Bangladesh

ACCEPTANCE TO THE UDDT:

POST EMERGENCY CONTEXT AND SOCIO-CULTURAL ASPECTS

Case study in Coastal Bangladesh

By

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EXECUTIVE SUMMARY

Following the disaster "Sidr" which occurred in November 2007, the INGO "Fondation Terre des hommes - Lausanne" is developing a water and sanitation programme in Bangladesh in partnership with MultiTask (a Bangladeshi NGO). 100 families should benefit from this programme by the end of 2009. The programme is located in the Barisal district, in a rural and coastal area, characterised by a high frequency of floods and risk of storms and cyclones. Classical solutions applied in post emergency context for sanitation are VIP or pour flush latrines, these solutions are not easily adapted to flood and cyclone prone areas. Therefore MultiTask and Terre des hommes built 100 Urine Diversion Dehydration Toilet (UDDT) based on the fact that sanitation should also meet some environmental standard, linked to health consequences.

The agencies are aware of the potential barriers that can jeopardize the sustainability of urine diversion dehydration toilets in this area. Challenges exist at different levels: technical, health, financial, institutional, and also socio cultural acceptance. This study focuses on this socio cultural aspect as, it is an essential parameter for the future use and maintenance of the facilities. But also as this aspect have been too often ignored in the planning of sanitation projects and particularly in the case of ecological sanitation.

This study investigates the potential socio-cultural barriers of a urine diversion dehydration toilet project and asks whether a specific technology can be developed in a context characterised by different socio-cultural parameters. Going away from preconceived ideas about the Bangladeshi culture and focusing on two coastal villages of Bangladesh, this report investigates the following problem statement:

The urine diversion dehydration toilet implies a new behaviour and a change of habits for the household in terms of use and maintenance. Some socio-cultural aspects (such as religion, gender, poverty, social structures, etc...) might constitute a barrier in the acceptance of this facility.

Following this statement, the aim of the study is to identify the socio cultural barriers in a urine diverted dehydration toilet project in the coastal area of Bangladesh. Due to the lack of time and resources available during the study, focus has been given to three following socio-cultural aspects, given that they seem to be the most eloquent:

- Religion (Islam)
- Gender
- Social structure

Using questionnaires and focus group with the beneficiaries, conducting interviews with key informants in two villages of the Barguna district and in Dhaka, a six weeks fieldwork show the following:

- After two months, 75% of the UDDT are under regular use.
- The use is not homogeneous amongst the households' members. Some families are still using their previous sanitation facility in parallel with UDDT.
- Beneficiaries who adopted the UDDTs recognized the comfort and the safety of the UDDT. They also use the UDDT because it is the only toilet non flooded during storm events.

Specific requirements for operating and maintaining urine diversion dehydration toilets, contradict some traditional and religious practices in rural Bangladesh:

- Traditionally emptying of latrines is most of the time done by hired sweepers. Taboos on sanitation may jeopardize the handling of dried excreta required to maintained the UDDT. Beneficiaries explain that they do not know exactly what they will do when the chamber is full.
- Some informants cited concerns about the orientation of the squatting pan and the location of the toilets. For them it is not in accordance with their religion and tradition. However, people understand the principle of urine diversion dehydration and don't demonstrate any resistance to it.
- A woman is not using the UDDT because the toilet is not located behind the house as some tradition required it.
- The weight of traditional practices and the difficulties of changing the practices of the rural population are underlined in addition to other issues.

Drawing a hierarchy amongst different aspects such as religion, gender, level of education and social structure remains context specific. The analysis of findings demonstrates that socio-cultural aspects such as gender or social structure can be a barrier for dry toilets project. Implementers need to mitigate these aspects through adapted communication programmes.

Terre des hommes anticipated some of these aspects. The training of local trainers and the work made on the field by the different social workers allow a good communication on the project. Beneficiaries and other villagers get use to the project.
To reinforce the quality of its promotion work on the field, Tdh got involved in a national consortium on ecological sanitation. Members of this consortium agreed on the importance of awareness campaign. Drawn from the fieldwork and the interviews, the following recommendations are made to NGO's who plan to

implement an UDDT project in coastal Bangladesh and wish to ensure a durable acceptance:

- Reduction of health hazards should be promoted amongst the whole community.

- Promotion of the different drives already appreciated by the population interviewed such as comfort and privacy should be the main axe of communication together with the potential benefits issue from compost.

- However, the health, environmental and economic impacts of this form of sanitation should remain motivational factors for the implementers themselves.

- Programmes following the appropriation of the technology by the beneficiaries need to be carried on during three to five years after technical completion of the UDDT.

LIST OFACRONYMS AND TERMS

BARD	Bangladesh Academy for Rural Development
BASA	Bangladesh Association for Social Development
BUET	Bangladesh University of Engineering and Technology
Burqa	A garment Muslim women used to veil themselves.
Caste	Inherited social status determining a social and economical position in the society. A **caste** is a combined social system of occupation, endogamy, culture, social class, and political power. Caste should not be confused with class, in that members of a caste are deemed to be alike in function or culture, whereas not all members of a defined class may be so alike
CBO	Community Based Organisations
Decimal	Square unit used in agriculture, equivalent to a square of 21 feet (6,4 meters) long on each side
District	Administrative level, depending on divisions and divided into *upazila*s. There are 64 districts in Bangladesh
Division	Administrative level, divided into districts. There are 6 divisions in Bangladesh
Gender	In this report, the analytical concept of gender, introduced in the 1970s, indicates the social roles, characteristics, and values assigned to males and females in a given society.
Madrassa	Muslim education institution
NGO	Non Governmental Organisations
Purdah	(or *parda*)_The system of exclusion and segregation of Muslim women, with both physical and behavioural means
Taka	(BDT) Currency of Bangladesh, 100 BDT = 1,45 US$.
Tdh	Terre des hommes (Foundation Terre des hommes Lausanne)
UDDT	Urine Diversion Dehydration Toilet
VIP	Ventilated Improve Pit latrine
UNICEF	United Nation Children's Fund
Union	Administrative level, depending on *upazila*s and divided into villages. There are 4 484 unions in Bangladesh
WAB	Water Aid Bangladesh
WHO	World Health Organization

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1.1. The programme of Terre des Hommes

Following the disaster caused by the cyclone "Sidr", the INGO Terre des Hommes Lausanne, already working in Bangladesh, decided to develop a programme of water sanitation hygiene and a programme of mother and child health in the Patharghata area. The project is targeting 3000 children and their families. The project period is between June 2008 and December 2009 The project is qualified as post rehabilitation following the Cyclone SIDR in 2007.
The technical aspect of the programme includes the construction of 100 houses with urine diversion toilet and 2 pond sand filters divided between the two neighbouring villages of Padma and Rohita. Beneficiaries receiving houses are also receiving the UDDT. This form of sanitation was not directly chosen by the beneficiaries since their knowledge about sanitation was limited to what was existing in the village: raised pit, simple pit, ring slab latrines. The choice was made by technicians based on some elements of the local context such as high water table, type of soil, climate risk, and cost of maintenance.
The main objective of implementing UDDT is to ensure the containment of excreta during the time that some pathogenic elements present a risk for the health and the environment. Providing a durable structure resistant to flood and storm is also a key objective for the implementers.

To implement this project, Terre des hommes works with its local partner "Multitask". This local Ngo working in the Pathargata Upzila is involved in gender, education, water and sanitation operations and is working with around 60 staffs. Multitask is in charge of implementation of the different components of the programme with a special focus on monitoring of maintenance and hygiene promotion.

1.2. Description of the Urine Diversion Toilet implemented

As explained in section 1.1, Tdh implementing the project decided to change the technical aspect of its programme concerning sanitation. For health and environmental reasons[1], they decided to implement urine diversion dehydration toilets instead of the pour-flush latrine initially planned.

The main features of the UDDT implemented in the two villages are:

[1] Initially, Tdh was planning to implement pour flush latrines. But this form of sanitation presents several risks such as groundwater contamination due to high water table, and other problems such as floods and those associated with Bangladeshi coastal areas. Moreover the maintenance is problematic when the pit is full. People need either to empty the pit or dig another pit and move the superstructure. Pour flush latrines with septic tank need a removal sludge system (and treatment) and this option is considered expensive by implementers. UDDT ensures a technical containment of the excreta which lead to a lower risk of contamination of groundwater pollution (Jönsson et al. 2005) or surface water pollution in flooded areas (Sijbesma 2008).

