

## **Assessment of Social Acceptance of Urine Diversion Dehydration Toilet (UDDT) in Sharsha Upazilla, Jessore, Bangladesh**

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**Abstract:** Urine diversion dehydration toilet (UDDT) is a kind of toilet that is used to recover resources such as nutrients. The study was carried out in one union namely Bagachra, Sharsha Upazilla, Jessore. The main objective of the study was to know about people's perception about UDDT and make a cost comparison between normal toilet and UDDT of the study area. In the study area 50 household were selected for collecting data. In the study area 22 respondents were UDDT user and 28 respondents were non user. Among the respondents more than 77% people were satisfied by using UDDT and 23% people were satisfied by using normal toilet. The study also focuses on the cost analysis of UDDT and other various types of toilet. From the surveyed data it has been found that, the average cost of normal toilet is 5000-16000 taka and average cost of UDDT is 18000-2300 taka. From the survey data it has been also found that, the social acceptance of UDDT is increasing day by day. Most of the UDDT users said that, by using the UDDT various types of health related problem has been solved. Moreover, the acceptance of UDDT is increasing day by day because of biofertilizer produced from it. In the study area about 59% people use UDDT fertilizer and they get more crops from it than other fertilizer. All these information need to be available to the planners, researchers to improve the condition of sanitation system.

**Keywords:** Socio economic status, Urine diversion dehydration toilet (UDDT), Cost of UDDT, social perception.

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### **I. Introduction:**

Presently, the concept of ecological sanitation which is also known as urine diversion dehydration toilet (UDDT) is widely acknowledged and accepted as an efficient way to execute sanitation. Ecological sanitation (UDDT) advocates an alternative to flush and discharge systems and also ensure sustainable water use. It can bring a fantastic solution to the overcome poor sanitation situation in many areas worldwide especially in developing countries like Bangladesh. Ecological sanitation is a holistic approach towards effective and sustainable sanitation and it is based on the idea of nutrient recycling from the waste. In UDDT, human urine, faeces and grey water from households are seen as sources of resource and not as a waste product. The main aim of the UDDT is to reach ecologically and economically sustainable sanitation system by closing the local nutrient cycles and returning the nutrients back to the soil [1].

Ecological sanitation is also effective to cope with climate change phenomena. UDDT decreases the use of nonrenewable energy resources and nutrients, such as use of phosphorus and water. Ecological Sanitation that does not use any water also eases the adaptation to the climate change phenomena by conserving the quality and quantity of water sources [2]. Moreover, a well-developed community is more eager to fight against existing environmental problems such as climate change effects.

Some scientists and practitioners have long questioned the wisdom of treating water to drinking quality at great expense, only to have a large share of water flushed down toilets to transport waste (including nutrients) in sewers and also for cleaning toilet. In recent years more cost-effective and logical approaches have been developed under the label of ecological sanitation or sustainable sanitation practices. Yet, as groundwater table is high in Bangladesh and the frequency of flooding is also high the most common pit latrines not only flush out and cause pollution; they also become inaccessible during floods, and remain filled with silt after the floods. Every year floods destroy most of the rural sanitation systems and forces rural people to open defecation, despite the capital-intensive investment. Urine Diversion Dehydration Toilets (UDDTs) were considered in case of their suitability in flood-prone areas and their affordability in the context of Bangladesh. A survey was conducted in two flood-prone areas of Bangladesh showed that the average height the UDDTs is 0.69 m that is higher than the average highest flood level (0.31 m). The survey also represent that, the most common form of sanitation is the pit latrine: 42% of the urban and 70% of the rural population uses pit latrines [3]. The locally available materials, high affordability and low installation cost contribute to the pit latrine's popularity. As the average emptying cost for a pit latrine (average lifetime of 10 years) was reported €3.40 per year and for UDDTs 20 years based on numbers reported by Action (2011).

Ecological sanitation is one of the common and widely accepted forms of sustainable sanitation technology. The study focused on a comparison of sanitation technologies suitable for urban and rural

settlements. In different countries and different cultures, sanitation systems based on ecological and sustainable principles have been used for hundreds of years. UDDT systems are also widely used in many parts of East and Southeast Asia. With flush and discharge becoming the norm in Western countries, this option was largely abandoned. Only in recent years, there has been a revival of interest in UDDT because of its multiple advantages [4,5,6]. UDDT represents a holistic approach towards ecologically sound and economically viable sanitation system and is a systemic environment friendly approach as well as an attitude. Single technologies are only means in relation to the observed environment but do not consider the ecological perspective. But applied technologies may range from various aspects of environment such as natural wastewater treatment techniques to compost toilets, simple household installations to complex, mainly decentralized systems [7]. The focus of the study is to find out the acceptance of UDDT among local people in terms of its ecological and resource base applications. The study also aims to make general comparison between traditional toilets and UDDT.

