Industrial Waste Water Impacts on Human Health

Locale: Chak No. 238 RB Tehsil & District Faisalabad

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Chapter# 1

1.0 Introduction

Industry plays a very important role in every country's development. Pakistan is a developing country. In Pakistan majority of people are engaged with agriculture. Faisalabad is third largest city in Pakistan and second largest in the province with fast growing population. The rapid urbanization coupled with the industrial revolution has not only brought unprecedented changes and comforts in the human life styles but has also created a series of problems. Among these, the most prominent is the pollution hazards that have made almost every one familiar with the term environment. The pollution hazards are due to release of toxic substances in to the environment which has subsequently damaged the life processes. This is a global issue now and Pakistan is not an exception. The cities are especially facing serious problems including the environmental problems.

In many ways man has made his environment much more hospitable in the past few centuries, but in some ways he has made it more hostile. Over population and industrialization have contributed in various ways to the general deterioration of the environment upon which man depends for life.

Faisalabad city has made rapid strides in the field of industry after independence. It is called the "Manchester of Pakistan" for its extensive development of textile industry. Faisalabad plays a very important role in the economy of the country. Its growth has been driven by the development of the city's textile industry. Major portion of the total exports of Pakistan emanates from Faisalabad.

Before the independence, there were only five industrial units in Faisalabad city. Now, there are 1057 large industrial units out of which 416 are Textile units. A number of data gathering exercises carried out in the area indicate that the majority of the industry is relating directly to textile production or its services industries which from the backbone of the industrial economy of Faisalabad other industries include hosiery, read made garments, power looms, oil mills, flour mills, sugar mills, engineering units, pharmaceuticals, chemical, soap, etc.

Evidence indicates that industry is scattered throughout Faisalabad reflecting its historic development without clear planning policies for the city. The industries closest to the city center are mixed with domestic housing and commercial activity whilst more recently, industry has congregated some distance from the center as is being augmented by purpose built estates.

In Faisalabad, the industrial sector produced very little solid industrial waste, the majority of which is reused or recycled. However, it produces a considerable quantity of liquid effluent which is discharged to the drains and then to the river untreated.

The liquid waste produced by the industries is carried by the domestic sewage system and drains operated by WASA in its operational areas and by the drains operated by the provincial irrigation department. There is virtually no treatment of the effluent; the few treatment plants installed by the factories rare work because of financial or technical constraints.

Industrial waste has resulted in a large number of social, environmental and health related issues for the citizens of Faisalabad. There is evidence to indicate that pollutants have entered the ground water and are entering the public water supply either through the public pipe work or directly through private tube wells. Countries, imparts immense pressure on existing water and land resources; and has resulted in the discharge of large volumes of solid waste and wastewater. Sewage or wastewater, in this report, means untreated city effluent including industrial and municipal wastewater. This is because, there are no separate drains for industrial wastewater and therefore, drains carry a blend of the both, i.e., industrial wastewater and municipal wastewater.

In Pakistan where safe effluent disposal facilities and its treatment are non-existent or limited, raw sewage is used to irrigate fodders, ornamental and food crops including vegetables. Although the actual composition of sewage may differ from site to site, yet the sewage contains organic and inorganic compounds including nutrients like nitrogen (N), phosphorus (P), potassium (K), toxic chemicals (including heavy metals) and pathogens. In almost all towns of Pakistan that have a sewerage system, the sewage is directly used for irrigating about 32,500 ha (Ensink et al., 2004).

A negligible proportion of this sewage is treated through sedimentation ponds to a primary level and no clear regulations exist on which crops can be irrigated with sewage. Vegetables irrigated are typically common crops that fetch high prices in the close by urban

markets. The wastewater used for irrigation is valued by farmers, mainly because of its nutrient contents and reliability of supply. In some cases, sewage is auctioned by the municipalities to the highest bidder, often a group of rich farmers, who then rent out their fields to poor landless farmers. Under these conditions, the use of sewage is considered a win- a -win situation by both the authorities those are responsible for sewage disposal and the farmers who get its reliable supply with high nutrient content (Ensink et al., 2004).

Therefore, very few incentives are left to invest scarce resources in sewage treatment. Rapidly growing population, saline and/or sonic ground water, poorly performing irrigation distribution system and recurrent droughts have added to the problem of canal water shortage and consequently use of wastewater for urban agriculture has become a common practice.

As we know industry is the key for the economic development of countries along with this it has also caused serious damage to environment. Industry provides significant benefits to the human society. However its use imposes also negative impacts on community.

According to Brandt land:

> *"Industry does have a key role, and manger in a industrial operation is well aware that environments impact of his business as seen by the community is a major factor in his ability to stay in business industry has a license to operate granted by the community. This is the relationship between human and development".*

Factories release toxic chemicals into the land, air, water. This hazardous waste leads to health problems it makes our rivers, lakes, lands and too polluted for us. Pollution is caused by industrial and commercial waste. And pollution is a major cause of effect environment and cause of disease.

Pollution is the one of the gifts, which is given by the rapid industrialization. Pollution has become a major threat to the very existing of mankind on earth. The pollution of various has gone to such an extent that we are unable to breathe fresh air and drink fresh water.

The advancements of science and technology have added to the human comforts automobiles, better industries, better medicines, and better chemicals to control harmful insects etc., but on the other hand, they have set us a very serious to face pollution.

In the Longmont Dictionary, the environment has been explained as:

> *"Environment the natural condition such as air, water and land in which people live".*

1.1 Statement of the problem

The research aim was to find out the "*Impacts of industrial waste water on the health of the people of village Awan Wala*" along with to explore the intensity and degree of effects of waste water on the health of native people.

1.2 Literature review

To make the study more authentic and valid the support of relevant literature is much needed. The relevant literature clarifies the different aspects of the study also acts as a confirmation of the results of the study. So to clear the concept of this topic the researcher has gone through several books and articles. A lot of work has done in this regard and the writer has defined the problem from different aspects.

The rapid urbanization coupled with the industrial revolution has not only brought unprecedented changes and comforts in the human life styles but has also created a series of problems. Among these, the most prominent is the pollution hazards that have made almost every one familiar with the term environment. The pollution hazards are due to release of toxic substances in to the environment which has subsequently damaged the life processes. This is a global issue now and Pakistan is not an exception. The mega cities are facing serious problems including the environmental problems.

In many ways man has made his environment much more hospitable in the past few centuries, but in some ways he has made it more hostile. Over population and industrialization have contributed in various ways to the general deterioration of the environment upon which man depends for life.

There are many things that contribute to the water pollution. Manufacturing and mining polluted the water with toxic chemicals and heavy metals. Coal and power plant emissions create acid rain, which contaminate surface water. Use of fertilizer, pesticides and herbicides by the farmers and homeowners harmed the underground water, and runoff to harm pond life. There have been accidents, which resulted in harmful oil spills. Animal waste and untreated sewage harms both the surface and underground water. Dumping is another culprit. In coastal forests, logging increases erosion of soil which polluted the streams. Population growth increases the need to develop land and roads, contributing to this problem.

Water is often used as a coolant in factories and power plants. The water is usually returned to the source. This water is typically warmer than when it was taken. Small temperature changes in a body of water can drive away the fish and other species that were originally present, and attract other species in place of them. Thermal pollution can accelerate biological processes in plants and animals or deplete oxygen levels in water. The result may be in fish and other wildlife deaths near the discharge source. Thermal pollution can also be caused by the deforestation and vegetation that shade and cool streams.

There are many causes of water pollution like industrial wastes, domestic wastes and solid wastes etc. there is pollution classified another point of view. Pollution caused by development and pollution caused by lack of development. As discussed below:

Both pollution caused by development and pollution were due to lack of development are on the increase, he states, and warns that far-reaching measures are necessary if catastrophes are to be avoided in the future.

According to Bernt I Dybern:

> *"It seems that no river, no lake, no part of the ocean is entirely free from pollution,"* writes the author.

In one of his speech the former Secretary General of the UN, Mr. Kurt Waldheim, warned of trophies' to come unless the countries of the world do not set about fighting against six impending threats: population growth, mass poverty, food stuff deficiency, energy problems, high military costs and inflations (1). He could have added a seventh threat the increasing

destruction of the environment, which affects air, water and soil (the outer environment) as well as many living and working places (the inner environment).

Water is necessary for all life and most human activities, and pollution of the water will strengthen the effects of several of the other threats listed by Mr.Waldheim. And water pollution is increasing due to two reasons:

A) Water pollution caused by lack of development;

B) Water pollution caused by development;

Type- A dominates in developing countries; it is most often connected with lack of hygienic facilities and type-B dominates in industrialized countries.

Both type of pollution damage the ecosystems of the water bodies and decrease their possibilities for producing food. Both are threats to human health or to human activities.

Bernt I Dybern said:

"Water pollution can also be classified from another point of view".

(Ambio, vol, 3 No,3-4)

Direct threats to human health are the most obvious aspect of environmental deterioration, and of these direct threats the phenomena commonly lumped under the term "pollution". Pollutants reach us through the air we breathe, the water we drink, and the food we eat.

In the Brundtland report on '*our common future' has pointed out':*

"It is necessary to consider environmental protection in the light of sustainable development"

(Brundt land; 1987)

Potable water supplies are polluted by untreated municipal and industrial wastes in many areas of the world. It is very easy to secure potable water. Because we belong to developing

country and there is a financial problems. We need not so much water treatment, but change in the process is affecting the water.

> *"The earth is facing many environmental problems like global warming larger depth acid rain and pollution which are due to both natural calamities are mine deposits in the earth crust etc. as well as various anthropogenic industries like industrialization urbanization, motorization, accidents and warfare".*

(Husain, March 2, 2000)

There is a problem that is the identification of an object or anything that can be said as the waste.

According to Mariam Webster Dictionary:

"Refuse from places of human or animal habitation."

The World Book Dictionary defines waste as:

"Useless or worthless material or *stuff to be thrown away."*

Zero Waste as America defined:

> *"A resource that is not safely recycled back into the environment or the market place."*

Another definition that defines waste as a resource, as well as the threat of unsafe recycling can present to the environment and public health:

> *"The word 'waste' and the act of 'wasting' are human inventions. Waste doesn't exist in nature. In nature, everything has a purpose. Waste was created by humans for short-term convenience and short-term profit. Wasting results in long-term harmful consequences for humans, nature, and the economy".*

Pollution is the introduction of a contaminant into the environment. It is created mostly by human action, but can also be a result of natural disasters. Pollution has a detrimental effect on any living organism in an environment, making it virtually impossible to sustain life.

W H O on health hazards of human environment said:

> *"Pollution may be accidental and sometimes grave consequences and is most often caused by two uncontrolled disposal of sewage and other liquid waste resulting industrial waste contains a variety of pollution".*

(W H O, 1972, P 47)

According to Webster Encyclopedia Dictionary (Health)

> *"Health is the quality of life, as foundation of a house. A sound house is built on a good foundation so it is with life to fulfill the aspiration of life, we need good health".*

Health is an important aspect of human life and is the catalyst, which triggers life activities. Importance of health is the most important phenomenon in human life. Winslow, former professor of Public Health at Yale, in 1920, defined Public Health as science and art of preventing diseases, prolonging life and promoting physical and mental health and efficiency through organized community efforts for the sanitation of the environment.

(Community Medicine) – Third Edition)

According to the constitution of World Health Organization (W H O):

> *"Health is a state of complete physical, mental and social well being and ability to function, not merely absence of disease or infirmity".*

There is a very deep relation between water and health. Today, one person in five across the world has no access to safe drinking water, and one in two lacks safe sanitation. And adequate safe water is to key to good health and a proper diet.

A fresh report brought out by the World Resources Institute tells us that degradation of the world's fresh water systems threatens their ability to support human, plant and animal life. Water borne diseases from fecal pollution of surface waters continue to be a major cause of illness in the Third World.

Disease is defined in Webster's New Collegiate Dictionary as:

"A condition in which body health is impaired."

Illness is a phenomenon in which one or more natural functions of the body are so disturbed that the affected individual cannot meet the natural requirements of everyday life. It is a state in which the equilibrium of the body and its functions are disturbed.

According to Encyclopedia of social sciences 1989:

> *"Illness is a disvalued process that impairs the functioning or appearance of a human person and may ultimately lead to death".*

Hygiene is defined as:

> *"Cleanliness and conditions or practices conducive in maintaining health."*
>
> (Oxford Dictionary)

"Health, Hygiene and Cleanliness are closely related to one another".

(Oxford Dictionary (Hygiene)

W H O 1998 Concept of water related diseases:

> *"Hygiene is actually the science of health and it preservation and hygiene is a system of principles for promoting health. It is basically a preventive mechanism against illness; hygienic conditions include the living standards, sanitation, food processing and maintenance of all these factors".*

Major contributors to pollution in Pakistan are petrochemicals, paper and pulp, food processing, tanneries, refineries, textile and sugar industries. This pollution has become threat to environment and health of people.

There are many effects of water pollution. Pollution can destroy aquatic plant life. Loss of this plant life results in a diminished food supply for natural inhabitants. This is known as loss of habitat. The delicate balance of the food chain upsets not only native inhabitants but also their predators called vanishing wildlife.

"Pollution causes deteriorated water quality. This deteriorated water quality limits available water supply or makes it necessary to filter and clean the water. Poor water quality is a health hazard and can cause illness, disease, mutation and in some cases death. Many disease-causing organisms that are present in small numbers in most natural waters are considered pollutants when found in drinking water. These parasites can cause illness".

(Roberts, S., 1992; 16)

Pollution has also an economic impact that has caused bans on fishing in many areas.

"This cause a loss of jobs and on a large scale has ruined certain industries. Fishing bans reduce the edible fish supply making some unavailable or most costly. Efforts to reduce or reverse water pollution have cost money in taxes or in increased costs passed on to consumers. Pollution can have a negative impact on recreation. Pollution problems have resulted in close beaches and swimming bans. Pollution has compromised land values. A reduced water supply can also jeopardize agriculture which is highly water intensive to produce".

(Burnett, Sir; 1990; 181)

There is another classification of water pollution resources. The sources of water pollution are classified into two types: Point sources pollution and non-point sources pollution.