- Separation of excreta and liquid
- Containment of excreta in vault where they are dehydrated.
- Infiltration of urine and wastewater in the soil
- Alternate use of the vault, approximately every twelve months

The construction of the chambers and the superstructure has been designed considering the occurrence of floods and cyclones. The chamber has been designed to dehydrate as quickly as possible the excreta (ventilation and solar effect on chamber south oriented). Most of the toilet has been built with concrete which explain the high cost of the final work. The average cost for this toilet is 40 000 BDT (580 US$). The toilets are fully subsidized by the Terre des hommes, including material and different labour costs. However beneficiaries were required to provide manpower during the construction of their house and their toilets.
Latrine and slab layout are as follows in figure 1, combining the overlapping needs:

- Vault, iron cover and the vent pipes to face south to receive the sun rays and favour the dehydration process of excreta
- The pan must not be aligned in the direction East-West as Muslims shouldn't face Mecca during defecation (Reynolds 1943, Pickford 1995).

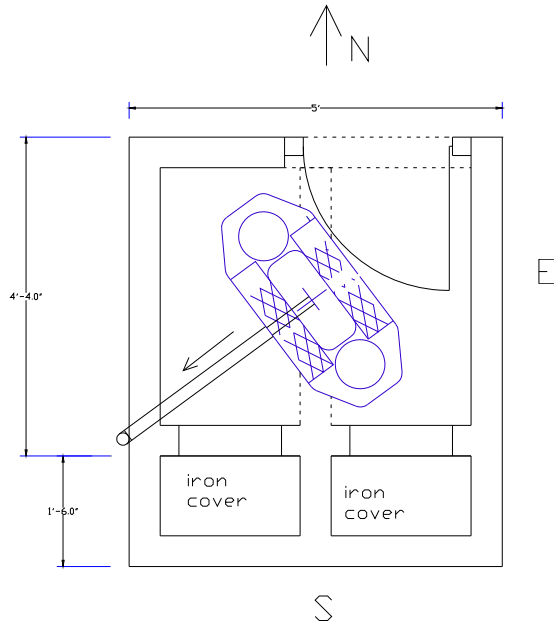

Figure 1: UDDT slab orientation Source: (© Tdh- Lausanne)

1.3. Progress of the project at the time of the fieldwork.

Two different situations were found during the implementation of the project. The first one took place in Padma where the toilets were already implemented for more than two months at the starting time of the field work. Thus the 70 beneficiaries of this village were able to use the toilets. First training sessions for the use of the toilets had been given, but more were planned in the following months. The second situation took place in Rohita where houses and toilets for the 30 beneficiaries were not fully completed and people were not using the different facilities yet. People received a part of the training concerning the use of the UDDT. Additional training will be reoriented following some of the recommendations made by this study.

2. METHODOLOGY

This study investigates the potential socio-cultural barriers of a ecological sanitation project. It asks whether a specific technology can be developed in a context characterised by different socio-cultural parameters. Going away from preconceived ideas about the Bangladeshi culture and focusing on two coastal villages of Bangladesh, this report investigates the following problem statement:

The Urine Diversion Dehydration Toilet implies a new behaviour and habits for the household in terms of use and maintenance. Some socio-cultural aspects (such as religion, gender, poverty, social structures, etc...) might constitute a barrier in the acceptance of this facility.

Following this statement, the aim of the study is to identify the socio cultural barriers in a UDDT project in the coastal area of Bangladesh. The reaction of a population towards the implementation of UDDT cannot be assessed without an understanding of the specific context where the project takes place. Therefore the study needed to be supported by field work. This field work took place in Bangladesh from the 25th of May to the 7th of July 2009 and was divided in two main components:

- Interview of key- informants involved in the field of sanitation, involved in the field of ecological sanitation in Bangladesh, and specialists of socio-cultural aspects in the Barisal division.

- Case study of the use of UDDT in the village of Padma and Rohita in the Barisal division. The case study includes observations, questionnaires[2] and focus group with beneficiaries and interviews of local teachers, sweepers and inhabitants.

The appendix A shows the fieldwork planning.

2.1. From problem statement to methods

Methods and their links to research questions and selection of informants are summarized in the table 1.

[2] Questionnaires were administrated face to face, with the support of a translator from the 6th to the 10th of June 2009. Interviewees were selected following systematic random method and discussions lasted in average 20 minutes including the observation of the plot and of the toilets.

Problem statement: Urine Diversion Dehydration Toilet (UDDT) implies a specific behaviour for the household in terms of use and maintenance. Some socio-cultural aspects might constitute a barrier in the acceptance of this facility.
Aim of the study: Identify the importance of socio-cultural barriers in a ecological sanitation project in coastal Bangladesh.

	Research objectives	Research questions (Specific objectives)	Methodology	Targeted groups
A	**Measuring the level of use of the new sanitation system by the population**	Are beneficiaries of the Urine Diversion Dehydration Toilet using their latrine? Is this utilisation homogeneous amongst the beneficiaries and amongst the family? How different group "interacts" with the new sanitation facilities?	Observation Questionnaires to households (Self administrated)	Beneficiaries of the project
B	**Establish if reaction of local people to the UDDT (during the uptake of the project) is motivated by social and cultural factors.**	Can social or cultural categorizations be made between people not using the latrines? What social or cultural link can be made between people using the latrines? Why beneficiaries of the UDDT are using or not using the latrines?	Conclusions from A Focus group targeting specific groups selected after the phase A Some additional interviews	Eldest? Women? Pupil? Poorest? Castes? (if any categorizations can be made amongst the beneficiaries)
C	**Verify the importance of some socio cultural factors.**	What are the opinions of the local leaders (politic, religious or social)? Which socio-cultural aspects could significantly affect the acceptance in the local specific context? Does there appear to be a critical aspect that could threaten the success of a UDDT project?	Conclusions from B Depth interviews of key informants decided after the phases A and B	Religious leader Politicians Teachers NGO beneficiaries
D	**Provide guidance to the NGO about the significance of the socio-cultural aspect during the assessment of any future ecological toilet project.**	Are proposed handling and reuse of excreta acceptable and sustainable in the context of south rural Bangladesh? Which aspects of this case study can be valid in another context? How and where these valid aspects can be reused and in the future?	Results from the phases A, B, and C Depth interview with planners of similar project Participation in national seminar on ecological sanitation in Bangladesh	WAB BASA BARD BUET

Table 1: Summarizing the methodology

2.2. Limits of the study

The different stages of the project presented in the section 1.2 influenced the methodology of the current study. It was initially planned to apply a similar approach to both villages, but finally most of the work was carried out in Padma. Some focus groups and observations have been made in Rohita to focus on initial perception of the future beneficiaries rather than in the use of the UDDT.

The methodology has also some biais:

- Using a translator during the administration of a questionnaire might not be ideal.
- As the main researcher didn't have previous experience in Bangladesh, understanding of certain cultural issues was essential before starting the fieldwork.
- The availability of key informants was also a major bias.
- The population developed a certain form of dependence to the relief system that followed Sidr and understood how they could use it. People are not likely to make any negative comments about a facility that has been donated to them.

The study by using various methods and adapting these methods to the solution mitigated some of these limits.

During the month of May, an important storm called Aila flooded most of the land and houses in the studied area. Many constructions and roads have been damaged. A few of the recently built UDDTs have been partially flooded. This storm also changed practical aspects of the fieldwork itself increasing the time needed to reach the field and particularly some remote houses. But it also influenced perceptions of the households, mostly during the questionnaire phase. Findings and analysis will integrate this new parameter in the global context.

2.3. Ethics

Any research work must respect right and dignity of the participants (Denscombe 2007). To ensure the ethic of the study during the collection of the data, the study followed some points as indicated by Bernard (1995: 517):

- Participation of informants had to be voluntary, the participants knowing that, after receiving enough information on the purpose of the study they can withdraw from the study at any time without explanation.
- Informants must know the eventual limit of the confidentiality of the data collected. For the questionnaires for instance people are referred with numbers into the computer.
- Participation to the study didn't bring any risks for the population involved.

