



# Impact of Tannery on the worker's Reproductive Health in the area of Hazaribagh in Dhaka, Bangladesh

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## Abstract

*Reproductive health is one of the rights for all both men and women where Tannery workers are exposed to hazardous chemicals by working in the tannery for short or long time. The aim of this study is to find out the impact of Tannery on the worker's Reproductive Health in the area of Hazaribagh in Dhaka, Bangladesh where highly toxic chemicals were used and resulted different kinds of reproductive health problems or other diseases and also this study explores the knowledge of men and women on reproductive health issues and their present state or level of reproductive health. To find the final result of the study, Quantitative study technique has been used on credible and reliable data collection methods and also used Chi-Square Test for testing significant level between different variables. In absence of baseline data, respondents have been selected purposively. There was a significant relation between reproductive health problems and working in tannery both men and women. It is very clear by this study is that the workers' fertility can be decreased day by day working in the tannery. And there is a possibility to be infertile working in highly toxic chemicals.*

**Keywords:** Reproductive Health; Tannery Industry; Tannery Workers; World Health Organization; Reproductive Health Services; Sexually Transmitted Infections; Fertility; Reproductive Health Conditions.

## 1. Introduction

Tannery industries play a massive role of the economy of Bangladesh. This is an old manufacturing sub-sector in Bangladesh with a long heritage of last six decades. Tanning factories are located in Bangladesh at Dhaka, Jessore and Chittagong but about 90% tanneries of the country situated in Hazaribagh of the Dhaka city. According to the World Health Organization (WHO), 2001 figures from the Bangladesh government that Hazaribagh community in the south-east corner of Dhaka where 240 tanneries are located on 25 hectares of land. Most of the tanneries are 30-35 years old and use mineral tanning processes that discharge about 6000 cubic meters of liquid effluent and 10 tons of solid waste every day.

By using many kinds of chemicals, here not only resulted unsafe working conditions but also created problems of occupational health hazards. There are numerous common health problems that tannery workers face like skin and respiratory diseases, which are resulted from repeated exposure to hazards mixture of chemicals and even exposure to such chemicals, can cause various reproductive health problems such as decreased fertility and reproductive tract infections (WHO, 2001).

According to UNFPA, 1994 reported that women of the developing countries suffer disproportionately from unintended pregnancies, maternal death, disability and sexually transmitted infections including HIV, gender-base violence and other problems related to



their reproductive system and sexual behavior. But reproductive health implies that people are able to have a satisfactory and safe sex life and they have the capability to reproduce and the freedom to decide if, when, and how often to do so and also to have access to safe, effective, affordable and acceptable methods of family planning of their choice and the right to get appropriate health care services that enable women to safely go through pregnancy and child birth with providing couples with the best

chance of having a healthy infant (POPIN, 2001).

Although Bangladesh has achieved remarkable progress in important aspects of health and nutrition but then the status of reproductive health remains unsatisfactory and the country, especially in tannery areas, still faces alarming obstruction in the path of getting success in reproductive health and rights.

### The Objectives of this study:

1. To find out the facts, which affected tannery workers' reproductive health by working in presence of highly toxic chemicals in the tannery.
2. To explore the unveil workers present state of reproductive health whether it is affected by the toxic chemicals or not and what was the probably of developing any kind of reproductive health problems or other diseases.
3. To find what their attitude towards health care services is, whether they have access to appropriate health care services that enable them to have safe and sound reproductive health system.

## 2. Literature Review

Reproductive health is the rights of all both women and men; as defined by the World Health Organization (WHO), Reproductive health is a state of physical, mental and social well-being in all matters relating to the reproductive system at all stages of life (POPIN, 2001). Reproductive health knowledge is important for women as woman's health and well-being, contraception, as well as those of her family may depend on her being able to delay the birth of her first child or space the birth of her children (Smith EJ, 2002 and Nazar-Beutelspacher A et al., 1999).

In Bangladesh, the term Reproductive health encompasses child and maternal health, family planning and the prevention and treatment of AIDS/ HIV and also sexually transmitted or sex related diseases. A recent focus of local and international organizations has expanded the scope of reproductive health to include the roles and responsibilities of men, adolescent reproductive health and reproductive health rights. Although every individuals have the rights to manage their own sexuality and unrestricted access to the full range of reproductive health care options but somehow it is not to be accessible always for all because of many reasons.

Tannery workers are exposed to hazardous chemicals. Tannery work is outsourced to newly industrialized countries (NICs) where attention into occupational health hazards is limited. In this study, investigated the skin exposure to hazardous chemicals in tannery workers and determined the prevalence of occupational skin diseases (OSDs) at tanneries in a NIC (Febriana et al., 2012).

The SEHD, 1998 reported that Chromium is one of the most harmful chemicals found in the tannery waste because of its carcinogenic potential. Acidic effluents, it adds, can cause severe respiratory problems. Gaseous emissions from the tanneries contain sulfur dioxide that is converted into sulfuric acid on contact with moisture and that can damage lungs.



On the other hand, 58% of the tannery workers suffer from gastrointestinal diseases.

Health knowledge is considered as one of the key factors that enable women to be aware of their rights and health status in order to seek appropriate health services. It is very important to study the overall situation and to know the differences between rural and urban Bangladeshi women by focusing on reproductive health issues. The results could be used as an important guide to assist policymakers and administrators in evaluating and designing the programs and strategies for improving reproductive health services with a special consideration for rural women (Haque M, 2015). Although many studies were conducted regarding health status of tannery workers but study on reproductive health of tannery workers is unusual. Research has shown that exposure to environmental pollutants may pose the greatest threat to reproductive health. Exposures to some chemicals or to stressful conditions can cause both male and female workers to experience a decrease in their desire or ability to have sex (WHO, 2009).

In 2006, ILO reported that chemicals which have depressant effects, such as certain solvents, may suppress the libido (sex drive). Occupational exposures can also cause menstrual problems, which may prevent ovulation from taking place. Stress, working on shifts or exposure to certain organic solvents can disrupt the normal menstrual cycle, which in turn can affect fertility.