A point source of pollution is one that discharged its pollution at some identifiable point. Hence the term point sources. These would include the hot water discharge from a power plant or the dumping of wastes from a factory because these sources are at specific places and easily identifiable.

A non-point source of pollution is one that cannot be traced to any one point of discharge. This includes pollutants like polluted water runoff, livestock feedlots, home lawns and septic tanks. So, as a leaking oil-rig would be a point source of pollution and can be more easily regulated, the oil dripping from massive amounts of automobiles, would not be as easily regulated and maintained.

"Point source pollution is discharged into the environment through pipes, sewers, or ditches from specific sites such as factories or sewage treatment plants. Non-point source pollution is caused by land pollutants that enter bodies of water over large areas rather than at a single point. It includes agricultural runoff, mining wastes, urban wastes and construction sediment. Soil erosion is a major source of non-point source pollution".

(WHO; 1998; 116)

1.3 Objectives

Formations of objectives for a research study are the sole responsibility of the investigator to keep his/her line of direction towards achieving the goals rather to concentrate on non-issues. The following objectives were framed by the researcher for his research study:

1. To study the impacts of industrial waste water on the health of native people.
2. To study the ill effect of waste water on agriculture land.
3. To know local cultural conception about health.
4. To know about methods to control the ill effects of waste water pollution.

1.4 Hypothesis

The hypothesis of the study was to identify the Industrial waste water is the major factor of diseases in human being.

1.5 Significance of the study

The current research on "Impact of industrial waste water on environment and human health" was conducted to explore the impact of Industrial waste water as the major factor of diseases among human being. All the facts collected about the socio-economic and political organization of the village were of immense significance for anthropologist, sociologist and other social workers for the better understanding of Punjabi village culture. The study also provided facts about what was the reaction of villagers against polluted drinking water. The study was a deep insight into the Punjabi culture and particularly water and pollution issue.

Study about industrial waste water impacts on the health of villagers was very important due to its influence of environmental change.

If there was any development launched in future by the government or by the NGO's, the data included in the thesis will be proved helpful in the better understanding of the problems, needs and welfare of the people.

1.6 Methodology

The research designed for the current study is cross sectional analysis which involves a cross section of my target population for the study of industrial waste water and its impact on environment and health. The researcher used particular tools and techniques to get reliable and qualitative data. Methodology involves the selection of particular techniques and relating the data with these methods and techniques. As it is described by Pelto & Pelto:

> *"Methodology denotes "the logic in use" involved in selecting particular observation techniques, assessing their yields of data and relating these data to theoretical propositions."*
>
> (Pelto & Pelto 1978:3)

There were different methods to be used for data collection in the field of research, but some of the important tools were use by the researcher for the collection authentic, reliable, quantitative and qualitative data:

- **Rapport building**
- **Participant observation**
- **Key informant**
- **In-depth individual interviews**
- **Focus group Interviews**
- **Stratified Sampling**
- **Snowball Sampling**

- **Purposive or Judgmental Sampling**
- **Photography and Recordings**
- **Questionnaire**
- **Case study**
- **Daily diary**

1.6.1 Rapport building

Rapport building is the first step in anthropological research through which the researcher establishes his relation with the community under investigation as stated by W. Lawrence Neuman:

> *"A field researcher builds rapport by getting along with members in the field. He or she forges a friendly relationship, shares the same language, and laughs and cries with members. This is a step toward obtaining an understanding of members and moving beyond understanding to empathy that is seeing and feeling events from another's perspective."*

A person who has knowledge about a particular community is key called informant. The main purpose of rapport building was to create relations with the native people because without their help the research objects cannot be achieved until the friendly relations are built among the researcher and the people, therefore the rapport establishment was the first step after entering into the locale of study.

The rapport building was not a easy task, it was accomplished with utmost efforts with the help of few know persons who introduced the researcher as a highly qualified person and explained the research motives, while the researcher to become familiar among the local people participated in their day-to-day activities and specially arranged ceremonies like marriage, birthday and death rituals.

The first anthropological technique employed was to take the people in confidence and develop friendly relations with them. In the beginning people hesitated to give answers of the questions. But later on the problem was solved through informal discussions, while the social

economic and census survey technique helped in gaining people's confidence and raising their comfort level. Report establishment was easier with females than male but overall it was a good job.

Rapport establishment is very important in anthropological research because this method provides key to use other method such as interview and it also provides chances to get the indispensable ideas of the natives. Rapport establishment is also compulsory for the utilization of participant observation.

H. Russell says

"It (Participant observation) involves establishing rapport in a community."

Being the native of the area, it was also difficult for the researcher to immediately built a friendly rapport with natives of the village, as the local people were not in habit of describing their internal matters to the unknown people. The goal of rapport building was achieved through some known persons and with the help of key informants by explaining the reason of his stay in the village and the nature of study the researcher intended to carry out with their participation. The researcher also took part in their social and religious rituals and adopted their dress pattern, while the language was the same at both ends.

1.6.2 Participant observation

The participant observation being an important technique of research had been used by the anthropologists for perusing their research studies in varied situations and in diverse areas for closed interlinks with the inhabitants of the community for congregation of authentic and quantitative data pertinent to their research topics.

Participant observation has been defined by W. Lawrence Neuman:

> *"A great deal of what researchers do in the field is to pay close attention, watch, and listen carefully. They use all the senses, noticing what is seen, heard, smelled, tasted, or touched the researcher became an instrument that absorbs all sources of information."*

Through the technique of participant observation, the researcher immersed herself in the society and observed the activities and cultural obligations of the local people by staying in the locale of study for a reasonable time. The main purpose of participant observation was to monitor the day-to-day activities, their social and religious ceremonies and marriage and death rituals, celebrations child births along with many other aspects of their life.

As D. Bailey argued:

> *"Participant observer is a regular participant in the activities being observed, and his or her dual role is generally not known to the other participant/"*
>
> (Kenneth D. 1978 p.215)

According to the method, an individual researcher learns the language of that particular community and he or she follows the daily routine of the people of community as the method is basically to observe the community and its people.

The method was adopted by the researcher to observer the problems of the people of *Awan Wala* by drinking polluted water by staying in the village for 4 months with the respondents that gave him firsthand knowledge about the problems associated with the polluted water, its causes and remedies that were adopted by the natives or given by at the government level. The researcher also explored the behavior of the people towards the inadequate facilities provided by the government and especially the lack of clean drinking water for which many of the families suffered from many dieses.

The participant observation was a very important and a primary technique for the collection of the data. It was the hallmark of the anthropological research. Field work was done in Awan Wala village in Tehsil & District Faisalabad. The participant observation was a way to apply other techniques smoothly and to cross check the data gathered through other techniques.
As a participant observer, the researcher observed the daily routine of the people, he woke up early in the morning; offered prayer, used the same language as that of the natives, and wore the same dress as that of the villagers but it took reasonable time to perform such actions.
As Malinowski states:

"The anthropological field worker, Malinowski stressed, should totally universe himself in the lives of people; and that can only be done through month of residence in the local community. Whenever possible the fieldworker should master the language of the people, through much of the behavior available for observation is non verbal."

(Pelto & Pelto 1978: 68)

The researcher used to go with the *panch* of the village to collect information about *biradari* and marriage pattern and many other rituals and ceremonies practiced in the village. He also used to go to mosque, market and in the fields in order to study the community's actual ways of livings and their social behavior. He tried his best to become familiar among the people in all aspects by following their food pattern, dress pattern, daily routine and sports etc. In a few days, through general talks, he established good relation with the community influential members and especially with the *Lumberdar* of the village.

1.6.3 Key informants

The selection of Key informant is an important and chief source of collecting data about the community by talking to the selected participants and being an important methodology it has been widely used by the anthropologists in their researches. The key informant interviewing is connected with exacting conditions of social research, one can with assurance predict its widespread use in the unstructured situations.

Key informants play a role of intermediary who introduced the researcher to the people of the community. It is vital to explain the objectives of the study to key informant so that he should understand the significance of the research. Key informant is a person who has information about the particular community, culture, and socio economic and political life. According to Bernard key informant is:

"More then someone who controls a lot of information about a culture and willing to talk to you"

(Bernard 1988 p.44)

It is important for the investigator that the selection of key informants should be without any favoritism; however credible persons should be considered, especially their recognition in the community and considerate with the investigator.

The uniqueness of the key informants has been explained by W. Lawrence Neumann:

> *"An informant or key factor in field research is a member with whom a field researcher develops a relationship and who tells about, or informs on, the field"*
>
> (W. Lawrence Neuman p. 410)

Usually an anthropologist chose a limited number of key informants from among the population who help the researcher about the culture of that particular community. Key informant has the qualities of being knowledgably and has good vocabulary and always willing to inform the researcher about the happenings and other issues important for the researcher.

Key informants proved to be a valuable source of data. Key informants play a role of bridge between researcher and respondents. Key informants are the persons who are capable of verbally expressing cultural information. Key informants are those individuals of the community under study who provide the investigation with detailed knowledge and information.

Through a tiresome exercise, finally the researcher selected 5 key informants very carefully because the reliability of research data was dependent to a large extent on them. The selected key informants had extensive vocabulary, a lot of information about their culture and even knowledge about general activities, local terminology expert and had the potential to express verbally and willing to give information about their culture.

Pelto & Pelto said:

> *"Most important, we notice that humans differ in their willingness as well as their capabilities for verbally expressing cultural information".*
>
> (Pelto & Pelto 1978: 72)

1.6.4 In-depth individual interviews

In depth interview as a way to get detailed information about respondents' point of views with reference to research topic, instead of generalizing was used in the study. During the conversation with people, a clear road map regarding objectives of research was kept in mind by the researcher. The interviews were started by introducing the topic and purpose of study later on a number of questions were asked to get relevant data from the respondents. A cross questioning technique also adopted for conducting the interviews and 25 persons were interviewed by the researcher.

The researcher also used the interview guide consisted of a list of questions covering the research objectives; the questions were of open ended nature and were easy to understand.

According to Goode and Hatt (1952):

> *"Interview guide uses a great proportion of unstructured or open ended questions so it allows a wide variety of responses."*

As the topic was multidimensional in nature and has couple of factors responsible for water pollution and as a result numerous ailments were faced by the people. The tool helped the researcher a lot to involve respondents in the process of interviews for grasping more information by asking extra relevant question beside the interview guide.

For the better outcome, structured and unstructured interviews were conducted and the respondents from different strata was included having different biradaries, occupations, age groups and education backgrounds. Through in-depth interviews with twenty five persons a handful of data was obtained.

1.6.5 Focus group discussion

The researcher conducted focus group discussion just to sit with the respondents for knowing their perceptions and experience about the people, community, their ailments and their cure that were the reason of drinking polluted water and its related aspects that impacted on the social and culture life. Through the focus groups discussions, very authentic data was collected by the researcher. Although it was very difficult to manage focus group discussions because of the availability o the respondents and other people who were included in the list, but as the

matter of urgent nature and took lot of time but researcher managed to conduct three focus group discussion at different *Deras* and *Bethaks* at the village.

1.6.7 Stratified sampling

For an ethnographical research, a single researcher has to study a village or community so it was very difficult for the researcher to observe and interview all the community members. After getting basic information about the village from key informants, interviewing and census forms, a sample was drawn from among the people of the village for helping the researcher.

Five strata's were selected on the base of *biraderi*, *patti*, age group, education and occupation and five persons from each stratum were engaged for the interviews. So, twenty five people were taken as stratified sample by giving same proportions.

According to Bernard:

> *"That way, the strata are represented in the sample as they are in the population under study. Stratifying a population is very attractive because the item in each sub frame is more like each other than they are like the items in other sub frames".*
>
> (Bernard 1994: 85)

1.6.8 Snow Ball sampling

The researcher used snowball sampling in the start of the research because snowball sampling was an effective way to build an exhausted sampling frame. First of all the researcher met with Haq Nawaz who was the cousin of Mushtaq Ahmad, *Lumberdar* of the village who helped him to select the proper sample size.

1.6.9 Purposive and judgmental sampling

The method of snowball sampling was practiced by the researcher because Haq Nawaz identified the people who were well aware of the research and its criterion, thus the sample was completely gathered and researcher started his research work.

1.6.10 Photography

The technique of photography was used by the researcher during the entire spell of his research work in the village Awan Wala and the visual data of different sites of the area was taken which helped a lot in documentation of thesis. Also some empirical information about

different sites and events such as interviewing sites, sports grounds and livestock farms was taken to make the research more authentic. The visual data also supported the data that was collected in the field and made it more qualitative, authentic and valuable.

1.6.11 Socio-economic survey

The statistical information was collected by applying a sociological method of data collection socio-economic census survey for collecting the basic demographic and socio-economic information of the people by filling the census forms by the selected sample size with the personal involvement of the researcher at their door steps, the forms were designed and formulated well before conducting the survey consisted of basis information about the respondent's family structure, caste, income, occupation, household structure, education level, marital status, marriage pattern, earnings etc.

1.6.12 Case study

Case study as a systematic inquiry of the issue was used to get detailed information about the views of respondents relating to the objectives of the research, while the method was a face to face interaction of researcher with a knowledgeable and experienced respondent who willing opted to share his views.

According to Pelto and Pelto:

> *"In brief the case study allows an investigation to retain holistic and meaningful characteristics of real life events".*

Through the case study method, a detailed history of the person is achieved by asking various questions and verifying the information by cross-questioning to get a reliable data.
The case study technique was used by the researcher to record related events experienced by a responsible person to have more details of the topic under study.

1.6.13 Daily diary and field notes

Writing diary is simple and effective in which one record the experiences and facts daily found in the field, it was a memorable and quite helpful when analyzing data. The technique was applied by the researcher to his research initiatives to record important events relevant to the field after returning from fieldwork.

The method of field notes was also used during the field study to record immediate nature of events, discussions, names of the persons and places etc. that were later on transferred to the daily diary in the evening to make them the permanent part of the research data.

1.7 Locale

The researcher conducted his fieldwork in the village Awan Wala, Chak No. 238 R.B, Tehsil & District Faisalabad.