- Different authors highlight the dangers when a western researcher is conducting studies in a developing country. An essential aspect was the necessity to share the findings of the field work with the community.

2.4. Validity of the study

The control of validity should be done regularly during the fieldwork through questioning the methodology and findings (Bernard 1995). However three main actions can increase the validity of a study: feedback to population, triangulation of methods and grounded data (Bernard 1995:297).
Triangulation of methods has been achieved, and as described in the previous section, giving feed-back to the community after the field work and welcoming their comments checked the validity of the study. The grounded data depended on the time spent by the researcher on the field.

Since this study explored socio-cultural barriers in a context not previously investigated, the methodology didn't exactly follow any existing research. Considering the specificity of the local context, carrying out a case study appeared to be the most suitable method. Collecting data directly from the field, triangulating these data and inviting different actors to participate ensured a comprehensive approach and enhanced the level of accuracy. Including perspectives of key informants on national sanitation challenges reinforced the accuracy of the study and its potential for broader applications.

3. FINDINGS FROM FIELD WORK

In this section, data are presented raw following the chronological order of the methodology used in the field. Each method was adapted from the findings of the previous method used. For instance findings from the questionnaire leaded to the theme developed for the focus group.

3.1. Results from 28 households questionnaires

The beneficiaries from Padma had owned the UDDT for two months or more at the beginning of the field work. The table 2 draws the main socio-economic characteristics of the interviewed households.

Characteristics of the households (n=28)		Number of household	%
Sex of people answering to the interview	Couple	11	39
	Woman	9	32
	Man	8	29
Main source of income in the household	Fishing	21	75
	Others (Trade, carpenter, ...)	7	25
Religion of the household	Islam	28	100
Owning of land	None	17	61
	<10 decimal	7	25
	>10 decimal	4	14
Literacy of one adult member in the household	Yes	17	61
	No	11	39
A member of the household has a responsibility in the community (political, social, religious)	Social	5	18
	Political/Religious	3	11
	None	20	71

Table 2: Socio-economic characteristic of the interviewed households
Source: Mazeau (2009)

The table 3 shows if the households who received a UDDT are using their new facility two months after the completion of the work. The table is also complimented by the observation of the chambers.

Explanation of the household (n=28)	Number of household	%	Observation of the chambers
Household are using UDDT	19	68	In use
Household are using UDDT	1	3,5	Empty
Household who was using UDDT until the storm Aila	1	3,5	Empty
Household never used UDDT	7	25	Empty

Table 3: Use of the UDDT by the household
Source: Mazeau (2009)

As it is shown, 75% of the households report to use or to have been using the UDDT. It was asked to these 21 households who in the family were usually using the UDDT. The results are shown in the table 4.

Explanation of the household (n=21)	Number of household	Percentage
All the members of the household are using UDDT	13	62
Only members of the household above 5 years are using UDDT	6	28
Only male members of the household are using UDDT	1	5
Only female members of the household are using UDDT	1	5

Table 4: Users of the UDDT in the household
Source: Mazeau (2009)

Using the UDDT

One representative of athe household reported that using UDDT is difficult. Some households announced that between two or three days were needed to get used to this new facility. After this period, they were not encountering any difficulties.
62% of the respondents mentioned that it is easy for the children to use UDDT and that the parents ensure the training themselves. Children were performing well after two or three days according to their parents.

Reasons for not using UDDT

During the fieldwork questionnaire informants from households not using the latrine were asked in an informal way why their household were not using the UDDT. This was done to get a first impression of the reason but mostly to be able to prepare for the focus group discussion. Amongst the eight households who announced not using the UDDT, reasons given were often different:

- UDDT is very clean and they don't want to start using the facility before the end of the rainy season (three households).

- Some staff from the local NGO asked the households not to use before an additional training (two households)

- Households don't have money to buy the pot for water and ashes (two households).

- One household was initially using UDDT but vaults were flooded during the cyclone Aila. After this event, the representative from the household emptied the vaults and decided to wait until the end of the rainy season before using again.
- One household explained that they are using regularly the new facility, but observation of the toilet showed that the vaults were empty and the toilet didn't seem to have been used at all.

3.2. Results from focus groups

The questionnaire was conducted to have an initial idea on the percentage of beneficiaries using the new facility. The second phase was the running of focus groups in order to understand why some people are using the UDDT and why some people are not. Understanding how people were using the facility and how they perceive this sanitation are important objectives of study.
Assessing if the perceptions and the use of the UDDT are similar in different groups give some basis to understand the relevance of some social, economic and cultural factors. Therefore compositions of the focus groups have been based on three main criteria:

- Gender: three groups of women have been made, one group of men, and one mixed group in order also to observe how men and women were interacting together in a group discussion.
- Geographical location: as we mentioned in the presentation of the case study, different areas are identified within the villages. It was attempted to have groups from all the different parts.
- Beneficiaries owning the facility and the one waiting for it: Most of the focus groups have been conducted in Padma where beneficiaries have used facilities for two or three months. One focus group was conducted in Rohita where people were waiting for the completion of the work.

Criteria such as religion and castes haven't been considered at this point of the study because in the villages studied the majority of the people practise the muslim religion and castes are not clearly identified. If a caste system exists, it is more based on economic than on a status and generational system. Compositions of the focus group are available in the appendix C.

The following chart shows why UDDT is appreciated by the beneficiaries. The aspects most often listed by the focus group participants are on the top of the chart.

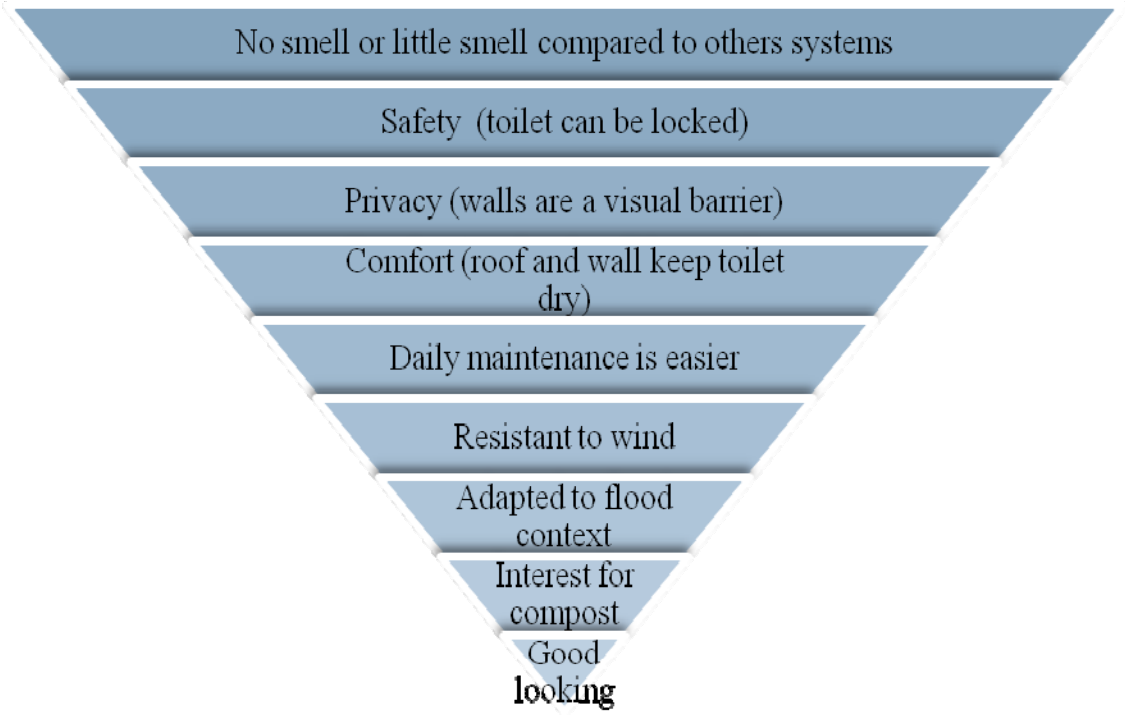

Figure 2: Benefits from the UDDT identified by the users

3.3. Results from interviews

After questionnaires and focus group, interviews with key informants in the field and in Dhaka (cf appendix B) highlight some specific aspects.
If 21 out of 28 households interviewed declared using UDDT, this use is not homogeneous within certain families. In some families smaller children are not using it, in one family the women are not using it and in one further family the men are not using UDDT. Some families are using their previous sanitation facility in parallel.
Some informants cited concerns about the orientation of the squatting pan and the location of the toilets. For them it is not in accordance with their religion and tradition. However, people understand the principle of urine diversion dehydration and don't demonstrate any resistance to it. Although traditionally the reuse of excreta is practised by some families, the emptying of latrines is often done by hired sweepers. Beneficiaries explain that they do not know exactly what they will do when the chamber is full. It seems difficult for a lot of beneficiaries to imagine how they will deal with that matter in six or twelve months. This might depend on their financial resources at that time.