Another possible effect of exposure to certain occupational hazards is their ability to cause direct damage to the germ cells (sperm and eggs) (EHC, 2001). Radiation and certain chemicals can cause decreased fertility or even sterility. Occupational risks can reduce the number of sperm to a level below the minimal necessary for

fertilization. Humans are exposed daily to a mixture of environmental contaminants in air, water and food. In a recent bio-monitoring study of over 150 contaminants, the U.S. Centers for Disease Control and Prevention (CDC) reported that all 150 chemicals were detected in some portion of the U.S. population and that several of the chemicals, such as environmental tobacco smoke, lead, mercury and phthalates, are detected in nearly all of the population (CDC, 2005).

Several adverse reproductive outcomes associated with maternal exposure to leatherwork and included an increased risk of prenatal death, reduced female fertility, spontaneous abortion, preterm delivery, low birth weight, and cleft palate (Garcia and Fletcher, 1998). In a study in Leicestershire describes the relation between leatherwork and reproductive outcome (Kurinczuk and Clarke, 2001).

A research was conducted in Ulaanbaatar, Mongolia to investigate the association of male leather tannery work with preterm delivery, spontaneous abortion, time to pregnancy, and infertility by comparing tannery employees to other workers (Greene et al., 2010). The results of this research suggest that tannery work may be associated with reduced fertility in males.

Reproductive health has been a great concern for every woman. It is a crucial part of general health and a central feature of human development. Reproductive ill-health has been an apprehension to many stakeholders as maternal mortality and morbidity are very high in developing countries, especially in Bangladesh compared to developed world. In the past few years, the issues of Reproductive Health/Rights (RH/RR) have been increasingly perceived as social problems; they have emerged as a matter of increasing concern throughout the developed and developing countries where Bangladesh has achieved much remarkable progress in important aspects of health and



family welfare since Independence. However, the overall health status, particularly the status of reproductive health, still remains unsatisfactory (Hasan MK, 2005). The insufficient health services available to women and children are evident from high infant and maternal mortality rates (Global Policy Committee of the World Health Organization, 1994 and The center for Reproductive Rights, 2005).

## 3. Methodology

### 3.1 Study Area

The study was conducted in Hazaribagh tannery area, located in Dhaka which is the capital city of Bangladesh. Hazaribagh situated in the south-western part of Dhaka city, surrounded by residential areas like Jhigatola, Dhanmondi and Buriganaga, one of the main rivers, lies just one kilometer away.

The present study was carried out among 8 tanneries. Selection of tanneries, tannery workers all were done purposively. The names of the tanneries were:

- Apex tannery
- Samina tannery
- Shahjalal tannery
- Ruma tannery
- Eastern tannery
- Ideal tannery
- S.B. tannery
- Alam tannery

Among these 8 tanneries only Apex tannery was relatively a large tannery that employ near about 600 workers, while medium-sized tanneries like Samina, Shahjalal, Rupa and Western tannery employ around a hundred workers and finally small tanneries like Ideal, S.B., and Alam have just a dozen or so workers.

### 3.2 Research Design

A cross sectional study design applied for research design of this study and also quantitative study technique has been followed as a means of credible and reliable for data collection mostly. In absence of baseline data, respondents have been elected purposively.

### 3.3 Sample Size

The study was conducted among 8000-10000 population in Hazaribagh area and the total number of sample size was taken 371 male and female respondents who are working in Hazaribagh tannery for a long time or short time.

### 3.4 Sampling Methods

The purposive sampling was used because of difficulty in obtaining an adequate sampling frame from tanneries and also due to time and resource limitations. After taking permission from the owner of tanneries or proper authorities, workers were chosen in this way that it meets the study criteria and to be as representative as possible.

### 3.5 Data Collection Tools

The data was collected for this study by using structured interview schedule containing a set of close ended and a few open-ended questions. To evaluate the knowledge on reproductive health, its present state or condition among the tannery workers, an assortment of questions were asked. The questions were brief and straightforward so that it would be convenient for the respondents to answer properly.

### 3.6 Data Collection Technique

Face-to-face interview method was used to administer the questionnaire. It took about 15 minutes on average to administer each

interview. Before taking the interview, first of all the study and its purpose were explained to the respondents and then informed consent was taken from each respondent. Probing and prompting were used for some questions though the intend was kept minimum and all the answers were recorded in the supplied questionnaire by the interviewer.

### 3.7 Data Analysis

Statistical tests were used to analyze the relationship between dependent variables with independent variables. Particularly Chi-square tests were performed by

computer software- SPSS version 21, MS-Excel and MS-Word where those were used for data analysis, making Tables and Figures.

## 4. Findings and Result

As the purpose of this study is to focus the impact of tannery on the worker's Reproductive health and the level of specific reproductive health conditions among the tannery workers of Hazaribagh, a quantitative study was carried out in tannery areas of Hazaribagh. The findings of the studied area are presented in this section.

### BACKGROUND CHARACTERISTICS OF TANNERY WORKERS

Figure 1 shows the percentage of male and female working in the tannery where among the 371 respondents 282 (76%) are male and 89 (24%) are female. The low percentage of female involvement in tannery area is due to three reasons. First of all, women are mainly getting involved

in this industry over last 5-6 years. Secondly, the heavy workload of tannery industries results in lower involvement of women. Lastly, the energetic works like pulling the raw hides and mixing acids in drone during the process of 'wet blue' etc. are more apt for men rather than women.

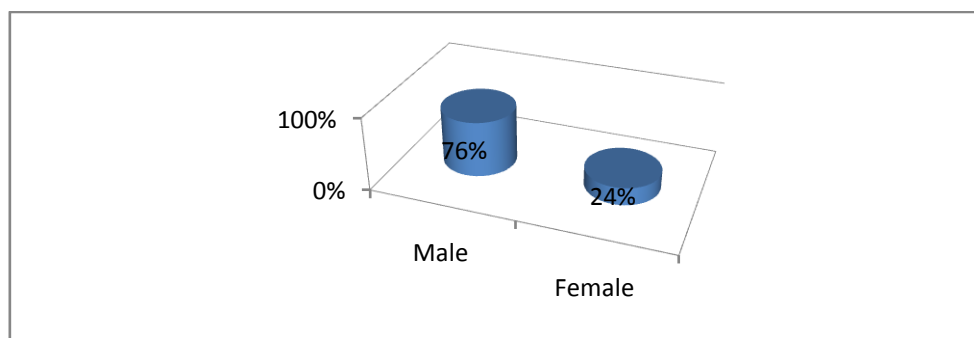


Figure 1: Percentage of male and female working in the tannery

Figure 2 shows the average age of male and female working in the tannery where the average age of the workers is 32 years

for male and 26 years for female presented in the following.