The village was selected as locale of study because industrial waste water has affected to ground water, underground water and soil of this village. Drinking water in the village was impure. Soil of the village was destroyed by waste water. Land of the village was imperfect for cash crops. The village was situated 10 kilometers away from city Faisalabad. Market was at Adda Khanu-ana which was 2 kilometers away from the village. The village was of special importance due to sports and Darbar Baba Makhan Shah Bukhari. People used to come at Darbar from other places daily and especially on Thursday and Friday. Occupations of the people were daily wage labor, jobs in private and government sector, agriculture farming etc. Land was irrigated through tube wells and canal water. People of the village belonged to middle and lower middle and lower class.

CHAPTER # 2

Area Profile

2.0 Introduction

The village AwanWala, was the locale of study that was located 10 kilometers away from city Faisalabad. Market was at Adda Khanu-ana about 2 kilometers away from the village. The village has a special importance due to sports and also due to Darbar of Baba Makhan Shah Bukhari. People were frequently visiting the shrine daily from the village and from other parts of the country, while Thursday and Friday were the special days. Occupations of the people were daily wage labor, jobs in private and government sector, agriculture farming etc. Land was irrigated through tube wells and canal water. People of the village belong to middle and lower middle and lower class.

2.1 Area profile

The city of Faisalabad had a vast of desert lying between Chenab and Ravi that was brought under plough. In the last decade of nineteenth century with digging the lower Chenab canal. It becomes possible to irrigate the waterless waste. In 1904, a new district named Lyallpur (now Faisalabad) was created after sir James Lyell Governor of Punjab. District Lyallpur was renamed again as Faisalabad after the name of late king Shah Faisal of Saudi Arabia. It has the area of 88 kilometer square kilometer with a big clock tower in center of the city. Its main eight bazaars taken off from the clock tower built by Queen Elizabeth in British colonize period. Faisalabad was famous for its textile industries and Agriculture University. The Faisalabad was also called the Manchester of Pakistan.

2.2 History of Faisalabad

Faisalabad was once part of ancient district of Jhang and Sandalbar, its 50 square kilometres (19 sq mi) part mainly consisted of thick forests and wild tribes. The tract from Shahdara to Shorekot, Sangla Hill to Toba Tek Singh, was traditionally called Sandalbar. In 1880, a colonial officer called Captain Poham Young proposed a new town, with a design based on the Union Jack, with eight roads radiating from a large clock tower in the centre. The eight roads developed into eight separate bazaars. The construction of various artificial canals allowed the surrounding areas to be irrigated. After the founding of the town, there was rapid growth as people were invited with promises of land. In 1895, the rail link between Wazirabad and Lyallpur was completed.

In 1896, Lyallpur was given the status of a tehsil of the Jhang District and its administration was carried on in tents on the old Theh (Mound) of Pucca Mari near Tariqabad. The majestic Clock Tower was constructed out of the funds raised by the Sikh land owners, who collected it at a rate of Rs. 18 per square of land. The fund thus raised was handed over to the Town Committee which undertook to complete the project. Pakistan Railways, Locomotive parked at Lyallpur Railway Station c. 1949 by 1902, the population of the town had exceeded 4,000. A considerable number of houses and shops had been constructed to cater the ordinary needs of the population. In 1903, a decision to have an agricultural college was made.

In 1904, the new district of Lyallpur was constituted composed of the tehsils of Lyallpur, Samundri and Toba Tek Singh with a sub-tehsil at Jaranwala which later became a full tehsil. By 1906, the district headquarters began to function in Lyallpur and all the bazaars and settlements within the bounds of a ring road were nearing completion. The city began to spread outside the circular road. The Town Committee was upgraded to a Municipal Committee in 1909 and the Deputy Commissioner was appointed as the first chairman. In 1916, the grain market saw its shops surging with customers. In the same year the civil hospital was expanded.

With the advent of World War II, there was an increase in political awareness across the city. Revolutionary meetings were held, fiery speeches were made, and slogans were written on walls. The prestigious Chenab Club, a social club built during the reign of the British Empire In 1943, Mohammed Ali Jinnah came to Lyallpur and addressed a gathering of over 2 million in Dhobi Ghat Grounds.

On March 3, 1947, when the creation of Pakistan was approved, the Muslims of Lyallpur held special prayers and distributed sweets and food among the poor. After independence, the city of Lyallpur enjoyed considerable development, and became a major commercial and industrial centre. The population grew quickly past one million. There was an expansion of the provision of health and education in the city. In 1977, the name of the city was changed to "Faisalabad", in honour of the late King Faisal of Saudi Arabia, who was held in high regard in Pakistan. In 1985, the district was upgraded to a division with the new districts of Faisalabad, Jhang and Toba Tek Singh.

2.2.1 Boundaries

Faisalabad was bounded on the north by Jhung, Hafizabad and Sheikhupura districts, on the east by Sheikhupura, Okara and Sahiwal districs, on the south by Sahiwal and Toba Tek Singh and Jhang districts and on the west by Toba Tek Singh and Khung districts. The district has an area of 1443,703 acres or 5,856 square kilometers.

2.2.2 Physical features

The district was a flat alluvial plain formed by Chenab and Ravi rivers. The river Ravi flows along the southern boundary of the district. The land close to the river was relatively lower than that away from the river towards west. The area was exceptionally favorable for irrigation. There was no interruption in the monitory of the plain and there was only a fall of some 38 meters from the northeast to the south-west of the district. The general elevation of the land was about 150 meters above the sea level.

2.2.3 Divisions of Faisalabad

Faisalabad Sadr;

Chak Jhumra;

Jaranwala;

Samundri;

Tandlianwala;

2.2.4 Towns of Faisalabad

In 2005, Faisalabad was reorganized as a City-District composed of eight autonomous towns:

Lyallpur Town

Madina Town

Jinnah Town

Iqbal Town

Chak Jhumra Town

Jaranwala Town

Samundri Town

Tandlian wala Town

2.2.5 Population

The fact of the emergence of Faisalabad as a major Agriculture-cum-Industrial center was reflected by the phenomenal increase in the city's population. From a population of 69,930 in the year 1941, it suddenly shot up to a figure of 179,000 in the year 1951, an increase of 152.2 percent and the population rose to a future figure of 425,248 in the year 1961, an increase of 137.4 percent. In that manner Faisalabad created a record in the demographic history of Pakistan by registering an overall population increase of 508.1 percent between the year 1941 to 1961, a record un-paralleled by even the largest city in Pakistan today, namely Karachi which recorded an overall increase of 338.8 percent in two decades between 1941 and 1961.

2.2.6 Flora and Fauna

A diversity of crops was grown in the area consisting of wheat, cotton, rice charri, sugar cane , maize, jawar, bajra, vegetables etc. In the village people do own very small tracts of land at an average of eight to ten acres, they were not the big landlords but the land was serving only their domestic purposes. Wheat and sometimes vegetables were the cash crops of the village. People worked very hard on wheat more than all other crops. Some vegetables were also grown like garlic, potato, cabbage etc. Fodder was also grown for domesticated animals and it also work

as a cash crop sometimes. Apart from major crops, flora and fauna of the village has a different kind of importance in rural life. “Swanjana”, peepal, beri, sheesham, sufaida, guava trees and keekar and vanh were common in the village. Buffaloes, cows, goats, horses were the animals of necessity of the village, people usually domesticate animals for domestic needs and to earn their living through pairs of bulls, donkeys etc.

2.2.7 Climate

In the village, there were four seasons, summer and winter are two long seasons and spring and autumn were two short seasons. Summer and winter were both intense in their effects. Sever cold in winter (October to March) and extremely hot in summer (May to September), the spring season arrived for short period of time and was very pleasant.

There were sufficient rainfalls in rainy season from July to September. June, July and August were the months of extreme hot when high temperatures were recorded. Dust storms blow up mostly in June and July. They were very speedy storms. Sometimes when blow up, trees were uprooted and thatched roofs of houses were thrown away.

2.2.8 Population

In the city of Faisalabad a census was carried in March, 1981 which showed the population of Faisalabad city as 1,092,000, which indicates that growth rate of Faisalabad city was only 3.37 percent per annum. In April 1981, another survey was carried out again which recorded the population to 1, 232,000 which made the growth rate approximately 4.6%. Given the growth rate the population at the end of 1981 was estimated to be 1,240,000 and total population was 2008861 in 1998. It has 289 union councils where population was 5.14 million.

(www.faisalabad.govt.pk.)

2.2.9 Sports

Cricket was the most popular sport in the city that was played pretty much anywhere a city dweller will find a large piece of land known as ground**.** Night time cricket could be seen at weekends when people played in night on less traversed city streets, the oldest and only venue for international cricket matches within the city was Iqbal Stadium by th**e** Faisalabad Wolves and local teams.

The city also has facilities for hockey; the Faisalabad Hockey Stadium was located on Susan Road and mostly hosts field hockey matches of national and international matches.

Other popular sports of the city were weightlifting, football, Kabaddi**,** table tennis**,** billiards, snooker**,** squash and horse racing**.** Sports like badminton**,** volleyball and basketball were also played but rarely.

2.2.10 Education

The literacy rate of the village was average, while the ratio of female education was high because the village was near the city where several institutions of higher education and several research centers were available including a few listed below:

University of Agriculture, Faisalabad

Institute of Cast and Management Accountants

Institute of Chartered Accountants

Government College University, Faisalabad

National Textile University

University of Faisalabad

Government College of Technology

Preston University

Punjab Medical College

Punjab Group Of colleges

Shiblee College

IMIT

Government Science College

Government Samman abad College

Government Municipal Degree College

Islamia College

Madina Town College for Women

Becon house School

LGS

Lahore Lyceum

Faisalabad Grammar School

Little Angles

Lassalle

DPS

2.2.11 Transport

Faisalabad International Airport was approximately 10 kilometers from the city centre, and was a major transit point for exporting goods to other parts of Pakistan and abroad. The main railway station was built in the nineteenth century by the British Empire, through which the city was connected to all parts of Pakistan including Karachi, Lahore, Rawalpindi, Islamabad, Quetta, and Peshawar.

There were many roads in Faisalabad which connected the city with many other localities as well as neighboring towns and villages. The National Highway Authority has reconstructed and improved the standards of roads. There was also a public bus network as well as private coaches within the city and many privately operated auto-rickshaws and taxis to get around the city. Rental cars were also available from many areas of the city. The Daewoo Express, Bilal Daewoo, Sky ways and Sky ways Daewoo, Kainat travel, Ravi Express, Kohistan Coaches, and Niazi Coach were some of the well-known services.

2.2.12 Media

The Daily Express was the only national newspaper published from Faisalabad. There were also other popular Urdu Faisalabadi newspapers including Daily Gareeb**,** Daily Shelter**,**

Daily Awam**,** Daily Aman**,** Daily Tajarti Rahber**,** Daily Paygaam**,** Daily Business Report**,** Daily Report and the Daily Surrat-E-Haal**.**

Cinemas were in number in the city, but most were closed due to lack of public interest for having household based entertainment facilities like TV, DVD and cable connections. Punjabi stage dramas were popular among the people of Faisalabad.

The radio broadcast was frequent through a number of private and government-owned FM channels such as Radio Pakistan**,** Mast FM103**,** FM 90**,** FM 101 and Dawn Media Group; City FM 89**.**

State-owned Pakistan Television **(**PTV**)** transmitted five terrestrial and cable television channels, while a number of private television channels had their offices in Faisalabad including Expres News**,** Geo TV, Apna Channel and Punjab TV.

2.2.13 Shrine

There was a shrine of Baba Makhan Shah situated out of the village. Shrine is very famous in this area. People come to shrine for different purposes. Urs (annual celebration) of Hazrat Baba Makhan Shah was celebrated every year on 3rd and 4th of January. Many game competitions were held on the eve of Urs for two days. People mostly visited the shrine on Thursday and Friday. People of this village also believed in superstitions.

2.2.14 Social organization

There weree 8 castes in the village, those were Luna, Awan, Cheema, Arain Kumhar(Bhatti) , Maachhi, Musalli(Malik), Mochi(Cobbler), Nai(Barbar). The main and dominating caste group was Luna Biradri ties were very important and helped them to be stable and solid against all the external influences and challenges. Cast hierarchy of the village was according to their dominance in economics, religion, politics and social activities.

2.2.15 Language

The language spoken in the village was Punjabi, while the educated people of the village could speak good Urdu but not spoken frequently because they were used to talk in their own language.

2.2.16 Food pattern

People of the village were used to eat three times a day. Staple food of the people was roti made of wheat which was eaten with salun (curry of vegetables and meat) Meat, beef and chicken were used occasionally, especially on festivals. Green pot herbs, vegetables, salad and pulses were commonly cooked. These people were very fond of rice pulao, and used fruit. Sugar was used mainly in the village along with Gur and shakkar. Lassi and milk were the popular drinks, while the trend of taking tea was also there, while the eggs were used frequently.

There was a tradition of distributing cooked food in neighbors and relatives on special occasions like Eid, wedding, birth rituals and Islamic festivals. On the wedding ceremony, an elaborated feast was served to guest who usually comprised of cooked rice, meat dish and some sweet dishes. The menu varied according to the socio-economic status of the family.

2.2.17 Dress pattern

Dress was a very important feature of the culture in the village. Males of the village used to wear kameez shalwar, while the elder people wore tehbend, kurta and pagri. Females used kameez shalwar and majhli. Woolen chadar and dopatta were also used. On festivals and marriages, new dresses were used. Females also used ear rings and bracelets on different festivals and occasions of happiness. Color of the dress varied with the age factor and gender. Men wear light colors as women used dark colors of their dress. Women who were above 30 years also done make up but not daily, rather lived very simple life. But girls who were students do make up daily. Purdah among the women of Luna biradri was also observed. In the marriage and on other festivals women done make up and do use jewelry. Trouser shirt was common in youngster of the village.

2.2.18 Settlement pattern

Like the traditional living in cities and towns of Punjab, variety of settlement pattern was found in thw village also. Variety was due to the difference of socio-economic status of the people living in the village. The people who have high status owned pakka houses whereas other

has semi-pakka houses and some of people have purely kacha houses according to the socio-economic status.