Interviews of key informants at the end of the fieldwork underline the weight of traditional practices and the difficulties of changing the practices of the rural population amongst other issues (economic or environment for example). They recognize that some aspects such as the interpretation of religious texts and the place of woman in the household have consequences for the introduction of a new sanitation facility. They note that the relevance of some socio-cultural factors remains context specific.

4. ANALYSING THE SOCIO-CULTURAL ASPECTS

In this section, data are analysed. The analyse is done around three aspects: religion, gender and social structures.

The Urine Diversion Dehydration System has been introduced in the coastal area of Bangladesh to answer to an environmental challenge using a new technology. The study identified three main characteristics of this technology that can be analysed separately:

- The location of the toilet within the compound and its orientation
- The use of the UDDT which includes daily practices and maintenance
- The reuse of dried excreta

In the context of the study area and from findings during the field work, different socio-cultural factors influence the perceptions and the use of the facility by the local population.

The figure 3 introduces the balance that exists between the hardware (technical) and the software (socio-cultural).

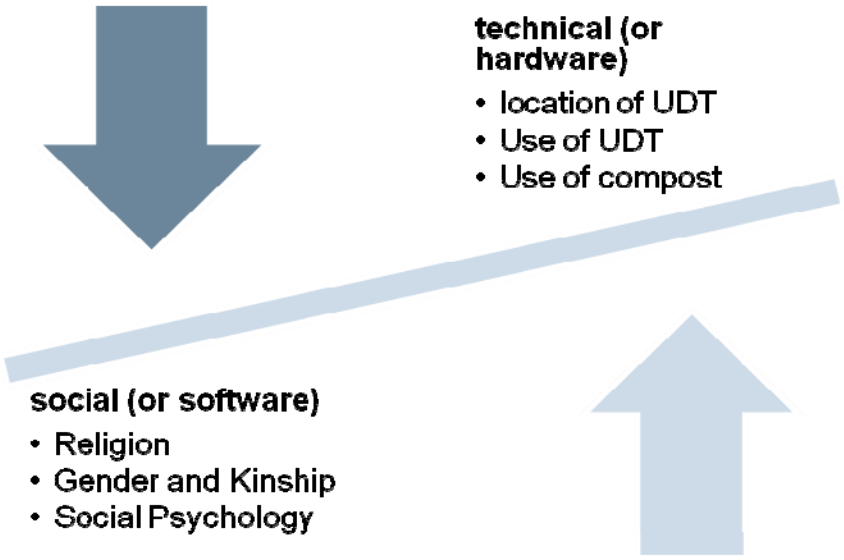

Figure 3 balancing technical and social parameters

In many cases, technical and socio-cultural factors don't naturally trend in the same direction. UDDT should ideally be located in a sunny area, but some part of the population want to practise defecation in a well hidden location. UDDT requires an annual handling of the dried excreta when a part of the population expressed reluctance about it.

As confirmed by many key informants, the categorization of the different socio-cultural factors will remain imperfect[3]. Borders between gender and religion or between poverty and caste are not clearly drawn. However, and for the understanding of the study the three listed socio-cultural aspects will be the main structure for the analysis work: religion, gender and social structures. This selection was made during the first week of the field work. Although these three aspects cannot explain all the behaviour of the populations towards the UDDT they seem to have the most important influence. Factors such as Hinduism or castes were not analysed during the fieldwork because they are not well represented in the villages in question.
The author of this study understands that some parameters such as illiteracy and lack of education affect the understanding and the acceptance of UDDT. These parameters might also have an influence on the validity of the study. The triangulation of research methods should mitigate these issues.

4.1. Islam and UDDT

In the present context two main issues concerning religion and UDDT can be investigated:

- Orientation of the pan
- Movement during defecation

Orientation of squatting pan

Results on the fields show that some toilets haven't been used by their beneficiaries during the first week due to the orientation of the squatting pan. Technical design of a UDDT recommends orientation of the vault to the south and traditional issues excludes an orientation of the pan to the West-East (religious texts). Therefore the pan needs to be positioned on an axe North West – South East. All the population doesn't understand the difference clearly. A movement of 45 degrees might not be sufficient for a population not fully aware of the technical details. Some guests coming to the village refuse to use the UDDT for this reason. However, encouraged by the quality of the UDDT and a better comfort, beneficiaries are using the UDDT, supported by some local religious voices. Hence, we see that the UDDT is widely accepted in spite of the shortcomings in terms of religious considerations. However it seems that the alliance with religious leaders is important as they can be a link between the agency implementing the project and the beneficiaries.

A teacher from the *Madrasa* indicates that the UDDT does not contradict Muslim practices. Some concerns have also been raised by some households about the orientation of the pan. Despite the work of the technician, the difference between the west which is the direction for praying and the north west which is the direction

[3] The question of purdah can be classified as a gender issue but is also influenced by the religion and the different social structures. The habits of reusing excreta can be explained by religion but also by some taboos that can exist only at an individual level.

of the pan was not understood by all. Additional awareness campaigns and training sessions should clarify this issue.

Moving during defecation

During a fieldwork in northern Pakistan, Nawab et al. (2006) were presenting movement[4] during defecation as one of the reasons for a Muslim population to reject UDD toilets.
In the current study the movement during defecation never appeared as a possible barrier for the use of the UDDT. This may partially be due to the decisions of the technician to develop a UDDT with two collection system instead of three. To reduce the movement constraint, they initially chose a system with only one separation: excreta in a first hole then wash-water and urine in a second hole[5].

Context specific

In the Bangladeshi villages included in the study, the population explained that if the UDDT is the only suitable method in this area, consequently they should follow the indications of use. They didn't express any concern about this point. The fact of not mentioning this aspect might also mean that a taboo exists about it. Observation of the toilets doesn't allow the study to state if the separation of excreta and liquid is properly done by the beneficiaries. If the interviewees said that they are properly separating liquid and excreta, the reliability of the beneficiaries interviewed can be questioned due to the taboo that can exist about this topic.
The relief atmosphere reactivated after the storm Aila might make people answering positively to any aid offer. They might put aside some of their values or some of their habits for a while to benefit from a new facility. The same study conducted again in the future will bring new elements about the influence of religion.

The above analysis was shared by key informants in Dhaka, (Hasin Jahan and Dr Habibur Rahman), who nuanced the analysis a little in a more general perspective. Application and interpretation of religious texts depend on many factors such as the influence of the imam, the tradition in the country, the specificity of the religious movement.

Thus, response to sanitation systems that imply a movement during defecation and a change in the traditional practices will depend on the local religious context rather than on the initial religious text (Mazeau 2009). Thus it is not given that the results found in this study will be confirmed if the study is conducted in other villages. Again it seems that the relative acceptance of UDDT practises is influenced by religious opinions.

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[4] UDDT requires a separation of liquids and excreta during the defecation. To achieve this, the user need to advance himself on the pan. Defecation is done in a first hole. Urination and anal cleansing has to be done in the next hole. A movement is then needed.
5 In the case that urine would also have been reused, a third collection system would have been needed to separate water and urine. This would have required higher cost, more awareness and the development of practices reusing urine.

It was also difficult to make an accurate analysis of the link between reuse of excreta and religion due to the early stage of the project. People haven't experienced emptying the vault and were not able to imagine how it will be.

4.2. Gender and UDDT

Main results from the fieldwork indicate that UDDT's provide a new level of comfort, safety and privacy to the women. However, the discussion with the women's focus group and interviews with key informants showed how UDDT can potentially reduce the opportunity for women to use the new facilities when compared to the benefits for men[6].

