years old man and also married to an educated girl. He belongs to the family average level family. He and his wife were highly educated but jobless. He was teaching in a private school and his wife also worked in a hospital as a contractor. he had two sons and one daughter. He lived isolated from his extended family and joined a nuclear family due to some economic issues. I asked him about the effect of consumption and usage of contaminated water.

*“Tou us na jwab dia k pani ka tou yahain per boht zayda masla hn. Ik tou Pani Ki kami hn aur dousri bath a hain k jo pani available hn Oh kafi ganda aur buda budar hn. Q k ham Talab ka pani istimal karthy hn aur o kahi mahinoon sa kara hotha hn. Jis ki whaja sya log bahoot pershsan hain Aur kahyi Bimarioon ma mubatla hain”.*

**Translation:** I have asked about the effect of the consumption of contaminated water then they replied that one of the issues is the scarcity of water and the other is that the available water is not pure for drinking. Because the water which consumes, they are not suitable for drinking. Because that water has been standing for many months it changes the test and color and the people are very worried about that issue.

### **5.2.3 Health Problem**

Most people say that the basic problem of health is water. Because water is one of the basic needs of a human being without water human life existence cannot possible. There are different types of diseases which are the people affected are Diarrhea, typhoid, Hepatitis A and B mostly, especially among children and old age people affected.

### **5.3.4 Types Of Water That Village People Consume**

The village people consume two types of water one is pool water and the second one is tap water. Both waters is not pure for drinking. Eighty percent of the people consume pool water and twenty percent people tap water.

### **5.3.5 Store Water In Homes**

They store water in the home in different things such as pitchers, Drum, and Bottles, and some who are economically good made a pool for storing water.

### **5.3.6 Filtration Of Water**

In the village, there was no water filtration for the village people. When they filtered water, they just simply put clothing on the pitcher, drum, and other things which carry water from home.

### **5.3.7 Water From Pool To Home**

The used donkey cart, hand cart, and some are brought on the shoulder. One issue is that they have a lot of time been spent and the second one is physically they have punished very badly.

### **5.4. Case Study**

The Second case study with Misbaha Din Who is a very nice person. He was a graduate student and their age was 27 years. He has a job on Tank Municipal committee. He was married. He had 2 sons. He has affected stomach disease. He said that I had gone to many doctors to solve that problem but at last one of the doctors asked me what I ate in my food and which water I drink. I said that drinking the pool water, but the water is not clean. Then the doctor advised me I cannot drink that water for one week you will be drinking to be filtered water for a week. Then after one week, my stomach set up automatically. Therefore, he said that we are so affected by many diseases such as Diarrhea, stomach diseases, typhoid, Habitats A and B cholera also especially every month hundreds of people arrested for that's disease.

### **5.5. Absence Of Proper Management For Storing**

The government should step on this serious issue of water proper management of the water. The government should have proper storage in pools and *Tanks* and protect the water from poisonous material and a good pipelining system for every home.





*Source: picture taken by Researcher*

**Figure 8 : water contamination & streets of Gara Hayat**

### **5.5.1. Case Study**

My third case study was conducted with Qismat khan Baloch who has political as well as educated he was very interested in the progress of the village. *“O kay ray thy Pani ka Aik bar masla hn tamam tank district ka. Aur khas kar hamrya ghoon ka ik Bara masla chal raha hn. Aur hamra b koshsh a hn k jald iz jald is masla ka hal nikal lain. Aur o kah raha tha k ham na ik tubweel b manzor kia hn Government sa. Aur jald iz jald ham is problem ka hal nikal k ham Aik acha khasa pani ka intizam karain gain. Aur village ko bahot sa bimarioon aur mushkalt sa nijat dilain gain”.*

**Translation:** Qismat khan Baloch was saying that the water has a big problem in Tank District and he said that especially in our village. He says that we are our village have a big problem are going now. We are trying to struggle with this serious issue and we have permitted one of the tube wells from the government Inshallah we have to solve this problem of water and safe and pure water will be provided to the government.

In the village, open utensils such as pitchers, drums, and bottles are open, and pet animals such as dogs, cats, hens, or other animals drink the water consciously and unconsciously, contaminating the water. Because there is no other way to pick or drop pitchers or drums from the pool, family members dip their fingers consciously and unconsciously.