2.2.19 Family size

Family was the basic unite of social organization in the village Awan Wala where minimum size of the family was 2 and maximum 30, but an average family size in the village was of 12 family members. In the past joint family pattern was high but nuclear family type was more than in the past. The ratio was increasing day by day. Due to social change, family type was changing from joint to nuclear due to certain factors.

2.2.20 Birth

At the birth of a child, weather boy or girl, rejoicing taken place in the family. The elder male member of the family or Imam of mosque was called to call Banng (Azaan) in the ears of the infant and when a baby was, that was the occasion of congratulations and celebration, sons were preferred rather than daughters because the family land passed down through the male line descent and the political stratagem of the family depends upon its men.

The ritual was performed for the male child to save him from Nazar and evil spirits, for that purpose, they were hanging the branches of Shirin (a tree) on the door of the house that implied that men and women were required to knock before they enter the house. The first food given to the newborn was called Ghutti.

2.2.21 Marriage

Marriage was another institution of social organization of the village as it was the union of a male and a female for a legal relationship approved by the community. Through the marriage, generation continued. In the village, both exogamous as well as endogamous marriages were practiced but inter cast and biradari marriages were predominant. There were rare cases of exogamous marriages. The average age of marriages was twenty years as determined through the census forms and questionnaire data. The marriages were arranged usually by the parents and elders as told by the respondents as the marriages were the family decisions, while some cases in which informants decided their marriage partner at their own discretion despite the resistance of their families.

2.2.21.1 Marriage ceremonies

The marriage ceremonies were observed in the same manner as observed in other Punjabi villages but with some inclusion and exclusion, especially Jahez (dowry) and gift giving. As told by the respondents, the engaged couple never come across before their marriage as there was a sense of Haya (modesty) among the people but with the changing social pattern, the young educated generation establish contacts with each other after the engagement with the influence of electronic media and mobile phones that destroyed the indigenous culture of the village and brought new trends which were considered as Behayaee. With the slight variations, the marriage ceremonies in the village were:

- Mangni (Engagement);
- Din bnana (Gadhhin pana) (Fixing of marriage date);
- Wara sui/warri (3 days before marriage, gifts are given to girl's family);
- Gharoli bharna (any cousin or brother-in-law performed the ritual by taking water from a tape of any house along with the males and females and drum beating);
- Kharay Charhana (Ceremony of taking a bath in front of all);
- Baraat (Ceremony of going to bride's family with drum beating along with friends and family members);
- Waleema (Feast given to friends and family members);
- Neondra (Money taken on the day of Waleema feast).

2.2.22 Kinship

> *"Kinship is the core of social organization. In every community ties by "blood" (biological descent) and by marriage tend to be the basis for building the more intimate and essential social relations".*
>
> (Keesing 1958, 171).

Kinship was the major factor in organizing group activities in the village Awan Wala because in all the group activities, like birth ceremonies, marriage ceremonies, death rituals, and

disputes, the kinsmen participated in the activities. Blood relatives were more strong and important in the village. Local kinship terminology table is given as follows:

Table: Local Kinship terminology

English Term	Local Term	English Term	Local Term
Father (F)	Abba, peyo	Mother (M)	Amma, Ammi
Brother (B)	Bhira, Bhai	Sister (Z)	Bhain
Son (S)	Puttr	Daughter (D)	Dhi
BW	Bhabhi	FF	Dada
FM	Dadi	MF	Nana
MM	Nani	FB (Elder)	Taya
FBW (Elder)	Tai	FB (Younger)	Chacha
FBW (Younger)	Chachi	FZ	Phupho, Phuphi
FZH	Phupha	FB	Mama
MBW	Mami	MZ	Masi, Khala
MZH	Khaloo	WF, HF	Saura
WM, HM	Saas	HB (Elder)	Jeth
HBW (younger)	Derani	HS	Nand
WS	Sali	WB	Sala
BS	Bhatriya	BD	Bhatri
ZS	Bhanja, Bhaneya	ZD	Bhanji, Bhaneyee

SS	Potra	SD	Potri
DS	Dohtra	DD	Dohtri
HB (Younger)	Dewar	HBW (Elder)	Jethani

Source: Interview and Informal Discussion

2.2.23 Death rituals

Death is also a transition for human being from living to non-living. Many rituals are associated with death which varies from culture to culture. If any person dies in the community, men and women sit separately in the home of deceased person and mourn his death. Kumhar (Sexton) were informed of the death of the person. Some men and elder women used to go to the near bazaar (market) and take some items such as roses, scent and coffin (cloths for deceased). Kumhar digs graves in the graveyard keeping in mind the size of the body. They do the work without taking any payment from the family of deceased person. Announcement of the death of the person was announced through loudspeakers of the mosque. Hearing the announcement, many of his friends and close relatives used to come to participate in funeral activities.

After the burial, some main sermons were arranged, first on 3rd day called 'Khatm-e-Qul'. Second on 7th day was called 'Saatwan', third on 40th day called 'Chaleeswan or Chehlem', and fourth on every year of the death of the person called 'Salana Khatam'. In all the sermons religious persons were used to recite Holly Quran and Hadith and afterwards, fruit and Chawal (Rice) were distributed among the participants.

2.3 Public spheres and hospitality

In the past, public spheres were very important and many people were used to give time on such places so that they could share their sorrows and happiness with other friends and villagers. Baithak, Dera, Shops, School playgrounds were important public spheres of the village. Elder people gathered at Deras and Baithak and they smoke cigarette and particularly water-pipe Hukka. Shops and School playground were mostly the ideal public spheres for the young generation.

2.4 Families living in the fields

In was observed by the researcher that four families of the village were living outside the main village in the fields by constructing their houses there, where they were comfortable than other people of the village due to the greenery and open air. They have a tube well near their houses for drinking water and irrigation.

2.5 Religion

The religion of the people of the village was Islam and belonged to both Sunni and Shia sect, while some of the families were of Deobandi sect. There were two mosques in the village, one was "Jamia Masjid" where Friday prayer was offered and religious education was given to the children, especially the recitation of the Holy Quran in the morning as well as in the evening. There was a shrine of Baba Makhan Shah situated out of the village. Urs (annual celebration) of Hazrat Baba Makhan Shah was celebrated every year on 3rd and 4th of January. Many game competitions were held on the eve of Urs for two days. People mostly visited the shrine on Thursday and Friday. People of this village also believed in superstitions. There was a graveyard, between the village and Darbar; people buried their dead ones and offered funeral prayer at "Janaza Gah" (place where funeral prayer is offered) which along with Graveyard.

2.6 Medical facilities

There were five Hakeems in the village, people were getting medicine from those Hakeems in normal situation but in emergency and serious cases, people used to go to in city hospitals. There was also a dispensary in the village but its condition was very poor as the government was not taking progressive steps and caring about the health of the people of the area. In the city, there were many hospitals both private and governmental. Private clinics were more famous for their treatment and dealing with patients.

2.7 Educational facilities

The educational system of "Awan Wala" was somehow good as compared to other villages. There were two government schools in the village, like high school for boys and middle school for girls. There was also one private English medium school for young children's. For further education, the boys and girls used to go to different areas of Faisalabad city. Children also get their religious education from Imams of the mosques who were known as Maulvis. There were also some elder women in village who taught the Holy Quran at their homes.

2.8 Market

In the village, there was a small market available to fulfill the daily needs of villagers. The people belonged to well families used to go to Faisalabad city for shopping. There were some other small shops of cosmetics, medicine and sweets. The local peoples were running all

the shops. Fresh fruits and fresh vegetable were available at the village shops. The shops were in shape of a small market where few shops of barbers, and tea shops were seen by the researcher.

2.9 Water supply

In the village "Awan Wala" many people used sub-soil water of the area with hand-pumps and motor-pumps in their homes. There were also water supply connections provided by the government, but mostly the water was obtained by making boring in the soil.

2.10 Electricity

In the village "Awan Wala" about 98% percent households had electricity connection. For irrigation purpose mostly formers used tube-wells operated by electricity. Electricity brought many comforts in the lives of the villagers. They have improved their standard of living. They have lot of electric appliances like television sets, tape-recorders, decks; video cassette records (VCRs), refrigerators, electric-fans, bulbs/tube lights, motor pumps and computers at their households.

2.11 Sports

There was a playground in the government Boys Primary School chak 238 R.B. Youth was obsessed playing the shooting ball (a game like volleyball). Almost forty to fifty players both young and elders participated in the evening to play game at two different places. The playground was a blessing for the youth in the village because the people were fond of playing games.

2.12 Post office

In the village, there was no proper post office. A postman distributed the mail in the village. He could not distributed the mail properly and delivered the mail to major shops of the village, from where people collected their mail or sometimes shopkeeper goes to near mosque and make an announcement for the recipients to collect mail from his shop than the villagers visited the shop for collecting their mail.

2.13 Telephone

There were many telephone connections provided by Pakistan telecommunications corporation Ltd. (PTCL) to the majority of the households and shops. One small telephone exchange was available at Satiana road approximately 2KM away from the village. There were

number of PCOs available in the main market of the village, while people of the village used to use their cell phones that were available with each and every individual.

2.14 Transport

Transport was freely available which connected the village to city Faisalabad. Rich people have their own cars and motor cycles. The village has good roads, which connected the village with city as well as with other villages. The roads were built by the local government but at night time it was difficult to get any transport.

2.15 Graveyards

There was a graveyard in the village, where most of the graves were made of mud but some of them were cemented and decorated with marble. All Muslim sects were using the graveyard for burial purposes.

2.16 Water filtration project

The project was started in 1997 during the PPP government to provide clean water to the village because the available water at that time was polluted. But after the completion of the project, people used the polluted water for other purposes like bathing, cloth washing. The women and girls were used to fetch drinking water from the hand pumps fixed on the bank of the canal. A canal was passing through the village where hand pumps were fixed. The industrial waste water was diverted to the main along with Satiana Road.

The construction of the water project was completed but it was not made functional for the reasons known to the responsible authorities.

Chapter # 3

3.0 Industries in Faisalabad

Faisalabad was founded in 1890s as a market centre for the newly irrigated lands that surround it. It was the third largest city of Pakistan and second largest in the province with fast growing population. The population Census 1998 recorded its population as 2.01 million with growth rate at 3.58%. Its population is expected to touch 3.0 million in 2015 and will be doubled by 2030.

Faisalabad City has made rapid strides in the field of industry after independence. It was called the "Manchester of Pakistan" for its extensive development of textile industry. Faisalabad played a very important role in the economy of the country. Its growth has been driven by the development of the city's textile industry, which was the second industrial city after Karachi. Major portion of the total exports of Pakistan emanated from Faisalabad.

Before independence, there were only five industrial units in Faisalabad City. Now, there are 1,057 large industrial units out of which 416 are Textile Units. A number of data gathering exercises carried out indicate that the majority of the industry was relating directly to textile production or its service industries which form the backbone of the industrial economy of Faisalabad. Other industries include hosiery, readymade garments, power looms, oil mills, flour mills, sugar mills, engineering units, pharmaceuticals, chemical, soap, etc.

Evidence indicated that industry was scattered throughout Faisalabad reflecting its historic development without clear planning policies for the City. The industries closest to the city centre were mixed with domestic housing and commercial activity whilst more recently, industry has congregated some distance from the centre as was being augmented by purpose built estates.

3.1 Existing situation of industrial waste in Faisalabad

In Faisalabad, the industrial sector produces very little solid industrial waste, the majority of which was reused or recycled. However, it produces a considerable quantity of liquid effluent which was discharged to the drains and then to the river untreated.

The liquid waste produced by the industries was carried by the domestic sewage system and drains operated by WASA in its operational area and by the drains operated by the provincial Irrigation Department. There was virtually no treatment of the effluent; the few treatment plants installed by the factories rarely work because of financial or technical constraints. There was only one sewage treatment plant in the northern part of Faisalabad designed for the treatment of domestic sewage but it treated both domestic and industrial sewage. It treated less than 10% of the combined industrial and domestic sewage of the City. Resultantly the vast majority of industrial effluent was discharged "raw" without any treatment into two main drains that were Paharang drain to the North West and Madhuana drain to the South-East. Paharang drain eventually discharged to the Chenab River and Madhuana Drain to the Ravi River. Both drains were under the control of the Irrigation Department.

The receiving drains were severely depleted of oxygen, devoid of aquatic life and heavily polluted with a range of pollutants including heavy metal.

Without intervention, the existing industrial waste management situation in Faisalabad was likely to deteriorate especially with the introduction of additional and more diversified industries.

The regulatory environment does not encourage resolution of the problems because at least two authorities Water and Sanitation Agency and the Provincial Irrigation Department appeared to share responsibilities over differing geographic areas. The Municipal Services Department of the CDGF and its sub-department i.e. Environment Department also shared some responsibilities. That was also linked with the provincial Environment Protection Agency (EPA). The regularity framework was the not better not encourage in factory treatment and the few attempts of enforcement were often thwarted. None of the departments seems to take responsibility for the quality of waste disposed to the drains. Proper records for the quality and quantity of industrial effluent were not maintained by any of the departments and agencies.

Industrial waste has resulted in a large number of social, environmental and health related issues for the citizens of Faisalabad. There was evidence to indicate that pollutants have entered the ground water and are entering the public water supply either through the public pipe work or directly through private tube wells. The quality of ground water was less polluted near the canal. The waste water was used downstream for irrigation and for fish farming. Bio-accumulation of certain contaminants has been identified in certain crops and in fish.

The water was widely regarded as unfit and those that could not afford to buy bottled water, boiled it themselves or bought privately supplied filtered water. Such options were only available to those that could afford it; the remainder has to use what water they could find/purchase and suffered from the resulting ill health.