In charge of maintenance

Women are in charge of the hygiene education for their children and also in charge of their hygiene. Access to toilets for the smaller children is an issue for their mothers. Nappies for small babies are disposed and washed in the open area and infants are not encouraged to use UDDT. Some mothers are thinking that their children will dirty or not respect the system and then prefer that their children use the old toilet.
Observation showed that in many houses the old pit or ring slab latrine is kept despite what the household said. If family said that they didn't close it due to lack of time or money, observation showed also that the use is sometimes recent. If only few households explained that small children are using old toilet, this practice might be more generalised. If households have more than one toilet on use, it also means more work for the woman who is in charge of keeping the compound clean including the toilets.

Influence of *Purdah*[7]

During the questionnaire, one man explained that the women in his household were using the old toilets when he was using the ecological toilet with his son. For him, women cannot use the new toilet because they are built in an open area and in front of his house. Traditionally, toilets should be built in the back yard of the compound. The man explained that "according to the *Purdah*, women cannot be seen without veil outside of the house".
The *Purdah* or *Parda* system draws spatial and temporal boundaries to the activities of the woman. If the woman doesn't respect these culturally known boundaries the honour of her family but also her family in law and the honour of the village will be endangered (Rozario 2003). Due to *Purdah*, "women require a high degree of privacy

[6] During discussions in a mixed focus group, a man identified easier maintenance as a positive aspect of UDDT. He showed his satisfaction explaining that this task will be easier for his wife. Cleaning the toilet seems to be clearly identified as a female task in most cases.

[7] Purdah is not considered only as a gender issue, it includes some cultural, social and religious aspects. The most important academic source used in this study on this topic can be found in Rozario 2003.

especially when it comes to use public facilities like water points or toilets" (IRC 2008).

Therefore some women cannot use the new toilets if they are located in front of the house close to the road. Some of the UDDTs built in the studied areas were not located at the back of the house due to some technical prerequisites:

- The back side of the vault of the UDDT had to face south to improve the dehydration of faeces
- UDDT should be built in an unshaded area for similar reason
- When it is possible, UDDT should be built at the highest point of the compound

Locating the UDDT in front of the house to suit technical requirements has created an involuntary discrimination within the family[8]. At the very least, this risk of discrimination could be pointed out in one household. Fieldwork hasn't been long enough to be able to extrapolate or reject this risk to other houses but as said before, for some population, it's very important to have the toilets well hidden. In consequences, we can suspect that the location could have an influence on the use of latrines and that it is one of the factors guaranteeing its sustainable use by all.

A hypothesis of *Purdah* acting as a barrier for an access to safer sanitation was supported by data showing that traditionally in some village men and women are not sharing the same toilet. Men can then decide to have access to the newest and safest toilets. Key informants in Dhaka made it clear that not sharing toilet practises are limited, localised, and are on decline in Bangladesh. However if it is admitted that the cultural patterns in any society evolve with time (Harstad et al. 2005).

Menstruation

Difficulty to dry menstrual clothes, the taboo that it represents in certain villages of Bangladesh and the hygienic problem that it could represent for women, (Ahmed & Yesmin 2008), make menstruation a necessary part of the study. Unfortunately, this aspect hasn't been directly investigated in the field and further work would be required. According to Hasin Jahan in Dhaka, menstruation can justify why some women would prefer to continue to use a separate toilet where it will be easier for them to dry their menstrual clothes out of the man's eyes. This aspect can also explain why in another family the men are not often using the UDDT and use a pit latrine.

Emptying the vault

[8] Similar consequences appeared in a water supply project in Bangladesh. Women were under using arsenic-free tubewells because they were located outside the women compounds and the "religious conventions prohibit women from leaving the Homestead" (EAWAG 2009: 45). Following the earthquake in Pakistan in 2005, some agencies understood the important link existing between *Purdah* and sanitation. Wearing a *burqa* is the first barrier for women when they have to use sanitation facilities (UNHCR 2008). OXFAM built screened latrines and toilet blocks in camps to prevent visual contact between men and women (Nawaz et al. 2006).

Women expressed mostly positive comments about UDDT, an issue particularly difficult to appraise. When it came to know who will empty the chambers after one year of dehydration process, focus group and individuals showed a difficulty to project themselves in the future. Women were divided in this topic. Based on the potential economic value some were willing to do it, but most of them explained that this task will be fulfilled by the husband. If the household has money, a sweeper will be hired. Some other issues suppose that vault will be emptied by a member of the household. Some women clearly stated that they will never do it because of the mental barriers.
This is in contrast to Hannan and Andersson (2002) who suggest that where ecological sanitation is promoted as a gender opportunity, woman will reuse the dried excreta to use compost, and urine for fertiliser and take financial benefit from it.
If any benefit is made in the future through the reuse of excreta and urine, nothing guarantees at this stage that this benefit will be equally shared in the household. Data will need to be collected in the future to assess the gender aspect of cleaning the vault and use of the compost. If women have the opportunity to make economical profit through the crops grown with compost, it might reduce their vulnerability[9].

4.3. Social structure and UDDT

A majority of the households interviewed and visited seemed to use the UDDT. In most of the cases and based on the discussions with the beneficiaries, the full family is using the facility and few people admitted encountering difficulties. Focus groups and the different interviews in the villages showed that the real picture is more difficult to draw. The context of the study where social structures[10] play an important role is a key explanation.

Change of practice

Influenced by traditional practices, two main religions, the patriarchal administration of the family (Rozario 2003), the introduction of a new technology should consider the presumed difficulty of changing habits. Based on other examples such as the development of biogas plant (Rahman 2009), it seems that rural populations in Bangladesh are willing to try new technology. But if the maintenance and training are not insured or if the benefits are not properly understood the practices will not be durable and might also be unhygienic. Peasey (2000) emphasizes this aspect by noticing the sensitivity of dry toilets to misuse, and warning about the health hazards of this misuse.

[9] This aspect should be investigated in further studies.

[10] In this report, the social structures is the social environment that affect actions and thinking of an individual. Social structures can be defined as follow: Social structures consist of all those relatively stable features of a social system which an acting unit would be prudent to take into account if it wishes to make rational decisions in interacting with others" (Kuper & Kuper 1985:787).

The decision of changing practices will also depend on other factors such as the technical possibilities offered in a particular area. This field work shows that even if UDDT is not the best option for the local population they announce that they like it because it is the only satisfactory alternative that they can get. This is supported by Calvert (2003) who thinks that the first interest of people for ecological sanitation is the sanitation itself. In the singularity of a post emergency context with a high density of agencies offering different kinds of support, populations are probably ready to accept any facilities even if they should forget some of their social or cultural codes. But, there is a high chance that the same population will come back to its traditional practices learned. To overcome the barriers to change, Curtis (2001) explains that giving choice to the population is a key factor. In the present study, the technology implemented is dependent on the physical parameters and opinions of populations are not considered at first. To balance this fact, Curtis also highlights the importance of motivational factors. Developing these factors will be essential for long-term acceptance. This motivation can be the reduction of burden and health hazards. Economic benefits from compost might appear as a new motivation in the future.

Handling excreta

Apart from one or two publications[11], little information is available concerning the potentiality or handling and reusing excreta and urine in Bangladesh. Key informants in this study admit that little work have been done on the topic. Common belief in Europe but also in Bangladesh is that due to their religious culture, the bangladeshi population cannot reuse excreta and urine in agriculture. The concept of "faecophobic culture[12]" seems to exclude the possibility of a reuse of excreta in Bangladesh. However Sudgen (2003) noticed many preconceived ideas people can have about the perception of other culture's sanitation.
During the focus groups and interview people explained that traditionally some families are reusing sludge from pit to grow most often tree and in some cases vegetable. Farmers appear more familiar to this reuse than fishermen and other socio professional household. The eventual problem of reusing excreta never appeared as a main issue during discussion. However it is difficult to know if it is because the problem is minor or because this topic represents such a taboo that it cannot be evocated.

Observing the actual reuse of dried excreta from the UDDT as a fertiliser in the villages was not possible due to the timing of the study; therefore discussion on future practices but also on traditional reuse of sludge from pit and ring slab latrine gave information about this key topic. This is considered a key topic because the

11 Hiroto et al. in 2006 present in a journal paper the UDDT project managed by BARD in Comilla. Quazi and Islam in 2008 investigate the reuse of human excreta in Bangladesh.