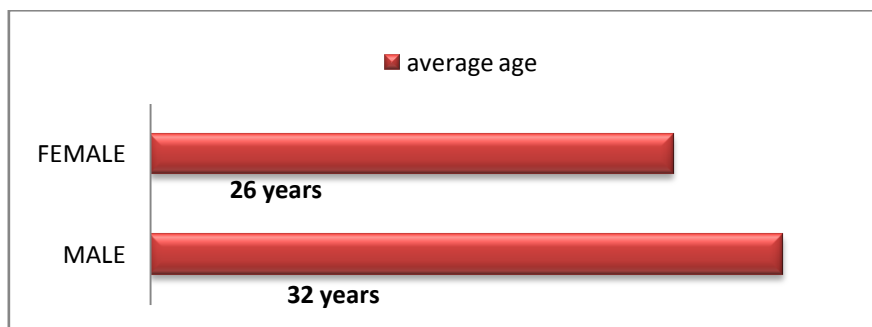


Figure 2: Average age of male and female working in the tannery

Table 1 represents the age group of respondents that among the workers the minimum age is 14 and maximum is 53. When the variable age was categorized into 5 categories, it was observed that most of tannery workers were age of 21 to 30. The numbers of tannery workers were

found higher of that age groups were 142. After that 119 tannery workers were from age 31 to 40 followed by age group 11-20 (76) and age group 41-50 (29). The lowest figure (5) was observed in the age group of 51-60.

Table 1: Age group of respondents

Age Category	Numbers	Percent
Age 11-20	76	20.5
Age 21-30	142	38.3
Age 31-40	119	32.1
Age 41-50	29	7.8
Age 51-60	5	1.3
<b>Total</b>	<b>371</b>	<b>100.0</b>

Figure 3 shows the academic education among the tannery workers where in terms of academic education women are far behind than men as among the respondents 84% men had academic education whereas only 16% women had. Among the male 82% had completed primary education, 17% had completed secondary education

and very negligible percent e.g. around 1% had higher secondary education. The scenario was quite different for female as 95% had completed primary education however only 5% had secondary education and no one had reached up to higher secondary level.

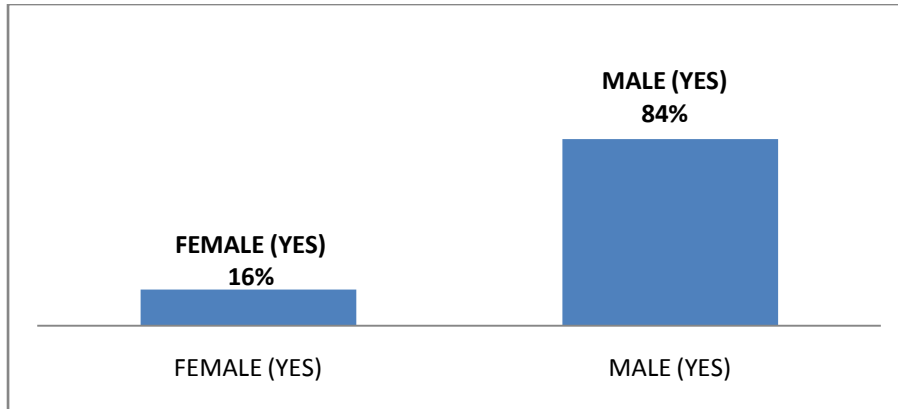


Figure 3: Academic education among the tannery workers

Figure 4 represents the marital status of tannery workers where most of the tannery workers were married and the percentage was greater for female than that of male.

About 79% female and 65% male tannery workers were married while 21% female and 35% male workers were unmarried.

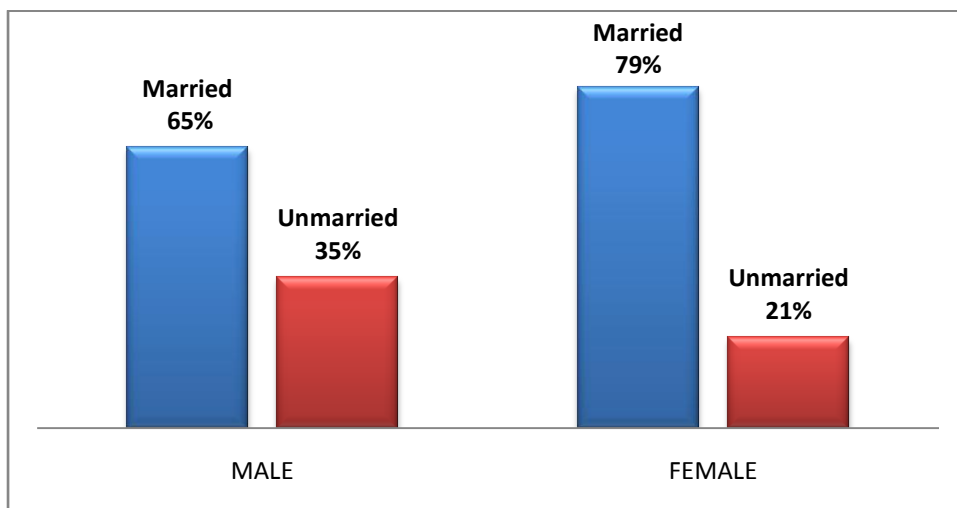


Figure 4: Marital status of tannery workers

**TANNERY WORKERS EXPOSURE TO CHEMICALS IN THE TANNERY**

Table 2 shows the knowledge regarding pregnancy among different age group that there is a significant relationship between different age group and the knowledge of pregnancy ( $p < 0.000$ ). Among different age groups age 11-20 had highest percentage

(63.2%) of respondents those didn't have knowledge of pregnancy but the percentage decreased as the group proceed and at age group 41-50 it become 24.24% and continues till the last group.