3.2 People and Environment

One of the most effective methods for learning about infectious diseases from a global perspective is to examine, the epidemiology and ecology of the diseases that have the greatest impact on people and their physical and social environments. Changes in the ecological environment, such as agricultural development projects, reservoirs and dams, deforestation, floods, droughts, industrialization and other climatic changes, have resulted in the emergence or reemergence of diseases. The significance of environmental factors to the health and well-being of human populations is increasingly apparent. Environment pollution is a worldwide problem and its potential to influence the health of human populations is great. Pollution reaches its most serious proportions in the densely settled urban-industrial centers of the more developed countries. In poor countries of the world more than 80% polluted water have been used for irrigation with only seventy to eighty percent food and living security in industrial urban and semi urban areas. Industry, clustered in urban and semi-urban areas surrounded by densely populated, low-income localities, continues to pollute the environment with impunity. Over the last three decades there has been increasing global concern over the public health impacts attributed to environmental pollution. Human exposure to pollution is believed to be more intense now than at any other time in human existence. Pollution can be made by human activity and by natural forces as well. Selfish private enterprise and their lack of awareness of public well-being and social costs and natural disasters e.g. volcanic ash from Iceland are the one of the main reason of pollution.

At present, the adoption of environmental auditing in any economic sector is voluntary but future legislation could well make it mandatory. There is no doubt that excessive levels of pollution are causing a lot of damage to human & animal health, plants & trees including tropical rainforests, as well as the wider environment.

3.3 Air Pollution

The air we breathe is an essential ingredient for our wellbeing and a healthy life. Unfortunately polluted air is common throughout the world especially in developed

countries from 1960s. South of Poland (Krzeslak & Korytkowski, 1994), Ukraine (Avdeev & Korchagin, 1994), China (Kan, 2009), and Pakistan (Government of Pakistan, 2009; Khan, 2010) even famous crowded cities and countries are facing air pollution. Polluted air contains one, or more, hazardous substance, pollutant, or contaminant that creates a hazard to general health (Health and Energy, 2007). The main pollutants found in the air we breathe include, particulate matter, PAHs, lead, ground-level ozone, heavy metals, sulphur dioxide, benzene, carbon monoxide and nitrogen dioxide (European Public Health Alliance, 2009). Air pollution in cities causes a shorter lifespan for city dwellers (Progressive and related air pollution at high levels pose hazards to human health. According to Mishra (2003) rapid growth in urban population, increasing industrialization, and rising demands for energy and motor vehicles are the worsening air pollution levels. He added other factors, such as poor environmental regulation, less efficient technology of production, congested roads, and age and poor maintenance of vehicles, also add to the problem. He further added that air pollution is caused of ill health tobacco smoke, combustion of solid fuels for cooking, heating, home cleaning agents, insecticides industries, automobiles, power generation, and poor environmental regulation, less efficient technology of production, congested roads, and age and poor maintenance of vehicles. The natural sources include incinerators and waste disposals, forest and agricultural fires (European Public Health Alliance, 2009).

3.4 Water pollution

The water we drink is essential ingredients for our wellbeing and a healthy life. Unfortunately polluted water and air are common throughout the world. The WHO states that one sixth of the world's population; approximately 1.1 billion people do not have access to safe water and 2.4 billion lacked basic sanitation (European Public Health Alliance, 2009). Polluted water consists of Industrial discharged effluents, sewage water, and rain water pollution and polluted by agriculture or households cause damage to human health or the environment. This water pollution affects the health and quality of soils and vegetation. Some water pollution effects are recognized immediately, whereas others don't show up for months or years.

Estimation indicates that more than fifty countries of the world with a n area of twenty million hectares area are treated with polluted or partially treated polluted water including parts of all continent and this poor quality water causes health hazard and death of human being, aquatic life and also disturbs the production of different crops. In fact, the effects of water pollution are said to be the leading cause of death for humans across the globe, moreover, water pollution affects our oceans, lakes, rivers, and drinking water, making it a widespread and global concern.

In present scenario due to industrialization and increased population, the drains of Pakistan carry the industrial and municipal effluents that are ultimately carried that polluted water to the canals and rivers. The untreated industrial and municipal wastes have created multiple environmental hazards for mankind, irrigation, drinking and sustenance of aquatic life. The drainage water contains heavy metals in addition to biological contaminations. This water pollution infected our food in addition to groundwater contamination when used to irrigate crops.

Pakistani cities are facing tribulations of urban congestion, deteriorating air and water quality and waste management while the rural areas are witnessing rapid deforestation, biodiversity and habitat loss, crop failure, desertification, land degradation, clean drinking water, noise pollution, sanitation.

3.5 Land/solid waste pollution

Improper management of solid waste is one of the main causes of environmental pollution. Land pollution is one of the major forms of environmental catastrophe our world is facing today. World Bank (2002) found particulate matter is the most serious pollutant in large cities in South Asia.

3.6 Effects of dying Environment on Human, Animals and Plants

Environment dying is global perilous point which catastrophically the human, animals and plants. Air pollution results are Cancer, neurobehavioral disorders, cardiovascular problems, premature death, asthma, asthma exacerbations, headaches and dizziness, irritation of eyes, nose, mouth and throat, reduced lung functioning, respiratory symptoms, respiratory disease, disruption of endocrine and reproductive and immune systems. London Fog episode of 1952, where a sharp increase in particulate matter air pollution led to increased mortality among infants and older adults. High air pollution levels have been linked to infant mortality. Air pollutants can also indirectly affect human health through acid rain, by polluting drinking water and entering the food chain, and through global warming and associated climate change and sea level rise. According to Gardiner (2006) acid rain destroys fish life in lakes and streams and kill trees, destroy the leaves of plants, can permeate soil by making it inappropriate for reasons of nutrition and habitation, unwarranted ultraviolet radiation through the ozone layer eroded by some air pollutants, may cause skin cancer in wildlife and damage to trees and plants, and Ozone in the lower atmosphere may damage lung tissues of animals and can prevent plant respiration by blocking stomata (openings in leaves) and negatively affecting plants' photosynthesis rates which will stunt plant growth; ozone can also decay plant cells directly by entering stomata.

Polluted drinking water or water polluted by chemicals produced waterborne diseases like, Giardiasis, Amoebiasis, Hookworm, Ascariasis, Typhoid, Liver and kidney damage, Alzheimer's disease, non-Hodgkin's Lymphoma, multiple Scleroris, Hormonal problems that can disorder development and reproductive processes, Cancer, heart

disease, damage to the nervous system, different type of damages on babies in womb, Parkinson's disease, Damage to the DNA and even death, meanwhile, polluted beach water contaminated people like stomach aches, encephalitis, Hepatitis, diarrhea, vomiting, gastroenteritis, respiratory infections, ear ache, pink eye and rashes (Water Pollution Effects, 2006). Loss of wild life is directly related to pollution (Progressive insurance, 2005) and according to Water Pollution Effects (2006) on animals (i) Nutrient polluted water causes eruptions of fish diseases, (ii) Chemical contamination can cause declines in frog biodiversity and tadpole mass (iii) oil pollution can increase susceptibility to disease and affect reproductive processes and negatively affect development of marine organisms and it can also a source of gastrointestinal irritation, damage to the nervous system, liver and kidney damage (iv) Mercury in water can cause reduced reproduction, slower growth and development, abnormal behavior and death (v) Persistent organic pollutants may cause declines, deformities and death of fish life and Fish from polluted water and vegetable/crops produced or washed from polluted water could also make impact on human and animal health. More sodium chloride (ordinary salt) in water may kill animals and plants, plants may be killed by mud from construction sites as well as bits of wood and leaves, clay and other similar materials and plants may be killed by herbicides in water (Kopaska-Merkel, 2000). For tree and plants water pollution may disrupt photosynthesis in aquatic plants and thus affecting ecosystems that depend on these plants (Forestry Nepal, n.d).

Soil Pollution effects causes according to tutor vista (n.d) are cancer including leukaemia and it is danger for young children as it can cause developmental damage to the brain furthermore it illustrated that mercury in soil increases the risk of neuromuscular blockage, causes headaches, kidney failure, depression of the central nervous system, eye irritation and skin rash, nausea and fatigue. Soil pollution closely associated to air and water pollution, so its numerous effects come out as similar as caused by water and air contamination. TNAU Agritech Portal (n.d) soil pollution can alter metabolism of plants' metabolism and reduce crop yields and same process with

microorganisms and arthropods in a given soil environment; this may obliterate some layers of the key food chain, and thus have a negative effect on predator animal class. Small life forms may consume harmful chemicals which may then be passed up the food chain to larger animals; this may lead to increased mortality rates and even animal extinction.

Wastewater use in agriculture and its land application for other purposes is a global practice. Rough estimates indicate that at least 20 million hectares in 50 countries are irrigated with raw or partially treated wastewater. In addition to being a valuable resource as a source of water, the major objective of wastewater reuse has been the effective utilization of its rich stock of nutrients for agricultural and other purposes. The countries in the arid and semi-arid regions are the largest users of wastewater, as water scarcity is a major problem in these regions. With growing water scarcity in other regions, due to increasing population and industrial as well as urban expansion, the production of wastewater and its reuse has grown rapidly. The composition of wastewater has also changed from being predominantly organic (from human wastes) to including more toxic components such as heavy metals, and other chemicals, as industries expand into urban areas.

Wastewater is a complex resource, with both strong positive and negative aspects. To the extent that wastewater and its nutrient contents can be used for crop production and other agricultural enterprises including aquaculture, it can provide significant benefits to the farming communities and society in general. However, wastewater use can also impose negative impacts on the related communities and ecosystems. The widespread use of waste water with more toxic wastes and the lack of adequate finances for treatment is likely to cause an increase in the incidence of wastewater-borne diseases as well as more rapid degradation of the environment.

The biggest challenge faced by policymakers at present, is how best to minimize the negative effects of wastewater use, while at the same time obtain the maximum

benefits from this resource. While most of the impacts of wastewater use, both negative as well as positive, are generally known, a comprehensive valuation of the benefits and costs of these impacts has not been attempted. Conventional cost benefit analysis is not adequate to evaluate wastewater impacts due to the environmental and public good nature of the impacts. The framework provides practical guidelines for monetizing environmental impacts with special reference to wastewater reuse.

3.7 Potential benefits

The potential benefits of wastewater use in agriculture may be summarized as follows:

- Provides a reliable source of water supply to farmers, for crop production;
- Conserves nutrients, thereby reducing the need for artificial fertilizers;
- Increases crop yields and returns from farming;
- Provides source of income through its use in other enterprises such as aquaculture; and
- Is a low-cost method for sanitary disposal of municipal wastewater?

3.8 Potential Costs

Wastewater could also have harmful impacts in agriculture, with potential costs attached to its use. For example, its use in agriculture could:

- Increase exposure of farmers, consumers and neighboring communities to infectious diseases;
- Lead to groundwater contamination;
- Long-term wastewater use can have negative impacts on soil resources- buildup of salts, heavy metals in the soils, which may reduce soil productive capacity in the long run;
- Have negative impacts on property values in the vicinity; and
- Have other negative impacts on socio-ecological systems.

While these are the generally perceived potential benefits and costs of wastewater uses, their magnitude and extent may vary from community to community and from region to region; and depends on a range of factors. These include:

- Volume and source of wastewater (residential, commercial, industrial);
- Composition of wastewater;
- Degree or level of treatment before use;
- Management aspects related to disposal/distribution of wastewater – at secondary level;
- Management aspects, including methods of application, related to farm level use of wastewater – at tertiary level.

The term urban wastewater includes wastewater from all urban sources such as industry, commerce and residence. Impacts of wastewater include impacts on crop production, and on environmental, health, and other socio-ecological systems. The overall aim is to provide a holistic picture of costs and benefits of urban wastewater use in agriculture.

The Faisalabad metropolitan area, which formed as the Faisalabad – Sheikhu pura-Lahore growth corridor has experienced rapid industrial development during the last 2 decades and has emerged as an area of high economic activity and a major growth center in Pakistan. The industrial development has in turn contributed to structural transformation of urban, pre-urban, and rural agricultural industry in the region. More than half the regional population was engaged outside agriculture, with large villages and pre-urban areas experiencing transition from primary agriculture to export based industries. There was also migration from other parts of Pakistan to Faisalabad in search of employment in textile, manufacturing, services and contractual work. People from villages located within a radius of 25 kilometers and merchants from other cities and towns, travel to Faisalabad regularly, for trading.

During the recent past, the regional rural areas have become functionally integrated into the economy of Faisalabad. This structural transformation has changed the face of agriculture in Faisalabad. While sugarcane, wheat, maize, sorghum, fodder crops, vegetables and citrus orchards dominate the regional cropping pattern, high return crops such as soybean and sunflower are gaining rapid popularity among farmers. It is common for the peri-urban farmers to grow seasonal fruits, vegetables, fodder crops and plant nurseries instead of traditional crops to maximize their returns. Canal irrigation remains the major source of water for agricultural production. However, due to the high water requirements for these crops, farmers in this region often augment canal water supplies with municipal wastewater, and in certain systems, municipal wastewater is being used increasingly as the primary source of water. The untreated wastewater is reported to have high concentrations of pathogenic microorganisms and, therefore, poses a greater than normal risk to public health. However, untreated wastewater also has higher concentrations of plant food nutrients as compared to treated wastewater, thus providing an incentive to farmers, in the form of a reduction in fertilizer cost, to use untreated wastewater.

Given the high cost of treatment and the lack of resources for treatment facilities, the municipality also discharges untreated wastewater into the environment thereby incurring hidden environmental costs, which are not accounted for. The municipality is further encouraged to do so, as the stated objective of wastewater management from an agency's budgetary viewpoint, is cost minimization, rather than enhancement of environmental quality. There seems to be a lack of information or awareness of the public health impacts of wastewater irrigation on the part of the farmers and the municipality of the Faisalabad area. For these reasons, the pre-urban areas of Faisalabad appear to be an appropriate choice for applying a framework for assessing and valuing the wider impacts of wastewater irrigation.

3.9 Impacts of wastewater irrigation

This section provides some discussion on possible impacts of wastewater use in agriculture on crop production, public health, soil resources, groundwater, property values, public health, ecology, and social parameters.

