

Gender Dimension of Arsenicosis: A Sociological Study in Selected Villages of Nilphamari District



Submitted By:

Examination Roll No: 4615; Registration No: Ha-5676

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ABSTRACT

This study focuses on gender dimension of arsenicosis at selected village in Nilphamari district from a sociological point of view. It seeks to explore the gender specific nature of vulnerabilities related to arsenicosis and strategies taken to mitigate the vulnerabilities of arsenicosis in Nilphamari district. The study also addresses several research questions: What are the nature of vulnerabilities of men and women related to arsenicosis? What are the impacts of arsenicosis on women? What are the variations of the responses to arsenicosis between man and women? What is the gender based coping mechanisms addressing the vulnerabilities? In countering to these questions an exploratory research has been conducted. This research also adopted a sociological perspective to analysis the situation of men and women particularly the women's sufferings due to arsenicosis in the northern part of Bangladesh. The study follows qualitative method to have the in-depth explanations of complex issues that have greater influences on arsenicosis patients. The most prevalent vulnerabilities of arsenicosis include physical, economic, psychological and social factors that depend on gender. The qualitative method has been employed in this work to obtain sensitive issues related to gender specially the mechanisms that have taken by the arsenicosis patients in Nilphamari. Through such procedures, this study contributes in demonstrating gender dimension of arsenicosis in selected villages of Nilphamari district.

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CHAPTER ONE

Introductory Chapter

1.1 Introduction

Water being an essential component on the earth surface, human beings able to live and perform their causal activities depending upon it. Water resources are turning to a fatal challenge, polluted water sources growing human casualties in the recent couple of years because of contamination with toxic arsenic as it is a cumulative toxin; patients become gradually sicker over time due to drinking arsenic contaminated water (WHO, 2000). Longitudinal studies (Nasreen, 2002; Zheng, 2004) revealed that there was found a potential presence of arsenic in ground water of Bangladesh in 1978 and ultimately in the early 1993 (UNICEF, 2008). Thus, the arsenic contamination has become a major hygiene concerns in public life concern as well as in academia, policy makers, and health experts and so on.

Arsenic is first detected in well water of Bangladesh in early 1990 (Zheng: 2004). UNICEF reported that water, naturally contaminated by arsenic was first detected in Bangladesh in the year 1993 (UNICEF, 2008). Now it has become one of the major public health concerns for the people in Bangladesh. Arsenic occurs approximately 10-70 meters below the surface and the fact is that vast majority of the drinking water tube wells tap into these shallow aquifers (Hossain, 2003).

In rural areas, 97.00 percent of the population relies on tube well for daily use (UNICEF & BBS, 2010). Between 2000 and 2003, 4.94 million tube wells across the country were tested for arsenic and marked as safe or unsafe with green and red shapes (UNICEF, 2010). Since then people used to drink water from alternative sources which have partially succeeded in reducing the severity of arsenic exposure (Van Geen, 2002). But the severely affected areas have few safe water options and need alternative drinking water sources (Flanagan et al., 2012). ‘Areas showing high proportions of unsafe wells are largely the same areas experiencing the highest arsenic concentrations’ (Flanagan et al., 2012:02).

At present, 61 districts out of 64 are contaminated by the excessive presence of arsenic in groundwater. More than 14,000 people have been identified as suffering from Arsenic related disease and an estimated 20 to 35 million are exposed to highest level (Caldwell, 2003; WHO, 2000; Adeel, 2001). The UN estimates around 50.00 percent of the country's population is living at a great risk for cancer due to arsenic contamination in the well water (Adeel, 2001). 'Officials noted that the number of people at risk exceeds the number of people infected with HIV worldwide' (Mahmood & Halder, 2011). Within upcoming decade, one-tenth of the deaths could be caused by Arsenic because arsenic contamination has been found in 61 districts of Bangladesh. The number of proportion of fatalities owing to arsenicosis could be happened on an endemic scale. The arsenic hazard will affect agriculture, water management, the economy, society as well as the health of individuals and families (WHO, 2000). For this reason, arsenic has become a major concern for the environment specialists, medical researchers and also for sociologists. The majority of the rural people are using the arsenic contaminated water for their daily survival. Most of them know nothing about arsenic contamination in groundwater. As a result, they use the polluted water and gradually become victim of arsenicosis.

Acute and chronic poisoning through arsenic creates arsenicosis in human body. According to World Health Organization the safe level of arsenic content in drinking water is 0.01 milligram per liter but the tolerance level may vary worldwide. The Department of Environment under the Government of Bangladesh has suggested the accepted amount of arsenic in drinking water is 0.05 milligram per liter (Nasreen, 2011).

Nasreen (2002) highlighted that from 1990s to present, several researches have been conducted survey nationally and most of them paid their attention to the identification, mitigation and supply of safe drinking water. Scientific research has also been done by different organization like BUET, ICDDR'B, WHO, BRAC, Dhaka Community Hospital, Disaster Forums and others. These organizations are mostly involved in identifying contamination of groundwater, causing massive impacts on human health and also the mitigation options but the social issues are avoided by those organizations. Arsenic is a health hazard. So, concentration has been given on the physical effects of arsenicosis rather than on the social affects. Scientists and medical researchers are dominating in the field. As a result, social issues like gender issues have attracted less attention comparing technical and scientific issues related to arsenic contamination in drinking water. However, this socio-

cultural aspect, gender issues have immense influence and impact on arsenicosis in the society.

Hanchett (2004) touted that men and women are affected with arsenicosis in different ways. She strongly emphasized on gender and its relations with arsenicosis. Variations in gender responses and coping mechanisms occur due to socio-cultural construction of gender. For this reason, women who know about it and want to use safe drinking water are faced with new problems. The women's workloads have increases as they spend much time in fetching water and they face family concerns. Poor women face insult due to sharing well water from their affluent neighbors.

In this research, attempt has been made to explore the gender based differential vulnerabilities of arsenicosis in selected villages of Nilphamari. Both man and woman are affected with arsenicosis. But the severity of being affected with arsenic and the consequences of arsenic differ from man and woman due to gender variations in roles and responsibilities of man and woman in society. The severity to be affected with arsenicosis including its impact on health is different for men and women. As a result there are variations in gender responses and coping mechanisms of the people affected with arsenicosis. The present study sheds light on the gender specific vulnerability of arsenicosis and possible mitigation options and measures yield to address the vulnerabilities.

1.2 Statement of the Problem

Arsenic as a serious environmental and social disaster has been recognized as a major public-health concern in several parts of the world including Bangladesh. The first Bangladeshi Arsenicosis patient was diagnosed in 1987. In 1993, the DPHE confirmed Arsenic in a tube well in Chapai Nawabgang and found eight Arsenicosis patients (Mahmood & Halder, 2011). It is estimated that 21 million tube wells are pumping Arsenic contaminated water (Frisbee et al., 2002). 'Government of Bangladesh estimated the number of people exposed to 50 ppb level as 29.24 millions' (DPHE, 2010). From the above mentioned statistics on arsenic situation of Bangladesh, we can easily realize how serious the problem is.

Arsenic menace has severe effects on physical as well as social health. Many researches have been done on the impact of arsenicosis but a few researches have been concentrated on the socio-cultural impact of arsenic problem. While in the study, researcher will focus on one of

the social aspects, gender which has strong correlation with arsenicosis. Moreover, little attention have been provided on gender variations in treatment, awareness, response, coping mechanism and gender specific social impact related to arsenicosis in Nilphamari district. All these encourage the researcher to conduct a research concentrating on the gender variation and its relation with arsenicosis.

1.3 Objectives of the Study

Broad objective: The broad objective of the study is to explore gender dimension of arsenicosis in Nilphamari District from sociological point of view. My study is mainly exploratory and the basic objectives of this study can be mentioned as below:

1.3.1 Specific objectives

1. To investigate gender based differential nature of vulnerability related to arsenicosis in Northern Bangladesh;
2. To identify the impacts of arsenicosis on women;
3. To examine the gender variations of responses to arsenicosis;
4. To address the gender based coping mechanisms of the arsenicosis patients;

1.4 Research Questions

To examine the gender dimension of arsenicosis, researcher seeks to answer these following questions:

1. What are the nature of vulnerabilities of men and women related to arsenicosis based on gender roles and responsibilities?
2. What are the gender specific social implications of arsenicosis as a disease?
3. What are the variations of the responses to arsenicosis based on gender?
4. What is the gender based coping mechanisms to address the vulnerabilities?

1.5 Operational Definition of the Concept

Operational definition means to define or ready something for using or relating with relevant works or research projects. Some types of terminologies are being operationalized in following literature.

1.5.1 Arsenicosis

Arsenic is venomous element and the arsenicosis is the disease caused by arsenic poisoning. In this study, the researcher has defined arsenicosis as an effect of arsenic poisoning.

1.5.2 Gender

Gender is a state of social and cultural fact, not a biological circumstance. Gender refers to the socially constructed roles, behaviours, actions, and attributes a men and women who are considered appropriate for a given society. Social inequality is generated in terms of gender and gender discrimination (Hanchatt, 2003; Giddens, 2006).

1.5.3 Gender division of labor

Gender division of labor is defined as the assigned role of man and woman in society. Society determines the role of male and female members (Giddens, 2006; Nasreen, 2011)

1.6 Rationale of the Study

Bangladesh is a country overwhelms with different social, political and economic problems and equally challenging are serious environmental problem resulting from over population, rapid industrialization and overuse of natural resources. One of the serious environmental problems in Bangladesh is water pollution which is caused by excessive presence of arsenic in ground water. Though arsenic is an environmental hazard and mostly affects physical health but it has social dimension which we could not ignore. Studies on social dimension of arsenicosis attracted less attention in comparison with scientific studies. WHO (2000) reported that poorer households are the worst victim of arsenicosis. They have less access to food, treatment and education due to their lower socio-economic status.

The severely affected areas with huge number of arsenicosis patients reported that they are victim of ostracism. In these areas women are disproportionately experiencing social stigma (Sultana, 2006). Thus differences in gendered location in arsenic affected areas differentiate the impacts of arsenicosis on men and women. While both men and women are suffered in

those areas, this study indicates that arsenic poisoning has led to greater ostracism of afflicted women and girls.

Women's sufferings and marginalization increases due to arsenicosis. They have less access to resources and with these limited assets they have to cope with the arsenicosis. Scholars have generally noted that women, particularly marginalized and poor women, bear the brunt of environmental degradation and natural resources crises. Access to knowledge, information, management options, choice, decision making and ownership of natural resources vary by location, social structure, culture, institutions, and resources (Agarwal, 1992). Gender is a critical factor in shaping how people access, control and use natural resources, information, technologies, and decision-making processes. Thus the physical, psychological as well as social implications of water scarcity and water poisoning for women and men vary across social strata and locations (Mahmood & Halder, 2011). The link between water, social hardship, and gender thus needs further investigation. In this research, attempt has been made to provide gendered analyses of the arsenic problem.

The discourses of 'gender' are often problematically used in water resource management and development literatures and particularly means woman's' position and woman in development (WID).Whereas it should be a comparative study of both man and woman in any given context and relation (Agarwal 1992). In the present study, researcher has attempted to provide the gender based vulnerability of arsenicosis which indicates sufferings of both men and women.

Arsenicosis has strong correlation with malnutrition. Women become worst victim of the disease due to having less nutritious food (Ahmad et al., 2007). Moreover, they are not provided with proper treatment when they got ill and have less access to economic resources because of the gendered division of labor. This research project attempt to explore gender specific nature of vulnerability related to arsenicosis in Nilphamari district based on assigned roles and responsibilities of men and women and their socio-economic conditions.

1.7 Layout of the study

Chapter one entails an introduction of the study including its underlying principle, operational definitions, objectives, research questions. The next chapter is the review of literature which contains the background of arsenic in Bangladesh. Moreover in this chapter, also shed light on the causes of arsenic contamination in drinking water and its effect on

physical, psychological and social health based on gender. Chapter three illustrates the theoretical framework of the study. The methodology chapter is entitled in chapter four where the study area, study population, techniques of data collection and ethical considerations are on priority. The next chapter is about conceptual framework. In chapter seven case studies of the arsenic affected people has been illustrated. The results of the study are in chapter six where there are some categories relating to the findings. In chapter eight, discussion relating to the findings is entailed. Lastly, in chapter eight, conclusion of the study is focused.

Besides these eight chapters mentioned above, references has been presented in the end of this research that will help to find out the source of secondary data used in this research. Appendix contains the Key Informants interview used in this research.

1.7 Limitation of the Study

As the study is initial one into the field of research regarding gender dimension of arsenicosis in selected villages of Nilphamari district, there were many constrain in the path of the study. Some of the major constrains are written below:

- Lack of availability of handful and relevant literature as well as sufficient theoretical knowledge, was the main hindrance of the study to a complete understanding of gender dimension of arsenicosis.
- A sample size of 30 respondents was literally too small to make a significant conclusion about the study.

1.8 Conclusion

In this chapter, researcher shed light on the overall research work including statement of the problem, objectives and scope of the research project as well as rationale of the study. The researcher has explained the unavoidable and unintentional limitations of the research. In this way; researcher tried to interpret an overall introduction of the research project.

CHAPTER TWO

Literature Review

2.1 Introduction

Bangladesh has achieved the highest position in water supply coverage (about 95.00 percent) among the South East Asian countries by using tube well as a major source of ground water (DPHE & JICA, 2010). In early nineties, the identification of arsenic in shallow ground water suppressed the commendable achievement. One of the major reasons behind this is the frequent and unplanned establishment of tube well that raises the level of arsenic in groundwater. From early nineties to present, arsenic has become a curse for the people who are afflicted with it. Women are particularly the worst victim of arsenicosis. Several factors like social, cultural, and economic have influence on the impact of arsenicosis and peoples response toward the disease. Health and illness is related with the socio-cultural and economic factors, manipulate people's behavior and their perception about the disease.

The disease arsenicosis has disclosed a different dimension to the study of social issues such as gender. Variations in gender relations can be found in almost every segments of rural Bangladesh and it is mostly presents in workplace considering public and private sector. This gender dimension in workplace may have differential effect on men and women's health considering arsenicosis.

Different scholars have focused on the issue of sex role, gender equality, gender opportunities; gender based social and economic status. The researcher has gone through different bodies of national, South Asian and global literatures, articles, journals newspapers and research reports on water, gender and vulnerabilities in order to get insight about the proposed research topic. In this chapter, researcher focuses on some relevant intellectual traditions and writings which will help to understand the gender specific nature of vulnerabilities related to arsenicosis and gender based strategies taken to address the vulnerabilities.

2.2 Conceptual Interpretation

Concepts are very important for any research process and conceptual clarification helps to conduct the research in a proper way. In this section, researcher will discuss about the concepts which are relevant for the study. This will help the researcher to limit the scope of the research in a needed area of inquiry.

2.2.1 Defining gender

To understand the gender dimension of arsenicosis at first we have to know what constitute as gender. Gender usually means women in many people's minds and gender specialists are also mistakenly promoting women's activities and women's position solely but not men's. This mistaken fallacy creates debate: some women are born to privilege and need no support from outside while some men are in a terrible situation, so taking the women's side at all times seems not appropriate and even unjust; another opposition is that seeing women's interests too distinctly from men's interests may create conflict where none existed before. Sociological background might clarify our understandings by resolving disagreements on the issue of gender (Hanchett, 2003).

Gender is a state of social and cultural fact, not a biological circumstance. The foundations of gender are: 'Male and female socialization, perceived experiences, normal duties and responsibilities performed inside and outside the household (sexual division of labour) at each socioeconomic level; Values (Social, economic and political) assigned to men's and women's customary work and duties; Chances & difficulties influencing people's control of economic resources, information, social networks, economic opportunities, and power; and Existing inequalities that are expressed created and challenged by actions of men and women' (Hanchett, 2003:02 -03).

Gender is the definition of women and men that is socially constructed and is not the anatomical characteristics of women and men, determined by the conception of tasks, functions and roles attributed to women and men in society and in public and private sphere. Both women and men shape gender roles and norms from side to side their activities and promote changes in gender relations.

Sometimes it seems difficult to differentiate exactly the meaning of gender from sex. A sociological explanation of gender touted by Anthony Giddens, raise a clear-cut distinction

between cultural gender and biological sex : “social expectation about behaviour regarded as appropriate for the members of each sex and is not refer to physical attributes in terms of which men and women differ but to socially formed traits of masculinity and femininity” (Giddens, 2006 :1017). So, sex refers to the biological and a physiological feature that differentiate men and women on the contrary, gender refers to the socially constructed roles, behaviours, actions, and attributes of men and women that considers appropriate for a given society. The aspect of sex does not differ from country to country but the facets of gender vary greatly in human societies. However, conceptual clarifications on gender and gender roles are persistent problems in Bangladesh (Nasreen, 2000).

2.2.2 Arsenic and Arsenicosis

For the purpose of the study the researcher have to define arsenic from physical, social and cultural point of view. The physical view suggests that Arsenic is a chemical element with the symbol As, atomic number 33 and relative atomic mass 74.92. Arsenic occurs in many minerals, usually in conjunction with sulfur and metals, and also as a pure elemental crystal. It was first recognized by Albertus Magnus in 1250. Arsenic is a metalloid. It can exist in various allotropes, although only the grey form has important use in industry. The main use of metallic arsenic is for strengthening alloys of copper and especially leads (Lahri, 2000).

Arsenic is a common n-type dopant in semiconductor electronic devices, and the optoelectronic compound gallium arsenide is the most common semiconductor in use after doped silicon. Arsenic poisoning from naturally occurring arsenic compounds in drinking water remains a problem in many parts of the world. Arsenic joins with oxygen, chlorine and sulfur to make inorganic arsenic compounds and Inorganic arsenic compounds are used to preserve wood, and make insecticides and weed killers. Arsenic in plants and animals combines with carbon and hydrogen to make organic arsenic which is usually less harmful than inorganic arsenic (Muhamad et al., 2012).

Arsenic can be defined from social and cultural perspective. A study conducted in Kushtia revealed that for some people ‘arsenic is considered as a curse of Allah’. Arsenicosis patients are also believed to as the patients of leprosy (Sultana, 2006).

Arsenic is a metal which is found in ground water. The contamination of arsenic in groundwater causes arsenicosis. Arsenicosis is a kind of disease. When we talk about arsenicosis it particularly means the impact of arsenic on health. In Bangladesh 37,039 arsenicosis patients were found in the areas where Arsenic contamination is high and safe water coverage is low (DPHE, 2010). DGHS (2010) registered other 1636 arsenicosis patients which have safe water access.

2.2.3 Gender division of labour

Gender division of labor can be defined as the assigned roles and responsibilities based on gender. Gender division of labor is seen in different places globally. In Bangladesh, specifically in rural areas, women and girls collect water for everyday needs. While men are predominantly undertaken irrigation and agricultural water management (Sultana, 2005:56 cited from Crow and Sultana, 2002).

The activities of men and women are different and what should be their roles based on sex determined by society. Mahbuba Nasreen (2012) shed light on the activities of women in rural Bangladesh. They work hard to maintain their family and household chores. They also participate in agriculture and food production through preparation, storage and rising of seedlings. Women are more involved in agricultural works than what the official statistics presents (Nasreen, 2012 cited from Rothschild and Mahmud, 1989:2). The production and reproduction concepts are also related to women's work. Women have to reproduce their works such as cooking, cleaning, washing and also have to maintain social reproduction (Nasreen, 2012 cited from Edholm et al, 1977).

2.2.4 Vulnerability

Vulnerability can be used as a concept which warns us to need for obligatory to take action (Brown, 2011). The concept vulnerability is connected to the personal, economic, social and cultural circumstances within which the individuals discover themselves at several point over their life. 'Vulnerability is associated with potentiality of harm within a given system' (Sarewitz et al., 2003 cited in Brown, 2011: 06). According to Sarewitz, the concept, vulnerability is more associated with the concept risk. In this research, the concept of vulnerability is used to define the impact of arsenicosis on arsenic victims.

2.2.5 Social vulnerability

The concept 'social vulnerability' emphasizes two central themes: 'both the causes and the phenomenon of disasters are defined by social processes and structures. Thus it is not only a geo- or biophysical hazard, but rather the social context that is taken into account to understand natural disasters; Although different groups of a society may share a similar exposure to a natural hazard, the hazard has varying consequences for these groups, since they have diverging capacities and abilities to handle the impact of a hazard' (Hewitt, 1983). The hazard arsenic has varying consequences for different group.

2.3 Arsenicosis in Bangladesh: An Overview

Talukdar (1998) stated, arsenic crisis in Bangladesh is reported to be the biggest calamity in the world in terms of afflicted population. WHO (2002) reported that the Government of Bangladesh has considered it as a biggest calamity in the world. The excessive presence of arsenic contamination has caused a serious concern for the people in Bangladesh. It is felt that the magnitude of arsenic problem in Bangladesh surpasses the aggregate problem of all the twenty countries of the world where groundwater arsenic contamination has been reported. This is the worst case of mass poisoning the world has ever experienced. Alarm bells are now ringing in Bangladesh since arsenic in groundwater has emerged as a serious problem across the country (WHO, 2002). The problem is made more complex by the fact that the contamination is arising below the ground where it cannot be easily dictated.

2.3.1 Causes of arsenic contamination in groundwater of Bangladesh

Arsenic contamination in groundwater can be occurred naturally and industrially. The natural existence of arsenic in groundwater is directly linked with the arsenic complexes existing in soils. Arsenic can release from these complexes under some situations. Arsenic in soils is highly mobile, once it is released; it turns in possible groundwater contamination. The alluvial and deltaic sediments having pyrite has favored the arsenic contamination of groundwater in Bangladesh.

Most regions of Bangladesh are composed of a vast thickness of alluvial and deltaic sediments. The regions can be divided into two major parts – the recent floodplain and the terrace areas. The floodplain and the sediments beneath them are only a few thousand years old. The terrace areas are better known as Madhupur and Barind Tracts. Most of the arsenic is

occurring in the younger sediments derived from the Ganges Basin. Investigators found that there is a layer containing arsenic compound at a depth of 20 to 80 meters (The Independent, 1998). This layer is rich in arsenic-pyrite, pyrite, iron sulfate, and iron oxide as exposed by the geological investigation. Although arsenic is occurring in the alluvial sediments, the ultimate source of arsenic is in the outcrops of hard rocks higher up the Ganges catchment. These outcrops were weather-beaten in the recent geological past and then the battered soil was deposited in West Bengal and Bangladesh by the ancient courses of the Ganges (Karim et al, 1997). Mortoza stated that arsenic in sediment or water can move in adsorbed phase with iron, which is available in plenty in the Himalayas. Karim (1997) reported about 100 to 300 mg/kg arsenic combined with iron oxides can be found in the sediments under aerobic conditions. When these sediments were deposited in Bengal basin under tidal environment, it came under anaerobic condition. The sulfate available in Bengal basin was reduced to hydrogen sulfide in presence of sulfur reducing bacteria. Iron minerals and hydrogen sulfide rapidly tie together to form iron sulfide (Karim, 1997).

Arsenic had been engrossed on the surface of iron sulfide and created arsenic-pyrite. This mineral usually remains stable except it is mixed with oxygen. In aerobic environment, arseno-pyrite is oxidized in presence of oxygen and arsenic absorbed with iron sulfide becomes mobilized. The groundwater in Bangladesh has declined increasingly due to the excessive extraction of water for irrigation and domestic water supply, absence of water management and inadequate recharge of the aquifer. The groundwater declined beyond 8 meters in 12% areas of Bangladesh in 1986 and this extent rose to 20% areas in 1992 and 25% areas in 1994 (NMIDP, 1996). The study on forecasting groundwater level fluctuation in Bangladesh indicated that 54% areas of Bangladesh are likely to be affected up to 20 meters in some areas particularly in northern part of the country (Karim, 1997). Excessive groundwater extraction may be the vital cause for producing a zone of aeration in clayey and peaty sediments containing arsenic-pyrite. Under aerobic condition, arseno-pyrite spoils and releases arsenic that mobilizes to the subsurface water. The mobilization of arsenic is enhanced by the compaction of aquifers caused by groundwater extraction.

Geological and hydrological characteristics of Bengal delta and the various impacts of human activities including use of fertilizers, pesticides in agriculture are considered as one of the main causes of groundwater arsenic pollution in Bangladesh. Burning of fossil fuel is also regarded as one of the causes of arsenic contamination. It is assumed to many that the sole

cause of arsenic contamination in ground water is excessive use of groundwater by tube wells and hand pumps (Nasreen, 2002: 162).