Table 2: Knowledge regarding pregnancy among different age group

Category of age	Knowledge of pregnancy		Total (N=371)	Pearson Chi-Square (P- Value)
	Yes (%)	No (%)		
Age 11-20	36.8%	63.2%	76 (100%)	.000
Age 21-30	84.5%	15.5%	142 (100%)	
Age 31-40	92.44%	7.56%	119 (100%)	
Age 41-50	75.76%	24.24%	33 (100%)	

**KNOWLEDGE ON POST-PARTUM COMPLICATION**

Figure 5 explains the knowledge on post-partum complication among female tannery workers that in the present study eight types of problems that occur just after having baby i.e. post-partum complications were considered to assess the knowledge on reproductive health problems. The complications were- maternal death, premature birth, spontaneous abortion, stillbirth, low birth weight, bleeding, high level of childhood

illness, and mental and physical disabilities in children. Among the female respondents 43% know more than four types of post-partum complications, 18% know four, 9% know three, 6% know two and 1% know only one type of post-partum complications. However, about 23% respondents didn't have any idea about any kind of post-partum complications.

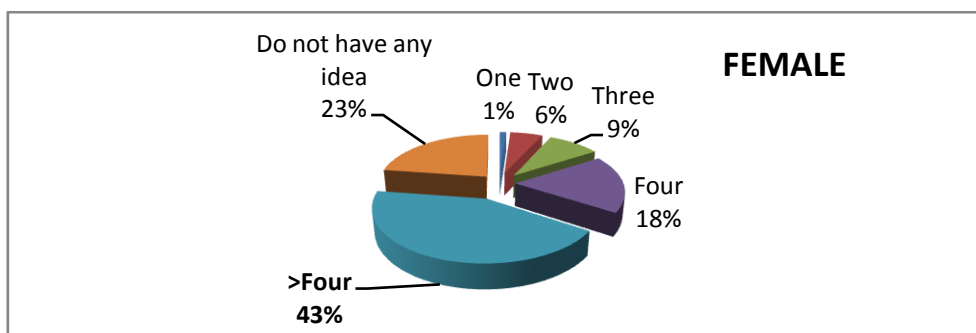


Figure 5: Knowledge on post-partum complication among female tannery workers

In the Figure 6, it shows that the knowledge on post-partum complication among male tannery workers where the picture was quite opposite for male respondents as a major portion of the respondents that is 75% didn't have any

idea regarding problems that occur just after having a baby. About 12% know only one type – maternal death, 8% know two, 3% know three and only 1% know four and more than four complications.



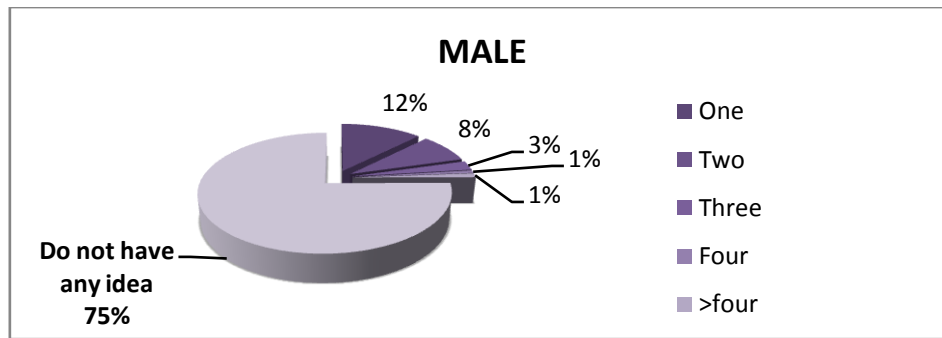


Figure 6: Knowledge on post-partum complication among male tannery workers

### KNOWLEDGE REGARDING MENSTRUAL HYGIENE

Figure 7 shows the knowledge regarding menstrual hygienic where the female respondents were asked about how they manage their menstruation or more precisely what they use during their

menstruation. Almost all i.e. 97% use cloths and surprisingly 2% of respondents use nothing during their menstruation. No one use sanitary napkins although a very negligible percent i.e.1% uses cotton.

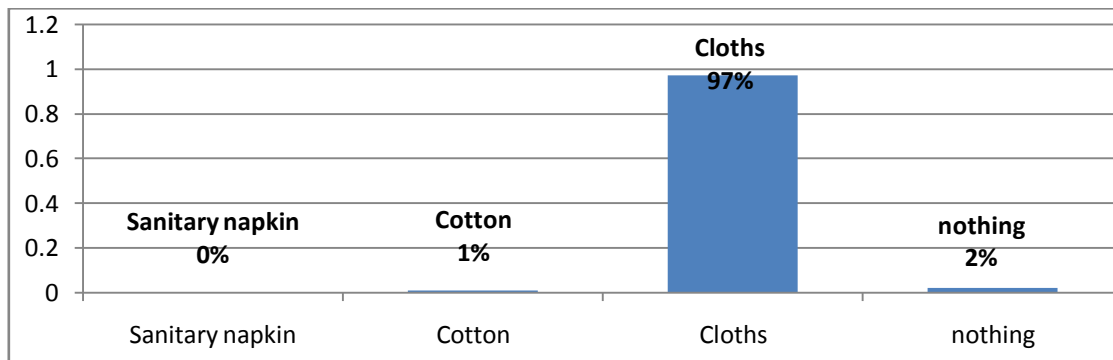


Figure 7: Knowledge regarding menstrual hygienic

### REPRODUCTIVE HEALTH CONDITIONS

Table 3 represents the situation with menstrual cycle where the reproductive health conditions respondents were asked about the state of their menstrual cycle in

last one year. 71.9% of respondents had a regular menstrual cycle whereas 28.1% had irregular menstrual cycle in last one year.

Table 3: Situation with menstrual cycle

Situation with menstrual cycle	Number	Percent
Regular	64	71.9
Irregular	25	28.1
<b>Total</b>	<b>89</b>	<b>100.0</b>

Figure 8 shows the irregular menstrual cycle before working in the tannery among the 25 respondents who had irregular menstrual cycle, were again asked whether they had these irregularities before

working in the tannery or not. 58% replied “no” and 42% replied “yes” i.e. they had irregular menstrual cycle before working in the tannery.