The major objectives of the study are:

- ❖ To know about the link between sanitation practice and health status among UDDT user and non-user.
- ❖ To understand public perception on eco-sanitation.
- ❖ To know about the cost comparison between normal toilet and UDDT.
- ❖ Appraisal for sustainable sanitation solution

## II. Materials and Methods

For this study, Bagachra union of Sharsha Upazilla of Jessore district was selected as the study area (figure 1). Sharsha upazilla is located at 23°04'28"N 88°52'00"E/ 23.0744°N 88.8667°E in the Division of Khulna, Bangladesh. The study area has a total of 46084 units of house hold and total 336.34 km<sup>2</sup> area. Data were collected through a well- developed questionnaire survey.



Figure 1: Map of the Study area (Bagachra union, sharsha, Jessore) (Source: LGED)

To conduct the study two types of data sources were utilized, primary data were collected through field surveys conducted by the authors during 2014 in the selected study area of Sharsha Upazilla and the second data source is secondary materials, relevant to the study. A questionnaire survey was completed through direct interview of the respondents through pre-schedule structure questionnaire in the study area for collecting

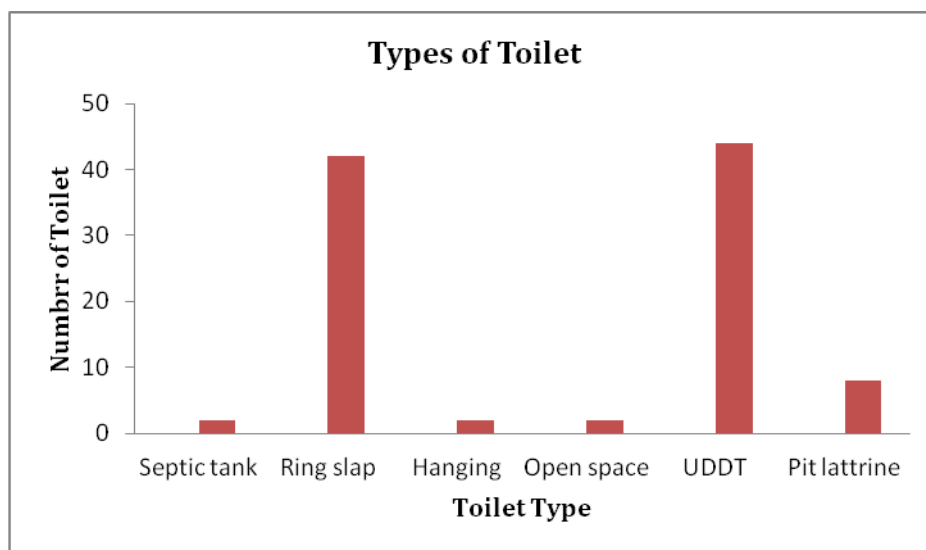
primary data. For questionnaire survey, 50 households were selected randomly. Among the 50 households 22 respondents were UDDT users and 28 respondents were normal toilet users. This type of primary data collection system helps to find out socio economic status of the study area and to make a comparative study among the UDDT users and non-users groups.

The data analysis has been done in two steps; the first step is the analysis of the accurate phenomenon that was observed. The second step of the analysis focused on the interpretation of the collected data. This approach was complemented from simple quantitative analysis, for example frequencies and cross-tabulation. A combination of quantitative and qualitative data analysis was used to find out a better understanding of the real picture that exists in the study area.