### **5.5.2. Case Study**

Musa Khan was the subject of my interview in this case. He was about 55 years old and had four sons and five daughters. He was a farmer who also raised buffalo at home. During my studies, I asked about the water problem and their problems, and he told me that in my house, there is a hand pump. The hand pump water is easily accessible, but it is not pure. When we use things like tea, the tea is completely disposable, and when we wash our clothes, the washing powder does not dissolve and remains as its means that it is completely contaminated. He stated that I require pure water and that if the government cannot properly manage water, the people of the village will face difficult living conditions in a few years.

### **5.5.3. Case Study**

*Faizan Khan* participated in the fifth case study. He is around 30 years old, married, and has two daughters. He has completed B A. However, due to financial constraints, he suspends the educational process. To meet his needs, he planned to open a grocery store in the village. He said about *Gara Hayat's health problem (District Tank)* He claimed that all of the problems stemmed from the water. However, most of them are the result of village sanitation; there was no safe water management, no filtration, no drainage system, and no safe gutter cover management. There is no village drainage cleaning system to clean the heap of destruction combined and the insect made home and cherished on him, which creates various types of disease.

## **5.6. Diarrhea**

Diarrhea is defined as stool loss and frequency. Diarrhea is a chronic (ongoing and prolonged) condition. Diarrhea in adults is usually mild and resolves quickly. When

someone is infected and loses one day in a row, especially infants and the elderly, they become dehydrated and weak, and their life is on the verge of ending.

### **5.7. Hepatitis A**

Hepatitis A is one of the *viral-caused liver diseases (HIV)*. Because of its ability to spread through personal contact, Hepatitis A is a type of viral hepatitis also known as infectious hepatitis. Hepatitis B and asymptomatic infection are extremely common, particularly among children. Hepatitis A does not cause a carrier state or chronic liver disease, and there is no lasting phase of illness once the infection is over. However, it is not uncommon to have a second period of symptoms about a month after the first, which is known as a decline.

### **5.8. Sanitation Is A Social Issue**

Sanitation is a social issue poor sanitation is linked to the transmission of diseases such as cholera, diarrhea, dysentery, and hepatitis A and B; poor sanitation reduces human well-being and social and economic development due to effects such as anxiety, risk of sexual assault, and lost educational opportunities; and poor sanitation reduces human well-being and social and economic development.

The government has joined the initiative to address the negative impact of poor sanitation on our people's health. Poor sanitation is an unsanitary condition that harms the environment and causes illness and disease.

#### **5.8.1. Case Study**

*Junaid Khan* interviewed my six cases. He was 23 years old. He had just gotten married. He had completed his F.sc. and then started his own business with his father. He is still my classmate and we frequently gossip. And I am confident that he will provide me with valuable information about the effects of consuming and using contaminated water. When I first met him, he was overjoyed because we hadn't seen each other in a long time, and we then talked about old memories from the past. I inquired about the issue of water consumption and the use of contaminated water. He explained that the village has a

single water pond from which approximately 80% of the villagers collect water. Although such a water system can supply water of excellent quality, there is a significant potential for deterioration to occur due to the amount of handling involved system often supply and consumption.

### **5.9. Water Collection And Transport**

Water collection buckets come in a variety of materials, including plastic and metal buckets. Plastic buckets with a capacity of around 25 liters were the most popular container. Though they were used with lids, bucket lids were brought to the well. Water was not collected in clay containers.



*Source: picture taken by Researcher*

**Figure 9 : children or Gara Hayat filling water from a tanker**

### 5.10. Water Storage And Usage

Water is stored in *Gara Hayat District Tank village homes (KPK)*. For hours and days, water is mostly stored in the pitcher and Cane. They drink water and use it as a drinking *cup, bowl, or glass*, among other things.



*Source: picture taken by Researcher*

**Figure 10 : little girls carrying water on their heads**

### 5.10.1. Case Study

I provided a sample of pond water in a disposable bottle from the *Gara Hayat District Tank village (KPK)*. Then I tested him at Islamabad's Quaid-I-Azam University's Department of Biological Science laboratory.

If the PH (mean of hydrogen) of the drinking water is less than 0.6, it means that the water is unsafe to drink. There are various parameters given according to the standard of different countries of the standard value of water and compared to the current water study report. There are differences between the water's standard value and the current study. According to the current study report, water is highly contaminated and unfit for drinking because some of the elements are at low levels. All the pure forms of water's standard values are not compared to the current water study report.