2.3.2 Arsenic crisis and its effect on health

According to a national daily newspaper in Bangladesh arsenic is labeled as a ticking time bomb (The New Age 26th April, 2010). Arsenic has following effects on human health- skin anomalies which may cause skin cancer, increases risk of cancer specially in liver, bladder, kidney and lung, irritation of digestive tract, reduces production of white and red blood cells, abnormal heart function, blood vessel damage and fetus damage during pregnancy. Gastrointestinal symptoms are common in acute poisoning but not in chronic poisoning like ground water arsenicosis (Lahri, 2000). Workers exposed to high levels of arsenic dusts or fumes suffer from nausea, vomiting and diarrhea (Morton et al. 1989). Effects of arsenicosis on the human respiratory system have been identified both from occupational exposure as well as from tube well water arsenic toxicity (Dekundt, G. L et al. 1986). Skin disorders have been documented in several epidemiological studies in which people consumed drinking water that contained arsenic of levels of 0.01 to 0.1 mg As/kg/day or more (Dekundt, G. L et al. 1986).

Liver disease can also occur through arsenic poisoning. Since the liver tends to accumulate arsenic with repeated exposures. Problems in kidney, bladder and cardiovascular disease, neurological effects can be occurred due to arsenic. Like the liver, the kidneys will accumulate arsenic in the presence of frequent exposures. The kidneys are the major route of arsenic secretion. Chronic inhalation of arsenic trioxide can increase the risk of cardiovascular disease. Like the cardiovascular system, both the peripheral and central components of the nervous system can be damaged by arsenic. Arsenic may create problem in reproductive health. Hardly any published information exists regarding reproductive effects in humans and animals after inhalation exposure to arsenic or organ arsenicals. The same is true for human oral exposure to these compounds (Dekundt, G. L et al. 1986).

The data collected by the governmental bodies, NGOs and private organizations reveal that a large number of populations in Bangladesh are suffering from melanosis, leuco-melanosis, keratosis, hyperkeratosis, dorsum, non-petting edema, gangrene and skin cancer patients extremely affected by the arsenicals. The daily consumption of arsenic contaminated water is very high in Bangladesh, especially in villages. The villagers consume about five liters water per day due to manual labor (Lahri,2000).

2.4 Socio-economic and Cultural Impact of Arsenicosis

Social, cultural, and economic factors have immense influence on the impact of arsenic-related illness and peoples' live and socio-economic patterns in Bangladesh. The socio-cultural status of women in Bangladesh is lower than men and have less social value. Women, in the poor families, are malnourished; on an average less educated and not as much of earner than their husbands. The status difference of male-female creates inequalities in the treatment of patients due to sexual identity. Because of their lower social status women are socially more vulnerable than men especially when the symptoms of arsenicosis are visible (Hanchett, 2004). Khalid Hasan's (2004) field report suggested that 'Compared to men the female arsenicosis patients suffer more social consequences in Sirajdikhan Upazila' (Hanchett, 2004:12 cited from Hasan 2004). This report notes that If women are symmetrically treated at household then changes in community attitude toward arsenic patients would be helpful for them (Hasan, 2004).

People's perceptions, priorities and other social, cultural, and economic factors influence public responses to the Arsenic crisis. A carefully managed public education programme can raise awareness levels of the less or uneducated and poor people (Hanchett et al. 2002). Arsenic is an abstract concept to many people. A survey on arsenic contamination estimated that some 47 percent people in Bangladesh considered arsenic related disease as contagious. Such types of believes hamper normal social life, create emotional pain (Hanchett, 2004 cited from ADB, 2003 and Rosenboom, 2004).

The APSU 2004 report by Hanchett emphasized the importance of heeding gender concerns in arsenic mitigation. The report underscored the need for more thorough gender analysis of arsenic situation in Bangladesh (Sultana, 2005). In this research focus will be given on the critical and through analysis of gender dimension of arsenicosis.

Women and girls have to spend a considerable time and energy in the collection of water (Sultana, 2005 cited from Crow and Sultana, 2002). Due to arsenic in drinking water women's workload increases. Sultana found, in her study conducted in the Araihasar (Narayanganj), Chaugachha (Jessore), Agailjhara (Barisal) and Ghior (Manikganj) Upazilas, which about 70% agreed that workload has increased for women and about 20% agreed, it has got worse for girls. About 80 percent women want men's help while 20percent said they

do not need man's support. Older women show less willingness to have men's participation in water collection. Such attitudes of stabilizing gender division of labor in water management may face challenges in future when scarcity of safe drinking water needs more active participation of all household members (Sultana, 2005). Women are willing to walk considerable distance at different times in a day but they often face trouble in negotiation with Arsenic crisis. Thus arsenic situation creates social tensions at water sources.

Sultana (2005) analyzed that both man and women agreed arsenic is a bigger problem for poor due to financial expenditure for treatment and accessing safe water sources. Poor women are socially stigmatized because they cannot raise their voices in society.

Nasreen (2002) explicitly highlighted on the socio-cultural impact of arsenicosis in Bangladesh. Arsenicosis is producing social instability through stigmatization and discrimination. It is also destroying social harmony and social relationship because of social conflict over contaminated water. Superstitious believe toward arsenic patients contributed to the worse situation of the victims. In Kushtia, arsenic is regarded as 'the curse of Allah' (Nasreen, 2002:164 cited from The Bangladesh Observer, 11September, 2000). Arsenic victims are abandoned by their family as well as society. The children are also ostracized and not permitted to attend any social functions. This literature will enable me to examine social implications of arsenicosis among man and women.

Arsenic effected peoples are gradually turn to death .The early symptoms of arsenicosis is dark spots on skin. It also destroys the working ability of the patients. The little children are severely affected with the disease.

Women are the worst sufferer of arsenicosis and many of them are getting divorce or abandoned by their husbands (Nasreen, 2002 cited from Daily Janakantha, 2 July, 2000). The poor people are forced to take contaminated water, thus they are heavily affected with arsenicosis. Lack of treatment further deteriorates the situation. The poor victims are incapable of doing hard work and as a result poverty increases on an extreme level. Because of feminization of poverty, when any social or natural disasters occur women are in an adverse situation. Arsenic in tube well forces women to collect water from remote place which increases their workloads. They have to maintain Parda or veil. Their vulnerability towards arsenic poisoning becomes doubled because of the disease and also for becoming outcaste (Nasreen, 2002). From this study, causes of arsenic contamination in groundwater of

Bangladesh as well some adverse impact of arsenicosis are realized properly which is relevant for my study.

Many studies have been revealed that social and economic loss for people in arsenic affected areas is acute and rapidly worsening (Ahmed, 2002; WHO, 2000). WHO (2000) reported that poorer households have been found to have higher percentages of arsenicosis cases. Many rural areas where arsenic contamination is very acute with large numbers of arsenicosis victims, people have been reported to be shunned or ostracized (Jakariya, 2003). While both men and women are suffering, this research indicates that arsenic poisoning has led to greater ostracism of afflicted women and girls, whose marriageability has decreased and divorces increased. Social stigmatization is disproportionately felt by women in most arsenic-affected areas (Hanchett et al. 2002; Hanchett 2004; Sultana 2006).

Even if people ‘know’ about arsenic, they may be reluctant to touch, take food, or share a bed with a patient; and high percentages express reluctance to form marital connections with families of arsenic patients. Some people appear to regard arsenic-related illness as a ‘curse of God’ and may ostracize the afflicted. (World Health Organization and UNICEF Bangladesh: 2003). According to the above literature, People have different believes and prejudices related to arsenicosis. This inspired the researcher to find out arsenic related vulnerabilities in terms of people’s belief and culture.

2.5 Gender Variations in Response to Arsenic Crisis

Social factors such as gender may have immense influence to determine the sustainability of long –term impact of mitigation projects. Farhana Sultana (2005) provides some explicit gender analysis based on gendered knowledge, perception, awareness, gendered coping mechanisms, gender and community management, and gender based health related to the arsenic crisis (Sultana, 2005:55).

Knowledge about arsenicosis helps to mitigate the severe impact of arsenicosis. Asian Development Bank conduct a survey on 536 adults in Shatkhira, Faridpur, Comilla and Manikganj districts found that people’s main sources of information about arsenic and its effects were: television (57%), radio (27%), government health workers (23%), and neighbors or relatives (19%) (Hanchett,2006). Men were somewhat more likely to get information from television and radio than women. This survey provides the ratio of men and women to get information from television were 60% and 33% vs. 54% and 20%,

respectively; and women more prone to depend on information from neighbors or relatives compared to men, the ratio was 20% vs. 18%, respectively (Hanchett, 2006). So, variations among arsenicosis patients occur in terms of getting knowledge and information. That difference in turns influence the coping mechanisms related to arsenicosis.

Male-female knowledge gap can easily be found considering arsenicosis. In Bangladesh women have less opportunity to have education compared to men. As a result there exist knowledge gap between man and woman. The same survey conducted by ADB presents that 76.3 percent male and 84.5 percent female considered arsenicosis as a dangerous disease .On the other hand, 11.3 percent male and 5.8percent female perceives arsenic as poison (Hanchett, 2004 cited from ADB, 2003). The survey found that responses from men and female were generally similar about the knowledge of arsenic. The ADB survey asked people what they knew about arsenic. Responses from men and women were generally similar, with the relatively high percentage of people recognizing arsenicosis as a dangerous disease, offset by the low percentage of people recognition of arsenic as a poison as indicated in Recognition of arsenic as a poison was higher among men.

Gender differences are found in the perception and awareness of arsenicosis patients. Hadi in his study stated that there is gendered knowledge gap about arsenic contamination and mitigation (Sultana, 2005:69 cited from Hadi, 2003). The research is an attempt to highlight whether variations in knowledge among arsenicosis patients generate variations in coping mechanisms and influence the patients to become affected with arsenicosis.

Marriage related problems are the biggest social problem for women. Women are the worst victim of marriage. The gender specific responses considering marriage are found among men and women. There is no such literature which focuses on the strategies taken by the arsenicosis patients particularly the female patients to solve the marriage related problems. This study attempted to highlight the how arsenicosis patients resolve the marriage related problems.

For resolving social problems related to arsenicosis, different communities take different initiatives. But ‘it was found that communities took initiatives to procure arsenic-free water when projects were started, or when awareness campaigns were prominent, and then reverted to consuming arsenic-contaminated water over time’ (Sultana, 2005: 75 cited from Ahmed et al., 2005). Women’s opportunity to participation in community water project and decision making is comparatively lower than men; as a result the arsenic crisis and its effects remain

unchanged in the villages. From this study we can learn various information and the realities of the arsenic crisis from a gender perspective. But there is a greater need for further research on why there are such gendered differences in awareness and responses, and how to ameliorate the situation and how to address the ostracism and stigmatization that women and men face as a result of arsenicosis (Sultana, 2005). This dissertation, 'Gender dimension of arsenicosis: A Sociological Study in Selected villages of Nilphamari' is undertaking these tasks of addressing ostracism and stigmatization of men and women and gender differences in awareness and responses.

A very few studies on people's perception found that those with better educational backgrounds have a greater understanding of the risks associated with consumption of arsenic-contaminated water. It has also been found, that a carefully managed public education programme can compensate for educational differences and raise awareness levels of the less or un-educated and to the same level as others' (Hanchett et al. 2002). This literature enables the researcher to explore effect of educational background in the responses of arsenicosis in terms of gender. In this thesis, researcher tried to focus on the initiatives taken by the arsenicosis patients and government to cope with and address the vulnerabilities of arsenicosis.

National Policy for safe Water Supply and Sanitation may take the responsibility to mitigate the gender based vulnerabilities related to arsenicosis through cost sharing and providing necessary information to the arsenic effected people.

2.6 Arsenic Mitigation Scenario

Arsenic is used for various purposes. It can be used as pesticide, chemical for preservation of woods. Worldwide the arsenic mitigation programme is different and people took different initiatives for mitigation of arsenicosis. The global arsenic mitigation programmes and strategies that are practiced in Bangladesh to mitigate the arsenic related problems are discussed here.

2.6.1 Global scenario considering mitigation programs

In many countries, once arsenic contamination has been detected, the most important action has been to provide safe water to these affected communities. Action was taken, for example, in Taiwan, Chile and Inner Mongolia. In these countries, piped water supplies were

introduced. In the developed countries arsenic mitigation programme is more technical compare to underdeveloped countries.

In the developed world, safe water is available at an affordable cost. In Chile, arsenic was removed by coagulation method which proved to be efficient and cost effective (WHO, 2008). In the US, only a few water supplies have higher levels of arsenic than 10 ppb, In India, many organizations have been working towards safe water promotion since 1996. These organizations have been working mainly towards partnering for simple, locally developed sustainable solutions, which included filtering water, dug well programs, etc. In Srilanka rainwater is use proven to be successful in China, India and Srilanka (WHO, 2000). Pipeline water supplies have been implemented in Taiwan Argentina and Chile to mitigate arsenic contamination in drinking water.

2.6.2 Practice of arsenic mitigation strategies in Bangladesh

In Bangladesh, arsenic in tube well water was first detected in 1993. Since 1996, the Government of Bangladesh (GOB) started implementing programmes with support from development partners and some national and international NGOs. The programmes included first nationwide tube well screening, awareness generation in affected areas and primary level of mitigations, such as three pitchers filter, rain water harvesting, dug wells, etc. That was a pilot level mitigation programme (DPHE, 2010).

Arsenic Mitigation Technology

Numerous projects have been taken by Government and NGO to provide arsenic free water to the afflicted people. The projects involved areas like careening, verification of technologies for arsenic removal, innovative design of technologies, community mobilisation, etc. Arsenic Removal Technologies Bangladesh Environmental Technology Verification - Support to Arsenic Mitigation (BETV-SAM) certified 6 technologies for selling in Bangladesh. This technologies are Sono 45- 25, MAGC/Alcan media based technology, Read-F, Nelima and Swadesh and the community scale one is the Sidko ADSORPAS Granular Ferric Hydroxide Technology. It has been learnt from various studies that these technologies are capable of removing arsenic. These technologies were believed as means for emergency response, the accreditation procedure took too long time for the effective use of the removal technologies.

Deep Tube wells

The DPHE/BGS (2001) reported that wells deeper than 150m were mostly safe from arsenic. Studies by DANIDA/DPHE, DPHE, and BAMWSP confirmed that deep tube wells over most of the country are low in arsenic. As a result numbers of deep tube wells have established significantly over the last few years. Most of those wells have been installed by DPHE under its various projects (DPHE, 2010).

Surface Water

Surface water is typically low in arsenic and potentially attractive drinking water sources in arsenic prone area. But surface water is frequently contaminated with human and animal faecal. The surface water must be purified and then it can be usable or drinkable. The pond water is used by the highly arsenic contaminated areas (WHO, 2000).

In Bangladesh, arsenic in tube well water was first detected in 1993. Since 1996, the Government of Bangladesh (GOB) started implementing programmes with support from development partners and some national and international NGOs. The programmes included first nationwide tube well screening, awareness generation in affected areas and primary level of mitigations, such as three pitchers filter, rain water harvesting, dug wells, etc. That was a pilot level mitigation programme.

National Policy for Arsenic Mitigation and Implementation Plan was published by the GOB in 2004. After finishing national screening campaign, arsenic mitigation programmes started through a variety of mitigation options, including re-sinking and deepening of tube wells. As the clear nature of arsenic contaminated tube well water seemingly harmless for people, extra installation and maintenance cost of options and improper sustainability of options reduced the pace of introducing acceptable safe water options. Moreover, geographical variability constrained the development of a unique mitigation model. Many years have passed, but no significant established mitigation options have been developed in Bangladesh.

In 1997, the Department of Public Health Engineering (DPHE) conducted a nationwide survey of approximately 23,000 tube wells. Field-test kits are used in that survey that only classified the arsenic concentration of the water as above or below 100 ppb, which was higher than 50 ppb, the maximum permissible level of arsenic in drinking water for Bangladesh. In

1998–99, Department of Public Health Engineering (DPHE) analysed a subsample of water samples that confirmed the arsenic contamination. In 1999, Bangladesh Rural Advancement Committee (BRAC), an international developmental organization in Bangladesh, initiated two pilot mitigation activities included testing wells, distributing mitigation options, and awareness building (Eval Carcinog, 2004). Later on, other NGOs such as NGO Forum for Drinking Water Supply and Sanitation, Proshika, launched a number of arsenic mitigation programmes in arsenic affected areas (Milton, 2012).

Better access to healthcare and health information is needed alongside improved patient identification. While monitoring of water and patients is critical, it is important to convey information accurately and clearly so as to reduce confusion or misperceptions. Taking into account the gendered realities on the ground is important in undertaking such tasks.

National policy for Arsenic Mitigation (2004) focuses on the necessity of gender issues in arsenic mitigation. Yet no detailed and organized gender analysis on arsenic mitigation has been undertaken. This study aimed at providing gender specific responses to the mitigation of arsenicosis.

2.7 Conclusion

The review of these literatures are essential to understand how the key themes of the proposed research gender, arsenicosis and vulnerability are addressed as a problem in scholarly literature and how this phenomena would be analyzed in the proposed study .While this review of literature establishes a context for the study, in the light of those scholarly traditions, it intends to explore the gender based nature of vulnerabilities related to arsenicosis including its impact on women and strategies taken to address the vulnerabilities.

CHAPTER THREE

Theoretical Framework of the Study

3.1 Introduction

This research demands number of theoretical approaches in connection with gender and vulnerability. Arsenic is an environmental disaster like other hazardous events and disasters; it has physical, psychological, economic as well as social impacts. To explore the gender specific vulnerabilities related to arsenicosis the researcher focuses on the vulnerability approaches and theories on gender inequality to understand the gender specific vulnerabilities related to arsenicosis. Arsenic crisis is an environmental as well as man-made disaster. In this regard, vulnerability theories are relevant to explore vulnerability of social groups affected with arsenicosis.

3.2 Vulnerability Approaches to Disaster

Arsenic is an environmental hazard. To understand the gender specific vulnerabilities related to arsenicosis researcher has adopted ‘Vulnerability’ Approach. The vulnerability approaches considers a broad range of social, economic and political factors shape disasters (Kamal, 2013). The concept of vulnerability is crucial in understanding why a hazard like arsenic becomes a disaster and for whom. ‘Vulnerability is a multi-faceted term incorporating susceptibility and impact to determine the potential for loss from a hazard event’ (Wisner et al.2004).

The social structures produce inequalities in gender, ethnicity, and class; in turn yield vulnerability to hazard (Blaikei et al., 1994; Hewitt, 1997). The overarching social structures rendered certain individuals and groups at greater risk of exposure to natural hazards (Bankoff et al. 2004). According to Blaikei (1994: 10) ‘Disasters are produced by the complex mix of social, political, and economic forces that produced vulnerability of people to hazardous environments. Important here is the focus on human agency as expressed in culturally reinforced social practice. That is, the specific things people do, situated in time and space, affect their vulnerability to various kinds of natural hazards’ (Blaikei et al 1994: 10).

Disasters only occur when it has an effect on vulnerable people (Cannon, 1994). So, disaster happens only when group of people become vulnerable due to natural hazard, this natural hazard turns to disaster. The term vulnerability refers to “ the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard” (Blaikei et al, 2004:11). Vulnerable groups can be identified under age, class, ethnicity, gender and physical or mental disability. The nature of hazards and socio-cultural circumstances determines the vulnerability of different groups. The main focus of vulnerability theory is to recognize which groups are more vulnerable to hazard like arsenic. The vulnerability theorists touted that when hazardous conditions unfold, women are the at most risk to disastrous events (Militzer, 2008).

There are three categories of vulnerability: individual, biophysical and social vulnerability (Cutter 1996, 2001). Social vulnerability defines demographic characteristics of social groups that make them susceptible to the impacts of environmental hazards (Cutter, 1996). Social vulnerability advocates the susceptibility for loss and capacity to recover from environmental hazard events are functions of a variety of social, economic, historic, and political processes (Hill and Cutter, 2001; Wisner et al., 2004). The concept ‘social vulnerability’ emphasizes two central themes: ‘both the causes and the phenomenon of disasters are defined by social processes and structures. Thus it is not only a geo- or biophysical hazard, but rather the social context that is taken into account to understand natural disasters; Although different groups of a society may share a similar exposure to a natural hazard, the hazard has varying consequences for these groups, since they have diverging capacities and abilities to handle the impact of a hazard’ (Hewitt, 1983). The hazard arsenic has varying consequences for different groups.

In social science, significant attention has been given to the human dimension of vulnerability to environmental disaster. The analysis of vulnerability perceives disaster as the interaction between hazards and people’s vulnerability. Cannon (2000) argues that an extreme climatic event only become disaster when a vulnerable group of people is affected. Arsenic, the extreme climatic event only becomes disaster when a group of people are exposed to arsenicosis. Person’s vulnerability is determined by the interaction of natural events and social, economic and political factors. The arsenicosis patient’s vulnerability is determined by the social, economic, political and also psychological factors.

The concept vulnerability is defined by different scholar in different ways. Adgar's definition of vulnerability contrasts with the dominant theories of disaster vulnerability. According to Adgar, vulnerability can be defined as the susceptibility of a person to stress due to social and environmental change. Societal factors determine which groups are vulnerable to disaster. Adgar's vulnerability approach to disaster focuses on the socio-economic factors that make people vulnerable to disaster (Adgar, 1999). The causes of vulnerability are associated with the environmental hazards. Vulnerability is also determined through formal institutional arrangements which organize warning, planning and other services and also with the institutions of the wider political economy. How society treats its members or groups in terms of access to resources is also related with vulnerability.

3.2.1 Pressure and Release Model (PAR)

There exists multiple theories on social vulnerability. The theory of social vulnerability which the researcher has taken, represents an attempt to understand the social conditions that transform an environmental hazard into a social disaster. The concept 'gender' is socially constructed and to understand the arsenic vulnerabilities in relation with gender, researcher has adopted theories on social vulnerability.

Blaikie, Cannon, Davis and Wisner (1994) developed the Pressure and Release Model (PAR). Pressure and Release Model explains relationship between disaster and vulnerability. The PAR identified the main causes of vulnerability as well as the various components of a society which increases vulnerability. According to the PAR, vulnerability can be occurred in three ways- First, the root causes of vulnerability are depended on less access to power, structures and resources along with ideologies of the political and economic systems. Second, the level of vulnerability exacerbate through dynamic pressures such as lack of local institutions, skills, local investments and markets and macro-forces such as rapid population change, urbanization, deforestation and government debt to revenue ratios. Third, vulnerability of an individuals or group can be created through the combination of unsafe conditions in the physical environment, local economy, and low income and at risk livelihoods, and social relations such as social inequality of certain groups and public actions.

The model differentiates among those three components on the social side: root causes, dynamic pressures and unsafe conditions, and one component on the natural side, the natural hazards.

The PAR model perceives a disaster as the intersection between socio-economic pressure and physical exposure. To understand the causes of vulnerabilities in relation with arsenicosis PAR model is appropriate. Researcher tried to link this model with arsenic vulnerabilities in study findings. Risk is defined as a function of the perturbation, stressor, or stress and the vulnerability of the exposed unit (Blaikie et al, 1994). In this way, it directs attention to the conditions that make exposure unsafe, leading to vulnerability and to the causes creating these conditions. The pressure and release model (PAR) explain social risk in terms of specific hazard vulnerability (Wisner et al. 2004). The social risk of arsenicosis can be discussed through The PAR model.

3.3 Feminist Theory

Feminist theory is an attempt to understand women's experiences and situation to improve their condition. Feminist theory encompasses verity of disciplines such as Sociology, Anthropology, and Economics etc. Feminist movement emerged from feminist perspective, aimed at breaking the silence on women's issues by using national and international law and the state to initiate and impose social change. This social movement aimed at eradicating gender inequality and promoting women's rights, interests, issue and opposed domestic violence, sexual harassment and sexual assault. Feminist movement redefined the concept power and politics with the declaration that 'the personal is political' (Miltzer, 2008).

This theory holds that women are oppressed on the basis of their gender due to dominant patriarchal ideology. In contemporary feminism, the concept of patriarchy received much attention. Patriarchy is closely related with Antonio Gramsci's concept of 'hegemony' which refers to the cultural dynamic by which a group claims and sustains a leading position in social life (Miltzer, 2008). Hegemony relates to the dominance of one group and the subordination of the other group. The foundation of hegemony theory holds that the subordinate group are suppressed by the dominant group in society.

The concept 'hegemony' is one of the important tools for feminist analyses of patriarchy. In feminist literature, hegemony is related with power which generates gender inequality. This point is related to Amartya Sen's contention, 'where the more powerful party, men, obtains a more favourable division of the family's overall benefits and chores and is also able to exercise power and control over others in the family' (Sen, 2005).

Feminist scholar Deniz Kandiyoti touted that women support the continued inequality within household though this beliefs and behaviours are harmful to them. The feminist theorist highlighted that patriarchal hegemony prevails in structural institutions of the state, religious institutions, the media, the school, and the household.