3.10 Crop production

The economic impacts of wastewater on crops may differ widely depending upon the degree of treatment, types and nature of crops grown, and the overall farm level water management practices. Normally, as wastewater is a rich source of plant food nutrients, higher than average crop yields may be possible with wastewater irrigation. If crops are under supplied with essential plant food nutrients, wastewater irrigation will act as a supplemental source of fertilizer thus increasing crop yields. However, if plant food nutrients delivered through wastewater irrigation result in an oversupply of nutrients, yields may actually be negatively influenced. Also, since wastewater contains undesirable constituents such as trace elements and heavy metals, organic compounds and salts, crop yields may be negatively affected depending upon their concentrations in the wastewater and the sensitivity of crops to these elements.

Thus from an economic standpoint, wastewater irrigation may have threefold impact on crop production: (1) source of irrigation water; (2) influence on extent of irrigated areas, cropping intensity, crop mix, and on crop yields; and (3) fertilizer application. These aspects have implications for cost of production and overall profitability of crop production.

3.11 Public Health

Wastewater contains pathogenic microorganisms such as bacteria, viruses and parasites, which have the potential to cause diseases in the user communities, consumers, and the neighboring communities. In particular, human parasites such as protozoa and helminthes eggs are of special significance in this regard. The use of untreated wastewater for irrigation poses a risk to human health in all age groups though the degree

of risk may vary among different age groups. Given the prohibitively high costs of the wastewater treatment to zero risk levels, prior to reuse for crop irrigation, treatment to this level may not be justified on economic, social, or political grounds. Nevertheless, valuation of public health risk should be an important decision variable in wastewater irrigation policy analysis.

3.12 Soil Resources

The use of wastewater for irrigation may add nutrients, dissolved solids and other constituents like heavy metals into the soil over time. Some of these elements may accumulate in the root zone with possible harmful impacts on soil. Long-term use of wastewater could result in soil salinity and water-logging. Breakdown of soil structure and overall reduction in productive capacity of soil and lower crop yields. However, the impacts and their intensity will depend on a range of factors including source, intensity of use and composition of wastewater, soil properties and characteristics of plants/crops grown. From an economic viewpoint, soil-related impacts of wastewater can be grouped under (1) potential yield losses; (2) loss of soil productive capacity; (3) depreciation in market value of land; and (4) cost of additional nutrients and soil reclamation measures.

3.13 Groundwater

The use of wastewater has the potential both to recharge groundwater aquifer (positive externality) as well as pollute groundwater resources (negative externality). Percolation of excess nutrients, salts and pathogens through the soil may cause degradation of groundwater. However, the actual impact will depend upon a range of factors including scale of wastewater use, quality of groundwater, depth to water table, soil drainage, and soil characteristics (porous, sandy). In irrigated areas with shallow sweet water tables, impact of wastewater irrigation on groundwater quality is likely to be substantial. However, in places like Faisalabad where the groundwater is brackish in many locations and cannot be used for irrigation or as potable water, the economic significance of pollution may be only marginal in such cases. Hussain and Hanjra (1996) evaluated the impact of industrial wastewater discharges on ground water quality in Faisalabad. The analysis of groundwater samples, collected from hand pumps and wells located within a radius of one kilometer of industrial effluent drainage, show very high concentrations of dissolved salts, trace elements, and heavy metals. A part of this pollution may be attributed to industrial discharges.

Around the globe, a number of studies have attempted to assess the impact of wastewater irrigation on groundwater resources in various regions. Not only do the findings differ from region to region, they are also cite specific. However, the general conclusion is that wastewater irrigation has the potential to adversely affect groundwater resources in the long run.

3.14 Property Values

Wastewater irrigation could also influence property values. One could hypothesize that properties neighboring major wastewater irrigation farms may have groundwater quality lower than the properties located some distance away, which may negatively influence property values. Also, the perceived negative impacts on wastewater irrigated soils, groundwater pollution, and potential for loss of soil productive capacity may adversely affect the property values. On the other hand, one could also argue that given the resource value of wastewater, irrigation with wastewater could lead to appreciation of property values- wastewater irrigated lands in this case. For instance, in Haroon Abad in Pakistan, the wastewater irrigated land has a higher value than the canal irrigated land, and the land rent of wastewater irrigated farms were on average three and a half times higher than those of canal water irrigated lands (Hassan et al. 2001).

3.15 Ecology

When the wastewater irrigation systems drains into small confined lakes and water bodies, the remains of nutrients may cause entrophication, particularly if phosphates in the orthophosphate form are present. Eutrophication causes imbalance in the plant microbiological communities of water bodies. This may in turn affect other higher forms of aquatic life and influence the presence of water birds and reduce biodiversity. In so far as these water bodies serve local communities their needs, the ecological impacts can be translated into economic impacts, which should be included in the analysis. For example, overloading of organic material resulting in decreases in dissolved oxygen may lead to changes in the composition of aquatic life, fish deaths and reduced fishery.

3.16 Social Impacts

In the context of the analysis, we defined social impacts as the concerns/doubts expressed by the public about their perceptions on wastewater irrigation. The general concerns were such as nuisance, poor environmental quality, poor hygiene, odor etc; while the social concerns such as food safety, health and welfare, impaired quality of life, loss of property values, and sustainability of land use. The natural resource concerns such as pollution of vital water resources, loss of fish, wildlife, exotic species, etc.

Public concerns about the perceived or real risks of wastewater irrigation may create business risks, which have to be addressed adequately to avoid exploitation by lobby groups. Business risk and potential liability can be covered, by obtaining appropriate level of insurance. The premium for general risk assurance against wastewater irrigation is likely to be high at the beginning because most developing countries, including Pakistan, do not have experience in agriculture sector insurance. Moreover, premium and indemnity structures are likely to vary significantly among crops and regions. Nevertheless, wastewater risk assurance premium is a cost worth paying to cover agribusiness against potential risk and liability.

Chapter # 4

CULTURAL CONCEPTION ABOUT DISEASES

4.0 Cultural conception

Analyzing the standard of health of a particular culture requires a general definition of cleanliness prevalent in that culture by which people determine their health. The link between health and illness is associated by the factor of hygiene. An attempt will be made to connect the perception of hygiene and its association with germs, and other disease causing organisms and whether these are believed to cause disease, in other words the association of the maintenance of health with that of hygiene will be studied.

Hygiene is one important factor interrelated with water and sanitation. According to Oxford Dictionary:

> *"Hygiene is defined as cleanliness and conditions or practices conducive in maintaining health".*

The role of hygiene in achieving health benefits is of utmost importance both for the children and for adults. Health and cleanliness are the personal responsibilities of every human being. The more a person looks after the healthiness and tidiness of his body the better health he would enjoy and the happier his life will be. Water is the best instrument for this purpose.

4.1 Hygiene in the locality

In village, "Awan Wala", it was observed that hygiene, according to popular believes, it had no footing there. It was observed that to the most of the people hygiene has hardly any concern with the occurrence of disease or ill health. People of the village are not much conscious to maintain hygienic conditions. Thus the combination of insanitation and poor hygiene in this village makes the spread of deadly diseases possible and most frequent. The diseases transmitted by fecal pollution know as fecal oral diseases

may not necessarily be water borne but may be passed on by other routes related to poor hygiene.

4.2 Hygienic Awareness Level

The maintenance of hygiene is a possibility in the case when the general awareness level is higher. This is dependent upon various factors like literacy; standard of living, family size, economic status and social position i.e. intensity of exposure).

The respondents were conscious of hygiene and its significance with regard to health as the area was displayed both verbally and through care in water storage and regular cleaning of the houses if not the complete household, then the bathing and defecating areas and the kitchen. The conditions around the household, such as garbage disposal, ineffective drainage system and the contamination of potable water was the source of polluted environment. The awareness of these problems in this part of the community was also apparent as it was discussed as well as suffering from these diseases themselves or their witnessing it.

4.2.1 Medium Level of Awareness

The people are aware of the hygiene and its consequences but do not practice it. Their mental state can be compared to the culture of poverty, where the people know about the fact that lack of hygiene causes disease but believe it to be out of their control. This state can be contributed to large families, comparatively with poorer standard of living and less education and exposure. Some also believe that disease is a punishment sent by God and is thus inevitable.

4.2.2 Low Level of Awareness

Those with a low level of awareness regarding hygiene can be mainly attributed to illiteracy. Lack of education reveals them to be mostly ignorant regarding hygiene and its contribution to maintenance of health.

Environmental cleanliness is more concerned with the cleanliness of the entire society. The streets are not kept very clean and no regard is shown as far as improper water disposal and garbage disposal are concerned. Drains usually lead into the streets and those built for draining of water are also used for the disposal of bathroom water and kitchen waste.

Although separate water holes have been allocated for the animals, their distant location from the village leads to hesitation and avoidance of the people taking their animals there instead, they are usually kept in close premises of the household which increases the risk of mixing of waters in the transmission of disease.

4.3 Culture and Disease

Disease is an inevitable part of life and coping with disease is a universal aspect of the human experience. All humans, during the course of their lives, harbor infections by disease organisms and suffer the consequences of those infections. The experience of disease, by individuals or whole populations, is as inescapable as death itself. Yet the particular diseases that afflict people as well as the way in which symptoms are interpreted and acted upon, vary greatly from culture to culture. Understanding the nature of interactions between disease and culture can be a productive way of understanding humanity and it is therefore an important topic in medical Anthropology. Because of its bio-cultural, evolutionary, and cross-cultural perspectives, anthropology has much to offer to the understanding of the causes and consequences of disease.

From an anthropological perspective, diseases cannot be explained as purely "things in themselves", they must be analyzed and understood within a human context that is, in relation to ecology and culture.

Culture plays a major role in determining the patterns of disease and death in a population for two reasons;

i) First, culture may shape important behaviors (with respect to diet, activity patterns, water use, sexual practices, etc) that predispose individuals to acquire certain diseases.

ii) Second, through culture, people actively change the nature of their environment, often in ways that affect their health. The archaeological and historical record clearly demonstrates that the environmental changes causes by humans can have profound effects, both positive and negative, on disease rates. Although humans have a dual system of inheritance through both genes and culture.

Culture is the primary mechanism for survival. Culture is a mechanism of adaptation to environmental threats, such as diseases, which act as agents of natural selection in the evaluation of both human biology and culture, cultural practices, however can also be maladaptive when they exacerbate health problems.

4.4 Health

According to the Constitution of World Health Organization and a revision of its definition "Health is a state of complete physical, mental and social well-being and ability to function not merely because of absence of disease or infirmity:

> *"The state of optimum capacity for an individual for effective performance of the roles and tasks for which he has been socialized".*
>
> (Talcott Parsons, 1977)

This is the general and specific definition of health, but it is obvious that health behaviors are adopted by their culture, and every culture is different from the other culture. People perceive the things according to their cultural norms and values.

During the fieldwork, the researcher observed that people mostly ignored the minor illness or troubles. Abdul Razzaq a respondents said;

"Bhai Ji Dukh Te Taklifan Zindagi Da Hisa Hundian Ne Mard De Puter He Bardasht Karde Ne"

People have different views about the health, some say that fatness is a symbol of health, according to others, happiness, no pains and no disease is a health. People consider active man as healthy. According to a respondent Mr. Shahbaz who belonged to a rich family and worked as lecturer in G.C University Faisalabad said:

"*Bimari Ghareeban waste poori zindagi da Rog ban janda Hai".*

In his opinion a man who is economically well-off must be free of all sorts of diseases and troubles because he can afford the expenses.

4.5 Defining Illness

Illness is a phenomenon in which one or more natural functions of the body are so disturbed that the affected individual cannot meet the natural requirements of everyday life. It is a state in which the equilibrium of the body and its functions are disturbed.

The medical definition of illness depends largely upon;

"The objectivity demonstrable physical changes in the body's structure and function which can be qualified by reference to normal physiological measurement"

The definition is very thorough and explanatory but it presents the western concepts of illness as it focuses more on the objectivity of symptoms. The concept of illness does not have one universal definition as it depends upon the individuals of a specific culture, society, social class to categorize what physical condition of the body can be considered as illness.

"By necessity man has undoubtedly always been concerned with questions of health, and survival, and has sought, within the framework of his knowledge, solutions to problems of illness."

(Foster, &Anderson, 1978:34)

Thus the different views about illness have cleared out that people have their own environment, circumstantial and cultural thinking about illness which is further investigated in the following discussion.

4.6 General Conception of Illness

No one wants to be sick or die regardless of history of culture. People learn to protect themselves, when given the opportunity and understanding.

It had been observed during the fieldwork that when people faced ailments they perceive it according to their own view or conceptions. Some myths and health practices were still the same practiced by their forefathers. Mostly people believed in the indigenous health practices.

We can say that cultural adaptations to diseases include behaviors and beliefs that function to limit morbidity and mortality in two general ways. First, there are behaviors and beliefs that have preventive functions, by reducing exposure to disease organisms. Second there are beliefs and behaviors about appropriate therapy for diseases, generally termed ethno medicine.

It was observed that villagers do not take the disease or illness as a serious issue. They take it for granted. According to their conception, it was every day routine of life.

One of my respondents, Baba Walayat told the researcher "*Puttar Choti Choti Bimarian Tu Elaiva Vi Bare Dukh Hunde Ne Insan Kis Kis Nal Nibre*".

(They had many other problems as well as minor illness. It does not matter us)

Perhaps he was quite right in this way as they have economic, social and educational problems as well so they cannot concentrate on one specific problem or issue.

During the formal research it had also been observed that people give more attention to the boys rather than the girls. According to them "*Dhi Paraya Dhun Hay*" (daughter is outsider for us) they believe in this thing that sons can help in their economic activities, and the "Waris" of their family and property who will generate income and multiply the family as well.

First of all they don't matter the minor illness like headache, flue, fever etc. according to them this is part of daily life. But if the situation seems to get out of control they consult the physician. When asked about diseases they never referred to flue dysentery and fever was the answer.

During the formal research it had been observed that mothers often don't care of their children, children play in dirty stagnant (polluted) water, and dirty streets and they are caught by number of diseases due to mother's unawareness as they ignore these diseases because they also think that these are the part of their childhood.

As far us elders are concerned their diseases are ignored too because they think it is because of age factor, they consult doctor when their disease become serious.