Parameters	WHO	USPH	European standard	ISIRI1053	Present study report
pH	6.9 - 9.2	6.0 - 8.5	6.5 - 8.5	6.5 - 9.0	7.12 - 7.92
TDS	500 - 1500 mg/l	500	500	1500	950 - 2066
EC	300 $\mu$ mhos/cm	300	400	300	1322 - 2975
Cl <sup>-</sup>	200 - 600 mg/l	250	250	250	165 - 674
SO <sub>4</sub> <sup>2-</sup>	200 - 250 mg/l	250	-	250	284 - 676
NO <sub>3</sub> <sup>-</sup>	40 - 50 mg/l	-	-	50	0.51 - 52.12
F <sup>-</sup>	1 - 1.5 ppm	-	-	1.50	0.65 - 0.92
Ca <sup>2+</sup>	75 - 200 mg/l	100	100	300	88 - 259
Mg <sup>2+</sup>	30 - 150 mg/l	30	-	30	0.33 - 67
Na <sup>+</sup>	50 - 60 mg/l	-	-	200	99 - 446
K <sup>+</sup>	20 mg/l	-	-	20	6.86 - 10.23
TH	100 - 500 mg/l	500	-	500	244 - 805

USPH - United States Public Drinking water Standard

WHO - World Health Organization

ISIRI1053 - Institute of Standards and Industrial Research of Iran, Drinking water

**Figure 11 : current water study report**

## CHAPTER NO. 6

### 6. Water Sanitation And Health Problems Of The People Of Gara Hayat

#### 6.1. Contamination Of Groundwater

Groundwater contamination in the village of *Gara Hayat District Tank* Khyber Pakhtunkhwa conducted the survey. The village of Gara Hayat Tank has different types of groundwater contamination. One type of groundwater contamination is that there is no good sewerage system, so all the contaminated water flows into drinking water ponds. Another reason for water contamination is that water is not protected from contamination by different poisonous gases that are mixed with water, making it unsafe to drink.



*Source: picture taken by the researcher*

**Figure 12 : POND water in village Gara Hayat**

### **6.1.1. Case Study**

In one of my interviews with Naveed Alam, he was around 30 years old. He works as a police constable. I meet him with the help of a friend and introduce them to the village. In the main, while he is unable to conduct the interview, he told me that afternoon that we will meet in the stadium and then discuss this interview. When I meet him on the football field, we first gossip and then I tell him about my research, that I worked on the water in your village and am now collecting data. He agrees and describes the impact and consumption of contaminated water. The main problem with groundwater in Pakistan, according to him, is high salinity, which is caused by irrigation, salt dissolution in sediments, evaporation under arid conditions, industrial pollution, industrial discharges, urban activities, agriculture, groundwater pump age, and waste disposal, all of which have an impact on groundwater quality throughout Pakistan.

In the *Khyber Pakhtunkhwa district Tank village of Gara Hayat*, the contamination of groundwater is caused by improper sewage and solid waste disposal, open ponds of water, an unsafe drainage system, and pollution from various types of waste material disposed in the village. As a result, the main cause of water contamination is the spread of various diseases in the village. He went on to say that one of the reasons is the scarcity of water in this area.

### **6.1.2. Case Study**

During a survey in the *village of Gara Hayat*, it was discovered that 40% of the villager hand pump is used as the primary source of available drinking water. It was discovered that approximately 25% of all water households in all villages used hand pumps as their primary source of available drinking water. As the primary source of drinking water, approximately 60% of the villagers rely on groundwater, 5% on rainwater, and 15% on other community tube well water (survey of the village).

## **6.2. Health Risks From Contaminated Water**

Health risks from water contamination caused the most serious health diseases such as carcinogenic, Hepatitis A and Hepatitis B, Diarrhea, typhoid, and other intestinal disease



caused by water contamination, and the water contamination effect on land animals and mirin animals was also very dangerous. Water contamination claims the lives of millions of humans and animals.



*Source: picture taken by Researcher*

**Figure 13 : a boy filling pond water in Gara Hayat**

### **6.3. Collection Of Water Samples**

A total of two types of water samples were collected in clean and sterilized bottles from tube wells, ponds, and drain water to assess ground and surface water quality and diseases. The samples were labeled with the date of collection, the nature or source of water, and the location of collection, and were tested in the Quaid I Azam University of Islamabad's Biological Science laboratory.

#### 6.4. Source Of Drinking Water

During a survey conducted in all of the selected villages, it was discovered that approximately 40% of the households used hand pumps as their primary source of available drinking water. About a quarter of the households reported getting their drinking water from community tube wells. 16 percent of the households got their drinking water from wells. However, 13% of the households stated that they obtain groundwater through pressure pumps in their homes, while 6% use rainwater as a source of drinking water.