There exists two aspects power within patriarchy: sexual privilege - the right of men to control women's sexuality, and economic privilege- the right to control women's labour and earnings. Both of these aspects of power existed in rural areas of Bangladesh including Nilphamari. Prior to disaster, the unequal gender relation stemming from patriarchal structure produces vulnerability amongst women. In addition, this patriarchal system continues to reproduce women's vulnerability after disaster (Miltzer, 2008). The numerous factions within feminist school of thought help to employ the key notion within feminist perspective. These numerous factions are-

3.3.1 Liberal feminism

Liberal feminist aims at equal opportunity to man and woman. The main thrust of liberal feminism is that female subordination is rooted in a set of legal constraints blocking women's entrance to public life. Liberal feminist do not see women's subordination as a part of a larger system rather focuses on the several factors that contributes to the inequality between man and woman. Liberal feminists strongly emphasize on legislative aspects of patriarchy. This narrow focus of liberal feminism fails to adequately address women's vulnerability in case of disaster like arsenic.

3.3.2 Radical feminism

Radical Feminism is a current theoretical perspective within feminism that focuses on the theory of patriarchy. Liberal feminist analyses patriarchy as the systematic domination of females by males. This theory focuses on woman's liberation. The existing patriarchal ideology works as barrier to enjoy women's right. Women also face oppression during natural hazard. Radical feminist views family as one of the primary source of women's

oppression in society. In family level the female arsenicosis patient faces discrimination due to the dominant patriarchal ideology.

3.3.3 Marxist feminism

The traditional Marxist theory argues that woman's oppression is a form of class oppression. 'The shortfalls in liberal feminism led to the development of a Marxist feminist analysis, which, based upon Marxist thought, maintains that capitalist class structure and the emphasis with private property is responsible for gender-based inequality and oppression'(Hartmann, 1993 cited in Militzer, 2008). In other words, this theory married the capitalist system to the institution of family, focusing on women's financial dependence on men as a result of the unequal opportunities within the workplace, as well as the challenges in realizing women's domestic work as 'real work.' This approach is limited to the economic system, and thus overlooks other important elements within the overall female discussion.

3.3.4 Socialist feminism

Socialist feminism, which bridges together components of Marxist, and Radical feminists, explains the origins of women's oppression with the interaction of both capitalism and patriarchy. Socialist feminists assert that women are unable to be free due to their financial dependence on males in society. The female victim of arsenicosis is unable to have treatment due to their financial dependence on male. Thus, they become victim of gender inequality. Socialist feminism seeks to understand sexism as it affects women's lives within the historical context of capitalism as well as intersecting inequalities among multiple oppressions and their various manifestations: economic, social, and domestic. Socialist feminists refuse to treat economic oppression and sexist oppression as secondary (Humm, 1995 cited in Militzer 2008). Socialist feminist approach is useful as it poses questions about the interrelation between systems of domination.

3.4 Conclusion

Gendered vulnerability is deeply embedded in patriarchal values. Women are inferior to men. It is often argued that gender power and privilege shape the division of labour in daily routines, including control over land and resources, housing conditions, access to education and training programs, the use of public spaces, health services and recreation, control over one's body, expressions of emotion and sexuality, and of course, religious, political,

economic and military institution (Connell ,2005). To understand the gendered vulnerability in relation to arsenicosis vulnerability theory on disaster is as a theoretical framework of the study. Vulnerability theory to disaster focuses on how a natural hazard turns to disaster and makes a social group vulnerable. While the feminist theory which has been taken as another theoretical framework, emphasized on the vulnerabilities of a social group due natural disaster like arsenic.

CHAPTER FOUR

Methodology

4.1 Introduction

In a research project the rationale of choosing a method depends on the nature and purpose of research, the type of information needed and the availability of resources such as time, money etc. This research needed qualitative method for collecting and analyzing the data. The present research is based on sensitive issue and to collect the information in-depth interview helps the researcher to get insight into the issue. Researcher has used Key Informants Interview (KII) and case study as a data collection tool. Research objectives, research questions, the methods of data collection and analysis of the data have been presented in this chapter to get an insight into the whole procedure of my research investigation.

4.2 Methods applied in the Study

The particular purpose and area of inquiry of a research project determine which method is appropriate for conducting the research. Researcher has adopted qualitative method due to the nature and subject matter of the study. Qualitative research concentrates on the study of social life in natural settings. Its richness and complicity indicates that there are different ways of looking at and analysis social life. So, the different versions of social reality can be elaborated from the multiple perspectives and practices offered in the different questions (Coffey & Atkinson, 1996: 14).

4.3 Role of Qualitative Analysis

To describe the gender specific vulnerabilities related to arsenicosis researcher has adopted qualitative method in this research work. Variations in responses and coping mechanisms occur among men and women due to the differential nature of vulnerabilities. So, to explore the gender variations related to arsenicosis in Nilphamari district semi-structured questionnaire is useful to address those sensitive issues. Since the qualitative approach provides close attention to historical detail. So, to construct new understanding of culturally or historically significant phenomenon, the researcher adopted this method.

In a developing country like Bangladesh the cultural and social domains are often determined by the patriarchal system and existing political order. Gender is social and cultural phenomena. This cultural fact plays an intrinsically dynamic role in determining the roles and responsibilities of men and women in society. By exploring the gender roles and responsibilities and its relations with arsenicosis, this research aims to discover gender specific vulnerabilities related to arsenicosis. Close in-depth empirical study is necessary to carried out such difficult task. Through the qualitative method of analysis, researcher aims to discover how variations in gender response occur considering arsenicosis. This research is more conscious with gender and its relations arsenicosis rather than with the measurement of those aspect.

This is an exploratory nature of research which will explore the unexplored information about the gender dimension of arsenicosis regarding gender roles, gender variations in response and gender specific coping mechanisms to address the vulnerabilities.

Although in groundwater of Bangladesh arsenic has been found in 1993 (UNICEF,2008), there has not yet been conducted informative as well as much more enrich research on gender specific vulnerabilities and response to arsenicosis, particularly in selected villages of Nilphamari.

Gender, water and its relation to arsenicosis are not a recent phenomenon in Bangladesh, relevant literature and documents are also available in this field. But the issue, gender specific response and coping mechanisms related to arsenicosis based on gender is not explicitly focused in any other research. For such kinds of reason it is inevitable to present a detailed view of the subject matter to gain an insight about socio-cultural context of gender related to arsenicosis in Bangladesh which are totally different from those of the developed nations and tagged with specific value systems and ideology based on gender roles and responsibilities.

4.4 Data Collection Technique

In this paper, researcher has used the semi-structured interview technique as a part of in-depth individual interview due to the nature of the research topic and research questions.

4.4.1 Semi-structured in-depth interview

Interview is one of the important methods of data collection techniques in qualitative research. Interview is the most common method of data collection in the study of human

behavior and a good way of accessing people's perceptions, meanings, and definitions of situations and constructions of reality (P.V.Young, 1996).

This research topic is highly sensitive and individuals' perception about the socio-cultural viewpoint on the issues of gender relation with arsenicosis is emphasized here. That is why it is impossible to study the issues in a group interview. Confidentiality of individual information is strictly maintained by the researcher because of patients' psychological issues and also for their social security. Although observation includes the face-to-face interaction, the fact is that we cannot observe everything (Patton, 1990: 278). It is not possible to observe how the gender difference in response to arsenicosis occurs through the perception, reaction and coping mechanisms of the arsenic affected people. In order to gain insight about these phenomena, the researcher has to ask questions to both man and women. In-depth interview in this context, is good way of accessing man and women's perception. Male-female perceptions and knowledge could be meaningful in case of exploring how arsenicosis patients cope with arsenicosis. The vulnerabilities of arsenicosis based on gender and gender specific strategies taken to address the vulnerabilities which has been coined through this piece of research, is very sensitive and directly connected with the agencies of socialization , culture, socio-economic condition and patriarchal system as well as social identity of men and women in rural areas of Bangladesh. As the researcher pursuing a topic of sensitivity and emotional depth, it requires an in-depth analysis.

Indeed, one of research objective is to investigate the gender specific vulnerabilities of arsenicosis. By scrutinizing the experiences of arsenicosis patients who are bound to live with the disease as a victim of it, researcher intends to discover the interaction between gender and the vulnerabilities related to arsenicosis, the qualitative interview in this regard invariably the path to deliver specific details on this topic.

4.4.2 Case Study

Case studies were conducted to get the real picture of gender specific vulnerabilities related to arsenicosis. In this study, thirty case studies of arsenicosis patients were conducted.

4.4.3 Key informants interview

The retaining Officers of Upazilla Health complexes and DPHE engineer of Nilphamari district are also interviewed for my research purpose as the key informants of this research.

The researcher collected some valuable information about the current situation of arsenicosis in Nilphamari district.

4.4.4 Interview with the respondents

Researcher has talked with the male arsenicosis patients to know about their perception about arsenicosis and make clear conception about gender specific vulnerabilities in relation with arsenicosis.

Female patients of arsenicosis have different perception about arsenicosis .Researcher has taken interview of the female arsenicosis patients to portrayed an exact picture of their perceptions of arsenicosis.

4.5 Preparation for Field Study

Before going to the field, researcher did the preliminary readings and prepared the research plan. Simultaneously, prepared guidelines in order to conduct the interview of the arsenic effected people. The researcher also prepared a consent paper for the organizations which works with arsenic hazard in Bangladesh to get information about the arsenicosis patients of selected villages of Nilphamari district. The researcher also made a consent paper to get the consent of the of the arsenicosis patients. Besides, researcher has prepared a letter of introduction to inform them about the research in consultation with supervisor.

4.6 Field Work in Nilphamari District

In order to conduct the fieldwork, the researcher went to the selected villages of Nilphamari district in October, 2013. Researcher has to go to selected villages of four Upazila of Nilphamari district to conduct the study because arsenicosis patients are identified only in selected villages of those four Upazilas of Nilphamari (DGHS, 2013). Demographic information of the arsenicosis affected people of those four Upazila are gathered from Upazilla Health officer and community hospital doctors of four above mentioned Upazilla of Nilphamari District. The engineer of DPHE also guided the researcher in collecting information about the arsenicosis patients. The relevant information of the study without which the research is undone is gathered from the arsenicosis patients of Nilphamari district. Nilphamari is a rural area under the division of Rangpur. Nilphamari is situated in the northern part of Bangladesh. Among the six Upazila of Nilphamari patients of arsenicosis are found in selected villages of four Upazila. Brief information about the four Upazillas of

Nilphamari where arsenic affected patients are recognized discussed here. Jaldhaka under Nilphamari district has 45456 units of house hold and total area 303.52 km² (BBS, 2005).Kishoregonj, Saidpur and Domar Upazilas have 36406 units of house hold, total area 121.68 km² and 33490 units of house hold with total area 250.84 km² respectively (BBS, 2005). So, we can see from the above information that Nilphamari is densely populated and like other parts of Bangladesh it is also facing the scarcity of safe drinking water .Water borne diseases are also very common here and because of its huge population the water borne diseases cannot be resolved properly. Nilphamari is not severely affected with arsenic. Low level of existence of arsenic in groundwater of Nilphamari is found.

The researcher went to Nilphamari in October 2013 to collect the field data. The researcher spent about one month to collect the information relevant for the study. I have interviewed thirty arsenicosis patients among the fifty to complete the fieldwork effectively within the limited time period. The researcher is unable to take interview of the rest of the patients due to time constraint. The researcher also takes interview of the Upazila health Complex officers and the DPHE engineer of local office to know the overall scenario of arsenic situation in Nilphamari district.

4.7 Sampling and Sampling Frame

‘The process of darning the elements from larger population or universe is called sampling’ (Black and Champion: 1986). As this research is an individual project the sampling was restricted by availability and feasibility due to which it was not possible to extend the sampling to the total population of Nilphamari district. Hence, to conduct this piece of work, the researcher decided to include fifty arsenicosis patients in her sample group which is found in DGHS (2013) survey .While the DPHE (2010) survey indicates that there are twenty seven arsenicosis patients in Nilphamari. Finally it was possible to include thirty arsenicosis patients in the sample of the study. The following tables indicate the total number of arsenicosis patients in Nilphamari district.

Table 01: Identification of Arsenicosis Patients in Nilphamari District by DPHE 2009-2010

Division	District	Upazilla	Number of Patients
Rangpur	Nilphamari	Saidpur	06
Rangpur	Nilphamari	Domar	11
Rangpur	Nilphamari	Jaldhaka	10
Total			27

Source: DPHE report 2010:65

Table02: Registered Arsenicosis Patients in Nilphamari District by DGHS 2012-13

Division	District	Upazilla	Number of Patients
Rangpur	Nilphamari	Kishoregonj	08
Rangpur	Nilphamari	Saidpur	10
Rangpur	Nilphamari	Domar	11
Rangpur	Nilphamari	Jaldhaka	21
Total			50

Source: DGHS report 2012-13:10

4.7.1 Sampling

Due to the time constrain and availability of arsenicosis patients the researcher was unable to take interview of the thirty arsenicosis patients of four Upazilla mentioned in the table 03.

Table 03: List of Arsenicosis Patients Interviewed by the Researcher

Upazilla	Union	Village	Number of Patients
Saidpur	Botlagari	1.DokhinSonakhuli 2.Shaskandor	04
	kamarpukur	1.Dolagach 2.Dolua	02

	Kasirampur Belpukur	1.Sipaigonj 2.Chaora Nayabari 3.East Belpukur	05
Kishoreganj	Bahagili	1.Uttar Durakuti	02
	Ronchondi	2.Bafla	01
	Nitai	3.Nitai	02
	Magura	4.Sigergari	01
	Putiamari	5.Ververi, 6.Putimari	02
Jaldhaka	Golana	1.Khariza Golana 2.Taluk Golana	02
	Balagram	1.Purba Balagram Hatkhola 2.Purba kathali Sarkarpara	03
	kathali	1.Babupara	02
Domar	Bamoniam	1.Bamoniam	02
	Boragari	3.Boragari	02
Total			30

Source: Fieldwork -2013, Data of registered arsenicosis patients of Saidpur, Domar, Kishoreganj, Jaldhaka by Upazilla Health Complexes of Nilphamari.

With the objective to organize the work in a representative manner, the researcher selects male and female respondents who are affected with arsenicosis. Researcher needed direct information about gender dimension related to arsenicosis patients. So, male and female arsenicosis patients both were needed. Moreover, there are many residents in Nilphamari district and the four Upazilla which are selected for the study. After talking with residential people researcher found that there are few arsenic effected patients in Nilphamari district and the prevalence of arsenic in drinking water is not severe. Although the vulnerability of men and women are different regarding arsenicosis and there also other arsenicosis patients in Nilphamari District but they are not eligible to be interviewee of the research work. Only thirty patients were found as severally effected with arsenicosis. In this context, researcher

has employed the purposive sampling which is used in exploratory research. It is appropriate in three situations, such as- ‘ a) A researcher uses it to select unique cases that are especially informative; b) To select members of a difficult to reach and c) To identify particular types of cases for in-depth investigation’ (Fontana and Frey, 1994). So, I have used purposive sampling to collect in-depth information from the arsenicosis patients as well as able to take part in interviewing of gender relations with arsenicosis.

4.8 Study Location

The researcher has selected villages of four Upazilla (Kishoreganj, Saidpur, Jaldhaka and Domar) of Nilphamari district as her research area for the following reason. According to the ‘arsenic patient identification survey’ conducted by DGHS, there were registered 1636 patients in 65 Upazillas which were not included in 301 surveyed Upazillas by DGHS. And the Upazillas of Nilphamari are among the 65 Upazillas which were not included in the survey but there are total 27 arsenic patients in Saidpur, Jaldhaka and Domar Upazillas respectively. (Arsenic Situation Analysis Mitigation Report 2010:65).This point has encouraged the researcher selecting Nilphamari district as study area.

Moreover, a recent report of DGHS (2012-13) indicates that there are fifty people are identified as a victim of arsenicosis in Nilphamari. So, this has inspired me to identify the arsenicosis patients in Nilphamari district and explored their vulnerabilities related with arsenicosis based on gender. There are also some troubles in selecting this area because it is quite tough to find out those arsenicosis patients. They usually conceal their problems to others. Though there are some problems, being a rural background student and familiarity with the dialect of that region, it will be a bit easier to communicate, build rapport, and find out arsenic patients in the selected villages of Nilphamari district.

4.9 Negotiation and Gaining Access of the Respondents

The procedure of searching arsenicosis patients was not so easy task. Moreover, researcher had to explain his research objectives in a simple manner but with honesty and clarity. Researcher enjoyed positive responses in collecting the name, holding number and other demographic information about the respondents. As male patients have to work outside the home .So, the researcher has to take their interview at their free time mostly in afternoon. The female patients who are affected arsenic, their interview have been collected when their household activities and other works have been done. The researcher contacts with the

respondents when they are available for talking and have much time to talk about the arsenic crisis. Before interview, researcher sets a good atmosphere for taking interview of the arsenic affected male and female.

4.10 In-depth interview: Recording the Data

After the phase of negotiation, the researcher succeeded in sitting with thirty arsenicosis patients for interview. Each interview session was with an individual respondent. The researcher spent almost one hour with each of my respondent to discover their insight about the vulnerabilities related to arsenicosis. Researcher tried to understand whether the level of vulnerability between male or female patients are different based on their social status, specifically the gender specific social implications of arsenicosis. The researcher also trying to explore various gender based strategies involved to address the vulnerabilities. The strategies include awareness, responses and coping mechanisms of the male and female arsenicosis patients. Interview session with male patients was about thirty minute's flat speech and about thirty minutes were recorded. For the female patients, the recording session was much more elaborated. Researcher watched the gender specific works during the interview. It was the observational session to watch the interviewee and note out their gender specific roles and responsibilities.

After gaining entrance, being a researcher, the researcher endeavored to create such an atmosphere in which the arsenicosis patients would be comfortable to talk freely about their suffering. Before each interview, the researcher adopted the strategy to tell the fact that in order to get accurate account of what the respondents say, it would be necessary for the researcher to record the interview. All tapes the researcher assured that would be kept by the researcher and the materials would be used exclusively to write up her advanced research thesis.

Indeed, the researcher initiated each interview in a form of chit-chat to warm up my respondent. Initially, each of my interviews began with the same question: For arsenicosis patients both man and women- Do you know about arsenic? How do you come to know about arsenic? Are you affected with arsenicosis? How long since you have been affected with arsenicosis and why? Researcher had put an extra part for the arsenic affected women in the checklist of the study. Nature of vulnerabilities of women regarding arsenicosis is not similar to that of men. So, the research demands extra effort to understand the situation of female

victims. The different portion in checklist for women will help to explore their miseries as a victim of arsenicosis.

Emotion, sensitivity, controversy raised in the multiple directions during my interview session with the arsenicosis patients. In order to comprehend male and females' passion and perception in association with arsenicosis, their body languages, facial expressions and the vocabularies were simultaneously appeared as the subject of my keen observation.

One of the important assumptions of qualitative research is to learn people's perspective not to instruct them. In some of the interview sessions although the researcher felt value conflict with the arsenicosis patients and their perception, but to learn what the respondents' thinking is and why they are that way the researcher do not change any information.

4.11 Pilot Study

Before starting the final survey the questionnaire was pre-tested by few respondents because, the final survey to avoid the lacking or any problematic issues regarding the questions. However, as per rule, those respondents were not included in the final survey. One of the main reasons, to conduct pilot test was to concern about the time to fill out all the questions. Before finalizing the questionnaire these types of requirement were taken into consideration very carefully, where language, sensitive issues, sequencing the questions, the techniques or options for documenting responses were the main focus.

4.12 Ethical Consideration

The researcher got the commitment that the subject identification should be protected in the research project through confidentiality and anonymity. The information, which had been procured and used in the work, would not be harmful and traceable to them in any possible manner. The researcher promised that their views would be kept confidential in this work. In any research work, to maintain a code of ethics is mandatory. So, the researcher has maintained some ethical considerations regarding the respondents and the research work.

- 1) Reviewing the literature of the research topics, researcher has selected a new title to maintain objectivity and integrity in research.

- 2) The researcher negotiated with the respondents with polite manner. The researcher showed the respondent the recommendation paper to convince them about my research work.
- 3) The researcher also granted that information collected from the respondents and used in the research work would not be harmful to them in any circumstances and it would be used only for the academic purpose.
- 4) In this research, the researcher has used the actual name of the respondents after getting consent of them.
- 5) The respondents were also assured that the researcher would not distort their perceptions in the research paper.

Finally researcher gave thanks to every of the respondents for giving their valuable information and time for this research work. In any research work, to maintain a code of ethics is mandatory. So, the researcher has maintained some ethical issues regarding the respondents and the research work.

4.13 Role of Documents

For the sociological and critical analysis of the research work, researcher collected documents from various sources. The study mainly depends on newspapers, published articles, relevant books and internet.

4.14 Field-note

After returning from each interview, the researcher kept detailed notes. As the field notes of the research include the physical appearance of male and female arsenicosis patients of Nilphamari district, their pattern of conversation, the narrative of their home environment and perception of their family member, it contributes in providing a holistic insight about how the socio-economic condition, cultural values of the rural Bangladesh is considering gender issues related with arsenicosis.

4.15 Method of Data Analysis

Data analysis is the process of systematically searching and arranging the interview transcripts, field-notes and other materials that the researchers accumulate to increase their understanding of them and to enable them to present what they have discovered to others. After completing the one week field study, researcher started the part of data analysis by transcribing the interviews of the respondents, whose interviews had been recorded on a digital recorder. Hence, at the beginning of the point of transcription, researcher took each interview in Bengali language and those original transcriptions remained intact and contained the hand-written notes. Later the researcher translated those written materials into English and maintained the notes. The researcher used original names of the respondents with their permission though the issue is so sensitive and related with the social status of the patients. Localities of the respondents are not changed in this thesis but exact locations are hidden for maintaining confidentiality of the patients. After that step of transcription, researcher read and re-read the transcripts with the objective to form the data and wrote four pages summary of what considered by the researcher had emerged. Simultaneously, organized and typed the main themes and concepts of each interview from those transcripts. The process contributed in splitting out the data and placed them into the distinct category.

As coding continued in this qualitative research, it discovered the fact that the gender specific nature of vulnerabilities and the coping strategies taken by arsenicosis patients differ from man to woman. Then the researcher has analyzed the data with the relevant theories to get an ending point. The researcher has interpreted how existing theories are related and theorized my research project.

4.16 Conclusion

The piece of qualitative research through its interpretative analysis demonstrates how men and women respond to arsenic crisis. By interviewing the arsenicosis patients of Nilphamari district, the researcher discovers the dilemma, and contradiction in the opinion and behavior patterns of the male and female arsenicosis patients regarding arsenic contamination in drinking water and their vulnerabilities. The opinions of the key informants provide an overview of the arsenicosis patients in selected villages of Nilphamari district.

CHAPTER FIVE

Conceptual Framework of the Study

5.1 Conceptual Framework

Conceptual framework provides the structure for the whole study based on literature and personal experience. Conceptual framework sets out the focus and content of the study. The act of the study is linked between the literature, methodology and the results; conceptual framework helps a researcher to gain the ability to move beyond descriptions of what to explain of why and how. It is also a filtering tool for selecting appropriate research questions and related data collection methods. It is a frontier of a research work (Smyth, 2004).

5.2 Linkages between Cause and Effect

The conceptual framework illustrated as particular presentation of the relationship between arsenicosis and its implication on gender dimension. The interaction between arsenicosis and its implication on gender dimension can be illustrated through gender specific vulnerabilities related to arsenicosis and coping mechanisms taken to address the vulnerabilities. The below diagram also illustrates about cause and effect relationships between the indicators. Every indicator is inter-related arsenicosis.

The interaction between arsenic poisoning and gender dimension can be illustrated through the gender based differential vulnerabilities like physical, economic, social and psychological vulnerabilities. Above mention the conceptual framework of this study provides a specific concept for conducting this research. Over viewing the conceptual framework, it will help to perceive and understand the purpose of conducting this research.