12 In many societies, excreta are a taboo (WSSCC 1994:3) and associated to the idea of disgust (Curtis & Biran 2001). But this connection between excreta and disgust and taboo is not uniform. Some authors argue that how excreta are perceived depends on the culture. A continuum from "faecophilic cultures to faecophobic cultures" is suggested (Warner 2000b:11, Manandhar et al. 2004:113). In some countries like in China human excreta are valuable whereas in the Hindu culture for example the concept of "clean and unclean" excludes handling of excreta for a large part of the population (Wimblad & Simpson-Hébert 2004). As a large number of cultures are somewhere in between this continuum, a properly managed ecological sanitation system should work in many places (Manandhar et al. 2004).

ability and the motivation to reuse the excreta will condition the potential for future economical benefits obtained from the toilets as defended by Dr Chowdury (2009). However, many studies conclude that social marketing could be a better guarantee of acceptance than economical benefits (Holden et al. 2003: 174).
Focus group participants had difficulties to express how they will manage the excreta from the UDDT's vault when it will be full and dried. The first explanation is that the training sessions are ongoing and the level of specific knowledge necessary to understand the hygienic and economic challenges of the compost haven't been fully transmitted. The other reason is that people think with the only point of reference they know, their old toilet. The sweeper himself who had to empty some flooded vaults during the Aila storm used the same procedure and asked the same price as for a ring slab toilet.
The safe aspect of handling dried excreta is not understood by a large part of the beneficiaries. Therefore they often said that they will hire a sweeper to clean the UDDT if they have the money. A justification of this could also be linked to the status. Even if the caste system is not clearly present in these villages, this work remains qualified as impure and is dedicated to a certain group of the population (IIDS 2008).

Individual and social pressure

The resistance to change and the reluctance to handle excreta seems to be linked more or less to different socio-cultural factors such as tradition, caste, and religion, and are expressed differently in the different groups of the population.
Sanitation remains a taboo (Jahan 2009), even if the population gave the impression of talking openly during the fieldwork, but the biases made by the translator should then be considered.
UDDT owners gain somehow new status, which can cause some misunderstandings. Informal discussions in the market area for instance show that people were considering UDDT as a good toilet or at least as a good construction. In opposition to the study of Nawab et al. (2006). They didn't associate it to a symbol of low status. The quality of the construction might explain this different result as underlined by Wimblad (2002).
If a beneficiary's family understood the hygienic aspect of the UDDT, and the environmental and economic interest, they will probably be willing to ensure the maintenance of their toilet. But only a small part of the village will be aware of these aspects and benefits. Neighbours are often not included in the awareness sessions. Misunderstanding on the practices can be developed, which can lead to misuse of the toilet from visitors not only from the outside, but also the village (neighbours). These are assumptions that cannot be confirmed or disconfirmed at the moment, however a risk of social conflict do seem to exist when a facility is offered to only a part of the community (Jahan 2009). Some studies indicate that the acceptance of a sanitation system cannot be done only at an individual level, community must also be included (Simpson-Hébert 1983).

Socio-economical factor

The study didn't focus especially on the socio-economical factor of UDDT but cannot ignore its importance. Different key informants referred to the role played by economic aspects in the motivation process for reusing excreta and urine. Reluctant people yesterday might be less uncomfortable by the idea of reusing excreta and urine tomorrow when they will understand the potential economic value of it. Economic benefit seems to be an important drive for change and for reusing excreta and urine in Bangladesh; this is supported by the experience of Dr Chowdury, and also put forward by the key informants in Dhaka. Observations in Padma and Rohita indicated that people don't understand fully the benefits of the UDDT. After some damaged caused by the storm Aila, the beneficiaries were apparently not willing to pay for the replacement of some ventilation pipes for instance. Globally, the study didn't investigate these aspects in details because the project is not old enough to observe and assess the use of compost and the different directions of the project.

4.4. Summarising the socio-cultural barriers and their influences

Table 5 summarizes the main socio cultural barriers identified during the fieldwork. For each technical aspects of the UDDT, different social barriers may appear. This table might be used as a check list but also a base to build adequate responses in similar projects. Responses can be technical or based on awareness campaigns. The table is built on subjective perceptions as justified by Schouw and Tjell (2003). However the perceptions are built on field work findings and on knowledge transmitted by the literature review.

By selecting the most relevant points of the table 5, it is possible to develop a succession of questions that will be able to support the agencies willing to implement similar projects in similar areas. This succession of questions presented in the figure 4 allows managers to assess the importance of some specific aspects directly linked to socio-cultural aspects and to assess the probable sustainability of a project.

	Location of UDDT	Using UDDT	Emptying the pit / Reusing excreta
Technical prerequisite of system	Backside of toilets exposed to sunrays and dominant winds	Separation at source excreta and liquid	12 months of drying before using as a fertiliser
Religion	Essential aspect for the orientation of the pan.	The separation at source and the movement that it requires don't seem to stop people from using UDT.	Informants explain that no religious text reject this practices. Some cleaning rules have to be observed after handling.
Gender / Kinship	Visual protection must be considered.	Menstrual clothes are unlikely to be dried in the UDT Small children who cannot easily use UDT encourage the mother to use another sanitation facility.	Focus groups show that this activity will mostly be done by men.
Social psychology	Interviews show that toilets are traditionally built in the back side of the house (relation with habits)	Key informants recognize the difficulty of changing durably habits .	Taboo of talking about excreta Link between sweeping and caste system will play a role.

Table 5: Potential significance of social factors on technical aspects
Source: Mazeau (2009)

This figure 4 is built following the analysis based on the findings from the field work and it is the result of a personal interpretation of these findings.
The different socio cultural aspects have been assessed focusing on the specificities of some groups of the population. Results from the field work showed that some groups encounter difficulties or barriers for using the UDDT. Some socio cultural aspects concern all the population, such as the orientation of the pan when some other issues concern the specific groups such as children or women. Another aspect of the figure 4 is the link between the socio cultural considerations and the sustainability of the UDDT. Aspects concerning the biggest part of population were put in first positions.

This study has focused on aspects that can be similar in other areas of Bangladesh or eventually in other areas of South-Asia. This table must be used with caution in other contexts. Hopefully, the understanding of the traditional perception of sanitation, the influence of religion and the gender aspects will allow the reader to adapt this table to their own situation. This adaptation can be done by changing the priority of the questions or adding or removing some non adapted questions.