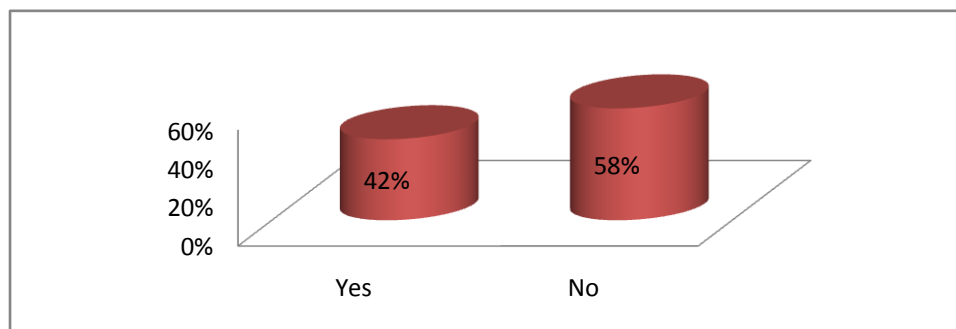


Figure 8: Irregular menstrual cycle before working in the tannery

### KNOWLEDGE REGARDING IRREGULAR MENSTRUAL CYCLE

Figure 9 represents the knowledge regarding irregular menstrual cycle, when the respondents were asked what they thought about the reason behind the irregularities in menstrual cycle, 33% thought working load and working long time in a tannery were reasons behind the

problem. However 11% respondents thought it might be due to anxiety. Lastly, a major portion (56%) of respondent considered others reason and most probably it might be due to their contraceptive use.

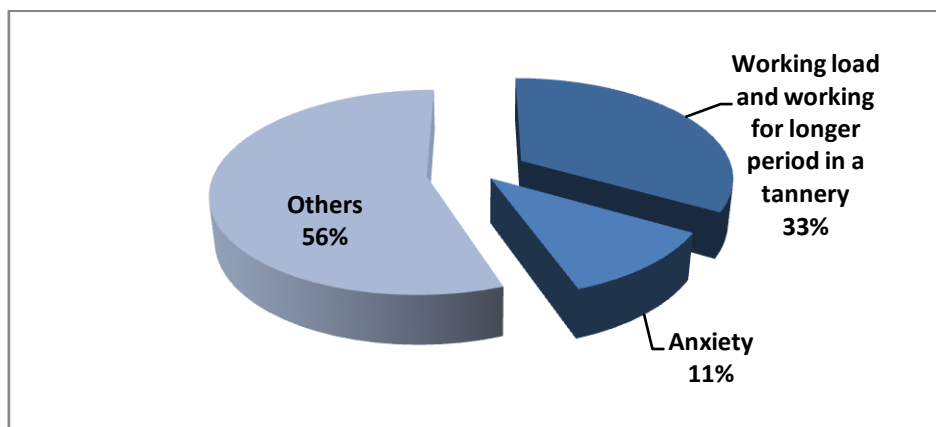


Figure 9: Knowledge regarding irregular menstrual cycle

### SITUATION OF PREGNANCY DURING WORKING IN TANNERY

Table 4 represents the situation of pregnancy during working in tannery that among the total female respondents 70 women were married and interestingly 19 were unmarried. In Table 4, only married women’s information was given where

Married women were asked whether they ever get pregnant during working in the tannery. About 24.3 % replied as ‘yes’ whereas 75.7% replied as ‘no’ that means they never get pregnant while working in the tannery.

Table 4: Situation of pregnancy during working in tannery

Get pregnant during working in tannery	Numbers	Percent
Yes	17	24.3
No	53	75.7
<b>Total</b>	<b>70</b>	<b>100.0</b>

### KNOWLEDGE REGARDING REPRODUCTIVE HEALTH SERVICES

Figure 10 explains the knowledge of services respondents seek regarding Reproductive Health(RH) including visiting doctors ; again to assess their attitude towards health services, they were asked what would be their perception if any of their colleagues had any kind of RH problems, whether they should consult to a

doctor or not. The reply was quite same both from male and female. 92% male and 93% female respondents thought they should consult to a doctor and a small portion 8% male and 7% female didn't think that they should consult to a doctor for any kind of RH problem or disease.

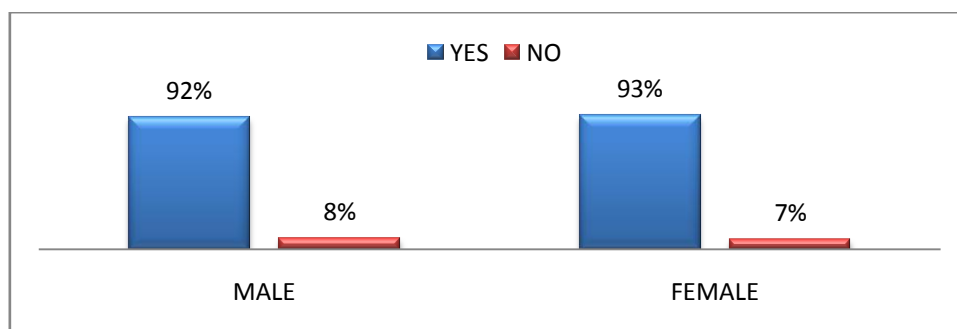


Figure 10: Knowledge of services respondents seek regarding RH including visiting doctors.

Figure 11 represents the attitude regarding reproductive health services that Respondents those who had RH problems, they were asked whether they ever consulted a doctor for their specific RH

problems or not. 70% of them never consulted a doctor while 30% had consulted to a doctor for their specific RH problems.

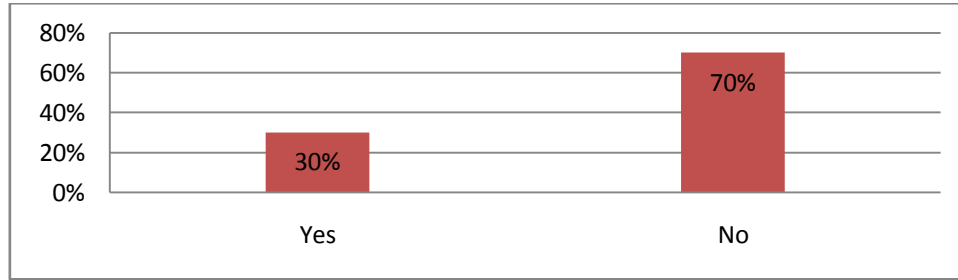


Figure 11: Attitude regarding reproductive health services

## REPRODUCTIVE HEALTH PROBLEMS

In Female, Table 5 shows the Reproductive health problems among 89 female workers that there are seven types of reproductive health problems or more specifically Reproductive Tract Infections were considered to assess the present state of reproductive health among the female

tannery workers. They are- Burning sensation during urination, white discharge, itching genital region, pain in lower abdomen, small red soars, swelling of vaginal area and cervix infection (pain in time of intercourse).