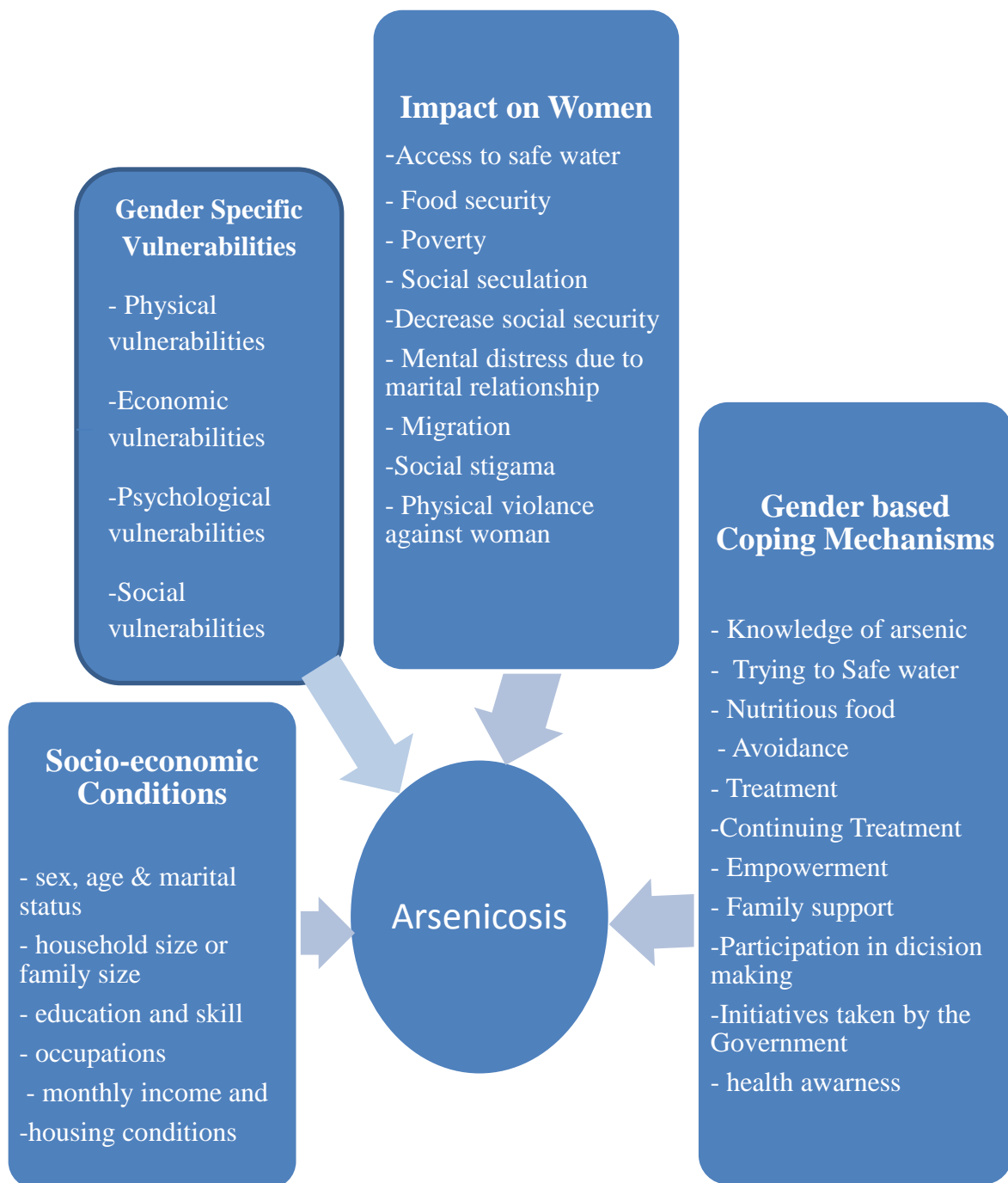


Figure: Conceptual Framework

CHAPTER SIX

Data Presentation

6.1 Introduction

Access to safe water is one of the important determinants of health. Poisoned water or arsenic contaminated water creates risk of several health hazards such as skin lesions, melanosis, keratosis, and hyperkeratosis and in an extreme case skin cancer. These types of health hazards due to having arsenic contaminated water render the arsenicosis patients vulnerable to different social, economic, psychological problems. Both male and female arsenicosis patients are suffered from these vulnerabilities. But the intensity of vulnerabilities depends on gender identity. Gender differences and variations in gender roles are learned through socialization process. The status of men and women are determined by society. Variations in socio-economic status and assigned roles of man and woman in society rendered variations in vulnerabilities of men and women. In this regard, to address the adverse impacts of arsenicosis man and woman takes different initiatives and coping mechanisms in response to the disease.

What are the vulnerabilities associated with arsenicosis and how do arsenicosis patients cope with their physical, economic, psychological and social vulnerabilities related with arsenicosis in selected villages of Nilphamari, is the prime concern of the researcher. Researcher explores the nature of vulnerabilities related with arsenicosis and coping mechanisms to address the vulnerabilities in selected villages of Nilphamari district based on gender specific roles with conducting in-depth interview of 30 arsenicosis patients. Gender specific differential vulnerabilities related to arsenicosis and strategies taken by the arsenicosis patients to cope with the disease in Nilphamari district are discussed below in order to the views of the male and female arsenicosis patients and key Informants of the study population.

6.2 Gender Specific Vulnerabilities

Vulnerability refers to the inability of a person to cope with stressful or hazardous situation. The UNISDR defines vulnerability as ‘the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard’ (UNISDR, 2009). If a person is vulnerable to a disease or hazard, he is more at risk of being affected with that disease than others. Generally, gender refers to male and female and gender specific vulnerabilities can be defined as the incapability of men and women to withstand with the effect of hostile setting.

6.3 Gender Specific Nature of Vulnerabilities Related to Arsenicosis in Nilphamari District

Gender is a social and cultural fact. Gender usually means woman in many peoples mind and gender specialists are inaccurately assumes promoting only women’s activities and women’s positions instead of men’s activities and positions (Hanchett, 2003).

The nature of vulnerabilities related to arsenicosis differs from man to woman. The physical effects of Arsenicosis are quite similar among men and women. But the nature of vulnerabilities associated with arsenicosis may differ considering economic, psychological as well as social issues. Researcher tried to explore how male and female are susceptible to be affected with ‘arsenicosis’. The following explanations are the outcomes of researcher’s analytical effort to find out the gender based nature of vulnerabilities related to arsenicosis in selected villages of Nilphamari district.

6.3.1 Gender based physical vulnerabilities related to arsenicosis

Physical effects of arsenicosis among men and women are quite similar. Though, to some extent female patients suffer more than the male arsenicosis patients because of their physical strength and gendered division of labor. According to Rosenboom: “the development of arsenicosis is influenced by diet, genetics, nutritional status and lifestyle choices, as well as the level and duration of arsenic exposure” (2004:174). The study finding reveals that almost all the arsenicosis patients of Nilphamari knew about arsenicosis and the physical vulnerabilities associated with disease. Most of the arsenicosis patients in Nilphamari commented that people become afflicted with arsenicosis due to drinking arsenic

contaminated water for at least six months. Then the symptoms of arsenicosis exhibits in patients' body.

The research reveals that some patients of arsenicosis have sufficient knowledge about the causes of disease. Early symptoms of arsenicosis are development of dark spots in skin which is called melanosis. Using arsenic contaminated water for long time creates spotted melanosis. When black spots diffused in palms and soles it is called spotted melanosis. Keratosis appears in palms and feet. Hyperkeratosis (hardened skin) predominately appeared in Palms and feet. Chronic arsenic poisoning or arsenicosis can germinate several health hazards like skin lesions, cancer restrictive pulmonary disease, peripheral vascular disease, gangrene, hypertension, black foot disease, non-cirrhotic portal fibrosis, ischemic heart disease, and diabetes mellitus (DPHE, 2010). Skin deviates due to arsenic poisoning and Rashes may be seen in skin. Black foot disease occurs if an arsenicosis patient uses arsenic contaminated water for about twenty years (Lahri, 2000). Black foot disease and cancer patients are very rare in Bangladesh; particularly in Nilphamari no arsenicosis patients are found who are suffering from cancer and black foot disease. Besides those diseases, arsenicosis patients suffer from headache, constant fever, dizziness etc. Because of not having nutritious food the patients specially the female patients even cannot walk properly. The physical weakness of the arsenicosis patients, due to not having proper food and treatment, makes the female patients so weak consequently they appear difficulty in doing their household chores. In this context, Shahina has stated, 'After being affected with the arsenicosis, I need lots of time to accomplish my all household chores rather than previous period' (Fieldwork, 2013). Some of the patients of Nilphamari have reported that they have lost their physical strength and working ability. In this context, Soleman said, 'Once I was very cheerful and hard working person but now I have lost my all working ability and energy' (Fieldwork, 2013).

6.3.2 Gender specific economic vulnerabilities of arsenicosis patients

Arsenicosis has enormous effect on economy and it accelerates economic vulnerability of arsenic affected patients. They have to spend more money for bearing expenses of treatment as well as becoming incapable doing work for maintaining their daily life expenses also. As a result, they become compelled to sell their limited assets for treatment of the disease. This makes them poor to poorest while women always experience the worst part of these. Johra Khatun, arsenic affected patient touted that 'I have sold my ornaments and assets for my

husband. A piece of land inherited from my father, the last hope of our survival, has been sold for my husband's treatment. Now, my husband has died and I have nothing left to survive' (Fieldwork, 2013).

Sikender Ali said, 'Among the three bigha land, I have sold one bigha land for my treatment and consequently it has become difficult for me to maintain the expenses of family with two bigha land' (Fieldwork, 2013). Rashidul Islam, patient of arsenicosis, expressed that before affected with the disease his family was economically solvent and 6000 thousands taka per month were sufficient for us to live happily. But a huge amount of money (ninety thousands taka) that has been spent for his treatment made Rashidul and his family economically vulnerable to lead a miserable life. He again stated, 'Our economic condition has been deteriorated and it has become quite impossible to continue my treatment with maintaining all expenses of our family' (Field work, 2013).

Due to lack of financial solvency, arsenicosis patients become bound to lend money from others. Afsar has stated that 'I have sold the land for me and my mother's treatment which I had used to cultivate crops. Arsenicosis patients are falling into debt crisis and have to pay the loan. They even have to sell their dwelling place. Afsar Ali has said, 'I had a small home which was the only place in the world for me but now I am nothing but a beggar of the street' (Field work, 2013). The women in rural areas of Bangladesh are economically depended on their husband. They do not earn money rather they work hard for their family. As a result the most of the rural women have no savings of their own. When these unemployed women though they work hard for family become victims of arsenicosis suffer a lot than the male arsenicosis patients. These women have to sell their resources or limited savings which they collected through their entire life. The female household families are the worst victim of the disease due to the prevailing gendered economy in society.

Lose of job or being unemployed is one of the major economic problems for the arsenicosis patients. Motilal has expressed, he was working in the shop two years ago; one customer came asked for something to buy but after seeing me he refused to take anything from our shop. He went to another shop and said about me over there. The shopkeeper told me about this and after that incidence, my father does not include me in that business.

The victims of arsenicosis are incapable of serving hard labour which affects their economic situation. Soleman (42) claimed that arsenicosis has diminished my working ability and he is unable to work in the rich mill now. In this situation my wife is bearing all the responsibilities

of our family. Akter Ali stated, 'I am a village doctor. People used to come to me for treatment but after seeing my condition no one come to my chamber for treatment. It has become tough for me to maintain my family' (Interview, 2013). Employment problem is mostly faced by the male patients of arsenicosis because they are the only bread earner of the family.

Termination from jobs or loss of jobs due to arsenicosis rendered the arsenicosis patients to live with hardship. They have to take loan from other with huge interest rate which make economically dependent on others.

Discrimination in jobs due to arsenicosis is a common problem for the arsenic survivors. The arsenicosis patients suffered from severe discrimination in the work place. They are maltreated by their colleagues. Even the day labors are paid less which increase poverty. The female labors suffering from arsenicosis are unable to work hard due to their physical weakness which renders them economically vulnerable to the disease. The female patients are also victim of discrimination in their workplace.

The poor victims, especially women who earns for their family, usually lose their jobs resulted hard core poverty. The woman headed household suffers much miserable condition for arsenicosis. Rozina Begum, a tailor, stated, 'Nobody comes to me for making dress, I am unemployed now. Consequently my parents and little brother will die without food if I would not be able to manage a job (Interview, 2013).

Most of the arsenicosis patients in the villages of Nilphamari district have no ability to spend money for pure drinking water. Their physical condition has begun to be weak to weaker because of having arsenic contaminated water. People don't have enough money to purchase safe water machine free from arsenic poisoning. They are using polluted pond water; as a result suffering from several waterborne diseases like diarrhea, dysentery and others.

The arsenicosis patients fall into great economic crisis because they have to take long term treatment for this disease. The empirical data show that men are economically more vulnerable to arsenicosis than women in Nilphamari district. Because male are the only earning members of the family. As a result they become unable to contribute in their family and members of the family have to face extreme poverty to survive them. On the other hand, women suffer miserable situation due to the economic vulnerabilities of the family.

6.3.3 Gender variations of psychological vulnerabilities of arsenicosis patients

Arsenicosis also creates psychological pressure that result in mental distress, depression and frustration. People become dispirited and puzzled for being affected with arsenicosis. In extreme cases, patients are emotionally affected and may commit suicide. Arsenicosis patients are always feared of being isolated from their surroundings which makes them emotionally vulnerable. Arsenicosis patients feel embarrassed to be with others. Shahina has stated that ‘I feel embarrassed to communicate with others because they always ask me about the symptoms of my body. So, I always conceal my problem rather than being seen strangely’ (Fieldwork, 2013). Arsenicosis patients suffered from mental distress and agony. Arsenic affected child are deprived from playground & recreations because other child are reluctant to play games with them and always hide them for making fun of them. They become separated from their family and friends that makes them depressed. Arsenic contaminated patients feel distress to perceive that their children do not show them any respect. Nuri has also expressed that ‘I feel shy and do not go to play in the playground because the boys of our locality tease me and utter bad comments about my disease (Fieldwork, 2013).

Marriage related problems create social tensions and frustrations among the arsenicosis patients. Shahina Khatun has stated, ‘I am in agony because my husband refused to continue our marriage’ (Fieldwork; 2013). Arsenic affected patient also want to commit suicide because they do not think that they will ever get married due to being affected with arsenicosis. Ismat Ara has expressed, ‘My life has been shattered when I get divorced because of arsenicosis’ (Fieldwork, 2013). The social pressure pertaining to marriage of arsenicosis patients give birth to mental distress. Family member of the affected person usually treat them as a burden for not having marriage which makes them mentally depressed. Feroza Begum has stated, ‘My husband frequently asked for dowry. I am mentally so disappointed that I do not know what to do’. The male arsenicosis patients also wrestle with marriage related problems which creates mental pressure upon them. Sometimes, male are also vulnerable to get married without hassle because bride’s family may reject the affected person.

The social beliefs and prejudices make the arsenicosis patient’s psychology vulnerable for arsenic syndrome. One of the respondents of my study named Shilpi has stated, ‘I am very worried about my child, he often remains ill but my mother in law always keeps me away from him’ (Fieldwork, 2013). The family members of women like mother in law, sister in law

and others insult saying that affected women as an impure one. These empirical evidences prove that women are the most vulnerable people due to being affected with arsenicosis.

6.3.4 Gender specific social vulnerability related with arsenicosis

Arsenicosis patients are suffered from enormous social problems. Arsenic is a social as well as physical phenomenon (Nasreen, 2002). The social problems faced by arsenicosis patients in Nilphamari district are acute which makes the patients economically and psychologically vulnerable for arsenicosis. Both men and women are socially affected with the disease 'arsenicosis'. Researcher reveals that respondent's socio-economic status and position determine patient's vulnerability to the disease. In rural areas of Bangladesh, attitude towards male and female arsenicosis patients differ because of their different status in society. Male and female arsenicosis patients are treated differently by people of the society. The patients are slighted by family members as well as others and they are not allowed to take any decisions in family affairs because of the disease. Avoidance is one of the problems experienced by both male and female victim of arsenicosis. The friends and family members neglect the victim by stop talking with them. Even the arsenicosis patients who go to school are avoided by the friends and also their school teachers (Fieldwork, 2013). These types of negative attitude towards both male and female patients are very common in society.

The female patients are the worst victim of the disease because of their lower socio-economic status. The village people shows negative attitude toward female arsenicosis patients rather than the male one due to their lower status in society. Most of the female patients of arsenicosis in Nilphamari district reported that the village people even their family members disrespect them and show negative attitude toward them. People blamed the arsenicosis patients as being cursed by God and avoid them; specifically the female patients are the most vulnerable toward the disease. Their own children also heated them and do not want to have any relationship with their mothers who are affected with the disease (Fieldwork, 2013). When the skin lesion exhibits on the patient's body, it goes to an ultimate effect. Husband usually becomes reluctant to continue their marital relationship with arsenic affected women. In fact, they are unable to attract their husband anymore. Even if all members of the family are affected with arsenicosis the female members are badly treated by family as well as neighbours. Thus the arsenic affected females are maltreated by their family members and as well as neighbours.

People are reluctant to establish marital relationships with arsenicosis patients. The arsenicosis patients and their families suffered from anxiety and depression regarding their unmarried adult children who are suffering from chronic arsenic poisoning. For example, Bishadi and Motilal in Nilphamari district whose parents are in great depression whether their children will be able to get married or not. The male arsenic victims are also having troubles in getting marriage.

Marriage related problems are very common with female patients. The female married arsenicosis patients have to face several marriage related problems like demand of dowry, polygyny, divorce and even being abandoned by her husband. The arsenicosis patients are misbehaved by their husband and in laws. Sometimes they become very rude towards arsenic affected victims. Before marriage, engagement broken down and the groom's family denied to have relationship with the bride's. After marriage when the symptoms of arsenicosis exhibits, patient's husband and in laws refuse to take any responsibilities of the arsenic affected women. For example, Minu, respondent of the study, has quoted that her husband is denied to take any responsibilities of her. In four Upazillas of Nilphamari district these types of problems have become acute among the arsenicosis patients.

In rural areas of Bangladesh demand of dowry has become a common social problem among the arsenic patients. The groom's family demands dowry from bride's family in different occasions. The female arsenic patients are the worst victim of excessive dowry demand. Among the arsenicosis victims prevalence of excessive demand for dowry is very common in rural areas including Nilphamari. Some people married to female arsenicosis patients and demands excessive amount of money as dowry. Even their lust do not end they demand more money again and again. Feroza Begum said, 'I have provided 1 lac taka as dowry to my husband, but this do not fulfill his last and he demanded another one lac (Fieldwork, 2013).

Polygyny is a practice of getting married to more than one person legally at the same time. In the context of Bangladesh the practice of polygyny existed mostly in rural areas. The victims of polygyny are the rural women who are suffering from arsenicosis. The husband of arsenicosis married again though their spouses are alive. It creates miseries to the female victims of arsenicosis. They are compelled to live with their husband who married to others because they have no place to go anywhere in the society. They are supposed to live as a second wife of their husband without intimate relationships and live their rest of life without any care and affections.

Being abandoned or getting divorce is also prevalent among the arsenic patients. The divorced women are forced to live isolated life. They are treated badly by their family members. After being abandoned the female patients are bound to go to their parent's house. But their miseries do not end here. The family members don't accept them and treated them as a burden for the family. One of my respondent has stated, 'My husband has abandoned me two years ago because of the disease, I am staying in my brother's house since that time. My sister in law insults me and insists my brother to leave me' (Fieldwork, 2013). These kinds of problem are very common among the arsenicosis patients of Nilphamari.

Beshadi, unmarried arsenicosis patient, has said, 'my father tried to arrange my marriage five years ago. But he has failed because the grooms' family demand excessive amount of dowry because of her disease. Her father has lost all hope of her marriage' (Fieldwork, 2013).

Arsenicosis has vast miserable impact in conjugal life. When symptoms of arsenicosis are exhibits in patient's body after marriage, chaos arises between husband and wife. Minu, 18 years old arsenic patients, has expressed, 'Symptoms of arsenicosis were not more prevalent before my marriage. So, my father was arranged marriage but a few weeks later symptoms of arsenicosis were exhibited in my body. After seeing this member of in-law began rude behaves with me' (Fieldwork: 2013). In rural areas of Bangladesh like Nilphamari female arsenicosis patients face much problems compare to man in maintaining their conjugal life. Women patients bear all physical and mental torture silently. The female married patients are physically abused by their husband. They are mentally tortured by their in law. The in laws and husband also emotionally tortured them by using slangs and harsh words. In this situation, it has become very tough for the female arsenicosis patients to continue their conjugal life.

The victims of arsenicosis are socially stigmatized by the people of community as well as by their family members. In many arsenic affected areas particularly Nilphamari where arsenicosis patients are also affected with social stigma. Both male and female patients are victim of it. People are reluctant to have water from arsenic affected house because it is the common believe of the people that they will also be affected with arsenic contaminated water. Social stigma creates discrimination that averts the arsenicosis patients to have their social rights (Fieldwork, 2013). The stigmatized people are not allowed to attend any social functions and people behaved with them so strangely that they are something like ghost. The school going children are also stigmatized by their friends and peer groups. As a result, they

are reluctant to continue their studies. Arsenic patients are ostracized and identified as a patient of leprosy. The study reveals that many people think it as a contagious disease and if they come close to the affected patients, they will also be affected with arsenicosis (Fieldwork: 2013). Both male and female patients are victim of ostracism. They are socially isolated by their community people and compelled to live isolated. People are reluctant to sit behind the arsenicosis patient even they do not want to talk with the patients. Some arsenicosis patients in Nilphamari district reported that they are not invited in any social functions because people fear of being affected with arsenicosis. The arsenicosis patients are deprived of having water from neighbor's tube well. Some patients are become outcastes in their society. For example Afsar's family in Nilphamari district who are outcast by the community people.

Agent of socialization means the groups or social context like family, peer group, and school, in which socialization occurs (Giddens, 2006). Arsenic has immense influence on agents of socialization that hampers the socialization of child. The arsenicosis patients as well as their children are stigmatized by the people of the community. The children of arsenicosis patients are not allowed to meet with other children. The children who are suffering from arsenicosis are not invited in any religious & social occasion. They are neglected by their peer groups even their teachers do not cooperate with them in their study. So, they are forced to leave their educational institutions. Researcher explores that in Nilphamari district socialization of both male and female child are hindered by arsenicosis in same way. The female child is reluctant to play in playground because of being affected. They rarely go to outside because other children make bad comments against them. They are also compelled to leave their education for arsenicosis like the male child. Thus arsenicosis works as a barrier socialization of children.

Most of the people who live in village are ignorant about the nature of arsenic poisoning. They are not familiar with the disease 'arsenicosis'. Even if they knew about the disease they are not well informed about it. For this reason different beliefs and prejudices have been constructed surrounding arsenicosis patients (Nasreen, 2012). Some of the village people in Nilphamari district neglect the arsenicosis patients and keep distance from the patients. People think that the arsenic patients have committed an offense that's why the Goddess has punished them severely. The patient's neighbor ill-treats them and some of them think that the black and white spots seen in the patient's body are act of devil spirits (Fieldwork, 2013). Some people also think that the spirits possessed them and they become victim of the disease.

Shahina has stated ‘I was so beautiful before I afflicted with arsenicosis. My neighbours think that I am possessed by the ‘Pori’ who has taken away all my charm’ (Fieldwork, 2013). Because of not having proper knowledge about arsenicosis, people blame the arsenicosis patients and consider them as witch. Neighbours of affected family humiliate the victims by saying her witch. These types of superstitious beliefs and tales surrounding arsenicosis patients are found in Nilphamari district which makes the patients particularly female patients socially more vulnerable for the arsenicosis.

The patients of arsenicosis both male and female are also victims of forced migration. They are forced to leave their home because of the social stigma and discrimination surrounding them. If all the members in a family are affected with arsenicosis, the family may force to leave their own dwelling place. In this context Nasir has stated, ‘our family is regarded as the arsenicosis family in the village, we are stigmatized by the community people and thinking to leave our house as soon as possible’ (Fieldwork, 2013).

6.3.5 Violation of human rights

Human rights are a set of universal entitlements that an individual enjoy regardless of their sex, nationality, religion, culture. Human rights are inherent to human beings and are protected by law (Mannan, 2000). Chronic exposure to arsenicosis poses numerous problems which in turns poses major challenge in maintaining human rights. This research explores that in Nilphamari district the patients of arsenicosis faces major challenges in having access to their social right which makes them socially vulnerable to arsenicosis. There rights are violated in terms of having access to education, standard of health, food security, water, work, justice and social security. Most of the arsenicosis patients in Nilphamari commented that their social rights are heavily being violated due to arsenicosis. They suffered from food security due to unemployment and poverty. The female headed household suffers more for having access to food.

The study indicates that arsenicosis patients are lacking sufficient medical facilities in terms of attaining standard of health. Moreover the female patients are suffering form more from and their right to health deteriorated due to lack of medical set up and skilled medical professional. Lack of medicine for arsenicosis patients in Northern part of Bangladesh is a major challenge for arsenicosis patients.

Both child and adult have the right to receive education. Access to education concerning arsenic poisoning helps to have knowledge about effective prevention and care programmes. The findings of the study exhibits the arsenic affected people in Northern Bangladesh are lacking valid and sufficient information regarding mitigation of arsenic poisoning.

Right to work is violated when a person having arsenical skin symptoms is terminated from his or her existing job or particularly in private job considering the disease as an infectious (Mannan, 2000). In Nilphamari district many people are reluctant to appoint arsenicosis patients because they think that the disease is contagious. In Nilphamari the female patients who works in private jobs are worst affected due to arsenicosis.