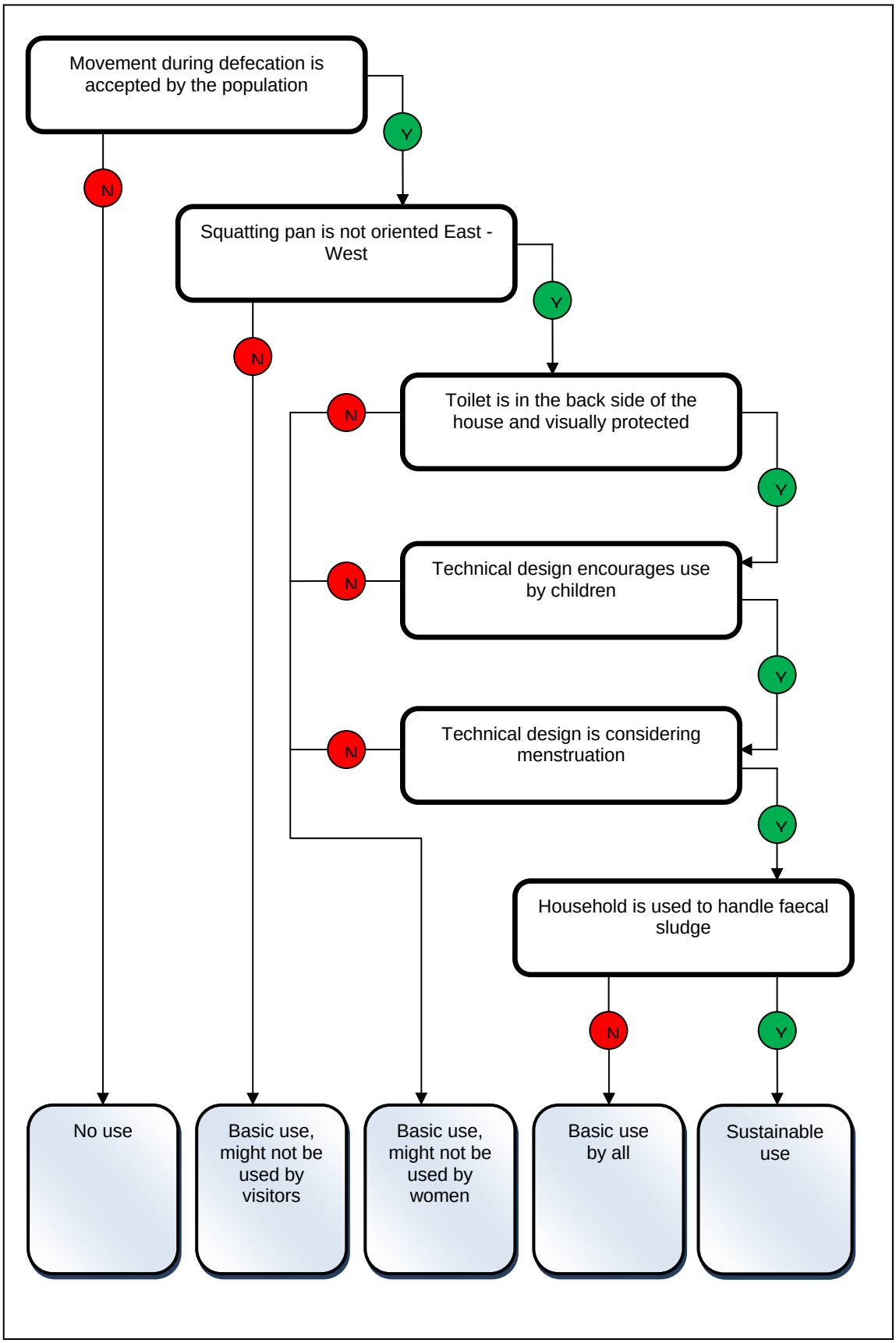

Figure 4 Conceptual model to assess the significance of socio-cultural parameters for UDDT implementation. *Source: Mazeau (2009)*

5. ANALYSING UDDT IMPLEMENTATION IN A POST EMERGENCY CONTEXT

Before being an answer to an emergency situation, UDDT is considered as a potential valid solution for sanitation in flood prone area (Sijbesma 2008).

5.1. Potentialities of UDDT

The storm Aila which occurred in May 2009 was a good indicator of the need to develop UDDT in the area. Observation of 21 toilets after this storm show that 80% of them where not presenting any smells. In four cases, flies were observed around the doors of the vaults. The doors were damaged by the heavy winds. Following this storm, some new doors are being designed to reduce these impacts. However most of the UDDT were usable after the Aila event, which was not the case for most of the traditional latrines.

It is interesting to note that using ecological sanitation, including UDDT, in emergencies is a practice under development. If for many years, international relief agencies were building simple pit latrines; recently, some stakeholders noticing the environmental weaknesses of those forms of sanitation launched a similar project (Munch et al. 2006). The development of ecological sanitation in developing countries in a stable context makes this group of technologies of potential interest for use in emergencies. However certain aspects threaten this environmental approach, particularly focusing on a Bangladeshi context.

5.2. Threats for long term appropriation of UDDT

Although most of the households are using the new facility, it seems that not all the members of the households are using the UDDT. Some parents preferred their smaller children to use other form of sanitation as they are not sure that they will respect the system. Households also often discourage the guest to use the toilet as they may spoil the composting system due to lack of knowledge on its use. More awareness and demonstration are needed to show how to make the use of UDDT universal.
The households who benefited from the UDDT represented less than 10 % of the total population of the village. Some beneficiaries noted that the effort they are making to protect their environment will have little benefit, because not all members of the community participate. Then promoting ecological sanitation only through environmental benefits might not be a sufficient drive for change for the local population.
Actually in Bangladesh, the agency develops awareness on the importance of the economic benefits made by the reuse of the dried excreta as compost. Dr Chowdhury, the joint director of the Bangladesh Academy for Rural Development, explained the importance of a close and constant follow-up and support of the beneficiaries. Because the economic benefits of ecological sanitation cannot be seen for two or three years, constant support is needed to maintain the level of

motivation. When introducing ecological sanitation to a new area, trial periods need to be set up to ensure that the system is adopted by the population (Holden et al. 2003). This follow-up will also ensure that the reuse of excreta, done informally before by certain household, will be achieved in a more hygienic way.
In a context of emergency, the reuse of excreta is not often perceived as a priority by the planners. However according to the observations and discussions on the field, the economic potential of this reuse appears as the main guaranty for a sustainable use. This include daily maintenance and safe disposal. Therefore planners should ensure that the beneficiaries will receive appropriate support during the first two to three years. This support can be done by developing partnerships with local agencies or government involved in the health or agriculture sector.

6. RECOMMENDATIONS

The analyses of the three socio-cultural aspects – Islam, gender and social psychology – shows us that they can have an influence on the use of UDDT and allows us to make a few recommendations for further implementations. The recommendations we make are valid for the region we have worked in and could be extrapolated but with cautions and taking into considerations the specific characteristics of the region and culture of the concerned region. We would like also to mention that this study does not pretend to give exhaustive results. Further investigations are really worth to be done.

6.1. The case of the Pathargatha area

Stress on the campaign: in the specific Pathatghata aera

Awareness campaigns should target at first the younger generation because young people are good vectors of information. Secondly women could also play an important role as they are involved in all daily tasks relating to hygiene and sanitation. But the place of men in the awareness programme should be reconsidered, too because they are users of the facility and they have important decision making power within the household.

Awareness campaigns and different strategies of communication shouldn't target only the beneficiaries. Benefits of dry toilets should impact in a wide environment. Other members of the community should be aware of the ecological and health benefits provided by urine diversion toilets without feeling obliged to own the system themselves. Promotion to the wider public can be done using newspapers or information boards in the villages.

In some cases, people are using the UDDT but also their previous sanitation system. In order to meet the environmental and health objectives, a campaign encouraging household to close their old system should be carried on. This campaign should be done on volunteer basis and after a good understanding of each household's situation.

In a context such as the one investigated in coastal Bangladesh, having a vision of sanitation through the vision of the community is not enough. Technical design and implementation of the UDDT should be the results of a discussion between the technician and the different members of the household. One household should not be considered as a single unit but as a sum of individual members of that household in order to understand the preferences of all. It is at this stage necessary to remind that assessment and awareness campaign should be conducted by team comprised of men and women.
Moreover, this study gives information about a specific context at a specific time. In order to provide a wider picture of the socio-cultural barriers in an ecological sanitation project, several studies need to be carried out. Future research with similar objectives should consider adapting the methodology used for this study. Spending a longer time in the field will improve the understanding of socio-cultural

aspects. Working with one male and one female translator will also improve this understanding.

This study also shows the challenges of providing sanitation facilities in an emergency situation with a specific physical context. Investigation into the factors affecting decisions on which forms of sanitation might suit both the socio-cultural traditions and the physical context would be of help for agencies intervening in post emergency settings. Such a study should include the financial and logistic aspects. For further implementation, we can make the following recommendation:

6.2. All over the world:

Each region should have a specific campaign:

The quality of the campaign informing the direct and indirect beneficiaries is a key to the success of the implementation of the project. It's very important to make each beneficiary conscious of the advantages, but also about the disadvantages of the latrines which are to be installed at their home. Taken this into consideration and in the case we would like to implement projects in other areas in the world, here a some recommendations.

Everybody is an actor:

The specific context as the main key of success

The sustainable use of ecological sanitation requires greater motivation than for other systems. The best way to obtain this **motivation** is to demonstrate some benefits that other forms of sanitation don't have. Depending on the local context and on the stage of the project, economic benefits from the compost shouldn't be always the main motivational factors. In the case of Padma and Rohita, partnerships should be developed with experienced professionals in Bangladesh. BARD has developed training for users and for farmers. Video from the experiences in Comilla (BARD) can be shown to the Tdh beneficiaries. Viewing the results of UDDT after four years of use will demonstrate the sustainability of this sanitation and also the interest of compost.