S. No.	Parameters	Reading 1	Reading 2	Average	Standard Deviation
1	PH	8.31	8.42	8.365	0.08
2	EC	445	945	695	353.55
3	TDS	315	776	545.5	325.98
4	PA	10	35	22.5	17.68
5	TA	140	230	185	63.64
6	TH	145	225	185	56.57
7	Ca	35	75	55	28.28
8	Mg	4.55	40.15	22.35	25.17
9	Na	18	55	36.5	26.16
10	K	3.5	19.5	11.5	11.31
11	Cl	10.61	65.28	37.945	38.66
12	SO4	6.5	92.7	49.6	60.95
13	CO3	2.4	36	19.2	23.76
14	HCO3	105.8	215.8	160.8	77.78
15	NO3	0	4.4	2.2	3.11
16	F	0	0.1	0.05	0.07

Figure 14 : water results



*Source: picture taken by Researcher*

**Figure 15 : Residents of village Gara Hayat filling water from the pond**

#### **6.4.1. Case Study**

One of the case studies was conducted in a group with participants of various ages and occupations. That incident occurred unexpectedly in the market of the village of Gara Hayat, District Tank KPK. That case study was conducted in such a way that when he first met with a group, he played the game of *laduo*, which is known locally as Chaka. First and foremost, I had a Salam and Duwa, then for a while a talk slowly and gradually I discussed all the information given to him, then a few refused to the given formation and some voluntarily agreed. Everyone has an opinion about the impact and use of contaminated water. One man named Barkat Khan stated that the majority of diseases in

the village were caused by the village's water and sanitation problems, which the government institutions such as the *Tank Municipal Committee* (TMA) and other public health institutions did not address. The people of Gara Hayat District's village are deteriorating day by day, and various diseases have emerged in the village. Diseases such as Hepatitis A, Neuse, Diarrhea, and Typhoid are mostly found in the village. This disease is most prevalent in the winter, with a prevalence of 70 to 80 percent.

## CHAPTER NO.7

### 7. Conclusion & Summary

Water covers over three-quarters of the globe. 97% of the water on the planet is salty. There is 2% ice in Antarctica and 1% fresh water in rivers, ponds, springs, and natural subsurface reservoirs. Life is impossible without a sufficient quantity of fresh water. Water distribution and disposal is a major issue in developing countries.

Life is impossible without a suitable supply of clean water. Water distribution and disposal is a major issue in developing countries. The current study sought to ascertain the effect of water consumption and a poor sanitation system on health. It was carried out at the *Gara Hayat District Tank* hamlet. The research was conducted in December 2021. The major purpose of the research was to gather data on current water consumption and its consequences, as well as the village's water delivery system.

The study also aimed to demonstrate a relationship between various diseases and other factors such as insufficient water and sanitation. The study was conducted in the hamlet of Gara Hayat in the Tank District. It is located 4 kilometers west of the Tank District on Wana Road. The settlement is divided into two halves, one on either side of the road. 300 people are living there. Muslim people make up the majority of the population system. The vast majority of the population lives together, and it has been discovered that their views of how to utilize and sustain the impacts of dirty water are inaccurate. They do not treat the underlying causes of sickness, leaving them vulnerable to waterborne infections such as diarrhea and hepatitis A and B, as well as skin disorders such as acne and blisters. Drinking polluted water carries significant health hazards. The most common water-related ailments in the hamlet are malaria, diarrhea, and typhoid. Skin infections, a sore throat, and so forth.

Most of the population lives jointly and it has been observed that their concepts of maintaining the effect and usage of contaminated water are flawed. They do not stop the cardinal factors of a specific disease, which makes them disease which is spread from water such as diarrhea, hepatitis A and Hepatitis B skin diseases like acne and blister.

Impure water causes serious health problems. The most common water-related diseases found in the village are malaria, dysentery typhoid Sore throat, skin infections, etc.

As a result, the people of the village drink unclean water and lack basic sanitary facilities. As a result, villagers regularly get ailments such as typhoid, malaria, diarrhea, hepatitis A and B, and so on. Because water is a necessity for human survival, the government must act to protect the village's ponds and water delivery infrastructure. Water contamination is a major issue that must be addressed. Waste dung and pesticides must be removed to preserve water channels free of hazardous intoxicants and chemicals that are harmful to health and hygiene.

The following procedures should be taken to avoid and prevent water-borne illnesses.