The human right to water entitles everyone to have sufficient, safe, acceptable, physically accessible water. The state parties should ensure the right to guarantee that the right to water is enjoyed without discrimination and equally between men and women irrespective of sex, color, age, language, religion, economic condition etc. (Mannan, 2000). The finding of the study reveals that in case of arsenical crisis the right to water disrupted due to not having access to safe drinking water. In search of safe drinking water sources the arsenicosis patients have to use pond water for their daily use. Both male and female arsenicosis patients of Nilphamari are facing problems in case of having access to right to social security. This research reveals that in terms of living standard of arsenicosis patients the social security right is disrupted due to not having proper foods. The patients are also dishonored by their friends and family members and also by their neighbors.

6.4 Impact of Arsenicosis on Women

Violence against arsenicosis patients particularly against the female arsenicosis patients are found in most of the rural areas of Bangladesh. The study highlighted that in Nilphamari district the female arsenic victims specially the married female patients are facing more physical violence. The female patients of arsenicosis reported that they are physically tortured by their husband. In some cases, they are also tortured by their in laws. Even husband of the female arsenicosis patients battered them so violently that the patients become faint or senseless. In this context, Munira expressed, ‘my husband used to beat me at almost every night and furiously scolded with a bunch of slang, he stopped at midnight after getting tired of beating’(Fieldwork, 2013).

In patriarchal society like Bangladesh, the role of men and women are determined by the society. The domestic works like cooking, cleaning and fetching water are done by woman because of the gender division of labour in society. However, the male member of the family works outside home. So, the responsibility of collecting pure drinking water depends on woman. Collection of pure drinking water from alternative source puts extra burden to them. The female arsenicosis patients despite their physical illness have to fetch water from another water source which makes them physically weak to weaker. Arsenicosis victim of Nilphamari reported that they have to work hard from morning to till night though they are ill. Nobody helps them in their regular activities. Thus they become more vulnerable to arsenicosis compare to male.

This research explored that the female arsenicosis patients are suffering from the marriage related problems like dowry. Even in Nilphamari there also prevails the practice of polygyny. The female patients reported that they have to bear all the violence against them silently. If they protest their husband threatened them. In some cases they are abandoned or divorced by their husband. In this context most of the female patients in Nilphamari reported that they stayed at their parent's house. They have no place to go elsewhere. Some of them reported that they have to involve in jobs or work as a paid worker in factory.

This research presents that women are the worst victim of the disease in terms of having access to food, education, water. The married women are physically tortured than the

6.5 Gender Variations in Responses and Coping Mechanisms of Arsenicosis Patients to Address the Vulnerabilities of Arsenicosis in Nilphamari District

Arsenic patients can cope with the arsenic vulnerabilities by taking different survival strategies. Survival strategies adopted by arsenicosis patients are divided into coping strategies and adaptation strategies. In coping strategy almost all the patients take immediate and temporary action for their survival while an adaptation strategy refers to the long-term and permanent attitudes of the arsenicosis patients to solve their differential problems (WHO, 2000 & Hassan, 2003). In Nilphamari district both male and female arsenicosis patients take the coping and adaptation strategies for their survival as well as for solving their social problems. To know about how the arsenicosis patients cope with the disease, researcher's prime concern is to find out people's perception about the disease and knowledge gap between male and female patients by conducting in-depth interview with 30 arsenicosis patients and 5 key informants of Nilphamari.

6.5.1 Coping mechanisms of arsenicosis patients

In general to cope with a problem or task is to deal with it. In disaster management coping refers to the method of using existing resources to deal with a hazardous situation. Researcher used the term ‘coping’ to explore how arsenicosis patients deal with the adverse effects of arsenicosis.

The concept of coping mechanisms or strategies is closely related to the idea of survival, and threat. It is a central concept of emergency management. Coping mechanism refers to the manner in which people and organizations use existing resources to achieve various beneficial ends during unusual, abnormal, and adverse conditions of a disaster event or process (Disaster Dictionary: 2009). It can also be defined as an adaptation to environmental stress that is based on conscious or unconscious choice that enhance control over behaviour or gives psychological comfort. Arsenicosis patients can use several mechanisms to cope with arsenicosis. They can use indigenous coping mechanisms which includes coping strategies at family level as well as coping at community level to adopt with the adverse impact of the disease. Researcher defines the gender variations in coping mechanisms and coping strategies taken by the arsenicosis patients to address the vulnerabilities related with arsenicosis

6.5.2 Gendered perception of arsenicosis

Karl Manheim said Knowledge is experience and we perceive it through our sensation. Proper education and information helps us to acquire knowledge and educate knowledge enrich our experiences. How knowledge of arsenicosis differs among men and women in Nilphamari district is the main concern of the researcher. Gender specific perceptions and knowledge gaps between men and women helps the researcher to found out gender variations in coping mechanisms to address the vulnerabilities of the disease. Researcher explores gender specific perceptions toward arsenicosis and knowledge gaps between men and women in Nilphamari district with conducting in-depth interview of 30 arsenicosis patients and 5 key informants of Nilphamari district.

Most of the people of rural Bangladesh are illiterate as a result they are not familiar with diseases ‘arsenicosis’. Even the affected people are not properly aware about arsenicosis. Merjina Khatun, arsenicosis patient of Nilphamari, stated ‘arsenic is a kind of allergy’

(Fieldwork, 2013). She does not know arsenic is a poisonous element. Even some patients denied that arsenic is a poison because it has no taste and colour. Maqbul Khan is one of them who do not consider arsenic as a poison. He told that ‘the good tasting water cannot be poisonous, the toxic water taste bad’ (Fieldwork, 2013). He is still using arsenic contaminated water because it tastes good. People have their own believes and perception about arsenic. People’s perception depends on their educational background and thinking process. Better educational background helps to understand the greater risk associated with the disease. Some educated arsenicosis patients know about the disease and they are also aware that after being affected with it what should be the steps for the patients to cope with arsenicosis. The ignorant arsenic patients in Nilphamari do not know that arsenic kills people but the educated people knew about the disease and they also know how to cope with it. The female patients are less educated compare to male patients. So, the knowledge gaps among male and female patients can easily be found. The lower socio-economic status of woman is a barrier for the female arsenicosis patients in Nilphamari. As a result because of not having proper education the female patients are unaware of the disease. The study reveals that the male patients take proper treatment and food compare to female patients because of their higher educational background compare to the female patients. So, the higher educational background of male arsenicosis patients helps them to cope with adverse impact of arsenicosis.

Less educated or illiterate person may also achieve proper knowledge about arsenic through campaign and public education programmes that help the patients, particularly female patients to cope with the disease. Amicha Begum, an un-educated woman said ‘Arsenicosis is a dangerous disease and people suffer from itching and sores if they drink arsenic contaminated water for long time’ (Fieldwork, 2013).

In some areas like Nilphamari where number of identified arsenicosis patients is less, people have trouble grasping the seriousness of the risk to their health. Besides misconception and misinterpretation arises due to ignorance. Some considered it as a result of sin or act of devil spirits which possessed people. Some may think that it is a kind of bacteria that found in the environment. Researcher explores that the misconception and misinterpretation prevails among male and female patients of arsenicosis. For example, husband of Munira Begum left her because he thought the disease is contagious. Afsar Ali another arsenicosis patient stated that ‘my neighbours fear of me and think that if they touch me they will also be afflicted with arsenicosis’ (Interview: June, 2013). In some cases, the male patient holds much misconception compare to the female patients. The female arsenicosis patients in Nilphamari

divorced by their husband because of their misconception that arsenic is contagious disease. Some people think that getting divorced from the arsenic affected patients is a part of coping strategy. After getting divorced there will be less possibility to become victim of the disease. This misconception about the disease makes the female patients more vulnerable to arsenicosis. Many people keep safe distance from the arsenicosis patients because of the fear of being affected with the deadly disease. Even the educated person who knows about the disease may reluctant to touch, take food and talk with the arsenicosis patient. For example, Shamim's teachers do not want him to come at school.

To make people aware of the disease The Government of Bangladesh has taken different programmes polices like APSU (Arsenic Policy Support Unit), awareness campaigns etc. Arsenic affected people may receive information from radio, television, Government health workers, doctor, relatives, Local NGO, health complex and in broader level from DPHE, and DGHS etc. Researcher explored that the arsenicosis patients of Nilphamari district received information from the health assistant of Upazilla health complex, doctors, Local NGO and also from the newspaper which helps the arsenicosis patients to cope with the disease. Most of the patients of arsenicosis came to know about the disease after being affected with it. In Nilphamari district the female patients have no previous knowledge about the disease but some of the male patients are familiar with the disease. Shahina Khatun, an arsenicosis patient of Saidpur upazila told that 'I discovered dark spots that covered my whole body. I become scared and went to the upazila health complex for treatment. From there I learned about the disease arsenicosis' (Fieldwork; 2013). Some patients of arsenicosis particularly the female patients pointed out that they came to know arsenicosis after being afflicted. Rahman has expressed that 'Though the symptoms of arsenicosis is prevalent in my body for ten years, I have been informed by medical officer of Saidpur Upazila Health Complex before three years'(Interview, 2013). Most of the arsenicosis patients learnt about the disease after being affected with it. If they know about the disease they will be able to take preventive measure to address the vulnerabilities of the disease. The knowledge gaps of man and woman and poor understanding capacity of woman prevent them to become fully aware of the disease.

Proper knowledge about arsenicosis helps the arsenic survivor to address the vulnerabilities of the disease. The female arsenicosis patients in Nilphamari have poor knowledge about the disease. So, they are more vulnerable to the disease and also do not have proper idea to cope with it.

6.5.3 Causes of arsenicosis

To find out the coping mechanism related with arsenicosis it is relevant to know why arsenic occurs in groundwater of Bangladesh and how can people be affected with the disease. The researcher has tried to find out whether the arsenicosis patients of Nilphamari have knowledge about arsenic causation in groundwater of Bangladesh or not. Most of the patients of Nilphamari revealed that arsenic occur in groundwater naturally. Some of them have explored that arsenic may also found in soil and rice. The female patients compare to man stated that they have no knowledge about arsenic causation in ground water of Bangladesh.

The findings of the study reveal that almost all the arsenicosis patients of Nilphamari knew about how people afflicted with arsenicosis. They commented that people become afflicted with arsenicosis due to having arsenic contaminated water for at least six months. Some of them argued that people may become afflicted with arsenicosis through using contaminated water for long time.

The study reveals that the people who have sound educational background have accurate knowledge about the symptoms of arsenicosis. Some of the patients touted that symptom of arsenicosis exhibits in patient's body due to having contaminated water for at least six months. The finding of the study reveals that both male and female arsenicosis patients in Nilphamari district have knowledge about the causation of arsenicosis. One of the female patients of arsenicosis, Amecha Begum expressed, arsenicosis may occur due to having excessive use of contaminated water.

6.6 Gender Specific Coping and Adaptation Strategies Taken by Arsenicosis Patients of Nilphamari District

The coping strategy refers to immediate and temporary actions and the adaptation strategies refer to long-term and permanent attitudes or action to solve the problems associated with the disease. Most of the patients in Nilphamari district use temporary actions or coping strategies to address the vulnerabilities of the disease (Fieldwork: 2013). One of the coping strategies taken by the arsenicosis patients is maintaining distance from the unaffected people. The arsenicosis patients take this type of initiatives to escape from social embarrassments. They feel shy to mix with the neighbours and relatives. Even they keep distance with members of the family. The female patients avoid their neighbours and keep distance with their relatives compare to male patients. Even the female patients have to tolerate misbehaves and harsh comments of their neighbours. So, one of the temporary coping mechanisms for the female patients are to keep distance from unaffected people.

The children who are affected with arsenicosis are reluctant to go to school. Both male and female children are reluctant to attend school in Nilphamari. Even female patients do not go to paly ground because of the dark spots which have covered their whole body.

The unaffected children of their locality make fun of them and use slangs. The arsenic affected girls are reluctant to go outside because of the disease. The boys of the community always tease them and try to make fun of them. Fear of harsh comments compelled the arsenicosis particularly the female patients to stay at home. The present research reveals that the people do not go outside and avoid their relatives and other people because of social embarrassment. Even some patients are reluctant to attend any social functions. They took this type of coping mechanisms as an immediate and temporary action for the disease.

Parents of arsenicosis patient suggested their child not to go in public place even in social functions. Both male and female child are used to take this initiative to cope with the disease. The arsenicosis patients used to conceal their disease and do not uncover their cloths at playgrounds even at home. They rarely uncover their body in front others. This is another temporary coping strategy taken by male child suffering from arsenicosis.

At family level some patients may use to remain isolated from their parents. Even they may force to remain isolated. Some patients do not want to have marital relationships or getting married with unaffected people. The female patients remain unmarried because some of them think it is a contagious disease. These are the temporary strategies taken by the arsenicosis patients in Nilphamari district. Most of the arsenicosis patients take coping strategies like keep distance with the unaffected people and avoid going outside.

The adaptation strategies are long term strategies taken by the patients which includes taking treatment, having nutritious food or depending on family support. The adaptation strategies taken by male and female arsenicosis patients are different. Knowledge about arsenicosis helps the arsenicosis patients to cope with the disease. If they have educate knowledge about the disease they will be able address the vulnerabilities of arsenicosis. Using safe water free from arsenicosis helps the patients to reduce its adverse impact of the disease. The first adaptation strategies taken by arsenicosis patients are whether they are using arsenic free water. Most of the arsenic affected patients of Nilphamari stated that they are using water

from the alternative sources. They are sometimes compelled to use pond water which is polluted as a result they are becoming victim of the several water borne diseases.

The arsenicosis patients specially the female patients sometimes have to use contaminated water because it is difficult for them to fetch water from alternative sources which are situated from the long distance. The female patients compared to male are compelled to use water from the same source because of their physical weakness. The female patients have to stay at home and do all the household chores. So, they have to use water again and again. It becomes very tough for them to fetches water from other sources.

There is a tendency of the arsenic affected people to have water from the same sources which are contaminated with arsenic. They have to drink the polluted water for several reasons. The arsenicosis patients who look for pure water in to their neighbours' house face different problems like criticize or harsh comments. Even they may refuse to provide water to them. For this reason the arsenic affected patients may use contaminated water from the same source. The poor household particularly the female headed household have not enough money to establish tube well. So, they have to drink water from the contaminated tube well and become affected with the disease.

Most of the rural people of Bangladesh are poor. It is hard for them to maintain their family with their poor income. Arsenic creates extra burden for them. They have to maintain their family and provide nutritious food to the member of the family who are afflicted with arsenicosis. In this context, Shamim express, 'My father could hardly manage nutritious food for me' (Fieldwork; 2013). The respondents of Nilphamari mentioned that having nutritious food like meat or fish is a dream to them. Most of them stated that they are having vegetables only. The study reveals that the majority of people living in Nilphamari are poor and they are the worst victim of the disease compare to the rich people. It is hard for them to manage fish or meat for the disease. The female patients in Nilphamari district are having less nutritious food than the male patients. The female patients are neglected by the family members. The female headed household are the worst sufferer of the disease. Compare to male headed household, the female household are economically very poor. And the disease arsenicosis make them economically so vulnerable that it has become very tough for them to manage food for them. Rozina expressed, 'I am unemployed because of the disease. My family members will die without food. So, how can I manage rich food for me and my family?' (Fieldwork: 2013).

The arsenicosis patients take different types of medicine which includes allopath, Homeopath and folk medicine. In this context, Shilpi expressed, 'One of my neighbours suggested me to take 'Kabiraji' treatment, I have taken treatment from the 'kibiraj' but it is of no use later I have taken allopath and homeopath as a treatment of the disease' (Fieldwork: 2013).

Treatment of arsenicosis depends on patients' economic and social status. The male patients use to take allopath medicine depend on their economic status. Some arsenicosis patients in Nilphamari are not having or continuing their treatment because of their poor economic condition. It goes beyond their ability to take medicine for the people who cannot eat properly twice a day. The female patients used to take homeopathic medicine after having long treatment when they have nothing left. Some are taking vitamin tablet provided by NGO. Some of the patients are taking treatment for long time but they do not get sufficient result.

Seriously affected patients think that taking treatment for long time will help them to recover from the disease. Although the continuation of treatment is an expensive adaptation, but they think that it will help them to recover them from their miseries. Some patients thought that this measure will stop them getting worse. They also thought that their all problems and hesitation will go if they take or continue treatment for long time. They thought that if their health improves, there will be no social problem which they are facing at present. As a result they are spending huge amount of money for the treatment of the disease. Pryer (1989) in a study explored that large medical expenditure is to be paid from the sale of assets. The arsenicosis patients particularly women have been victims of financial loss. They have to spend all their savings which they have collected in their entire life. The female patients have to sell their jewellery, poultry, livestock and trees. The patients who are farmer also have to sell their own land for the disease. Maqbul Khan expressed, 'I have sold one bigha of land in the hope of being recovered from the disease' (Fieldwork: 2013). In Nilphamari district almost all the patients are having treatment of the disease.

6.6.1 Indigenous coping mechanisms to address the vulnerabilities of Arsenicosis in Nilphamari district

Local communities or individuals use traditional wisdom in order to cope with arsenicosis. Indigenous coping strategies are depended on local people's beliefs, attitude, culture and lifestyle. These types of strategies are combination of arsenicosis patients' experiences, beliefs, social structures, resources, prevailing values, and customs. Arsenicosis patients in Nilphamari district use two types of indigenous strategies or capacities which are mechanisms at family level and coping capacities at community level (Fieldwork; 2013).

Coping strategies at family level

Various coping mechanisms are used to recover from arsenicosis in family level. The household head, usually father bears all the expenses of the disease. Beshadi expressed, 'My father has spent about 10000 taka for my disease' (Fieldwork; 2013). Moreover husband of the female arsenicosis patients also take all the responsibilities of the disease. But when he refused to pay for treatment the arsenicosis patients particularly the female patients have to go without treatment (Fieldwork; 2013). For example, the case of Shahina Khatun in Nilphamari district.

The sale of assets is a common way for rural household to survive any crisis. In family level most of the patients of Nilphamari used to take treatment by selling assets, ornaments even their dwelling place. Afser Ali said, 'I have mortgaged my dwelling place' (Fieldwork; 2013). Another coping strategy to cope with arsenicosis can be reduction of food consumption and consumption of other basic needs items includes expenditure for clothing, education and housing for their treatment (Mahmud et al., 2011). Sometimes the wife of earning members has to work extra hour for having treatment and maintaining family which puts extra burden to the female patients. In this context, Khadija expressed, 'My husband is unable to work. So, to maintain the family and treatment of my husband I have to work extra hour at the rice mill' (Fieldwork: 2013). At family level, these are the indigenous coping strategies taken by the arsenicosis patients in Nilphamari.

Coping strategies taken at community level

At community level the affected people who are rejected and isolated by the community tried to make links with different people and bodies to establish a relationship with them. Amecha Begum, an arsenicosis woman, worked with an NGO to know more information about the disease (Fieldwork; 2013). To save themselves from social injustice the arsenicosis patients tried to establish relationship with chairman or political leaders of their localities. Even they urge for help from the local government to recover from the disease.

6.7 Responses of Government and Other Organizations to Address the Arsenic Vulnerabilities

A number of programs have been initiated by the Bangladesh government to specifically address arsenic, including the Bangladesh Arsenic Mitigation Water Supply Project (BAMWSP) and the DPHE-UNICEF programs. The National Arsenic Mitigation Information Centre (NAMIC) was established by BAMWSP for collecting, storing and disseminating information related to arsenic problem. Beside the government initiatives a number of international and national NGOs, national and international universities (such as The Bangladesh University of Engineering and Technology (BUET), Dhaka University, Rajshahi University, Columbia University, Texas University, (Cornel University) have also undertaken initiatives to combat the arsenic problem in different parts of the country. Different NGO such as NGO Vision, the NGO Forum, Dhaka Community Hospital, BRAC, Care Bangladesh, IDE Bangladesh and Water Aid Bangladesh have been engaged in different mitigation activities. Some of these organisations engaged several other local NGOs and organisations for conducting the field level activities like awareness campaigns, tube-well screening, and patient identification (DPHE, 2010).

Researcher finds that in Nilphamari district Government and other organization have not taken sufficient initiatives to cope with the disease (Fieldwork: 2013). Even DPHE has not yet tested all the established tube wells in Nilphamari. Vitamin tablets are distributed to the arsenicosis patients by Medical Officers of health complex. Some of the arsenicosis patients are getting treatment from four Upazilla Health Complexes of Nilphamari. The Medical Officer of Upazilla health complexes mostly work for making people aware of the disease. The local NGOs are not so active in providing patients with all kinds of facilities necessary to recover from the effects of the disease. Bangladesh government is working from the outset to address arsenic contamination as a serious issue.

6.8 Conclusion

Arsenic crisis in Bangladesh poses significant challenge in having access to pure drinking water. People become forced to have contaminated water in absence of safe water sources. As a result, they are becoming the victim of arsenicosis. Chronic exposure to arsenic is producing differential vulnerabilities among arsenicosis patients in Nilphamari district which includes physical, social and economic vulnerabilities. The arsenicosis patients become emotionally distressed due to arsenicosis. It hampers the socialization of child, increase poverty, and creates social instability as well as discrimination in society. Female patients are the most vulnerable due to gender discriminations in family and community in Bangladesh particularly in Nilphamari. People have very few options to cope with the crisis. To address the vulnerabilities of arsenicosis the arsenic patients in Nilphamari district have taken coping and adaptation strategies which includes initiatives at individual, family and community level.

CHAPTER SEVEN

Case Studies on Arsenic Affected Patients of Selected Villages in Nilphamari District

In this chapter, a number of case studies have been presented aiming at illustrating the vulnerabilities of arsenicosis patients in Nilphamari district. Focusing on the lives of particular male and female arsenicosis patients, the case studies aimed to demonstrate something of the harsh reality of their situation.

7.1 Case Studies of Arsenicosis Patients in Saidpur Upazilla, Nilphamari

Mosammat Shahina Khatun: Case study 01

Shahina Khatun, 30 years old woman, has passed class five. She lives at Dolua village, Pakatipara in Kamarpukur Union of Saidpur. Shahina is a housewife. She has two children along with them there are five members in her family. She belongs to a poor family. Her husband is occupied with farming and earned about 3000 taka per month. He is a marginal farmer as well as the only earning member of the family. Shahina has been afflicted with arsenicosis for 5 years. At first, she identified some white spots in her body. She just ignored it and tried to do her everyday works normally. But gradually her conditions become worsen and dark spots covered her whole body. She was having several physical problems such as feeling weak, dizziness, headache etc. Then she went to the Saidpur Upazilla Health Complex for treatment and came to know that she was affected with arsenicosis. Later she took treatment of a skin specialist. But she cannot continue her treatment because the visit of the skin specialist is so high.

She has already spent about twelve thousand taka for the treatment of arsenicosis. When Shahina's husband and mother in-law came to know about the disease, they become very rude with her. Her husband used to bear the expenses of her treatment. Now days, he is reluctant to bear the expenses. So, she is incapable of having any sorts of treatment of the disease. She thinks that female arsenicosis patients are the worst victim of the disease. She has expressed that 'If I were a man I would get proper treatment and healthy food'.

She has to work hard and do all the household chores alone despite her illness. She is also bound to look after her sick mother in law. Her mother in law wants her son to divorce Shahina and get married again. Her husband does not help her and refused to continue their conjugal life. At present, Shahina is using well water of her neighbors.

Analysis

The story of Shahina Khatun demonstrates the prevailing patriarchal ideology of rural Bangladesh. It shows how an arsenicosis patient becomes victim of physical violence in family. Shahina's story revealed that the torture she has faced due to arsenicosis is so grave that she has emotionally broken down. Her husband physically tortured Shahina and reluctant to have relationship with her. Shahina's mother in law behaved rude with her. Despite all her miseries she had to work hard. Shahina is not having any treatment. Having water free from arsenic is the only coping strategy she has taken for the disease.

Rashidul Islam: Case study 02

Rashidul (17) is a college student, lives in Munsipara at Dholagach of Kamarpukur Union. Rashidul helps his father in cultivation in his comfortable time. There are five members in his family. They were economically solvent enough to maintain their family. His father earns about 6000 taka per month. He has been exposed to arsenicosis eight years ago when he was a boy of nine.

At first he noticed symptoms of arsenicosis in his body. But he does not know what the hell that was. His health condition was worsened and black spots found in his body, then he went to the village doctor in 2004. But the doctor was not able to detect what actually happened to him. He was first come to know about arsenicosis and identified as a patient of arsenicosis from the medical officer of Saidpur Upazilla health complex in 2008. Drug was provided by the health complex.

He has also taken the treatment from private doctors because the drug provided by health complex was not sufficient enough for his treatment. His situation has not yet improved. He is now taking Ayurveda treatment. More than 90 thousand taka has been spent for his

treatment and still his family is spending money for his treatment. They have already reached in their economic limitation.