Some times people cannot explain properly and because of having no diagnoses of the disease and instead of improving they become more serious. After analyzing all the factors it can be safely concluded that the awareness of diseases is very low amongst the villagers and the level of perceptions of the unhygienic conditions are absolutely nonexistent.

4.7 Primary Healthcare

Primary health care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford it, it forms an integral part both of the country's health system of which it is the nucleus and of the overall social and economic development of the community.

During my fieldwork it was observed that neither the people nor government has their emphasis on health policies. In the village there was one dispensary in poor condition, the village population used to go to city in serious condition, while their economic condition does not allowed them to have proper medical treatment. They perceived their illness according to their cultural norms and values.

4.8 Concepts of Primary Healthcare

The following were the concepts that emerged from the definition of primary health care:

i) Primary health care is for all specially for the needy which means equity regardless of social and economic status. Every individual of the nation must have access for good health.

ii) The services should be acceptable to the community and there must be active involvement of the community.

(In the village it was observed that due to the some political reason, people showed resistance, while religious reasons were also involved. For example religious leaders were against the family planning program).

iii) The health services must be effective – presumptive and curative.

iv) The services should form an integral part of the country's health system of which it is nucleus.

v) The program must be efficient, multi-sect oral because health does not exist in isolation. Economic productivity is based on other factors which include the cooperation of department of agriculture for crop improvement, coordination of sanitary engineers for the provision of safe water for a healthy life style.

In the village, it was witnessed that the successive governments promised active measures as part of their public statements and election manifestoes, never become a part of a comprehensive plan which could cover both preventive health and curative services.

In the end, the curative services which were mostly urban based, have managed to get the largest part of health expenditure. The village, on the other hand remained neglected both on terms of personnel as well as infra-structure which includes buildings, paramedical staff, equipment and medical supplies. The following problems were identified by the researcher while working in the village Awan Wala:

4.9 Environmental Problems

i) Absence of sewerage and sanitation services.

ii) Lack of analysis of the cost effectiveness of simple environmental engineering procedures that involve community participation.

4.10 Financial Problems

i) Lack of sufficient funding for operating expenses and failure to deliver the planned health services for want of operating funds.

ii) Low rates of pay for health man-power.

4.11 Hygiene in the Locality

i) Lack of proper organization framework fixation of responsibilities and definition of functions.

4.12 Problems of Health Planning

i) Lack of effectiveness of planning process.

ii) Lack of effective health manpower planning both in numbers and in content of training programs.

iii) Lack of evaluation of traditional medical sectors.

iv) Lack of research to provide baseline data.

v) Lack of interest in common problems.

The above data has mentioned the bad and poor health services in the

Village.

The Lemuel Shattack statement that has been given to elaborate the phenomena:

> *"It is the duty of the state to extend over the people its guardian care, that those who cannot or will not protect themselves, may nevertheless be promoted, and that those who can and desire to do it, may have the means of doing it more easily. This right and authority should be exercised by wise laws, wisely administered, and when this is neglected the state should be held answerable for the consequences of this neglect".*
>
> (Lemuel Shattack, 1850)

4.13 Major Health Problems of the Village

Water is essential for life, while safe water and adequate sanitation are not only the basis of life and health but are also essential factors which can contribute to economic growth, poverty alleviation and human dignity.

Over one billion people still lack access to safe water, and nearly two billion people lacked safe sanitation. Over three million people still die every year from avoidable water-related disease, mostly children. In the beginning of the 21st century, Pakistan is facing a water and sanitation crisis. Development cannot keep up with population growth, systems are not sustained and coverage is declining. People are unable to maintain minimum standards of personal hygiene are at constant risk of disease. The most vulnerable are children. In Pakistan diarrhea and other waterborne diseases are a major cause of child mortality.

In the village, the most common diseases were heart problems, blood pressure, diarrhea, cholera, dysentery, stomach pain, tuberculosis, typhoid, hepatitis A, B, C, Skin and eye infections, fever, and malaria etc.

One and only MBBS doctor of the village and other dispensers reported that water borne diseases ranked double as per occurrence of other diseases. The disease was determined by the environment of the individual, nutrition and housing pattern etc. The diseases in village are occurring due to all these factors.

Most of the diseases were occurring due to polluted water. The villagers were relying on contaminated water and insanitation conditions due to which the rate of the related diseases was much higher. Children were the major victims of such infections as they were more prone to unhygienic conditions side by side having less body resistance and immunity.

The biggest dilemma was the increased risk of getting disease and the level of awareness was quite low that often lead to tragic events. Those who were aware do not take care of their health and hygienic. They used to think that some other factors could be the cause of diseases. They always attached cultural meanings to disease and diseases were interpreted according to their cultural norms and values.

4.14 Superstitious Views

Culture plays a major role in determining the patterns of disease and death. Every society has its own perception and views which are different from others culture.

The concept of adaptation refers to a fundamental process of evolution in which particular traits are selected in a given environment because they increase an organism's chances for survival and reproduction. Adaptation implies that the environment poses certain "Problems" which organisms in the environment must "solve" natural selection is the mechanism by which such solutions are found (Lewontin 1978, 1984). Indeed, the

fact that cultural behaviors play a direct role in disease transmission and can hinder disease control programs is an important theme.

Although diseases have their own scientific definitions or causations but society determined its own cultural causations.

So in the village Awan Wala, the people have their own cultural conception regarding illness and remedies.

According to a respondent Ali Raza *"Janab Jeda Naseban Wich Likhya Hove Oh Ho k hi Rehnda Ae* ". Throughout the research it had been observed that people have the static ideas and concepts of illness.

Different causes given for various ailments were God, evil eyes, Jadu Tona (Magic) fate, whether changes, economic conditions, sorrows, unemployment related.

Most of the informants agreed that illness were due to the will of God or as a result of God's punishment for some sort of misconduct or due to fate. 25% of the respondents agreed and believed that illness befallen a person due to God's will.

Beathie (who worked among the Bunyoro, an African Kingdom) said:

> *"Supernatural beliefs and practices, then, may be in some degree understood as providing acceptable explanations for events which would otherwise be inexplicable, and so relieving ignorance and doubt, but they are more than just a body of beliefs, most important of all, they provide a means of coping with events".*
>
> (Beathie, 1960, 70)

12% do considered the effect of evil eye (Nazar Lagna) as a most important factor of diseases. They told that for the prevention from evil eye "Mashala the word must be uttered soon after having a glance on person. Mostly people agreed that diseases were

caused by water pollution and unhygienic practices. However, the respondents were educated and belonged to upper class.

20% believed that fate was the major factor of disease it can't be changed, it was some sort of super natural. 10% respondents believed that Jadu or Tona (magic) eas the major cause of illness, so people go to the magicians and quacks etc.

Food is very essential for the survival of human beings. Some food combinations could be dangerous for health due to their hot and cold effect and over consumption of these may lead to ill health. 20% considered food as a cause of illness, for example the combination of watermelon, and cucumbers taken together with water might cause dysentery or allied symptoms.

3% believed the disease were the result of sorrow, 10% of the respondents considered unhygienic conditions to be a major factor of diseases.

Table-2 Water borne diseases among the villagers

Diseases	Percentage
Skin infection	25
Malaria	20
Hepatitis	20
Eye infection	5
Stomach pain	5

Diarrhea	15
Typhoid	5
Cholera	5
Total	**100**

Source: Field Data

4.15 Skin Infection

Among the villagers, skin infection was one of the major common water borne disease. 25% of the respondents reported the skin disease. Due to illiteracy or unawareness people don't knew about the disease properly. In the local terminology it wass called "Kharish".

This disease can be transmitted from one person to another person. In the village people have no proper hygienic facilities that are why this disease was transmitting from person to person.

"Scabies" is one form of skin infection disease, which occurs mostly in women it is less amongst males and children. In rainy season they have wet scabies because of moisture in the air while in winter people have dry scabies.

4.15.1 Symptoms

The major symptoms include the redness and rashes on the body as a result of infection. This can be turned into wounds after prolonged itching spells.

4.15.2 Causation

The major cause of this disease was a pond of dirty water in the village, the reasons may include:

1. Animal germs

2. Mud
3. Mosquitoes

The children are the major prey to this disease. In the village, there were dirty ponds and drains, in the rainy season when the water flows out the drains people got scabies or when they take bath in rainy season, sometimes people were infected by animal germs which caused scabies, it could also occurred while cleaning animal rooms etc. Mud was also the cause of scabies in different ways as mostly scabies starts from feet because they walked bare footed everywhere.

Mostly people got feet and hand scabies while preparing the mixture of mud and donkey's dung for plastering floors and walls. This is because the donkey's dung has a lot of germs in it and when one used his/her hands and feet for mixing them got scabies. The reasons for scabies according to respondents were mostly the excessive heat of the body while others called it the mal functioning of blood. The most commonly cited reason was the excessive heat. Some others said that blood dilutes turned into water. The dilute blood caused scabies. Another section cited contamination of water, washing the cloths in dirty water and bathing in pond water.

People said that occurrence of the disease was greater during summer and rainy season. The reason for that was the unhygienic condition inside and outside the house and the use of contaminated pond water. Sometimes people got scabies at their power parts when they used mud stones for cleaning themselves after defecation.

4.15.3 Treatment

The treatment most commonly taken was discontinuation of hot things like eggs, fish, red meat etc. The affected area was oiled or being washed with berry leaves, Detol was also used for treating scabies. Mostly was used to take it as minor illness not necessitating a visit to doctor. Those having realized consistently either go to the shrines or to village Moulvi for Dum. If they do allopathic treatment then instead of consulting doctors they themselves take tablets or syrup for cleaning blood from medical shop.

4.16 Malaria

Malaria was yet another most rampant disease in the village Awan Wala, 20% of the respondents suffered from the disease. During the rainy months the disease affected the children, adults and the elderly. The entire population was vulnerable and at increased risk of getting the disease irrespective of the gender difference.

4.16.1 Symptoms

All respondents reported the same symptoms of the disease i.e. fluctuating temperature during the different hours of day and night. Other symptoms include feeling of cold, sweating, headache and loss of appetite, while some other respondents reported of dizziness and vomiting.

4.16.2 Causation

Medical explanation of Malaria reveals that malaria is caused by a specific malaria parasite "plasmodium". When a female mosquito of genus "Anopheles" carrying plasmodium in its saliva bites a person then many parasites are transmitted from the saliva of the mosquito in to the blood of man and cause malaria. Malaria attack had specific and well defined stages.

Cold stages: Patient feels cold and temperature rises.

Hot Stage: Fever gets increased and headache starts.

Sweating Stage: With sweating the temperature of the body gets normal.

Patients not having treatment of the fever again are taken into the grip and duration may last for ten days.

As the drain is a breeding point of mosquitoes, those who take bath in rainy reason have got ten the malaria. The occurrence of this disease is more frequent during summer as mosquito flourish in number and also because villagers slept in open air. Some villagers who were involved in unhygienic practices were reported to be victims of the disease.

Those areas where economic conditions are not good the occurrence of disease is more frequent. Small houses and poor ventilation are such factors which increase the chances of breeding of mosquitoes that usually lead to malaria. As far as the reason for its occurrence is concerned some believed it to be, God's will. Most of them reported that it is due to the bite of a specific mosquito. This mosquito is different in the sense that it has longer legs and is bigger size. The specific mosquito adds its venom to human body causing the disease.

4.16.3 Treatment

Generally people know to control malaria. They considered that it is necessary to eliminate mosquitoes from the village as most of the villagers responded that mosquitoes contributed in the assurance of Malaria.

For the treatment of Malaria, they adopted medical curing methods and presume those to be right treatment. They also make use of their knowledge to prevent themselves from malaria by using fans and by avoiding sleeping outdoors. While some other said that for keeping them safe from mosquito bites they burn cow dung near their "Charpai" at night.

4.17 Hepatitis Infections

The symptom of the viral hepatitis is the acute inflammation of the liver due to an unknown virus or viruses.

4.17.1 Etiology

The disease is caused by a virus. However it has yet not been isolate. Some of the associate viruses have been identified as suspected causes. The disease is transmitted by the oral and faucal route. It is common in young people in the village. It is common within a family group and particularly due to unhygienic i.e. ways. Epidemics occur

where there is faucal pollution of water. Though it causes systemic upset, it has low mortality. The disease seemed to be widespread in the village.

During the formal field work, hepatitis was the major health problem in the village. According to one of my respondents, who was the patient of hepatitis C said, that it was due to the water pollution. But local doctor had reported that there was no connection between water pollution and hepatitis C., in short he said it was not water borne disease at all, while 20% respondent had the very disease.

4.17.2 Symptoms

Consumption of raw or inadequately cooked food or vegetables cultivated in sewage polluted water is associated with epidemic outbreaks of hepatitis A. From the environmental viewpoint hepatitis A is transmitted by the fecal oral route, most commonly by persons to person contact and infection occurs in conditions of poor sanitations and overcrowding. Common source out-breaks are most frequently initiated by fecal contamination of water and food.

The villagers considered that when the excessive heat of the body becomes intolerable is manifested in the form of hepatitis. Reasons attached according to local population include taking hot meals, eggs, meat, fish, and chicken etc. All these produce excessive heat in the body thus causing hepatitis. Some other cited hot climate and after affects of medicine as another cause. Educated as well as illiterate shared the same perceptions about the causes of disease. Hence the relationship of hepatitis and medical explanation of hepatitis A is reciprocal. Over all the perception of villagers regarding causes of hepatitis was not clear and most of the time the responses were not given.

4.17.3 Treatment

As they considered the hepatitis “Warm” so to overcome it they consume cold eatables like vinegar with yogurt, carrots and sour oranges etc. The local population also used “Imli and Alubakhare Ka Sharbat” which according to them was very useful for

liver and stomach, while hot sour and spicy foods were avoided. If condition does not get normal the physician was usually consulted.

4.18 Eye Infection

In the village, 5% of the villagers were victims of eye infections. These were eye infections of many kinds with many symptoms.

4.18.1 Symptoms

Eyes get swollen and get reddened from one side, sometimes the entire eye gets red and become difficult to open, while mole gets erupted inside the eye. In severe infection, the small pimple is formed on eye edges and after three or four days it become filled with puss and does not let the person to open the eye.