Table 5: Reproductive health problems among female workers

Reproductive health problems	Frequency	Valid Percent
Burning sensation during urination	13	14.6
White discharge	21	23.6
Itching in genital region	11	12.4
Pain in lower abdomen	7	7.9
Small red soars	6	6.7
Cervix infection (pain in time intercourse)	1	1.1
Nothing	30	33.7
<b>Total</b>	<b>89</b>	<b>100.0</b>



In the present investigation (Table 5), among the seven RTIs white discharge was more prevailing among the female tannery workers, 21 respondents (23.6%) had it. After that, the common problems they faced were burning sensation during urination and itching in genital region accompanied with pain in lower abdomen. First one was found among 13 respondents (14.6%), second one among 11(12.4%)

In Male, Table 6 shows the Reproductive health problems among 282 male workers that there are eight types of reproductive health problems or more specifically Reproductive Tract Infections were considered to assess the present state of reproductive health among the male tannery workers. They are- Burning sensation during urination, itching genital region, pus discharge from urethra, ulcer on penis, ulcer on genital region, pain in testis, warts on genital region and semen discharge from the penis.

In the present study male respondents mainly faced the problem of burning

and third one among 7 respondents (7.9%). There were prevailing some other problems like small red soars among 6 respondents (6.7%) and Cervix infection (pain in time intercourse) in 1 respondent (1.1%). On swelling of vaginal area, there had not found any problems among the female respondents of this study. However, a major portion 30 respondents (33.7%) of the respondents didn't have any reproductive health problems.

sensation during urination, 83 respondents (29.4%) mentioned that they have this problem. Then 76 respondents (27.0%) mentioned itching in genital region, 4 respondents (1.4%) had ulcer on genital region and a very negligible percent i.e. 1 respondent had the problem of semen discharge from penis. On pus discharge from urethra, Ulcer on penis, pain in testis, warts on genital region, where there had not found any problems among the male respondents of this study. On the other hand, 118 (41.8%) respondents didn't have any of the above mentioned reproductive health problems.

Table 6: Reproductive health problems among male workers

Reproductive health problems	Numbers	Percent
Itching in genital region	76	27.0
Burning sensation during urination	83	29.4
Ulcer on genital region	4	1.4
Semen discharge from the penis	1	0.4
Nothing	118	41.8
<b>Total</b>	<b>282</b>	<b>100.0</b>

**REPRODUCTIVE HEALTH PROBLEMS - AS A RESULT OF WORKING LONGER PERIOD IN TANNERY**

In Female, Figure 12 shows the Reproductive health problems as a result of working longer period in tannery that among 59 female respondents those who had reproductive health problems almost half i.e. 49% thought that working in the tannery for longer period was the reason behind their specific reproductive health

problems like Burning sensation during urination, itching genital region and pain in lower abdomen etc. Nevertheless, 51% respondents thought that working in the tannery for longer period has no consequences upon their specific reproductive health problems.

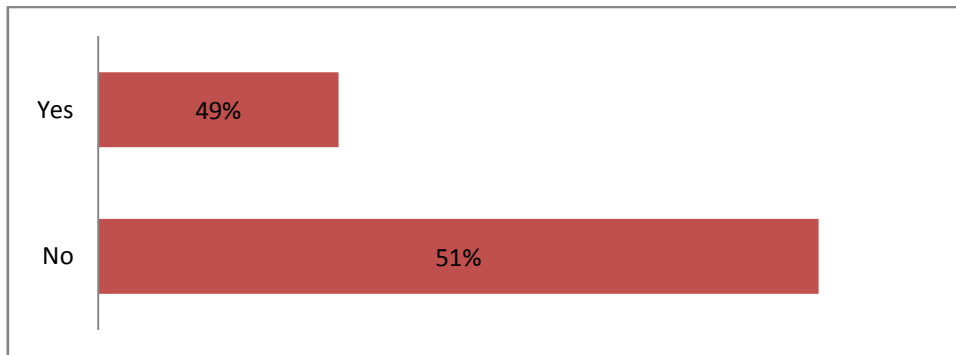


Figure 12: Reproductive health problems as a result of working longer period in tannery (female)

In Male, Figure 13 shows the Reproductive health problems as a result of working longer period in tannery that among 164 male respondents those who had specific reproductive health problems like burning sensation during urination, itching genital region and others, 79% of them thought that working in the tannery for longer period was the reason behind their specific reproductive health

problems. Although 21% respondents thought that working in the tannery for longer period has no consequences upon their specific reproductive health problems.

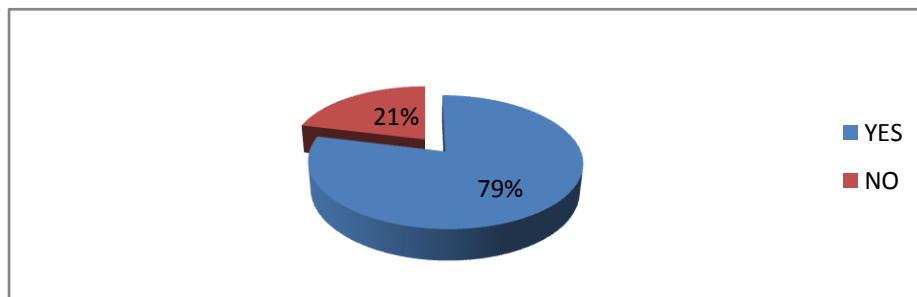


Figure 13: Reproductive health problems as a result of working longer period in tannery (male)





For Female, Table 7 represents the Likelihood of developing RH problems or disease in tannery based on working year where finding out or measuring the association of developing disease in tannery based on working year both for

male and female, cross-tab analysis along with chi-square test was done. For female respondents Chi square value is significant at 1% level of significance ( $p < 0.001$ ).

Table 7: Likelihood of developing RH problems or disease in tannery based on working year (For female)

	Workers those are suffering from various problems	Workers those are not suffering from various problems	Pearson Chi-square (P-value)
Working more than 1 year in the tannery	51	21	0.001
Working less than 1 year in the tannery	7	10	
<b>Total (Female)</b>	<b>58</b>	<b>31</b>	

**Odds ratio:**

$$OR = \frac{51 \times 10}{7 \times 21} = 3.47$$

Since  $OR > 1$ , it is suggesting that the respondents (female) who are working in the tannery for more than one year are 3.47 times likely to develop various reproductive health problems or diseases than those who are working in the tannery for less than one year. For female

For Male, Table 8, Likelihood of developing disease in tannery based on working year respondents Chi square value is not significant at 1% level of significance. So it can be stated that there

respondents Chi square value is significant at 1% level of significance. So we can conclude that there is significant dependency of disease development on working duration in the tannery among female tannery workers (Table 7).

is no significant dependency of reproductive health (RH) problems or disease development based on the type of exposure to chemicals, respondents involved in.