Black spots have covered his whole body. He is also facing some social problems for being affected with arsenicosis. His neighbors and peer groups avoid him. Residual's friends ignore him to include as play mate. They neglect him and always try to make fun of him. He is feeling isolated from his friends and family members. He is also mentally depressed for arsenicosis.

Rashidul sought help from the Government. He said that Government should take proper steps to identify the arsenicosis patients and make them aware about the disease. He thinks that if the Government took such steps it would be beneficial for the patients who are suffering from arsenicosis.

Analysis

In Rashidul Islam's experience we see how he has been isolated from his friends and family. Rashidul Islam used to help his father in his comfortable time. Rashidul's family reached in their economic limitation due to the treatment of Rashidul. After being affected with arsenicosis his face complexion has changed and black spots discovered in his body. Rashidul is avoided by their friends and play mates. Rashidul's story reveals that he is passing a hard time, facing negligence of friends and family members. He is taking treatment as ayuervadic treatment and sought for help from the government.

Morzina Khatun: Case Study 03

Morzina Khatun is a 40 years old woman of Shashkandore village, Botlagari Union of Saidpur. She has been abandoned by her husband two years ago due to arsenicosis. She is suffering from arsenicosis for seven years. Morzina Khatun came to know about arsenicosis from local NGO. She does not have any comprehensive knowledge about the arsenicosis and still don't know how to cure from it.

She has lost her taste in food. She cannot effort nutritious food. She needs more money to have nutritious food because it is too much expensive. Scarcity of assets and money shrink her away to take rich food. At present, there are black spots in her hands and feet. Her health condition is worsening gradually.

She is taking homeopathic treatment for it. Her husband get married again few months ago and he refused to take the responsibilities of his two daughters. Morzina is now staying in her brother's house. Her sister in law always blames her and claimed that she is cursed by God. She does not want Morzina to stay in her brother's house. She is looking for jobs. Nobody yet shows any interest to appoint her as an employee due to the disease 'arsenicosis'.

Now she is working as a day laborer in a brick factory. Though she works hard in the factory but didn't get rewards properly. She cannot bear the expenses for the treatment of the disease as well as the expenditure of her two daughters. Morzina is earnestly urging for help from the local NGO and government for living with minimal food & health facilities.

Morzina stated that Government should take initiatives to ensure justice for the arsenicosis patients particularly the female patients who are divorced or abandoned by their husband.

Analysis

Marjina Khatun's story demonstrates the great miseries a woman has to face due to their lower socio-economic status. Marjina has been forced to her husband husband's house. Her brother's house is the only place left for Marjina where she could live. Her sister law always blame her and do not want her to stay with them. Merjina's story shows that a women having lower status have to bear all the torture against them silently. To improve her condition Merjina is working at a brick factory. She is taking homeopathic treatment. Despite her illness she is working hard in the factory to maintain the expenses of her daughter and also for treatment of the disease.

Maqbul Khan: Case study 04

Maqbul Khan, son of Gafur Ali Khan, is distressed and surviving with the disease 'arsenicosis' for 6 years. He is now at the age of 65, lives at Pathanpara of Botlagari Union, Saidpur. There are six members in his family. His two sons are the earning members of the family.

Maqbul is unemployed for last five years. The disease has taken away his capability to work. He is physically very weak and unable to walk properly. Black spots have been identified in his back and hands. He is not having nutritious food and still using the arsenic contaminated tube well water. As a result his physical condition is deteriorating day by day.

The family members avoid him. His wife has to spend much time for his care. The family member do not show any respect to him. He also does not take part in any kind of decision making and social gatherings .He is not having proper treatment because about ten thousand taka has already been spend for him. His son does not want to continue his treatment. The community people also ignored him and do not communicate with him. He hardly attends any functions because of his disease. His presence in any functions considers as evil for the occasion. He is now hopeless and just waiting for death.

Analysis

The story of Maqbul Khan demonstrates how an arsenicosis patient becomes victim of negligence by the members of the family. Maqbul Khan has lost his ability to work. He is unemployed now and unable to contribute in his family. As a result his family members do not show any respect to him. Maqbul Khan hardly attends any functions. He has stopped taking any measures to cure from arsenicosis. Maqbul's story revealed that when person become disable how cruel the society is for them.

Mita: Case study 05

Mita (16) lives in Telipara of Botlagari Union, Saidpur. She reads in class nine of Botlagari High School, Saidpur. She is a young innocent girl and eldest among her two sisters. Mita's parents fixed her marriage with a boy who lives in adjacent village when she was at class six. She is now a victim of arsenicosis. Her complexion has been changed and black spots have been evolved in her hands and feet. The groom's parent has refused to take her as the bride of their son. The groom was also reluctant to marry her. Mita's parents requested them but they didn't listen to them. The groom's parents blamed them and alleged that she is possessed with evil spirits. They also stated that Mita's parents had cheated them by hiding the truth. They refused to accept her as bride. Her marriage had been broken. Her parents become hopeless. They do not know whether they will ever be able to arrange marriage of Mita.

At present, Mita is upset and wants to commit suicide. She does not know whether anyone will marry her or not. The neighbors always blamed them. Mita's parents are also worried about their other daughters' marriage. They have taken her to the village doctor for her treatment.

Analysis

Mita's story presents the sufferings of an unmarried woman afflicted with arsenicosis. Mita is psychologically distressed because her engagement has been broken. The groom's parents blamed her and alleged that they are cheated by Mita's family. Mita wants to commit suicide because she stigmatized by her neighbors. Mita is now taking treatment for her survival.

Mohammad Atiar Rahman: Case study 06

Atiar Rahman, 55 years old man, lives in Purba Belpukur of Kashiram Belpukur Union. He is suffering from arsenicosis for ten years. Atiar has completed class five and his monthly expenditure is around 5 thousand taka. He is a farmer and he used to get help from his son in farming. He has three daughters. Atiar first came to know about the disease after being affected with arsenicosis seven years ago from the medical officer of Saidpur Upazilla Health Complex. Almost all the family members are now affected with the disease. His family is treated as arsenicosis family. Melanosis and hyperkeratosis have exposed in his skin because of drinking arsenic contaminated water for long-time. He is concerned about his three daughters because they are also affected with arsenicosis. His dreams have been collapsed because he thought that it would never be possible to arrange marriage of his daughter. Atiar does not have enough money for the treatment of her daughter and also for him. Even he cannot manage proper foods contained with nutritious elements for his family. At present, he is not taking any treatment to recover from the disease rather drinking arsenic free well water.

Nobody came to their house .The relatives rarely visit them and they think that it is a contagious disease. If they come to visit them they will also be affected with arsenicosis. So, nobody came to see them. They are isolated from their relatives and neighbors.

Analysis

From the story we knew that Atiar's family is considered as an arsenicosis family. His dreams have been collapsed. He is so worried about his daughters. Atiar's story represents that he is isolated from his family. He is not taking any treatment for the disease instead using well water free from arsenicosis.

Johra Khatun: Case study 07

Johra Khatun, a poor village woman of 55, is a victim of arsenicosis since 2002. She is living a miserable life. Her husband died from arsenicosis. She is now living with her sons in the village named Chowra Nayabari of Kashiram Belpukur. She is unemployed and has no personal savings.

Johra used to work from the morning till night for her family. She always tried to win the heart of her children and her grandchildren by working hard for them. Despite her hard works for the family she did not get blessed with little sympathy. Her son's wives always blame her by saying that she is a 'Rakhosi' (witch). Johra's son in law doesn't provide proper food and insisted her son not to continue her treatment. When her husband was alive they both take treatment. She took allopathic medicines as a treatment of her disease. She sold her ornaments and assets for her husband's treatment. She said that 'A piece of land inherited from my father, the last hope of our survival, has been sold for my husband's treatment. Now, my husband is died and I have nothing left to survive'. Her son has refused to take care of her because of her disease. Around ten thousand taka has already spent for her treatment. She is now not taking any kind of treatment. She is now waiting to die. She is urging for government help to relief from the physical as well as social pain of arsenicosis.

Analysis

Johra khatun's story is about the miseries of a widow. Johra's husband died out of arsenicosis. She used to work hard for his sons and family members but unable to win their heart. Johra has sold a piece of land for her husband's treatment. When her husband was alive she used to take allopathic treatment. But now she is not taking any medicines. She is living with the mercy of others and urging for help from the government.

Mohammad Shamim: Case study 8

Shamim, a ten years old boy, lives in Dakhin Sonakhali of Botlagari Union. There are six members in his family and his father is the only earning person of the family. Shamim's father is un-educated and he is a rickshaw puller. His father came to know about arsenic two years ago when he saw white spots in Shamim's back and took him to the government hospital . Shamim also knew from the doctor of the hospital that he was affected with arsenicosis. He did not have any idea about arsenic and its impact on health till that time. Shamim's back is covered with white spots. He is not taking any kind of treatment for the disease. The Government Hospital is far away from their home and the doctor is not available there. Shamim's father does not have the ability to get treatment from private doctor. So, Shamim is not taking any treatment .His father trying his level best to provide Shamim nutritious foods. But he can hardly manage nutritious food in their daily meal. They are now using ponds water because they have not enough money to purchase or spend money for pure drinking water. Though the pond water is not safe for drinking but they are compelled to use it. They have not any alternative water sources near to their house.

Shamim is now in class three and he wants to continue his studies. But his friends and the teachers of his school neglect him. They don't encourage him to come into the school. Shamim's friend scared him and refused to play football with him. He is distressed and worried about his future .He does not know whether he can continue his education or not.

Analysis

Shamim's story represents that how socialization process of a child is hampered due to arsenicosis. Shamim wants to continue his study but faces complication for his disease. His friends avoid him and the school teacher is reluctant to cooperate with Shamim. His friends neglect Shamim. His father is poor rickshaw puller so he cannot buy medicine for him. He is taking nutritious once in a day and using pond water as a cure for the disease.

Mosammat Shilpi: Case study 9

Shilpi (22) was a happily married woman of Kashiram Belpukur. There are six members in her family. She has two children. She was an energetic young woman before affected with arsenicosis. Shilpi has been exposed to arsenic contagion six years ago. Black spots have been found in her face and her skin complexion has changed totally. She has lost all the attraction and love of her husband. Her son avoids Shilpi and she is also not allowed to come close to her child. Shilpi has stopped breast feeding her little child because of arsenicosis. Her mother in law and husband think that the child may be affected if she feeds the child. Her child's condition is not good and much often the baby fall ill. Shilpi is so worried about her child .Though she is taking treatment, no improvements of her health condition has been seen. Her husband tortured Shilpi physically and mentally. She has already paid about ten thousands for the treatment of the disease and she does not know how much it will take to get well.

Analysis

Shilpi is a misfortunate woman of Saidpur. Shilpi is cursed by the arsenicosis. The disease has took away her all happiness. She is tortured by her husband physically and not allowed to getting close to her child. Even she is not permitted to feed her child. She has already spent about ten thousand taka and still getting treatment for the disease.

Akter Ali: Case study 10

Akter Ali was informed from a NGO about the disease arsenicosis. He has been affected with arsenicosis since 2008. Now he is 55 and lives in Purba Belpukur of Kashiram pur. There are six members in his family. Akter has passed class five and used to be a village doctor locally called 'kaboraj'. Though he is a village doctor but failed to recognize the disease he is suffering from. A local NGO was screening tube well water for arsenicosis at his home and they recommended Akter for testing his blood due to seeing melanosis in his body. The test report shows that he has affected with arsenicosis. At present white spots covered his whole body. He always felt headache and cannot concentrate in his works properly. He does not feel taste in food. His wife is also affected with arsenicosis. Though he is ill and feels weak all the time but he has to work hard and manage his family with his limited income. He is maintaining his family with hardship because no one comes to him for treatment. The patients who rarely visit Akter for treatment, seeing his health condition do not want to take treatment from him. He is stigmatized by the neighbors and friends of him. They alleged that he is suffering from contagious disease. Akter is now living in miseries seeking alternative options to maintain his family. His wife is compelled to work outside home but no one shows interest to give her job. They are only showing sympathy for her family. His economic condition is getting worst day by day. In that circumstances, Akter and his wife are not able to take treatment of arsenicosis.

Analysis

The story of Akter Ali is a sad one, about how an employed person terminated from his job and become unemployed due to arsenicosis. Akter Ali is seeking alternative options to maintain his family. His wife is compelled to work who is also affected with arsenicosis. But nobody shows any interest to appoint her. Akter Ali is living an isolated life from his neighbours and relatives. He is not taking treatment of arsenicosis.

Case study 11: Feroza Begum

Feroza a woman of thirty two lives in Botlagari Union of Saidpur. There are five members in her family. Feroza's father was very poor and cannot effort her for schooling. As a result she remains illiterate. Feroza got married with Mizanur Rahman at the age of sixteen. At present she has two sons. Her husband is a farmer and he cultivates in his own land. She has been affected with arsenicosis at the age of twenty five. At the preliminary stage she feels dizzy and gradually began to loss appetite. She thought that it is happening for her physical weakness. So, she started taking vitamin tablet but it is for no use. About six months later she found that black spots covered her face she assumed that it is a kind of allergic reaction. Again Feroza started to take medicine but this time takes medicine for allergy. She spends lots of money for purchasing medicine for skin disease. Around 20000-30000 taka has been spent for her treatment but it is not helping. At present, a local NGO is providing her medicine.

Mizanur Rahman decided to marry again and he often demand dowry from Feroza. She has provided about 100000 taka as dowry form her mother on the excuse of disease. She is trying hard and soul to continue her marriage. But her husband again demanded money from his in laws and threated that if she cannot arrange the money he will divorced her. Feroza is now physically and mentally so disappointed that she cannot even think what to do in that situation. She has reported that she is still taking water from the same source.

Analysis

The story of Feroza Begum demonstrates the importance of dowry. Feroza Begum is a patient of arsenicosis who has spent about 20000-30000 taka for her treatment but it is not helping her. She is taking medicine from a local NGO. Feroza Begum is suffering from weakness and loses her appetite. Her husband demanded dowry from her and threaten to divorce her. Feroza is physically and mentally disappointed due to arsenicosis. Her husband increases her miseries by demanding dowry from her.

7.2 Case Studies of Arsenicosis Patients of Kishoregonj Upazilla, Nilphamari

Case Study 12: Nuri Begum

Nuri Begum (15) a young girl of Uttar Durakuti, Bahagali Union is suffering from arsenicosis since she was ten years old. She is now at class nine. Her father Nurul Islam is also affected with arsenicosis and can hardly manage rich foods for members of the family. Nuri has a little bit knowledge about arsenicosis and she thinks that lack of nutritious food is making their condition worse. Symptoms of arsenicosis have also been found in her brothers' body. She is so worried about her brother. Nuri's skin has become dry and she is so weak that she cannot walk properly. She is taking homeopathy medicine without knowing the actual treatment.

Nuri and her family members are deprived from their social rights. They are regarded as arsenicosis family in the village. Her classmates and friends stopped talking with Nuri. They did not play with her. The young boys of her locality tease her in playground. They made bad comments about her disease. The neighbors also avoid her. Even one of her school teacher said her not to come in the school. She compelled to stop going to school regularly rather she just attends the annual examination of the school. The relatives also scold her and make adverse comments about her disease. No one shows any affection to Nuri and also her family. Everyone believes that the family is cursed with Nuri because she is the first victim of the disease in her family. All these things make Nuri emotionally affected. But still she believes that she would recover from the disease and in future may lead a normal life like the previous time.

Analysis

In Nuri's experience, we see that how an arsenicosis patient deprived from her social rights. Nuri's family is regarded as arsenicosis family in their village. As Nuri is the first arsenic victim in her family everybody thought her family is cursed because of her. Though Nuri is ignorant about her disease, she is taking homeopath as treatment of arsenicosis. Nuri is avoided by her neighbors, friends and relatives. Her life has become much harder due to arsenicosis.

Case Study 13: Rubel Hossain

Rubel Hossain (35) has been exposed to arsenicosis six years ago. He is an inhabitant of the village Bafla where most of the villagers are illiterate. The villagers including Rubel have no proper knowledge about arsenicosis. He was a strong energetic man. But at present his health is deteriorating and loses the ability to work hard. He still depends in homeopathy medicine without knowing the proper treatment of arsenicosis.

Rubel and his family members are using the tube well water of their own. After being affected with arsenicosis he has not taken any kind of treatment. He used to get medicine only two years before. At present his major problem is having fever all the time. The homeopathy medicine is of no use. So, he has started taking allopathic medicine. But it does not cure him from the fever. His physical weakness is increasing day by day. Most of the villagers think that he is possessed by a 'zin' and his curse will only be removed after his death. So, they suggest him to take treatment from the 'Kabiraj'. He is also facing some social problems like other arsenic affected people. He does not get invitation in social occasion. If he rarely goes to any occasion everybody ask him about his disease. His neighbors and relatives do not visit his home. He is now living an isolated life.

Analysis

This story is about Rubel Hossain who was once a strong and energetic person. Rubel Hossain does not have sufficient knowledge about the disease. He is facing different social problems like the community people think he is a possessed person. So, the people try to avoid him and do not invite Rubel in any sorts of occasion. His physical weakness has increased day by day and he loses all his energy. Rubel has taken homath, allopath and Kabiraji treatment. At present he is taking allopathic medicine.

Case Study 14: Mst. Ismat Ara

Ismat Ara (33) knows about arsenic poisoning and the disease arsenicosis. She is a primary school teacher of Singergari village, Kishoreganj. Ismat married to Zillur Rahman in 2007. She has been suffering from arsenicosis for eight years. Her skin complexion has been changed. Black spots have covered her body. Zillur knew about the disease but he married to Ismat for dowry. Ismat's father gave her two lakh taka as dowry in her marriage. Besides, her father gives several gifts at her marriage to satisfy her in-laws. After two years of her marriage her husband again demanded two lak taka. He also physically tortured her. Her in laws forced Ismat to leave Zillur. Her husband also prevents Ismat to give birth to a child. She is also mentally exploited by her husband. But she stayed there and tolerates all physical and emotional torture against her. Isamt is an educated woman but she could not raise her voice. She always tried to continue her marriage because of the society. Her all effort and patience are in vein when her husband got married again.

Ismat is now living at her father's house. Her sorrows are not end here. Her sister in law always insult Ismat and persuaded her brother that her sister is an impure woman and if she stayed in their house all family members will be affected by her disease. Now Ismat is alone and woman in the village avoided her because she is divorced. The students of her school do not want her to teach them. She is now using the pond water and taking allopathic treatment, but it is not helping. Ismat is now praying to Allah that no one have to face such kind of miseries.

Analysis

In Ismat Ara's experience, we see how she is suffering physically and mentally. Ismat Ara has been divorced and at present she staying in her brother's house. Though she is an educated woman but she could raise her voice against her husband and in laws. Ismat is now alone, village people abandoned her. She is taking allopathic medicine and pond water for her treatment.

Case Study 15: Huzur Ali

Huzur Ali (54) lives in Veraveri of Putimari. He has passed S.S.C and works as a peon in a Government organization. Huzur has three daughters and one son. About eleven years ago he first noticed some symptoms of arsenicosis in his body. But he did not pay attention to the disease and at that time he thought that it is a kind of skin disease. So, he did not go to the doctor and used to drink water from their own tube well. In 2008 he came to know about the disease arsenicosis from newspaper. Then he went to the Upazilla Health Complex of Kishoreganj to know about the disease and how to cure from it. The doctor of health complex tested him and provided medicine to cure from the disease. The doctor suggests him not to drink the water from their home tube well. But Huzur and his family member drink water from that tube well because the safe tube well is far away from their house. So, they are compelled to drink water from the contaminated well. As a result all of his family members are being affected with arsenicosis. He has physical problems like rashes, black spots in his body. He has also lack of nutrition. At present he is taking vitamin pills provided by the health complex but the vitamin tablets do not cover the nutrition deficits.

In their village Huzurs's family is regarded as the arsenicosis family because all the family members are affected with the disease. They are socially deprived from their rights. Most of the villagers believed that Huzur and his family have been suffering from infectious disease. They thought that if they touch them soon they will also be the victim of the disease. Huzur is now leading a miserable life. He is deprived of his social rights. He has decided to migrate from that village to lead a normal life.

Analysis

In the experience of Huzur Ali we see how he is deprived of his social rights being patients of arsenicosis. His family is regarded as the arsenicosis family in the villages. His body is now covered with rashes and black spots. Though the doctor suggested Huzur Ali not to take arsenic free water but he did not listen to this as a result become severely affected with the arsenicosis. The story of Huzur Ali shows that how negligence of arsenicosis becomes a curse for them

Case study 16: Atahara Begum

Atahara Begum (25) is a patient of arsenicosis since 2006. At present she lives in Uttar Durakuti of Bahagili. She is not educated because her family did not allow Atahara to get education. She married to Imdadul Haq at the age of 18. Atahara has a five months old child. Her husband lives in abroad. When Imdadul arrives at home he does not behave well with her and tries to neglect Atahara. She is doing her level best to attract her husband but it is not helping her. Her in laws also torture her. Besides they think that if Atahara feed her child it will also be affected with the disease. So, they prevent Atahara to come closer to her child. She always prayed to God to relive her from that curse. She uses pond water for cooking suggested by the doctor. She is also trying to get nutritious food. At present headache and having fever are Atahara's major problems. Her skin complexion has changed.

Atahara has sold cows and ornaments for treatment inherited from her parents. She went to Dhaka and take treatment at a hospital. She arranged money for her treatment from a local mahajan with high interest rate. She is now paying the loans by working at a NGO. But the money is not sufficient enough to pay all the dues. Besides, the interest rate has been doubled so, it has become much more difficult for her. She wants all the people of the village to use safe drinking water. She also makes her neighbors aware of the disease.

Analysis

The story of Atahars presents that how the female arsenicosis patients at family. She sold her cows and ornaments for her treatment inherited by her father. She is now working with an NGO to repay the loan which she has been lent for her treatment. She makes her neighbors aware of the disease.

Case Study17: Mansur Ali

Mansur Ali aged 57 is a vendor lives in Nitai. There are six members in his family. He is suffering from the disease at the age of fifty. Mansur is very poor and it is hard for him to provide food for his family. His wife also works and contributes in the family. Mansur often remains ill and could not out for sell. He is very sick. He is taking contaminated water for long time. As a result his disease turns to Keratosis. Most of the times he used to remain at home. He could not support his family like before. Mansur gets allopath and homeopathy for treatment of the disease. Twenty thousand taka has already been invested and he is still taking treatment. Mansur can hardly manage nutritious food for twice in a month. There is no change in his physical condition. Day by day he is becoming weaker. Nobody buy things from him because of his disease. People are scared of him. At winter his life becomes much harder because rashes cover his whole body and he feels much pain. He compelled to stay at home in winter. Mansur's economic condition is deteriorating and his household expenditure increased due to increasing expense for treatment. Besides he had spent all the savings which he collected in his entire life. At present he thinks that he is a burden for the family members.

Mansur is also having some social problem. After being affected with arsenicosis there is an imbalanced relation between the members of the family. He does not take part in different ceremonies and development activities .The community people think that he is affected with a contagious disease. So, they are very rude with him.

Analysis

The story of Mansur Ali reveals that how the arsenicosis patients become victim of social injustice. He is not invited to attend any function and thinks himself as a burden for the family. He has spent lots of money which has increased his household expenditure besides he has spent all the savings of his entire life.

Case Study 18: Amicha Begum

Amicha Begum, aged 51, is a widow. She lives in Putimari of Kishoreganj. Her husband worked at 'Saidpur Railway Karkhana'. She knew about the disease 'arsenicosis' and its impact on health. She is now working as a volunteer of Upzila health complex of Kishoreganj and making people aware of the disease. Amicha touted that 'arsenic is a kind of poison and the disease caused by arsenic poisoning is called Arsenicosis'. About six years ago she first noticed the symptoms of arsenicosis in her body. At that time she did not know what actually happened to her.

She went to the village doctor and the doctor gave her medicine for pox. At that time she was using tube well water of her next door neighbor because they have no tube well. She first came to know about the poisonous chemical arsenic and its presence in tube well water in the year 2006. She knew it from the Health Assistant of 'Kishoreganj Health Complex'. For details information about the disease she went to the health complex. The doctor who was in charge of that complex gave her advice to take arsenic free water.

At present, she drinks water from 'Sono Filter' and use pond water for everyday use. But her condition is not improving as she used water containing arsenic for long time. The disease has had affect in both her physical and social life. The neighbours and relatives do not communicate with her about her economic condition. She asked for pension of old age from the local representatives (members and chairman). They refuted Amicha to manage pension. Amicha is a very poor woman and she is unable to have treatment of the disease. She if she does not get the pension then she will have no money to survive. She is trying to get financial help from the government.

Analysis

The story of Amecha Begum shows that she has proper knowledge of arsenicosis. At present, she is having water from sono filter and using water from the pond. Amecha is now all alone and trying to manage pension for her survival.