4.18.2 Causation

The reason of eye infection is related to rainy season. People are un aware about the cause of disease but the major reason of such infection is the contaminated dust getting into the eyes and rubbing results in the burning of eye which ultimately result in severe infection, sometimes people specially the children wash their hands and face with dirty pond water and when they touch their eye with their dirty hands then they got eye infection. Most of the villagers were unaware of the causes of such infection.

4.18.3 Treatment

People used cold icy water to get-rid-of it. They think the water being sprinkled in the eye will turn the warmness of infection out of the eye. Villagers considered it a normal routine complaint not necessitating a visit to doctor. The ratio of it was increased in children while females and male were sharing the same ratio for the likelihood of getting the infection.

4.19 Stomach Pain

5% were reported the victims of stomach pain. These may have a variety of explanations though generally there is a clear association with the digestive system. An

imbalance in the amount taken inside and the dirty water was seen as a cause of pain. According to the villagers the major cause of stomach is a weak stomach itself. They believed that the children have smaller and weak stomachs that are why they suffer more. Some respond the overeating as the major factor. The responses regarding the unhygienic intake and the dirty water were very low. Some villagers considered salty water as the cause of stomach pains. The treatment was normally given at home and the dispenser or doctor was consulted only when the situation gets worst and impossible to be handled at home.

4.20 Diarrhea

In Pakistan, diarrheal diseases are still a leading cause of mortality and morbidity in children under five years of age. It is estimated that of 35,000 children die each year from diarrhea and dehydration. Under nutrition and measles are very commonly associated with this mortality. The prevention of diarrhea ultimately depends on the improvement of water supplies and sanitation.

Diarrhea is the most frequently occurring disease in the village as 15% of the population suffers from this disease. It is characteristically abrupt and creates an acute health problem. It has a high potential to spread fast and cause deaths. Occurrence proportion in males and females is same. All age group suffer from this disease but children are at the increased risk of getting it.

4.20.1 Symptoms

Diarrhea is characterized by the passage of frequent, loose watery motions. Ingestions due to overfeeding or unsuitable food or to irregular feeding are considered the main predisposing causes of diarrhea in babies. But the disease may also be caused by un-cleanliness for example due to the poor environmental conditions, dirty nipples etc by direct bacterial infections. Diarrhea causes an unusual increase in the number of bowel moments especially if they become loose and watery. Severe diarrhea is usually accompanied by fever and vomiting. The smell of diarrhea stool is unbearable and

vomiting follows this condition. The body of the effected person gets completely “dried off internally, he feels weakness and his complexion turn pale. It gets out of control and may eventually lead to death.

4.20.2 Causation

It is caused by bacterial infection of the small intestine. It is mainly water borne disease. In rural areas among lower socio-economic groups, no care in eating, personal cleanliness and drinking habits was taken to decrease the risk of infection. Excreta in open and improper disposal of children’s stool lead to Diarrhea. Some persons do not wash their hands after coming from the lavatory and eating of food with dirty hands definitely lead to diarrhea. Vegetables are often washed with unclean water and sometimes these are taken in raw form. As far as the causation and spread of diarrhea according to the local people is concerned, attitude of people is fatalistic throughout as all the informants believed that diarrhea is a kind of punishment sent by God. Moral behavior and prayer can cure it.

Males specially the educated ones cite medical explanation while females specially the uneducated ones give cultural or other reasons for that. Although some give scientific reason for this but they are not very clear about this. They only follow whatever they have learned.

4.20.3 Treatment

For curing diarrhea, they firstly turned to home remedies. One was“ Pakka” which is a blend of clove added in tea. Another cure for diarrhea was a mixture of some black paper, fennels, small beads of celery etc. It is locally called as “*Chooran Da Phukki*”. Side by side they used egg white, left over water of rice and Isaphol husk. But the majority of the people believed that modern remedies were essential for curing diarrhea.

4.21 Typhoid

5% of villagers suffered from the disease. The villager called Malaria as "*Chota Bukhar*" while typhoid as "*Bara Bukhar*" and mean it that typhoid always occurred after Malaria. It attacked the males as well as females but the children were the most vulnerable to the infection. Typhoid fever was considered very dangerous for the health of children. Frequent attacks affected the health of the children badly. It has a direct effect on the intestines so it is also called the enteric fever. Typhoid is a contagious disease as it could transfer from one person to another.

4.21.1 Symptoms

Locally the symptoms of this disease are perceived as high fever, pain in body, increasing headache and drowsiness. There may be some cough and vomiting. The patient may faint when fever is very high. It may be very dangerous if the immediate treatment is not given.

4.21.2 Causation

It is an excreta related disease, which may also spread through many other routes. This disease is caused through a specific germ, which is found in human excreta. These germs get transferred through water unhygienic, ways by use of dirty fruits and vegetables and also through the air. The flies play their vital role in the spread of typhoid. As the unhygienic conditions of the village are apparent so the chances of occurring of this disease is increased.

This disease spreads through direct or indirect routes like the use of contaminated water, unwashed or unclean utensils, unhygienic lavatories and general conditions of cleanliness. As far as the season of its occurrence is concerned according to the villagers they usually attached fatalistic causes of disease. Other causes noted by villagers were dirty water, working hard and rainy season.

4.21.3 Treatment

For treating typhoid and for saving patient from any serious people give patients milk and fruit juices etc. They also do self-medication. In case of seriousness doctor was consulted.

4.22 Cholera

Cholera is the most common type of diseases that can be, for the most part traced to people coming in contact with drinking water that has been contaminated by sewage. The effect of cholera is an acute intestinal infection caused by ingestion of contaminated food or water. Cholera is rarely transmitted by direct person-to-person contact. Cholera can spread when basic hygiene is inadequate and open-air food stand or located in potentially contaminated areas. The World Health Organization (WHO) states:

> *"Cholera remains a global threat and is one of the key indicators of social development. While the disease no longer poses a threat to countries with minimum standards of hygiene, it remains a challenge to countries where access to safe drinking water and adequate sanitation cannot be guaranteed. Almost every developing country faces cholera outbreaks or the threat of a cholera epidemic".*
>
> (WHO, 2006a)

In 2002, the WHO Global Task Force on Cholera Control was launched, and one of its priority areas clearly addresses "linking health and management of the environment in order to improve access to safe water for vulnerable populations and diminish incidence of waterborne diseases" (WHO, 2006a). This link between people and their environment is vital in helping to better understand how cholera can manifest regardless of a nation's level of development.

Chapter # 5

Summary and Conclusion

The study was about the impact of industrial waste water on human health conditions and environment of the village "Awan Wala". The research focus was on socio-economic impact of industrial waste water and health conditions of villagers. And focus was also on treatment of diseases and knows the awareness level of villagers. The researcher also conducted data on ill effects of waste water used in agriculture. Village Awan Wala was 10 km far from city Faisalabad. The village was situated on main Satiana road from Faisalabad to Okara. Along with this road there was Madhuana Drain in which the vast majority of industrial effluent was discharged "raw" without any treatment.

There were many factories in city and on Satiana road. Industrial waste water has damaged land totally and drinking water also. Polluted water consisted of industrial discharged effluents, sewage water, and rain water pollution and polluted by agriculture or households caused damage to human health and the environment. The water pollution affected the people's health and quality of soils. The poor quality water caused health hazard and also disturbed the production of different crops.

The liquid waste produced by the industries was carried by the domestic sewage system and drains operated by WASA in its operational area and by the drains operated by the provincial Irrigation Department. There was virtually no treatment of the effluent; the few treatment plants installed by the factories rarely work because of financial or technical constraints. There was only one sewage treatment plant in the northern part of Faisalabad designed for the treatment of domestic sewage but it treated both domestic and industrial sewage. It treated less than 10% of the combined industrial and domestic sewage of the City. Resultantly the vast majority of industrial effluent was discharged "raw" without any treatment into two main drains that were Paharang drain to the North West and Madhuana drain to the South-East. Paharang drain eventually discharges to the Chenab River and Madhuana Drain to the Ravi River. Both drains were under the control of the Irrigation Department.

The receiving drains were severely depleted of oxygen, devoid of aquatic life and heavily polluted with a range of pollutants including heavy metal.

Without intervention, the existing industrial waste management situation in Faisalabad was likely to deteriorate especially with the introduction of additional and more diversified industries.

The regulatory environment does not encouraged resolution of the problems because at least two authorities Water and Sanitation Agency and the Provincial Irrigation Department appeared to share responsibilities over differing geographic areas. The Municipal Services Department of the CDGF and its sub-department Environment Department also shared some responsibilities. That was also linked with the provincial Environment Protection Agency (EPA). The regularity framework is such as to at best, not encourage in factory treatment and the few attempts of enforcement were often thwarted. None of the departments seemed to take responsibility for the quality of waste disposed to the drains. Proper records for the quality and quantity of industrial effluent were not maintained by any of the departments and agencies.

Industrial waste has resulted in a large number of social, environmental and health related issues for the citizens of Faisalabad. There is evidence to indicate that pollutants have entered the ground water and are entering the public water supply either through the public pipe work or directly through private tube wells. The quality of ground water was less polluted near the canal. This waste water is used downstream for irrigation and for fish farming. Bio-accumulation of certain contaminants has been identified in certain crops and in fish.

The water was widely regarded as unfit and those that could afford buy bottled water, boil it themselves or buy privately supplied filtered water. Such options were only available to those that can afford it; the remainders have to use what water they can find/purchase and suffered from the resulting ill health. Inevitably, it was the poor who were the most affected by ill health having little economic resilience to the resulting loss in wages. People living near the drains were of particularly adversely impacted because they have water neither for drinking nor for irrigation.

Pure drinking water was not available in the village. Men women and children fetch water from hand pumps and electric motor pumps which were situated on the bank of canal and

also from tub wells and collected open buckets and pitchers. Quality of the water was not satisfied which people fetch from those hand pumps. People did not drink water from their own hand pumps. So due to polluted water the people of the village have many diseases like typhoid, malaria, cholera, diarrhea, dysentery, stomach problems, kidney problems, and food poisoning, hepatitis and skin problems. The need for boiling water was felt only in cases of sickness and in extreme conditions. Majority of the people were of the belief that piped water was less safe than water in a pitcher, which was believed to be safe from all sorts of impurities, and was good for health.

The sanitation system was very poor in the village. There was no proper drainage system in the village. There was no proper garbage waste disposal system, with the garbage occupying one corner of the compound or vacant plot in streets. Domestic waste water was flowing in the streets. Streets were not paved and plain. Gas facility was not available in the village. The village was included in district but village was not facilitated as. The promises were not made true regarding the provision of facilities as promised by the local political leaders. In a social setup where the community was divided into groups and each person has its own interests and ignorance about health, there was no way to pressurize the local political elite to deliver on their promises.

The research indicated that water quality was absolutely unsatisfactory. It was further found that people were suffering from water born diseases quite often. The serious concern rose from the research that people were not properly aware of the fact that how contaminated water was going to affect their health. They were only aware of minor facts but were unable to conceptualize the whole situation in the broader perspective of their health. In other words they were aware of the diseases occurring from time to time but they failed to assess the long term effects of the situation on the social, physical and economic health of their families. Since industry and residential area were in close neighborhood in Faisalabad city, it was easy to say that a majority of the people are may be under the same threats to their health.

In the village there was launched a project for purifying the water. The project was launched by the government before sixteen years ago, but the project was not completed due to some political issues among villagers. Its construction and piping had completed. Major problem of the villagers was that they have lack of interest in any program which was for the welfare of

the village. People of the village don't unite on any issue about the village. They were drinking polluted water still but they don't talk to local political leaders about water issue. They people were much busy in their individual interest and individual problems. They don't care their health. Majority of people belonged to lower class and financially disturbed so they don't have any interest in welfare of the village.

Industrial waste water is being mixed with surface water and also ground water. In this village water is not suitable for agriculture land and also for cash crops. Cash crops production is very poor and low standard. There is some land pieces which are not in use due to water problems. This village is near the city Faisalabad but out of facilities. There are involved some political factors as well in this problem as political leaders are not interested in the developmental programmes in the region.

The local politicians like municipal councilors members of districts (Nazims) usually make false promises with the rural community of their constituencies like sewerage drains water supply, water plants and paving of streets etc. Promises are never fulfilled. Politicians are not loyal with their promises and duties.

All the villagers fetch water from hand pumps, motor pumps and tube wells for drinking which are situated on the bank of the canal. The women and children of the village go to fetch the water especially in early morning and evening. There can be seen large gathering at the tube wells, hand pumps and motor pumps in early morning and evening. Concept of mineral or boiled drinking was not prevalent all. Villagers have no access to mineral water due to financial problems. Very few educated people have the awareness; will use the boiled water only in case of some great risk or illness. In no other situation boiled water is used.

Glossary

Biradari	All the families of the village, who trace their descent from a known Common immediate ancestor.
Dera	Public sphere in village. A place of gathering of people in village.
Gadhein pana	Deciding the date of marriage.
Ghar	A local word for family.
Hukkah	Smoking of tobacco through water pipe. A traditional way of smoking.
Kammi	Families of lower economic class, who work for the upper class. They are also considered as of lower Biradaries or Zat.
Khandan	A joint or Extended family.
Kumhar	Potter (considered as of kammi biradari).
Laag	A right of due of kammies on different occasions particularly on marriage and birth ceremonies.
Mochi	Shoe maker
Musalli	People who repair roads and houses, a kammi biradari
Nai	Barber
Neondra	Vartan bhanji- Agift of reciprocity paid after valeema on marriage in form of money.
Nikah	A ritual for marriage contract.
Patti	A segment of biradari in the village.
Patwari	A government official to maintain the records of land of the village.
Pind or Chak	Local name for village
Salami	Gift in the form of money given to bride and groom on their marriage by Close relatives.
Talaq	Divorce document

Theka	Cultivation of land on share.
Valeema	A feast given after marriage.
Vartara	Give and Take process
Veyl	Gift given to kammies on ritual performamce.
Zameen	Land
Zamindar	Land holder
Zan	Women
Zar	Gold
Zat	Synonym of biradari. An occupational cast.

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