### III. Results and Discussion

#### Present Sanitation Systems in the Study Area

A variety of toilets (septic tank system, ring slab system, hanging system, open space system, UDDT system and pit latrine) are used in the study area. Among which UDDT and Ring slab are used widely and the number is almost same which is shown in the following figure-

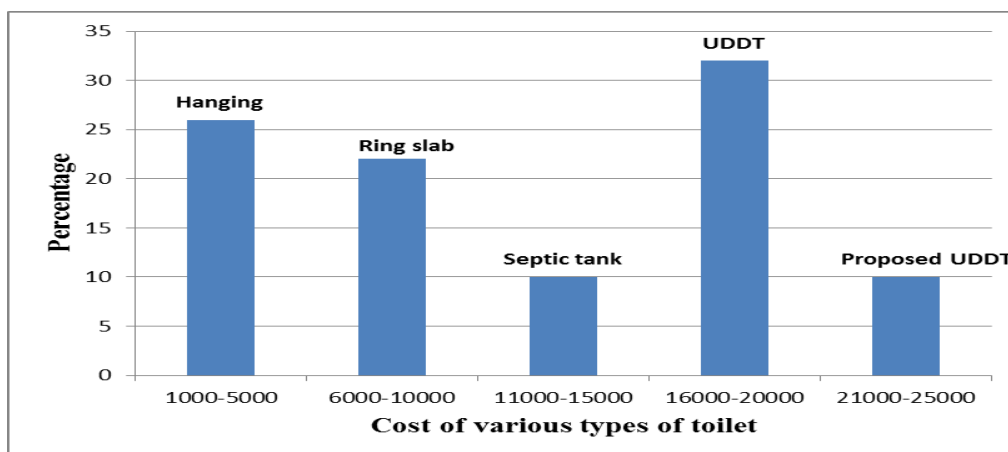


**Figure 2:** Various type of sanitation system in the study area

From the figure it is shown that UDDT is used in highest percentage (44%) by the respondent of the surveyed area. The second highest is ring slab system (42%). Among the respondents 92 % people said that their toilet is secure where only 8% people say no.

#### Cost of various types of toilet

The construction cost of various toilets also varies with types of construction materials. Generally the cost of UDDT is highest among all types which is shown in the figure below-



**Figure 3:** Cost of various types of used toilet

From the figure, it can be said that ring slab is popular in the study area because of its low construction cost and UDDT is popular because of its multiple benefits.

#### Ecological sanitation system in the study area

##### UDDT using and satisfaction

In the study area maximum number of people uses UDDT and they are satisfied with it. More than 70% people in the study area said that they are satisfied by using UDDT whereas only about 20% people said that there is slight problem with it. The distribution is shown in the figure below.

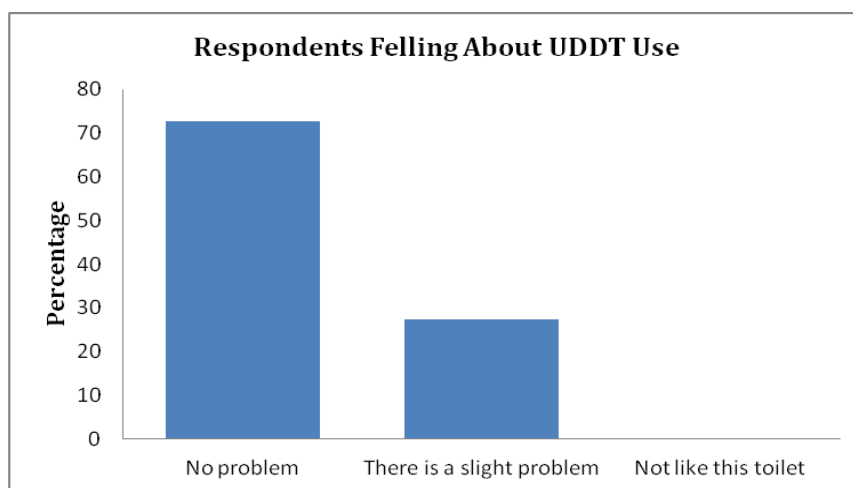


Figure 4: Feeling about using UDDT

##### Cleaning Materials of UDDT

In the study area UDDT users use various types of cleaning materials such as ash, sand, soil, soap and detergent powder. Among all types of materials detergent powder is used by highest number of respondents for cleaning the UDDT. The percentages of use of cleaning materials are shown in the figure below:

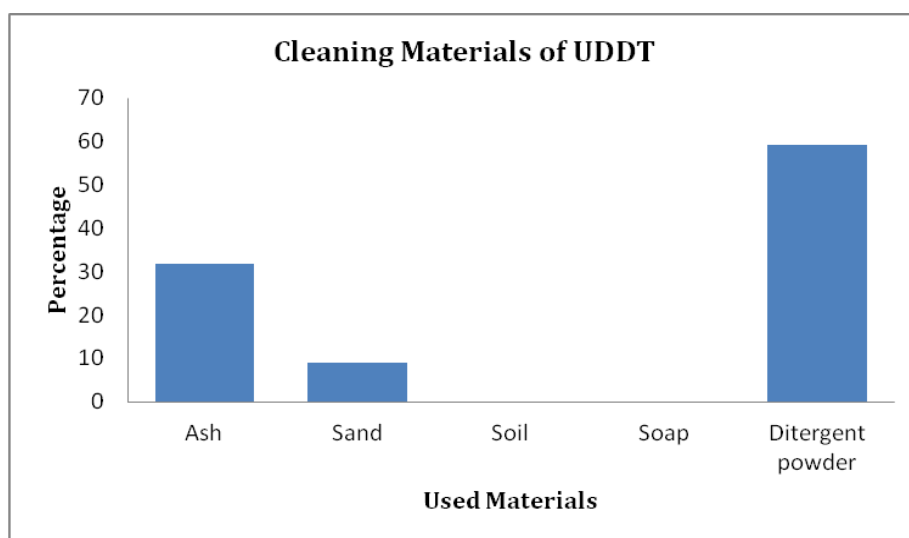


Figure 5: Cleaning option of UDDT

From the figure it has been shown that, detergent powder is used by the highest percentage of respondents (59%) whereas 31% respondents used ash for cleaning toilet.

##### Comparison between normal toilet and UDDT

A comparative study was carried out between normal toilet and UDDT in the study area. About 77% respondents said that UDDT is good with comparison to normal toilet which is shown in the figure below-

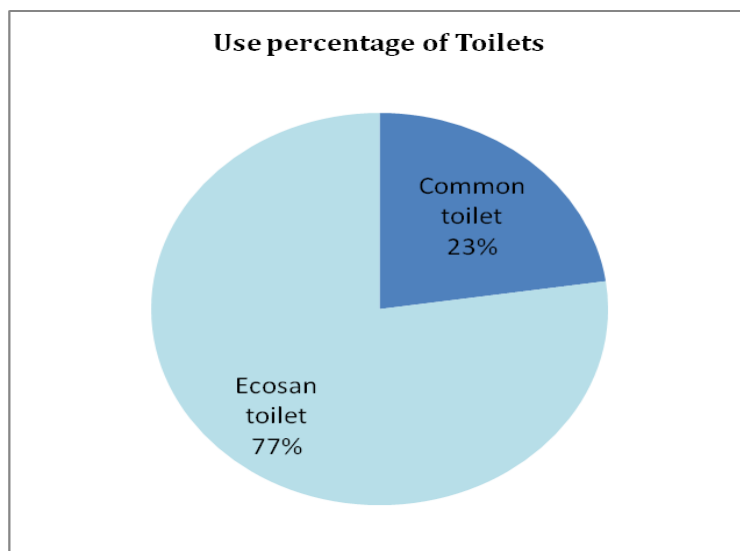


Figure 6: The comparison between common toilet and UDDT

**Use of UDDT Fertilizer:**

In the study area more than 50% people use urine and about 59% people use faces as fertilizer which is shown in the figure below:

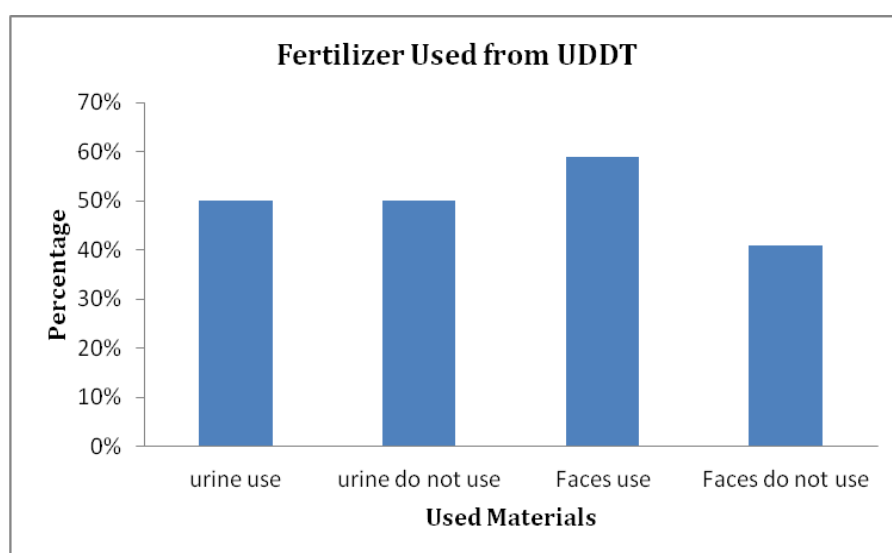
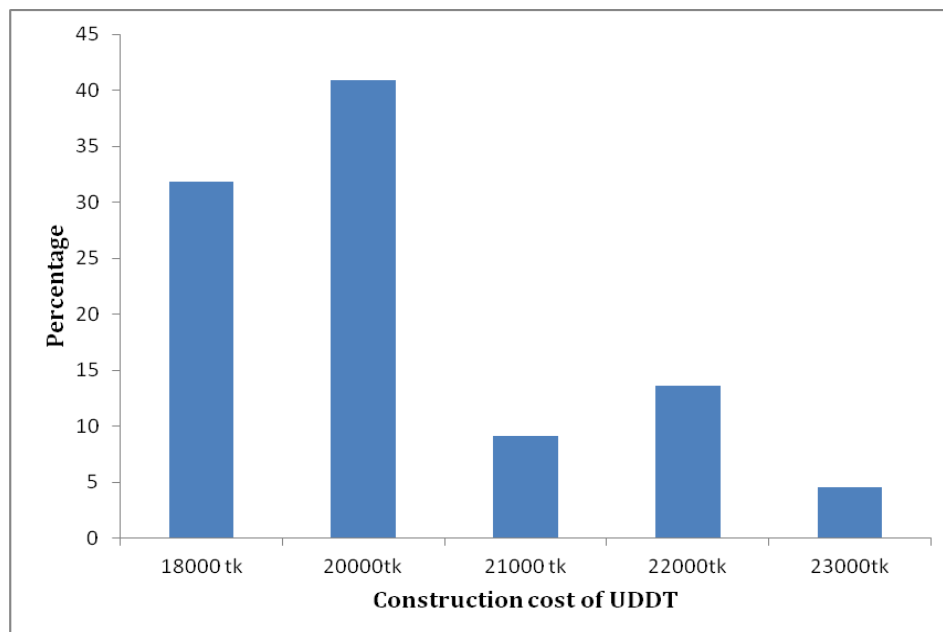


Figure 7: Use of urine and faces percentage by respondents

**Construction Cost of UDDT**

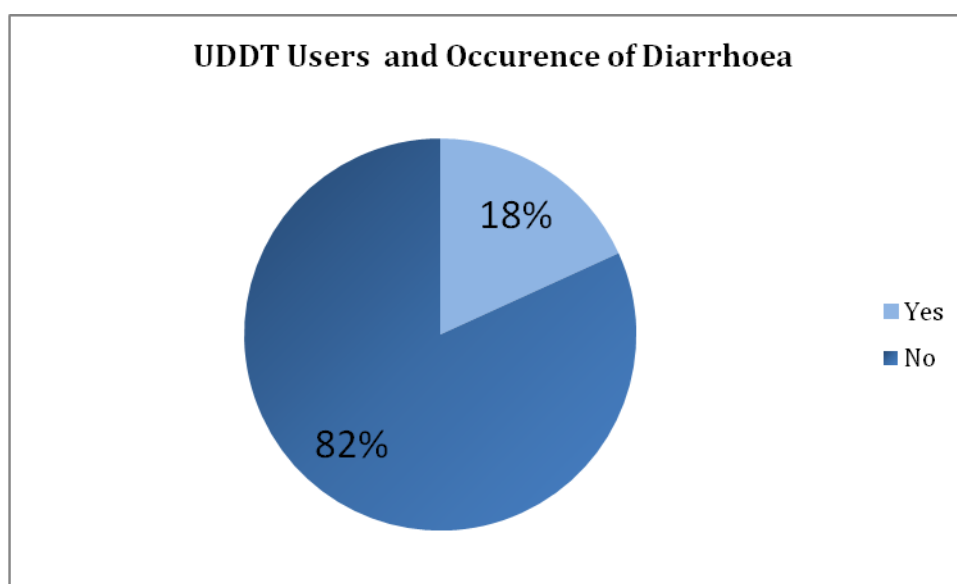
From the study area it is found that, the construction cost of UDDT varies with different construction materials. UDDT which is made of bamboo costs 18000 taka and is used by about 32% respondents. UDDT which is made of tin shed cost 20000 taka and used by 41% respondents in the study area. UDDT which is made of brick but the roof is made with tin cost 21000 taka used by 9% respondents. UDDT which is made of bricks both in wall and roof cost 22000 & 23000 taka used by about 14% and 4% people respectively. From the figure it is found that, the UDDT which cost 20000 taka is used by highest number of people. The distribution is shown in the figure below-.