The individual motivation and comfort

Other motivational drivers such as status, comfort, privacy but also environmental concerns can support development of new technology. Motivations from the agency implementing the **project** and from the beneficiaries using the toilets are not exactly the same. Therefore Tdh should also build its awareness campaign on the positive aspects perceived by the users. Comfort and privacy are important drivers for sanitation in general and for ecological sanitation in particular, mostly amongst the women.

The role of the community's participation

At different stages of the project, religious leaders, teachers but also sweepers have to be involved. Sweepers, due to their status are still not consulted enough. However, they are often the only ones having a real knowledge of the potential for reuse of excreta and of the perception of excreta by the population. Religious leader and teachers play a double role. They can first advice technicians or social workers about decisions that will fit the specifics of the local context. At the same time, they have a role of communication between the agency implementing and the beneficiaries.

Finally, we can say there that before attempting to introduce a new technology in a specific context, studies need to be carried out investigating the socio-cultural aspects. Support of social sciences is suggested. However, there are financial and also contextual limits to this recommendation. In an emergency situation, the time available and the post disaster trauma might mean that it is not appropriate to implement social analysis aimed at introducing a new sanitation system.
Exchange of experience with NGO implementing UDDT in emergencies such as OXFAM or ACF can reinforce the knowledge of humanitarian actors on how to introduce and follow-up the implementation of this form of sanitation.

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APPENDIXES :

Appendix A: Fieldwork planning

	Activities	Location	Details
Tue 26 May	**Meeting on ecosanitation**	Dhaka	BASA / WAB
Wed 27 May	**Visit BASA ecosanitation projects**	Gazipur	BASA
Thu 28 May	**Visit BARD ecosanitation project**	Comilla	BARD
Fri 29 May	**Interview BARD Manager**	Comilla	BARD /BASA
Sat 30 May	**Interview Tdh director of programme**	Dhaka	
Sun 31 May	**Travel Dhaka - Patharghata**		
Mon 01 June	**Visit village**	Rohita	
Tue 02 June	**Visit village**	Padma	
Wed 03 June	**Water testing for Pond Sand Filter**	Rohita	Delagua kit
Thu 04 June	**Preparation questionnaire**	Patharghata	
Fri 05 June	**Off**		
Sat 06 June	**Administration face to face questionnaires**	Padma	6 hh
Sun 07 June	**Office work**	Patharghata	
Mon 08 June	**Off**		
Tue 09 June	**Administration face to face questionnaires**	Padma	10 hh
Wed 10 June	**Administration face to face questionnaires**	Padma	12 hh
Thu 11 June	**Transcription 28 questionnaires**	Office	
Fri 12 June	**Travel Patharghata – Dhaka**		
Sat 13 June	**First debriefing**	Dhaka	TDH
Sun 14 June	**National Workshop on Ecosanitation**	Dhaka	
Mon 15 June	**Reporting, discussion with supervisor**	Dhaka	
Tue 16 June	**Travel Dhaka – Patharghata**		
Wed 17 June	**Preparation focus group**	Patharghata	
Thu 18 June	**Field visit, general work progress**	Rohita	
Fri 19 June	**Off**		
Sat 20 June	**Preparation focus group**	Patharghata	
Sun 21 June	**Focus group discussion**	Padma	
Mon 22 June	**Focus group discussion**	Padma	
Tue 23 June	**Focus group discussion**	Padma	
Wed 24 June	**Focus group discussion + Interviews**	Padma	
Thu 25 June	**Focus group discussion + Interviews**	Rohita	
Fri 26 June	**Transcription interviews**	Patharghata	
Sat 27 June	**Interview Ngo Staff**	Padma	
Sun 28 June	**Feed back to Padma village**	Padma	
Mon 29 June	**Travel Patharghata –Dhaka**		
Tue 30 June	**Transcription interviews**	Dhaka	
Wed 01 July	**Interview WAB director of programmeme**	Dhaka	WaterAid
Thu 02 July	**Sorting out findings**	Dhaka	
Fri 03 July	**Off**		
Sat 04 July	**Preparation interview and feedback**	Dhaka	
Sun 05 July	**Interview director ITN-BUET**	Dhaka	BUET
Mon 06 July	**Feed back to INGO**	Dhaka	TDH

Appendix B: Guide for observations and questions

Reference	Code							
	Village			Padma	Rohita			
	Area							
	Beneficiaries N*							
	Hh name							
	Date							
	Time							
	Intervied			Hh	Man	Women	Child	
Questions	Q1	What is the main activity of the household?		Fisherm	Agr/Farm	Manpow		no answer
	Q2	How many members in the household?		A= 2	B= 1, 1	C= 3, 3	D= >3	no answer
	Q3	How many children in the household?		A= 0	B= 1, 2	C= 3, 4	D= >4	no answer
	Q4	Which religion are you practising?		Muslim	Hindu			no answer
	Q5	Do you have any responsibilities in the community?		No	Social	Pol	Rel	no answer
	Q6	Do you have land for gardening / crop?	decimal	No	Small <2	Med <4	Lar>4	no answer
	Q7	Are you reading books or newspaper ? (1member in hh)		No	Yes			no answer
	Q8	Are you satisfied with the house provided?	Bef. Ayla	No	Yes			no answer
	Q9	Which water are you using for drinking? *(Ranking)*	Bef. Ayla	Pond	WPSF	Rain	Sea River	no answer
	Q10	Which water are you using for bathing? *(Ranking)*	Bef. Ayla	Pond	WPSF	Rain	Sea River	no answer
	Q11	Which water are you using after going to latrine? *(Rankin*	Bef. Ayla	Pond	WPSF	Rain	Sea River	no answer
	Q12	Where are you practising defecation? *(Ranking)*	Bef. Ayla	Open	Pit	Flush	Ecosan	no answer
	Q13	What is your favorite latrine? (Ranking pictures)	Bef. Ayla	Open	Pit	Flush	Ecosan	no answer
	Q14	Is it difficult for you to use ecosan?	If ecosan	Yes	No			no answer
	Q15	Is it easy for your children to use ecosan?	If ecosan	Yes	No			no answer
	Q16	Who in your family is using ecosan?	If ecosan	All	Parents	Old out	None	no answer
	Q17	Are you using ashes after defecation?	If ecosan	Yes	No			no answer
	Q18	What can we do to improve ecosan toilet?	If ecosan	Open				no answer
Observation	O 19	Is there evidence of using of toilets?		Yes	No			
	O 20	Is the latrine in working order?		Yes	No			
	O 21	Is there a pot for ashes in the latrine?		Yes	No			
	O 22	Is there a soap in the latrine?		Yes	No			
	O 23	Is there an unpleasant smell?		Yes	No			
	O 24	Is there flies around the latrine?		Yes	No			
	O 25	Are vault doors properly closed?		Yes	No			
	O 26	Are vault doors damaged?		Yes	No			
	O 27	Pictures numbers						
	O 28	Comment from staff						
	O 29	Comment from research						

Appendix C: List of interviews and focus group

	Characteristic of the group	Number participants	Date	Location	Length
A	Households beneficiaries (mixed)	3 women 3 men	21/06	North Padma	35 min
B	Women beneficiaries	9 women	22/06	Bossogran Padma	50 min
C	Men beneficiaries	6 men	22/06	Bossogram Padma	40 min
D	Women beneficiaries	8 women	23/06	Bossogram Padma	40 min
E	Women future beneficiaries	6 women	25/06	Rohita	40 min
F	Primary school girls (9 years average)	5 girls	25/06	Central Padma	10 min

	Key informant in the field	Date	Location	Length
G	*Madrasa* teacher	24/06	Central Padma	15 min
H	Assistant teacher	25/06	Padma primary school	20 min
I	Local sweeper	24/06	Padma	20 min
J	Mason of UDDT	27/06	Patharghata	10 min
K	Technician NGO	27/06	Patharghata	20 min
L	One beneficiary woman	24/06	Padma Bazaar	15 min
M	One beneficiary woman	25/06	East Padma	15 min

	Key informant in Dhaka	Date	Location	Length
N	Dr Masudul Hoq Chowdhury BARD Joint Director and Team Leader	29/05	Comilla	30 min
O	Hasin Jahan Water Aid Bangladesh Programmeme director	01/07	Dhaka	45 min
P	Habibur Rahman BUET Professor of Civil/Environmental Engineering	05/07	Dhaka	55 min