1. It is critical to prevent any unclean water and drainage systems from mingling with pure water and wreaking havoc on the lives of the helpless people of Gara Hayat.
2. To avert a serious sickness among inhabitants of Gara Hayat village and all districts, expert physicians must be assigned to shift to examine and gauge the community's water pollution and use possibilities.
3. The government started a specific awareness campaign for the village's people to ensure they obtain proper training and familiarization on how to maintain health and hygiene standards.
4. To be proactive, every water sample must be properly tested under the supervision of the government.
5. Proper waste disposal must be ensured by developing these strategies, so that it does not mix or blend with pond water, river water, or other types of pure water. Poor water and sanitation are a direct or indirect cause of nearly 70% of mortality and illness among developing-country rural populations. The absence of a protected water supply and indiscriminate defecation are the two most serious issues. The factors help to spread specific gastrointestinal diseases. As a result, the rural water system in Gara Hayat District Tank's hamlet needs to be improved in order to protect the community from disease, supply water, and dispose of waste.

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## 9. ANNEXURE

<b>S.NO</b>	<b>Category</b>
<b>i.</b>	Name
<b>ii.</b>	Age
<b>iii.</b>	Gender
<b>iv.</b>	Profession
<b>v.</b>	Income
<b>vi.</b>	Qualification
<b>vii.</b>	Ethnicity
<b>viii.</b>	Marital status

## **INTERVIEW GUIDE**

Q what is your name?

Q what is your age?

Q what is your Education?

Q What is your occupation?

Q which type of water facility is available?

Q what are the types of water in the village?

Q What is the difficulty in transporting water from the pool to your house?

Q Increase public awareness and motivation about stagnant water and the health dangers it causes.

Q Why isn't the government doing more to address this critical issue of water sanitation and hygiene?

Q People unaware of the difference between clean and contaminated water?

Q What issue does water sanitation raise?

Q How many people are aware of the waterborne disease?

Q The minister of health's special package addresses the critical issue of sanitation and hygiene.

Q Is it true that the government did not build a safe water pool for the community?

Q Water should be supplied at medical and educational facilities at the village level?

Q Poor Quality of water creates what types of disease?

Q Should I wash my utensils before cooking or eating?

Q Increased hygiene promotion training, particularly for women and children, is needed to prevent diarrhea and other diseases.

Q To remove water supply contamination, implement suitable water treatment process technologies.

Q Construction of water supply scheme and filtration for the protection of contamination of water in the village?

Q Building a water supply system and installing filters within the village to reduce water pollution?

Q Is the neighborhood cleaned adequately every day with the help of TMO?

Q what is the effect of contaminated water?

Q The gross national GDP (Gross development of Pakistan) is linked to the availability of better water and sanitation.

Q Do political issues particularly political stability and government performance, influence Pakistan's access to improved water and sanitation resources?

Q What type of water facilities does the neighborhood have?

Q Should I wash the utensils before cooking or eating?

Q What is the effect of standing water on Village Street?

Q Do you think that encouraging hygiene behaviors and restroom facilities will have an effect?

Q What kinds of water facilities are available in the village?

Q Wash the utensil before eating or cooking and after them?

## GLOSSARY

Words	Meanings
salwar kameez	Dress pattern
Dupatta	A long wide scarf name which usually women over the head
Gan khat	One of the large dress name
Waja	Reason
Gara Hayat	Village name
Tank	District Name
Kacha	Crude
Pukata	Cemented
Gara	One of the muddy past name
Zaida	Offensive
Masla	Problem
Hein	Is
Pani	Water
Budabudar	Smell
Mubatala	Affected
Persian	Worry
log	People
Bahot	Very
intimal	Use
Talab	Pool
Dousri	Secondary
Tamam	All
koshsh	Try
Jald is jald	As soon as possible

Intizam	Arrangement
Acha khasa	Better
Mushkalat	Difficulties
Keer	Milk

Nijat	Relief
Manzor	Appealing to the general public
Manzoor	Accept
ghee	Oil
Warna	Name of the village
Panjpir	Religious sects name
Bravali	Religious sects name
Deobandi	Religious sects name
Moulvi	Religious scholar
Masjid	Mosque
Dahsi	Indigenous
saraki	Language name
FR	Frontier Region
Tamma Nizam	All arrangement
UNICEF	United nation children education fund
WHO	World health organization
WASH	Water sanitation and health
EED	Early childhood Diarrhea
STH	Soil transmission helminths
Ug/L	Microgram per liter
ECD	Early child Development
PH	Power of hydrogen

MOH	Minister of Health
SDGs	Sustainable development goals
TMA	Tank Municipal Committee