Table 8: Likelihood of developing disease in tannery based on working year (for male)

	Workers those are suffering from various problems	Workers those are not suffering from various problems	Pearson Chi-square (P-value)
Working more than 1 year in the tannery	146	75	1.226
Working less than 1 year in the tannery	18	43	
<b>Total (Male)</b>	<b>164</b>	<b>118</b>	

**Odds ratio:** 
$$\text{OR} = \frac{146 \times 43}{18 \times 75} = 4.65$$

Since  $\text{OR} > 1$ , it is suggesting that the respondents (male) those are working in the tannery for more than one year are 4.65 times likely to develop specific reproductive health problems or diseases than those who are working in the tannery for less than one year. Another remarkable association or relation was measured between respondents those are suffering from various reproductive health problems based on the type of exposure to

chemicals, respondents involved in (Table 8).

For Female, Table 9, the Chi square value is significant at 1% level of significance. Therefore, it can be concluded that there is significant dependency of developing of RH problem or disease development based on the type of exposure to chemicals, respondents involved in.

Table 9: Likelihood of developing of RH problem or disease development based on the type of exposure to chemicals (For female)

	Workers those are suffering from various problem	Workers those are not suffering from various problem	Pearson Chi-square (P-value)
Working in presence of much toxic chemicals	32	14	0.045
Working in presence of less toxic chemicals	26	17	
<b>Total (Female)</b>	<b>58</b>	<b>31</b>	

**Odds ratio:** 
$$\text{OR} = \frac{32 \times 17}{26 \times 14} = 1.49$$



Since OR >1 , it is suggesting that the respondents (female) those who are working in the tannery in presence of much toxic chemicals are 1.49 times likely to develop various RH problems or diseases than those who are working in the tannery in the presence of less toxic chemicals (Table 9).

For Male, Table 10, the Chi square value is not significant at 1% level of significance. Therefore, it can be concluded that there is no significant dependency of developing of RH problem or disease development based on the type of exposure to chemicals, respondents involved in.

Table 10: Likelihood of developing of RH problem or disease development based on the type of exposure to chemicals (For male)

	Workers those are suffering from various problems	Workers those are not suffering from various problems	Pearson Chi-square (p-value)
Working in presence of much toxic chemicals	139	70	3.432
Working in presence of less toxic chemicals	25	48	
<b>Total (Male)</b>	<b>164</b>	<b>118</b>	

**Odds ratio:**

$$OR = \frac{139 \times 48}{25 \times 70} = 3.81$$

Since OR >1 , it is suggesting that respondents (male) those who are working in the tannery in presence of much toxic chemicals are 3.81 times likely to develop

various RH problems or diseases than those who are working in the tannery in the presence of less toxic chemicals (Table 10).

## 5. Discussion

The present study was intended to assess the impact of reproductive health among the tannery workers of Hazaribagh area. In brief, the study aims to find whether the tannery workers have the necessary knowledge regarding their reproductive health that it could be affected by working in presence of highly toxic chemicals in the tannery. The study also likes to reveal

workers present state of reproductive health conditions whether it is affected by the toxic chemicals or not and what was the probably of developing any kind of reproductive health problems or other diseases.

The study shows that knowledge on post-partum complication among the female



workers was good as about 43% know more than four symptoms like maternal mortality, severe bleeding, low birth weight of baby, premature birth etc. However, among the male the knowledge is poor, only 1% know more than four symptoms and 75% didn't have any idea regarding problems that occur just after having a baby (Figure 5 and 6). In 2000 Ashraf et al. reported that more than 60% of the men in the rural areas and about 80% in the urban areas had no knowledge about postpartum complications. Of those having knowledge, a small number could cite some symptoms. Excessive bleeding, convulsions, and fever for more than 3 days were the most cited post delivery-related complications.

In Bangladesh, women do not always have access to contemporary treatment materials such as sanitary napkins, tissues or clean cloths during their menstruation. Women can be infected by variety of bacterial, viral and protozoan infections (RTIs) not only through sexual intercourse but also the use of unclean menstrual cloths, insufficient knowledge on menstrual hygiene. Therefore, knowledge regarding menstrual hygiene is very important for women. In the present study knowledge regarding menstrual hygiene is also poor among the female workers as 97% use cloths, 1% use cotton and surprisingly 2% of respondents use nothing during their menstruation (Figure 7). Akhter, 2007 reported that a large portion- more than 87.3% of urban women and more than 90% of rural women use old cloths, during menstruation and they reuse them without washing properly and drying them thoroughly.

Among the female respondents 25 workers had irregular menstruation in last one year and 58% of them had no irregular menstruation before working in the tannery but 42% had and 33% thought working load and working long time in a

tannery were reasons behind the problem. However 11% respondents thought it might be due to anxiety. Lastly, a major portion of respondent, (56%) considered others reason and most probably it might be due to their contraceptive use (Figure 8 and 9). Occupational exposures can also cause menstrual problems, which may prevent ovulation from taking place and stress, working on shifts, or exposure to certain organic solvents can disrupt the normal menstrual cycle, which in turn can affect fertility (WHO, 2009).

The study interestingly pointed that Reproductive health problems as a result of working longer period in tannery that among 59 female respondents those who had reproductive health problems almost half i.e. 49% thought that working in the tannery for longer period was the reason behind their specific reproductive health problems like Burning sensation during urination, itching genital region and pain in lower abdomen etc. Nevertheless, 51% respondents thought that working in the tannery for longer period has no consequences upon their specific reproductive health problems. On the other hand, Reproductive health problems as a result of working longer period in tannery that among 164 male respondents those who had specific reproductive health problems like burning sensation during urination, itching genital region and others, 79% of them thought that working in the tannery for longer period was the reason behind their specific reproductive health problems. Although 21% respondents thought that working in the tannery for longer period has no consequences upon their specific reproductive health problems (Figure 12 and Figure 13).