Case Study 19: Siam

Siam (12) is a student of class five lives in the village Nitai of Kishoreganj. There are five members in his family. Siam is a victim of the disease since he was eight. Siam's father Barat Ali is a farmer. His father is the only breadwinner of the family and his monthly income is about 4000 taka only. He can hardly manage rich foods for Siam twice in a month. Siam is suffering from malnutrition. Siam's chest and back covered with black spots. He is very weak and cannot even walk properly. He does not uncover his body outside or playgrounds. His parents spend a lot of money for him. His mother sold her ornaments for his treatment which were reserved for her sister's marriage. His mother cries and said that how could they will arrange marriage of her daughter without ornaments. Besides she is very worried about Siam and praying to God for their son to recover from the fatal disease. In winter Siam's condition gets much worse. His parents are taking extra care of him. At present Siam is taking allopath medicine as a cure of the disease.

Siam's friends denied playing with him. Most of the parents of his friends are anxious about that if Siam touches their children they will also be the victim of the disease. So, they suggested them not to play with him. His classmates stopped talking with Siam at school. They hated him. Moreover, the teachers did not co-operate him in education. In a word Siam is forced to leave his study. Now do not to go outside. He remains in the house alone and cries all the day. These all makes him psychologically ill.

Analysis

The story of Siam presents how arsenic victim become emotionally affected for arsenicosis. Arsenic poisoning has made Siam psychologically ill. He is facing some problems like avoidance, negligence etc. The major problem faced by Siam he is forced to leave his study. His parents are taking more care of Siam. Siam is now isolated from his friends and also keep distance from his friends.

7.3 Case Studies of Arsenicosis Patients of Jaldhaka Upazilla, Nilphamari

Case study 20: Bishadi

Bishadi is 23 years old girl who is still unmarried. She lives in the village Purba Balagram Hut Khola of Jaldhaka. She is a victim of arsenicosis since seven years. Bishadi's dreams are all fallen apart. She wants to be a doctor. But the disease arsenicosis has shattered her life and thrown her into hell. She compelled to leave her study. Her skin has become dry and spots found in her throat and hands. She always feels shy because of her skin complexion and keeps herself away from others. Bishadi do not go outside and reluctant to mix with others. Everybody asked Bishadi about her disease which makes her feel embarrassed.

Her father Dhizen is a carpenter and his earnings are not enough to manage the expenditure of the family. Without Dhizan has to buy medicine for Bishadi. In that circumstance Bishadi's father failed to manage rich foods for her.

Bishadi's father has already spent 10000 taka and also borrowed money for her treatment. Five years ago he tried to get her married but the groom's family demanded about three lakhs taka as dowry. Her father was unable to provide such amount of money. At present Bishadi's health condition has become much worse and she is physically very weak. Beshadi's father thinks that she will never get married because of her disease. Bishadi has broken down mentally. She reported that committing suicide is the only way left for her. The relatives treat her as a burden. Her age is increasing but nobody is interested to marry her.

Analysis

Bishadi is facing marriage related problems due to arsenicosis. She does not go outside and always remain at home. She has completely broken down and wants to commit suicide. About 10000 taka has already been spent for the treatment of Bishadi. She has become a burden for the family.

Case Study 21: Minu

Minu is a younger sister of Bishadi. She is 18 years old. She is suffering from the disease for two years. There are five members in her family. They used to drink water from their home tube well. About two years ago she found black corns in her body. Her family thought that it was chicken pox. Later when the spots continued to spread over her body she started taking herbal medicine. But it is of no use. She started taking homeopath and then allopath. But instead of improving, her condition worsened. One of her neighbour suggested Minu to go to the health complex in Jaldhaka. Her father took Minu and Bishadi in the health complex. After seeing Bishadi the doctor also recommended her for test. They reported that Minu and Bishadi both are affected with arsenicosis. After hearing this Dhizan's life shattered. Minu states that 'the neighbours always blame us and some of them alleged that it is an act of devil or impure air spirits.' As Minu's condition was not very prominent her father somehow arranged her marriage. Few weeks later her health condition deteriorated and the members of in-law began to behave very rude with her. They refused take any responsibility of her .They tortured Minu emotionally and physically. She is now in her father's house.

Analysis

Minu's story reveals arsenicosis patients particularly the female patients faces marriage related problems due to their poor socioeconomic status and dominant patriarchal ideology. Minu's husband refused to take any responsibilities of Minu.

Case Study 22: Soleman

Soleman, a 42 years old man is a victim of arsenicosis since he was thirty years old. He lives in the village Khariza Golana of Jaldhaka. There are six members in his family. He was a worker of a rice-mill. His wife also works there. With their small income they used to live happily. But there dreams fallen apart when the symptoms of arsenicosis first found in his body. At first he was not concerned about it. He came to know about arsenicosis from an NGO. One year later he was diagnosed as heavy arsenicosis patients. Then his miseries know no bound. Soleman once was a cheerful worker of the rice mill. His owner liked him so much because he works hard. But gradually he becomes weak. He is incapable of hard labour. At present, his physical condition does not support to work in the rice mill anymore. He is jobless now. His wife Khadija is the only earning member of the family. The owner of the mill likes him so he gave 4000 taka for his treatment. This money is not sufficient enough to continue his treatment. So, Soleman stopped taking treatment. The doctors suggested him to take nutritious food. But Soleman says that ‘we are very poor, we cannot even arrange rice for twice a day, having nutritious food is a dream for us.’

Soleman reported that he is drinking boiled water of pond. He stated with sorrow that everybody avoid him. The relatives also abandoned him. They treated him as a patient of leprosy. He is not allowed to attend any social function. This middle aged and once cheerful man is counting the rest of the days of his life.

Analysis

In Soleman’s experience, we see that his wife has to do man’s job as well as women’s job. Soleman once a cheerful person is unable to do any works due to arsenicosis. Soleman has stopped taking treatment. He reported that he is taking boiled water of the pond as a cure for the disease.

Case Study 23: Eliza

Eliza a 17 years old charming girl lives in the village Purba Balagram Hatkhola. She is a victim of arsenicosis. She is suffering from the disease for five years. Eliza came to know about arsenicosis from his father Shafiqul Islam who is a school teacher. Their home tube well is not tested by DPHE. So, they did not know whether it contains poisonous element arsenic or not. When the symptoms of arsenicosis were found in Eliza's body she did not show it to anybody.

She does not reveal it toward her parents because of her shyness. One year later when her back and chest covered with the black spots she was frightened and went to her father. She has informed her father about her disease. Eliza's father took her to the health complex in Jaldhaka.

The doctor diagnosed her and reported that she is suffering from heavy arsenicosis. The disease has become prominent. Eliza cries 'Oh Allah what I have done to me, If I would inform my parents the disease will not be so severe'. She is now taking nutritious foods and trying to make people aware of arsenicosis. At present Eliza is drinking well water free of arsenic. Her condition has not been improved though she is taking medicines. Her father took her to the Rangpur Medical hospital for treatment in every single month.

Life has become meaningless to Eliza. She does not mix with her friends. Her mother is worried about her and praying to God for Eliza. She cannot concentrate in her studies. She is broken down mentally. But she still hoping to recover and requested the Government to test all the tube well of their locality whether it contains arsenic free water or not.

Analysis

The story of Eliza shows that how life becomes meaningless for arsenicosis patients. Eliza does not mix with other. Black spots have covered her body and chest. She is taking medicine and hoping to recover from the disease.

Case Study 24: Md. Afsar Ali

Afsar Ali (40) lives at Purba Kathali Sarkar Para in Kathali. He is a patient of arsenicosis since 2005. He is a farmer. There are only two members in his family; Afsar and his mother. His mother is also a victim of arsenicosis. The village people have stigmatized Afsar and his mother and compelled them to live an isolated life. His father Md. Jahan Mahmud died of arsenicosis.

About six years ago symptoms of arsenicosis has been revealed in his body. He went to the doctor and diagnosed him. The doctor found that he has become a patient of arsenicosis. Since then he is surviving with the disease. His skin has become like 'snake skin'. Rashes cover his whole body. He has lost his energy for work. His major problem is having fever all the time.

His mother's condition is much worse than Afsar. His mother Mozila Khatun is even unable to stand straight. She is suffering from black foot poisoning. Afsar sold a piece of land inherited by his father. He mortgaged their home and borrowed money for treatment. He is worried about whether he could pay the loans. Afsar states that 'I had a small home which was the only place in the world for me but now I am nothing but a beggar of the street.' At present he is jobless. Nobody gives him job. They just show sympathy to him. Despite his illness Afsar has to do all the household chores and also look after his mother.

Afsar is not allowed to take water from his neighbour's tube well. So, he is using the pond water. Afsar do not go to the tea stall for having tea with others. If he went to the public place everyone behaves so strangely that they have seen something ghostly. They avoid him and show no respect to him. The people of the community hated Afsar. They fear him for being afflicted with arsenicosis. None of them are keeping contact with Afsar and his mother. They have become outcasts in their society. Afsar and his mother are passing their life with miseries.

Analysis

Afsar and his mother stayed isolated in their village. His physical condition is worsening day by day. Afsar is not allowed to take water from his neighbor's house. He has sold their land and mortgaged their home for their survival. Afsar is still unmarried and he is outcaste in their society.

Case Study 25: Motilal

Motilal is an unmarried man aged 35. He lives in the village Babupara of Kathali Union. There are ten members in his family. He lives in a joint family. Motilal is a patient of arsenicosis since 2005. Black spots covered his hands and body. His father Mokaram is a small business man. Motilal used to help his father in business. At present, he is working in the fields, cultivating, weeding and tending cattle. His younger brother helps his father in business. His father did not want him to involve in business. His father thinks that the customer would be reluctant to buy goods from their shop if they see Moti.

Motilal says that ‘two years ago while I was working in the shop a customer come to me and asked for some goods he wanted to buy. After seeing me he refused to take anything from our shop. He went to another shop and said about me over there. The shopkeeper told me about this and after this incidence father is reluctant to involve me in business.’

Motilal came to know about arsenicosis from the health complex in Jaldhaka. The doctor suggested Moti to have nutritious food and take water from ‘sono filter’. But he is unable to manage foods because his father is reluctant provide Moti nutritious food. At present Moti is not taking water from the sono filter. He is taking allopathic medicine as a treatment of the disease.

Motilal wants to marry. He thinks that he will never get married because the bride’s family will refused him due to his disease. Motilal’s siblings make fun of him; he is discriminated in family as well as in community. Moti urge for help from the Government and said that government should make people aware of the severity of disease.

Analysis

The story of Motilal reveals that the male patients may also face marriage related problems. Moti is suggested by the take nutritious food and drink water from the sono filter. Motilal used to live alone in the family. His father does not want Moti to involve him in business. Now, he is taking allopathic medicine as a treatment of the disease.

Case Study 26: Md. Sikender

Md. Sikender (57) lives in Taluk Golana of Golana Union. There are five members in his family. Sikender inherited three Bigha land from his father. He used to cultivate at that land and live happily with his family. Sikender was capable to maintain his family very well. The disease 'arsenicosis' has entered in his happy life as a curse. His all dreams have collapsed. It has taken away his all happiness and through him into the ocean of sorrows.

Sikender is suffering with the disease at the age of forty five. At that time nobody in the locality knows about the disease. He started taking herbal medicine. He also went to the doctor but the doctor cannot dictate what is happened to him. Without knowing the actual disease he started to take medicine of leprosy because white spots seen in his back and chest. But his health condition is not improved.

He first came to know about the disease from the Government campaign in the year 2005. He realized that he might also be afflicted with the disease. He went to the general hospital of Nilphamari situated at Nilphamari town. He was informed about the disease from the hospital and started to take treatment.

About 1 lac taka has been spent for his treatment. He sold one bigha land for his treatment and still having treatment. He is facing economic hardship.

Having arsenic contaminated water for long time affects him severely. His face complexion has been distorted. People scared him. His son also avoids him. He does not attend any social functions. His wife has become tired of taking care of him. He is discriminated by his family and as well as by the member of his locality. The family members behaved with him very rudely. The people of the community stigmatized him by saying that he is a bad person.

Sikender told that government should make people aware of the disease and provide proper treatment and medicine to the people who are contaminated with arsenicosis. The NGO should take proper steps to ensure arsenic free well water.

Analysis

This story is about Md. Sikender who has been stigmatized by the community people for arsenicosis. Having arsenic contaminated water for long time has changed his face complexion. He is also facing some social problems like discrimination at family level, misbehaved by the family members etc. He has spent about 1 lac and sold a piece of land for

his disease. Now, he is urging the government to provide proper treatment and medicine to the arsenicosis patients.

7.4 Case Studies of Arsenicosis Patients of Domar Upazilla, Nilphamari

Case Study 27: Shafali Rani

Shafali Rani (30) is an inhabitant of Bamunia of Domar Upazilla. She has two daughters named Rekha and Akhi. Her husband is a poor farmer. She is afflicted with arsenicosis at the age of 21. She is now taking treatment of arsenicosis. Her health condition is worsening and the treatment is of no use.

At the very beginning dark spots were developed in her skin. The neighbors thought that she is punished by the Goddess for her sins. The Goddess is not satisfied with her. They thought that to impress the Goddess she has to keep fast. Shafali tried to impress the Goddess by praying and arranging 'Puja' but it is not helping her. At that time she was not aware of arsenicosis. Even she did not have any knowledge about what arsenic is. About five years ago she first came to know about the disease from an NGO. Now she knows about arsenic and its impact on health. She stated that arsenic is a kind of poison and the disease caused by arsenic might kill people. She is trying to make people conscious about the disease.

At present, Shafali Rani is passing a much harder time. Despite her illness she has to do all the household chores alone. She is unable to work properly due to the disease. Arsenicosis has made her feeble. Arsenic has increased her physical burden and she have to spend lots of time to accomplish any sorts of household activities.

Besides she has to share water of her affluent neighbor which made her feeling embarrassed. She seeks permission from the neighbor to have well water. Sometimes she used the arsenic contaminated water. Her workload has increased due to the disease. She asked the Government to establish a dug well in her locality.

She is having allopathic medicine for the last five years. Instead of improvement, her health condition is deteriorating day by day. She stated that she is having some social problems. She used keep distance from the unaffected people of her locality. She is mentally broken down due to negligence of others.

Analysis

The story of Shafali Rani shows how arsenicosis patients become victim of superstitious beliefs and prejudices. Shafali Rani is passing a much harder time due to arsenicosis. People believed that the Goddess has been dissatisfied with her. Despite her illness she has to do all her household chores alone. Shafali has to fetch water from her neighbor's house which made her embarrassed. Arsenic has increases her physical burden. She is having allopathic medicine as a treatment of the disease. Arsenicosis has made her feeble and she has now become unable to walk properly.

Case Study 28, Munira Begum

Munira Begum, aged 35 has been abandoned by her husband three years ago. She is also an inhabitant of Bamunia. Munira has been exposed to arsenicosis at the age of 22. She first came to know about the disease from a health assistant of 'Domar Upazilla Health Complex' in the year 2007. The health assistant recommended her for test. The test report revealed that she is suffering from arsenicosis. At the beginning drug has been given by the health complex for one month. She was informed by the medical officer not to have arsenic contaminated well water. The medical officer advised her to change the water source from which she is having water.

Munira reported that their home tube well has not yet screened by DPHE. So, they still do not have any knowledge whether it contain arsenic or not. When Munira has been informed about arsenicosis by the medical officer she has stopped taking water from that tube well.

At present, Munira is passing her life with misery. She is severely affected with arsenicosis. Her palms and soles are covered with black spots. She is facing physical problems such as dizziness and headache.

Her husband is reluctant to have relationship with Munira. Munira commented that she has no physical relationship with her husband. He used to avoid her. Her husband tortured her physically due to her disease. He intimidated her to borrow money from his in laws. Munira told that 'he used to beat me at almost every night and furiously scolds me with a bunch of slang; he stopped at midnight after getting tired of beating'. Munira shows us the beating marks in her body.

For the last few years she is bearing all the physical and mental torture silently. But her husband called for a ‘Salish’ and accused her as an impure woman. The member of the ‘Salish’ endorsed her husband to abandon Munira. After this incident she has emotionally broken down. Munira is now living alone in this village. She is not taking any sorts of treatment. To increase awareness of arsenicosis Munira recommended propagating arsenic as not a contagious disease. Munira is not permitted to go near to her daughter. She is not allowed to talk with others. She is counting the rest of days of her life.

Analysis

The story of Munira Begum demonstrates the domination of men over women. Munira has been abandoned by her husband. She has been considered as an impure woman by the members of her locality. Her husband tortured her before getting abandoned. Munira is not permitted to near to her daughter. She is counting her life all alone.

Case Study 29, Antor

Antor, a 13 year old little boy is suffering from arsenicosis for three years. Antor lives in Boragari of Domar. He passed class two. He belongs from a poor family. Her father said Antor was a very charming boy. Their neighbors and relatives loved Antor. He used to be very happy. But his life shattered and dreams are fallen apart when he knew from his father that he is suffering from a fatal disease arsenicosis. Antor's father is a farmer who used to cultivate in his own land. Antor is the only child of his father. His father earns about 6000 taka per month.

Three years ago Antor's father took him to the Upazilla health complex due to the spots in his chest. His father was informed by the medical officer of Upazilla health complex that Antor is suffering from arsenicosis. At that Antor was only 10 years old boy.

Once the beautiful Antor, turns into an ugly boy. He has lost his all charm. His sweetness has gone away. Nobody loves Antor anymore. Antor's father Aziz Mia is illiterate. When the symptoms of arsenicosis revealed in Antor's body his father could not recognized what was happened to Antor. His father asked to the neighbors and relatives but no one can give any reasonable answer about Antor's disease. Antor's father thought that Antor was cursed by a 'Pari' (Fairy). Antor's father expressed, 'Pari become jealous after seeing him, and she envies her and took all charm of Antor'.

Aziz Mia spent lots of money for the treatment of his son. He spends about eight hundred taka per month for Antor. Eight hundred taka per month is lots of money for his family. His father is facing economic hardship due to expending a fixed amount for Antor's treatment. At present, Antor is taking treatment from a private doctor. Antor's reported that he used to take medicine from the government hospital. But the doctor often remained absent in the hospital and without the permission of doctor nobody provide medicine in the hospital. So, his father decided to go to a private doctor.

Antor's father is trying to provide his son with nutritious food. But it is difficult for his father to manage nutritious food twice in day. Antor is still taking water from the same source

Analysis

The story of Antor reveals how the arsenicosis patients become worst victim of superstitious beliefs. Antor was a very charming boy. But when he became affected with arsenicosis his father believed that he was envied by 'Pori'. The people of the community also believed that 'Pori' has taken away his all charm. He came to know about the disease from the Upazila health complex and started taking medicine. But it has become late for him and he was severely affected with the disease. Antor is now taking nutritious food and allopath medicine provided by a private doctor.

Case Study 30, Rozina

Rozina Begum (18) lives in the village Boragari of Domar. There are four members in her family. She is a tailor. Rozina used to maintain her house with the low income of 3000-4000. Her father is ill and unable to work. Rozina's father lost his working ability when she was 15. At present, she is the only earning member of her family. Rozina has to work hard from morning till evening for the family. Rozina faces difficulty in maintaining the family alone. Sometimes her mother helps her. But her mother always remains busy with her household chores like cooking, cleaning, washing etc. Rozina's mother tends to look after her husband who is unable to work and most of the time remains ill. Rozina has a little brother aged 12. Her brother used to go to school one year ago. At present, Rozina is unable to manage education expenses of her brother. So, he has compelled to leave his education.

Two years ago she went to the government hospital to take treatment of the white spots which exhibits in her back and chest. The doctor suspected that she is suffering from arsenicosis. He recommended her for blood test. The test report revealed that Rozina is suffering from arsenicosis. The doctor suggested Rozina to take nutritious food and vitamin tablets. Before afflicted with arsenicosis she was ignorant about the disease. Although she is now aware of arsenicosis and making people aware about it but she is not taking any treatment or having nutritious food. Rozina and her family is now using pond water.

Her skin has become harden and the spots becoming dark. She is also facing other physical problems like feeling weak, headache etc. Because of constant headache she could not concentrate in her work. As a result she is unable to work and earn like before. People of her community avoid Rozina. The female clients who used to make dress from Rozina are

reluctant to make dress from her. They think that Rozina is suffering from contagious disease and if they make dress from her they will also be afflicted by the disease.

Rozina is now unemployed. Nobody came to her for making dress. She is using her savings to maintain her family and continue his father's treatment. She feels guilty because she could not manage educational expenses of her brother. She said with sorrow, 'What kind of sister I am who cannot send her brother to school'. Rozina is now using her savings. She saved the money for her marriage. Her savings are almost finished. Rozina is very worried about her future. She told that I have no savings right now, who will marry her with that disease. She cried 'my parents and little brother will die without food'. She is urging for help to the Government.

Analysis

The story represents that how active and energetic women, Rozina become unemployed and her miseries increase due to the arsenicosis. She belongs to a poor family. She is the only earning member of the family. The story shows that how Rozina become familiar with arsenicosis and make people aware of arsenicosis. Rozina is suffering from arsenicosis and her family members are passing their life with hardship. She is using her savings for the survival of her family. Rozina is taking pond water as a treatment of arsenicosis.

7.5 Summary of Case studies

The case studies presented in this chapter reveals the detailed information about the the situation of arsenic afflicted people in Northern part of Bangladesh. The case studies show the vulnerabilities of arsenic affected people in Nilphamari. The case studies also show the coping strategies taken by the arsenic affected people of Nilphamari.

CHAPTER EIGHT

Findings and Theoretical Relation

8.1 Theoretical Relation

This dissertation is a study on gender dimension of arsenicosis in Nilphamari district; it has made up or developed by gender specific vulnerabilities related with arsenicosis; Impact of arsenicosis on woman; gender variations of the responses of arsenicosis and gender based coping mechanisms to address the vulnerabilities. This exploratory work particularly on gender based vulnerability related with arsenicosis discloses the differential vulnerabilities associated with arsenicosis. This piece of work therefore attempted to highlight the gender specific coping mechanisms related to arsenicosis to address the vulnerabilities under the circumstances of coping and adaptation strategies, indigenous coping mechanisms, awareness and perception of arsenicosis patients and different initiatives taken by Government and NGOs to cope with the disease.

8.2 Gender Specific Nature of Vulnerabilities Related to Arsenicosis

Chronic arsenic poisoning or arsenicosis has had immense impact on peoples' life as well as society. Arsenic contamination in groundwater is affecting millions of people life in Bangladesh. They are suffering from different vulnerabilities related with arsenicosis. Arsenic is an environmental hazard. According to vulnerability theory of disaster, a natural hazards turns to disaster when a vulnerable group of people is affected (Canon, 2000). So, arsenic is a natural disaster because chronic arsenic poisoning makes a group of people vulnerable to arsenicosis.

Arsenic crisis produced several vulnerabilities in Nilphamari. According to vulnerability theorist, risk can be defined as the combination of vulnerability and hazard. Vulnerability and hazards combine in numerous ways which produces risk. Disaster occurs due to the presence of the risk. The arsenic hazard makes a group of people vulnerable through different ways which in turns yields risk. Arsenic hazard creates physical, economic, psychological and social vulnerability. These vulnerabilities lead to risk. Thus, the presence of risk turns the arsenic hazard into disaster.

Vulnerability theory of disaster deals with the causes of disaster. Arsenic is an environmental disaster. In this context, this theory is applicable to find out the causes of arsenicosis in Nilphamari district. There are a few causes of arsenicosis which make a group of people vulnerable to arsenicosis. For example, people become victims of arsenicosis using arsenic-contaminated water for long time. Using arsenic-contaminated water for long time makes a group of people vulnerable to the disease. Arsenic is not absorbed very well through the skin. Even using arsenic-contaminated water for bathing and washing does not increase the arsenic levels in the body as long as one does not drink the water. Arsenic in soil would be even less well absorbed through the skin than arsenic in water.

Various factors contribute to the vulnerability of arsenicosis. According to the vulnerability approach, people's vulnerability is determined by the interaction of natural and social, economic and political factors. So, people's vulnerability to natural hazards or disaster may be defined through several natural, social, economic and political factors. These myriad factors shape the vulnerability to arsenicosis. The impacts of arsenicosis on male and female patients are different. So, the severity of being vulnerable with the disease is also different among men and women. Vulnerability theory determines an individual's risk or stress due to environmental or social change. So, this theory is applicable in determining the risk or vulnerability of arsenicosis patients due to arsenicosis. Arsenic hazard makes the Arsenicosis patients of Nilphamari physically, economically, psychologically and socially vulnerable (Fieldwork, 2013). Both male and female arsenic patients are victims of those above-mentioned factors.