**Figure 8:** construction cost variation of UDDT

**The use of UDDT and occurrence of diarrhea**

Diarrhea is a common disease that occurs frequently before and after using UDDT. In the study area about 86% people said that their family members are not affected by diarrhea and about 18% people said that their family members are affected by diarrhea after using UDDT. Their percentage distribution is shown in the figure below-



**Figure 9:** percentage of diarrhea occurrence after using UDDT

**4.5.11 Cost comparison between different types of toilet**

The figure below represents the cost comparison between two types of toilet. Those are UDDT, normal toilet (ring slab toilet). The cost comparison between UDDT and ring slab is given below-

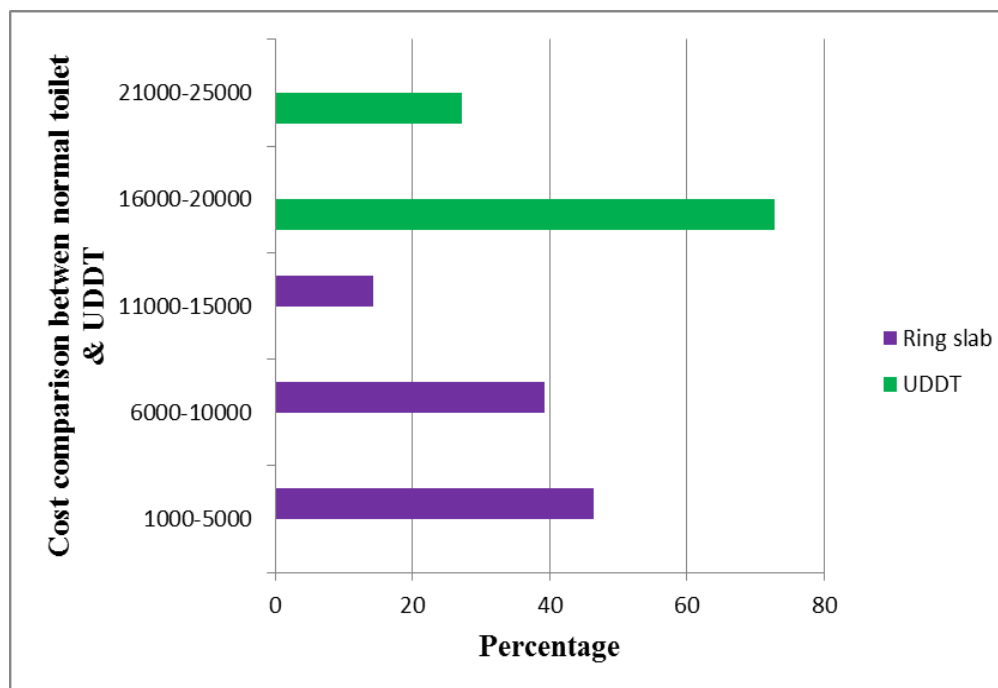


Figure 10: Cost comparison between normal toilet and UDDT

From the above figure it has been shown that, the costs of ring slab ranging from 1000- 5000 taka used by about 45% respondents. In this taka there is no UDDT. The cost of UDDT ranging from 16000-25000 taka and is used by highest numbers of respondents which is about 72% in the study area. Though UDDT is expensive, it has numerous advantages than other types of toilet that’s why it is used by highest number of respondents in the study area.

#### IV. Conclusion

Ecological Sanitation ensures sustainable environmental sanitation in Bangladesh. From the study area it has been found that, about 44% respondent use UDDT and 42% respondents use ring slab system. Among the respondents 92% people said that their toilet is secure where only 8% people say no. More than 77% people were satisfied by using UDDT and 23% people were satisfied by using normal toilet. From the cost analysis of UDDT and other various types of toilet it has been found that, the average cost of normal toilet is 5000-16000 taka and average cost of UDDT is 18000-23000 taka. From the survey data it has been also found that, the social acceptance of UDDT is increasing day by day. Most of the UDDT users said that, by using the UDDT various types of health related problem has been solved. In the study area about 86% people said that their family members are not affected by diarrhea and about 18% people said that their family members are affected by diarrhea after using UDDT. Moreover, the acceptance of UDDT is increasing day by day because of biofertilizer produced from it. In the study area about 59% people use UDDT fertilizer and they get more crops from it than other fertilizer.

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