To evaluate the hypothesis that there is an association between duration of working and developing various RH problems or more precisely reproductive tract infections (RTIs) Chi-square test was



done. It was found that there was a significant relation between the variables for female at 1% level of significance (Table 7 and 9) but there is no significance for male (Table 8 and 10). Furthermore, workers those who are working in the tannery for more than one year are 4.65 times (male) and 3.47 times (female) more likely to develop specific reproductive health problems or diseases than those who are working in the tannery for less than one year (Table 7 and 8). Therefore, it indicates that more the duration, it's more likely to develop RTIs in the tannery. Chemicals used in tanning can be injurious to human health if proper safety precautions are not taken; some are known to be confirmed or potential human carcinogens, the effects of which can only be observed years after exposure (HRW, 2012). If the trend continues around more than 15 years, these can even cause cancer (WHO, 2009).

Most of the tannery workers who involved in the work where different types of chemicals are used, they are suffering by various reproductive health problems. For male workers there is no significant dependency of reproductive health (RH) problems or diseases development based on the type of exposure to chemicals, they involved in but among the male tannery workers who are so higher in odds ratio to develop the situation. For male the probability is higher, it is 3.81 and 4.65 times likely to develop various RTIs among those who are working in the presence of much toxic chemicals then to less toxic chemicals. As male workers are more involved to hazardous work means in presence of toxic chemicals but then they are more likely to develop diseases or problems (Table 8, and 10). However, for female workers there is significant association at 1% level of significance. In addition from the odds ratio it can be stated that female workers those who are working in the tannery in presence of

much toxic chemicals are 1.49 and 3.47 times likely to develop RTIs than those who are working in the tannery in the presence of less toxic chemicals and this situation is less than that of male workers (Table 7 and 9).

The study indicates that most of the workers are directly use these chemicals each and every day because of being done the process manually. They don't like to use hand gloves or any other safety items. On the other hand, the workers work with bear feet when they clean dirt, bloods and chemicals which cause various diseases most of the time.

The reproductive health problems of tannery workers—such as itching in genital area, burning sensation during urination, pain in lower abdomen etc. are the result of repeated exposure to hazardous chemicals when measuring and mixing chemicals, adding chemicals to hides in drums, or manipulating hides saturated in chemicals.

Several studies found undesirable impacts on RH as a result of toxic chemicals or leather work. Both men and women can be affected by reproductive occupational health risks and certain chemicals can cause decreased fertility or even sterility and it can reduce the number of sperm to a level below the minimal necessary for fertilization (EHC, 2001). Young men may be exposed to toxic chemicals that can affect the quality of their sperm, bring home workplace toxicants and expose their family members (e.g. pregnant wife, small children). During reproductive age, women may be exposed to hazards that can affect the outcomes of pregnancy and the health of their offspring (WHO, 2009).

Although tannery workers knowledge regarding pregnancy as effect of tannery work is low means they do not think that tannery work has any effect upon their



undesirable termination of pregnancy but literature reveals opposite views. Certain occupational hazards that are working in presence of radiation and hazardous chemicals can cause mutations in genetic material that can be passed on at future generations. Such hazards are called mutagens. Genetic mutations can result in birth defects, stillbirth or miscarriage, depending on the type of damage caused (EHC, 2001). Several adverse reproductive outcomes associated with maternal exposure to leatherwork and included an increased risk of prenatal death, reduced female fertility, spontaneous abortion, preterm delivery, low birth weight, and cleft palate (Garcia and Fletcher, 1998).

Almost 70% of the tannery workers never consulted a doctor while 30% had consulted to a doctor for their specific RH problems (Figure 11). A pervasive sense of shame and embarrassment prevents female from seeking health care for their RH problems especially if the provider is male (Bhuiya et al., 2000). Prominent barriers to male is the notions of feelings (awful happening), shyness and embarrassment at dealing all these publicly (Shahjahan and Kabir, 2007).

## 6. Conclusion

By this study it can be assumed that reproductive health is such a vital component of general health but it is a prerequisite for social, economic and human development. The highest attainable level of health is not only a fundamental human right for all; it is also a social and economic essential because human energy and creativity are the driving forces of development.

It has found that there are no health care services available near the Hazaribagh tannery areas where tannery workers can seek proper health care and there is no proper education, counseling, prevention,

detection and management of reproductive health problems. In this study, it also found that number of male workers who involved in different kinds of harmful works than the female workers ; the risk among male and female is equal to be infertile or to face many reproductive health problems those can affect their reproductive health mostly. The tannery workers are not used to follow much in reproductive and health components and they also do not use any kind of protective materials or instruments, can keep them save from different kinds of reproductive health problems.

So, it is clear that the determinants of reproductive ill-health lie in poverty, gender and other forms of inequity, social injustice, and marginalization and development failures. As a result, All sectors affect and are affected by reproductive health.

## Limitations

1. Time constraint was a limitation of this study. More data could be collected and an in-depth analysis could be made if more time was available for this study.
2. The study was done in a small scale as respondents were selected from only 8 tanneries.
3. Reproductive health problems among tannery workers are very unusual in our country so that there is a lack of proper literature on this field.
4. Since the matter was extremely many secret the data collectors faced some problems while collecting data. In some cases the respondent intentionally might have hidden information. This might have affected the outcome of the study leading to some bias in the result.





5. The interviewers sometimes left the interview in the middle of their interview because of the respondent's personal problem so that it was very hard to get more information about the study.

## Recommendations

1. It is very important to use masks, safety goggles, special suits, gloves and special shoes to save themselves from the hazardous effect of toxic chemicals.
2. The government has not enforced environment and labour laws in the leather sector, owing to which workers' safety issues remain mostly ignored so that government should take some policies and law interventions.
3. It is recommended that Bangladesh's Labour Act should be more stringent so that each tannery must take the necessary steps for the prevention, treatment and

control of occupational and other diseases in the tannery.

4. It should ensure the right of everyone to the enjoyment of just and favorable conditions of work including safe and healthy working conditions as well as provide all the necessary protective equipments for the tannery workers.

5. The Government should take appropriate initiatives to provide a healthy and sound environment not for the tannery workers but also for all the residents of Hazaribagh area.

## Further Study Scope

Reproductive Health is a much discussed issue nowadays. Although the present study was done in a very small scale due to limitations such as resources, time but the study findings will certainly support as a base line study for further and extended research in this regard at future.

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