The physical effects of arsenicosis are severe. The patients of arsenicosis in Nilphamari district, both male and female, have to go through immense physical pains. The arsenicosis patients suffer from numerous physical pains due to not having sufficient food and treatment. Lack of educated knowledge, including both male and female patients, makes them physically more vulnerable to the disease. The ignorant people are unable to take proper steps to reduce the severity of the disease. Thus, the arsenicosis patients in Nilphamari become physically more and more vulnerable to arsenicosis.

The physical vulnerabilities related to arsenicosis are huge. There are several indicators which create severe physical vulnerabilities. According to Rosenboom: "the development of arsenicosis is influenced by diet, genetics, nutritional status and lifestyle choices, as well as the level and duration of arsenic exposure" (2004: 174). So, diet, genetics, nutritional status and life style are the important determinants of being physically affected with the disease.

The imbalanced diet of arsenic victim increases malnutrition and malnutrition increases physical burden. Thus the poor diet becomes one of the major causes of being physically vulnerable to arsenicosis. Genetics also have influence on physical inconsistency. The female arsenic victims are genetically vulnerable to the disease. The male patients have much strength than the female patients. So, they are physically more capable to survive with the disease. The life style factor and consumption patterns also determine physical vulnerability of the disease. Lower the life style determined by the economic conditions higher the risk of being vulnerable with the disease.

Social structure generates inequality which in turns physically affects the arsenicosis patients. Arsenic diminishes the working capacity of the patients and gradually kills people. Arsenic creates different disease like sores, skin lesions, melanosis, keratosis, gangrene, black foot disease, skin cancer, cancer in kidney and bladder etc. Skin complexion changed for the disease and the victim become incapable of doing works. In Nilphamari district it has been found that both the male and female arsenicosis patients are suffering from melanosis, keratosis, hyperkeratosis, headache, dizziness etc. Physical weaknesses are common among most of the female arsenicosis patients of Nilphamari district.

The patients of arsenicosis are economically vulnerable to arsenicosis. Arsenicosis creates economic vulnerability. The natural hazard arsenic creates variability in living standards caused by consumption or income shock. The patient's physical weakness makes them unable to work properly. It diminishes their ability to hard labor. In Nilphamari district most of the arsenicosis patients commented that their working ability has been decreased due to arsenicosis. The arsenic victims have to face economic hardship. Termination from job increases poverty which in turn generates vulnerability. The male arsenic victims bear much economic problems compare to female patients as they are the breadwinner as well as the only earning member of the family. The arsenic victims face discriminations in work, though they work hard but paid less. Discrimination in work sector and low wages rendered the arsenicosis patients of Nilphamari leading a miserable life.

Poverty yields risks to arsenicosis while arsenicosis make the patients economically vulnerable. So, there is an interrelationship between poverty and economic vulnerability. Being unemployed due to arsenicosis create poverty while the poor family particularly the female headed household faces much economic hardships due to arsenicosis in Nilphamari district.

According to the vulnerability approach vulnerability is caused due to lack of social and political rights. Arsenic crisis poses significant challenge in achieving social and political rights vis- a- vis social and political rights are violated due to arsenicosis. The social rights are violated due to arsenicosis in terms of right to education, right to work, right to water, right to food, right to social security etc. The patients faces problem of social security. People are reluctant to have relationship with the arsenicosis patient. They are avoided by the community people, their friends and families. Both male and female patients are ostracized by the community people in Nilphamari. They are not invited in any social functions. Thus, changes in social structure makes a group of people vulnerable to arsenicosis.

The vulnerability theorists argue that vulnerability should be seen as the exposure of a group to social stress caused by changes in environment and society (Adger, 1999). To understand the factors that contribute to social vulnerability of arsenicosis it is necessary to understand the social vulnerabilities related with arsenicosis. The social vulnerability among arsenicosis patients in Nilphamari is caused due to poverty and hunger, poor health, gender inequality, education, access to resources and services, limited access to public awareness, limited access to political power and repression etc. The patients of arsenicosis in Nilphamari are socially vulnerable to arsenicosis. They are stigmatized by the community people.

Poor headed household particularly the female households are socially more vulnerable to arsenicosis. The poor women have to sell their assets due to treatment of the arsenicosis. This compelled them to face economic hardship. The economic hardship yields poverty. Thus the economic problems make the poor household more poor due to the disease.

Ostracism is very common problem faced by arsenic victim. The patients are ostracized and considered as patient of leprosy. Thus the social structure makes them isolated from the mainstreams. The arsenic hazard hinders the socialization of children. Arsenic affected child are not allowed to continue their study. They are avoided by their peer groups. They are neglected by their friends and family.

In family level discrimination arises due to arsenicosis. The female arsenic victims are maltreated in family as well as in community. They are given less food and less treatment though they are ill. Thus the environmental change, arsenic in groundwater, generates gender based social vulnerability among arsenicosis patients in Nilphamari.

Though vulnerability theory focuses mostly on social vulnerability but the social vulnerability makes the arsenic victim psychologically vulnerable to arsenicosis.

8.3 Impact of Arsenicosis on Women

Impacts of arsenicosis on women in Nilphamari district cannot be theorized with only one theoretical perspective because there are different factors that contribute to the miserable situation of women in society.

The analysis of vulnerability holds the conception that the vulnerable groups are often characterized under age, sex, ethnicity or class. The social vulnerability theorist narrate the overarching social structures rendered certain individuals and groups at greater risk of exposure to natural hazards. The poor socio-economic structure renders a social group more vulnerable to arsenicosis. Society differentiates among men and women in terms of gender role socialization. Women are economically poorer than men. Most of the women in Nilphamari are engaged in private sector while men are involved in public sectors. So, they have no earnings of their own. In case of chronic arsenic exposure the female patients are economically vulnerable and dependent on others. If their husbands or family members are reluctant to continue their treatment they will not be able to have treatment. They become vulnerable due to not having treatment.

The patients of arsenicosis have to go through several vulnerabilities like physical, social, economic and psychological vulnerabilities. According to vulnerability theory different groups may share a similar exposure to arsenicosis, but the hazard has varying consequences for these groups. For example both male and female patients are affected with arsenicosis but the consequences of vulnerabilities related with the disease are different. The physical effects of arsenicosis among men and women are quite similar but the social, economic and psychological vulnerabilities differ among men to women. According to vulnerability approach, the nature of vulnerability among men and women in association with arsenicosis may differ considering economic, as well as social issues.

Arsenic is more prevalent among the people who belong to the lower socio-economic status. Chronic arsenic poisoning is related to nutritional status (NEAB, 1999). Vulnerability theory focused on how society treats its members or groups in terms of access to resources. Arsenic increase poverty as well as poor people particularly poor woman is the most vulnerable group to arsenicosis because of having low access to resources.

Researcher found that arsenicosis patients of Nilphamari are getting poorer to poorer for arsenicosis. One of the major economic vulnerabilities related to arsenicosis is loss of jobs. In

rural areas of Bangladesh male are the only earning members of the family. So, they are at more risk of being unemployed because of the disease. The arsenicosis patients spent vast amount of money without knowing properly about the disease. Huge expenditure for treatment to cope with the disease makes the patients economically vulnerable to the disease. As a result they have reduce consumption of food to buy medicine. The patients have to sell their assets even their dwelling place. The male patients borrow loan from others compare to female patients. On the contrary the female patients sell their ornaments and livestock for their treatment. The vulnerability theory emphasis on how a particular social group becomes vulnerable to a disease.

Impact of arsenicosis on women can be theorized through theories on gender inequality. Different factions of feminisms determine the causes of vulnerability of female arsenicosis patients based on gender inequality. Socialist feminist views that there are powerful interests in society which are hostile to equality of women.

According to the feminist theory, women are oppressed on the basis of their gender due to the dominant patriarchal ideology. In rural areas of Bangladesh female arsenicosis victims have to face several psychological pressures due to the patriarchal ideology. The vulnerability of female arsenicosis patients due to existing patriarchal ideology are given below:

The patients become emotionally affected for the disease. The married women are psychologically more vulnerable than man because they are always in pressure of getting divorced or abandoned. The male patients are psychologically less vulnerable than the female. The female arsenicosis patients are force to live isolate which creates extreme psychological pressure upon them. The unmarried woman feels mental distress. They think they will never get married. The young boys and girls also psychologically vulnerable and faces extreme problems to maintain their social relationships.

The feminist theorist considered hegemony as a dominant tool for analyzing patriarchy. Hegemony is dominance of one group upon other. The female arsenicosis patients are dominated by the family members particularly husband. In an extreme case they are victim of physical violence.

The arsenicosis patient faces social discrimination in family as well as in community. According to the radical feminist, family is the primary source of women's oppression in society (Giddens, 2006). Female patients are socially discriminated in family and also in

community. In family discrimination among arsenicosis patients occur in terms of having treatments, foods etc. At community level female patients face problems like social stigma, ostracism etc. The other consequences related to arsenicosis are social instability, chaotic environment in locality, disrupt social network etc. The socialization of child is hampered for the disease. Both female and male children are dropped out from their study. The arsenic affected family forced to migrate into another place for arsenicosis.

8.4 Gender Variations in Coping Mechanisms

Although both male and female patients are affected with arsenicosis, variations can be seen in coping mechanisms and responses of the disease. Vulnerability theorist argued the arsenicosis patients have diverging capacities and abilities to handle the impact of a hazard. Arsenicosis patients can cope with arsenicosis by taking different survival strategies. Gender variations among arsenic patients found in terms of coping and adaptation strategies. Variations occur in terms of gender division of labour, economic conditions, prevailing beliefs, customs and values. Both male and female patients take coping strategies or immediate actions like keeping distance from friends and families. The female patients try to conceal themselves by avoiding their friends and families. The female patients try to avoid go outside due to embarrassment.

People also use indigenous coping mechanisms to reduce vulnerabilities of arsenic hazard. Indigenous coping strategy involves coping capacity at family level and coping capacity at community level. Radical feminist views family as a source of oppression. In family, the female arsenicosis patients may not get proper support. As result lack of family support compelled them leading a miserable life. In family level, they are the worst victim of arsenicosis. Nobody give them respect. The female arsenicosis patients are discriminated in family in terms of having food or treatments. As a result variations occur in having foods or taking treatment. Taking nutritious food is one of the major preventive mechanisms to relieve from arsenic hazard. But the prevailing patriarchal ideology and discrimination is a barrier for them to take nutritious food.

Liberal feminist views equal opportunity for men and women. Variations occur in having access to safe drinking water. The male and female victims are not getting opportunity to have access to safe drinking water. Women in Nilphamari reported that they have less access to have pure drinking water than man. Men get much opportunity to go outside so they can

take water from the alternative source but female have less opportunity than male. In terms of access to safe water they are discriminated in society.

Radical feminists consider that men are responsible for and benefit from the exploitation of women (Giddens, 2006). The female arsenicosis patients sold their ornaments and assets to continue their treatment. In some cases they sold their valuable assets for their family members due to the treatment of arsenicosis. The male arsenicosis patients are benefitted from their wife. Their wives took care for them and are not abandoned by their wives. But the female patients are not treated with same opportunities. In most of the cases their husband neglects them. They are abandoned by their husband due to arsenicosis. So, the same disease affects men and women differently.

The female arsenicosis patients have low socio-economic status than the male arsenicosis patients. They are not provided with proper information about arsenicosis. As a result they become unaware about the disease.

Due to the prevailing patriarchal ideology of the society women have less access to take part in decision making programmes of any water related project. As a result one essential part of society is unable to participate which increases the severity of the disease.

At community level the arsenic victims take initiatives like establish tube-well, making people aware of the disease etc. The arsenicosis patients use arsenic free water as a mechanism to cope with the disease. The female patients are unable to have water from the tube well established by the community. The arsenicosis patients particularly the female patients have to take pond water as a coping mechanism. They used polluted water for their daily use.

8.5 Conclusion

This research is an attempt to highlight the gender specific nature of vulnerabilities related to arsenicosis in Northern part of Bangladesh. The excessive presence of arsenic in groundwater of Bangladesh is one of the major reasons of suffering of millions of people. In Northern Bangladesh particularly in Nilphamari, arsenicosis patients are identified in selected villages of four upazilas including Saidpur, Jaldhaka, Kishoreganj and Domar. This study attempted to present gender based differential impacts of arsenicosis in selected villages of Nilphamari. Arsenicosis affects both men and women but the severity to be affected with the disease is different among men and women. This research reveals that arsenicosis patients in

Nilphamari district are facing differential vulnerabilities such as physical, economic, psychological and social vulnerabilities. It is evident that although arsenicosis affect both men and women but the nature of vulnerabilities associated with the arsenicosis differ from men and women. This study highlighted the variations in vulnerabilities of men and women.

Physical vulnerabilities of arsenicosis patients include arsenic related differential health problems like pigmentation, melanosis, keratosis, having fever, dizziness, headache etc. The present study explores that in Nilphamari district only one patient is died out of arsenicosis. The economic vulnerabilities related to arsenicosis are poverty, unemployment, malnutrition, termination from jobs etc. The male patients have gone through severe economic hardship comparing to female patients. The patients are also emotionally affected with the disease. They suffer from mental depression, distress etc. The social problems in association with arsenicosis are negligence, social stigma, ostracism, migration, violation of human rights etc. This reveals that the people who are unaffected with arsenic have little knowledge or have no knowledge about arsenicosis. They think that the arsenic victims are the patients of leprosy or suffering with a contagious disease.

It has been revealed in the study that arsenic is affecting men and women but the consequences of arsenicosis are not the same particularly for women. The female patients suffered mostly from physical violence. They are avoided by their family member and tortured by in law. Their husbands are reluctant to have relationship with them. The women are also not safe in their parent's house. They are emotionally tortured by the family members. Marriage related problems affect them severely. Most of the unmarried female patients remain worried about their marriage. The male patients are also having troubles regarding marriage. Nobody wants to have marital relationships with arsenicosis patients.

The research explores that most of the arsenic victims in Nilphamari are poor. They are unable to manage nutritious foods twice in a day. There is shortage of food, nutrition and medical facilities. Some of the patients are using polluted pond water as they have no alternative options to get arsenic free water. As a result they are suffering from different water borne diseases.

The study also attempted to highlight the mitigation options taken by the arsenic victims in Nilphamari. Most of the arsenicosis patients revealed that they are using some common mitigation without any technocratic solution. Most of the patients were not previously

informed about the disease. The patients of arsenicosis came to know about the disease after being afflicted with it.

In this research attempt has been made to explore how the arsenicosis patients cope with the arsenicosis. It tried to identify the socio-economic impact of arsenicosis. This study has attempted to provide information about realities of the arsenic crisis from gender perspective. The coping mechanisms taken by the arsenicosis patients in Nilphamari mostly are not depends on the technocratic solution rather depends on the indigenous coping mechanisms. The mechanisms involve using water from alternative sources, taking treatment from government hospital or Upazila health complex, trying to manage nutritious food, selling assets for treatment. The female patients sold their jewellery for the treatment of the disease while the male patients take attempts like selling lands, reducing food consumption of the family etc. The women are the worst victim of arsenicosis. So, some of them are passing their days without having any treatment.

Arsenic mitigation has to involve water provision and water management institutions as well as has to address interlinked health issues and social implications of the situation. Social impacts of the arsenic crisis need further attention. Gender issues in the implications of the arsenic situation clearly need greater attention from researchers, policy-makers, and project implementers. This study has attempted to provide information on the various and nuanced ways we can come to understand the realities of the arsenic crisis from a gender perspective.

There is a greater need for further research on why there are such gendered variations in responses and coping mechanisms of arsenic survivors. Attention should be given to find out variations in terms of awareness and responses of arsenicosis patients. Further attention should be given to ameliorate the differentiation between in awareness and responses between men and women.

In order to address the gender concerns raised in this research, intensive efforts at all levels should be implemented. Some issues related to arsenicosis can be addressed more directly during arsenic mitigation, while the societal issues cannot be addressed within very short period. It would be unrealistic to expect single projects or interventions to change social dynamics and gendered power relations, but it is possible to hope that moments of crisis in the country can provide opportunities for change for more gender equality and equity. The arsenic crisis can perhaps be the incentive that starts to bring about such social change.

8.6 Recommendations

People are compelled to have contaminated water due to the scarcity of safe drinking water. So, the first step of arsenic mitigation is ensuring safe water free from arsenic. People are accustomed with using well water. There is a tendency of the arsenic affected people to have well water contaminated with arsenic. They have to make aware by the government or different organizations that some well water of their locality are contaminated with toxic arsenic. Without adequate safe alternative water sources being accessible, awareness campaigns will not have much impact as people continue to face acute water shortages in many areas.

The main challenge is how to have affordable and acceptable options to improve access to safe water. Recent promotion of piped water can be an ultimate suggestion of this issue but it is costly for the poor household to have piped water. Similarly, how community-based options are operating, who is benefiting, who is not, and why, are all issues that require much greater attention from funders and implementers. Initiatives should be taken to have mitigation option which is accepted by the community people.

In terms of existing approaches and interventions, how and why certain approaches succeed while others fail after some time needs more investigation and success stories and lessons learnt shared more broadly.

To address the gender specific vulnerabilities related with arsenicosis the researcher has suggested some initiatives this will help the arsenicosis patients to cope with the vulnerabilities produced by arsenicosis-

1. It would be wise to distinguish two types of arsenic related programme intervention: emergency diagnostic, treatment, and social support activities in hot spots and prevention oriented activities in arsenic contaminated areas where no patients have been diagnosed.
2. Government should take sufficient initiatives to create employment opportunities for the arsenic affected people.
3. Promote local, regional, and national information sharing among all stakeholders.
4. Differential attempts should be taken by the local representatives like female member of union parishad to make the female patients aware of arsenicosis.

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Annexure

Annexure A

Semi-Structured Interview Checklist for Arsenicosis Patients

1. Demographic information of arsenic affected people

Name of the respondent.....

Address.....

Village.....

Post- office

Upazilla.....

District.....

1.1 Sex

1.2 Age

1.3 Marital status

1.4 Household size

1.5 Occupation

1.6 Years of education

1.7 Pattern of Household

1.8 Household Head

1.9 Household income

1.10 Members of the family

2. Knowledge about arsenic and arsenicosis.

3. Gender division of labor based on collection of water.

4. Impacts of arsenicosis on psychological, economic and physical health.

5. Social implication of arsenicosis.

6. Gender specific facilities toward arsenicosis patients in terms of medical care, social justification and others.
7. Sufferings of arsenic affected women.
8. Gender based responses related to arsenicosis.
9. Gender specific strategies taken to address the vulnerabilities.
10. Responses of different organizations.
11. Suggestions for empowerment or recommendations.

ANNEXURE B: KEY INFORMANTS' INTERVIEW

Opinions of Key Informants at Jaldhaka

List of Key Informants: Member of Union parishad, DPHE engineer, Upazilla Health Officer

Key informants of Jaldhaka have pointed out several issues related to arsenic and its implication on the aspects of gender dimension. One of the key informants touted that he came to know about arsenicosis in 2006. He was well informed about the disease from a government campaign of arsenicosis telecasted in BTV (Bangladesh Television). Other respondents are familiar with the disease very well.

One of the key informants has mentioned arsenic as a poisonous element and the disease caused by arsenic poisoning is called arsenicosis. Nobody can escape from the disease if he drinks arsenic contaminated water for long time. The key informant, highlighted chronic exposure through drinking water rendered arsenicosis which cannot be cured easily.

The key informants explained the reasons of arsenic contamination in ground water of Bangladesh. These are excessive withdrawal of underground water, high use of chemical or pesticides in land, and naturally it may occur in soil. It has been reported by one of the key informants that arsenic can be ingested through rice.

The Upazila health officer mentioned that the total number of arsenicosis patients in Jaldhaka is 21. The percentage of arsenic affected peoples is very low compare to other parts of Bangladesh. The respondents have pointed out the impacts of arsenicosis on their locality. One of the respondents explained about the symptoms of arsenicosis. Firstly, hands and legs become hard. Spots are seen in back and breast. Corns are found in palms and feet. Arsenic affects liver; kidney may damage and in an extreme people may become victim of cancer. Arsenicosis patients may lose taste in food. He also mentioned no arsenicosis patients are found in Saidpur suffering from cancer.

Respondents also mentioned about suffering of arsenic affected patients. Almost all informants have congruent with the issue; both male and female arsenicosis patients have to bear the brunt of arsenicosis. The respondents pointed out that the female victim of

arsenicosis are most vulnerable than male victim. Other respondents pointed that the female patients have less access to nutritious food. They are forced to take arsenic contaminated water. The female patients are used to stay at home. The respondent opined that woman get less opportunity to go outside, as a result they used the arsenic contaminated water. While the male used to get opportunity to go outside and they also take nutritious food. The male patients also take water from alternative source.

The key informants mentioned that the victim of arsenicosis suffered from social problem like stigma, ostracism etc. One of the respondents commented that the social stigma associated with the arsenicosis victim compelled them and their family to migrate elsewhere. Other respondents commented men are getting unemployed which affects their family and increase poverty. One of the respondent stated the poor people are facing problems of food security.

One of the key informants reported that the arsenicosis patients are taking vitamin pills from Upazila health complex. The member of Upazila parishad claimed that they are not taking any sorts of treatment. The respondents mentioned almost all the arsenicosis patients in their locality are having arsenic free water.

The key informants of Jaldhaka informed that the arsenicosis patients have taken some adaptation strategies like having safe water free from arsenic, long term treatment and some of the patients are trying to arrange nutritious food as a part of their adaptation strategy.

Opinions of Key Informants at Domar

List of Key Informants: Upazilla Health Officer, Engineer of DPHE

Key informants pointed out that they are familiar with the disease from the very beginning. They commented that the prevalence of arsenicosis in groundwater of Domar is not so high. In explaining about the arsenicosis patients of Nilphamari they pointed out only 11 arsenicosis patients are found in the villages of Domar, Nilphamari.

The informants stated that the ratio of arsenic affected people in the villages of Nilphamari is very low compare to other parts of Bangladesh. One of the informants reported, tube-wells of Domar Upazilla are tested by DPHE for two times in a year. But the other informants commented the almost all the tube wells in the villages are screened by DPHE, there is also some tube wells which are not screened.

Key informants explained the reasons for the causation of arsenic in groundwater of Bangladesh. The informants stated that arsenic is caused by using excessive use of shallow machine, unplanned establishment of tube-well etc.

The key informants mentioned about the impact of arsenicosis on health. They reported that in Domar, the patients of arsenicosis are mainly suffered from melanosis, keratosis, hyperkeratosis and different skin lesions.

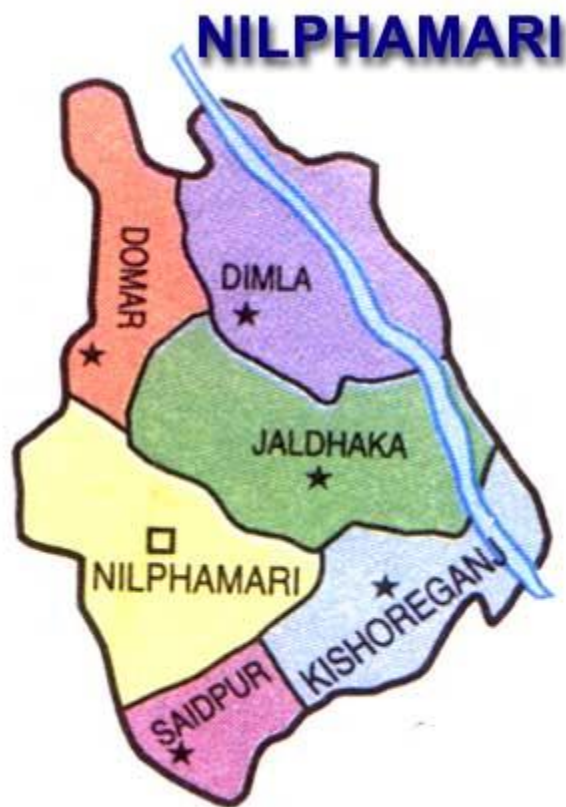
One of the key informants stated that the female arsenicosis patients are not fully aware of arsenicosis; even they do not have proper conception about arsenic, they are the worst victim of arsenicosis.

In explaining the social problems faced by arsenicosis patients, the key informants stated marriage related problems are largely faced by the female arsenicosis patients than male patients. One of the key informants said female arsenic victims are often face domestic violence. One of the key informants commented that most of the arsenicosis patients belong from the poor family. He reported that doctor has suggested people to take medicine, nutritious food to cure from the disease. But it is quite impossible for them to have nutritious twice in a week.

One of the respondents stated that sufficient Government initiatives are fruitful enough to remove arsenicosis from the locality. The key informants think that it is possible to make people aware of arsenicosis if additional people are appointed. They commented that coordinated works of Governmental organizations and NGO render it possible to remove the sufferings of arsenic affected people.

ANNEXURE C

Map of Nilphamari District



ANNEXURE D

Photograph of Arsenicosis Patients in Nilphamari



Photograph: 01

Photograph: 02

