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'Factors affecting slum sanitation projects in Dhaka City: learning from the dynamics of social-technological-governance systems'

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Introduction

> *"What's your problem? I will do whatever I like. This is not your private property and not your father's land. Mind your own business and don't stick your nose into my personal matters".*
>
> - (Field Survey, October 11, 2009; Gulshan City Colony, Mirpur, Dhaka).

This is a common type of vocalization that can be heard frequently during verbal clashes between residents in low-income urban settlements. During our field observation in one of the study areas, we heard this offensive language when a woman was collecting drinking water and another was washing clothes. Due to dirty water splashing, the first asked the second to stop washing for a while but received back a volley of offensive language that ended in a confrontation. Such clashes in the slums are part of the cultural landscape and often originate in a difficult physical, societal and neighbourhood environment. The quotation is an example of existing 'social-technological-governance' (STG) systems in the slums, where a lack of social cohesion (Bajracharya et al 2013), inadequate and/or unsystematic technological options, and mismanagement and/or lack of guidance/regulation of using such water and sanitation (WatSan) facilities were observed including that unpleasant incident. In this paper, the STG systems are used as three familiar concepts of 'society', 'technology' and 'governance' and we will try to analyze these three concepts separately to see how the local contexts (i.e. society, technology and governance) are affecting sanitation projects in Dhaka's slums.

The Bangladeshi capital, Dhaka, is the world's fastest growing primate city, having nearly 15 million people, approximately 6 million of whom live in slum areas (Royal 2011). The Centre for Urban Studies has identified about 5000 slums and squatter settlements in Dhaka (Figure 1) scattered throughout the city (Podymow et al c2006; World Bank 2008). Their high

population density and growth rates, coupled with inadequate and inappropriate water and sanitation facilities, are matched by deteriorating social, economic and environmental conditions including water, land and air pollution. Because complex social dynamics, together with inappropriate or inadequate facilities, and an inefficient governance system, obstruct the pace of WatSan interventions it is very difficult to identify the factors affecting WatSan projects, as the WatSan service providers tend to implement slum development projects in a piecemeal way (Asthana 1998; Sandhu 1998). The situation is exacerbated by insecurity of tenure where people have no legal right to the land and are under a cloud of possible future eviction. This land-tenure issue creates many visible barriers in WatSan projects. For instance, there are fears about investment, insecure residential identity, demotivation for participation, the absence of self-help initiatives, and even impacts on the culture and design of living (Rahman 2012). This is the foremost, universally known (WaterAid 2001), and influential barrier obstructing WatSan development pathways in Dhaka. Notably, the aspirations of slum dwellers in enabling a sound STG system in their neighbourhood are not sustained and the poor lack the encouragement to improve their living conditions and achieve a sense of security (Baharoglu 2002). The slum dwellers themselves allege that their temporary residential status destabilizes their place in society, including their group characteristics, power and gender relations, cultural practices, sentiments, needs and desires. In this regard, Movik (2011) argues that social factors in slum neighbourhoods inevitably influence sanitation technology choices. Governance is also a challenge in these settlements since the origin and the practices of the people are heterogeneous.

It could be argued from our study areas that inadequate WatSan facilities are one of the major causes of unhygienic practices. Some argue that the slum dwellers tend to become fatalistic (Das 2003; Patwary 2010) and that being members of a polarized society they lose aspirations for better living conditions (Ray, 2006). On the other hand, WatSan-related service providers also know about their limitations and insufficient activity in this sector. However, our objective is not to apportion blame. Instead, we will explore the factors that facilitate or hinder sanitation interventions. We will attempt to identify these factors by comparing the dynamics of STG systems in government-managed (GO) and NGO-managed projects. Mehta et al (2007) argue that while improving WatSan systems involves rapidly-changing social, technical and ecological processes, governance is the key to dealing with these challenges. Our paper will

explore the elements of a STG system that are interrelated and/or influence each other and we argue that a single input mechanism would not be appropriate for the sustainability of WatSan projects. Sustainability is not only determined by project inputs but can be accelerated through establishing strong STG systems throughout the community. The paper will present some of the key dimensions of 'society', 'technology' and 'governance' that impact upon sanitation projects.

Study Area and Methodology

In Dhaka, nearly 40 percent of the city's population live in informal settlements that occupy only 5.1 percent of the city's total land (CUS, NIPORT & Measure Evaluation 2006). Academic research reveals that the slums are located in unattractive, environmentally sensitive, dangerous and unstable places (Hardoy and Satterthwaite 1995; Das 2003, Davis 2006) that have become poverty niches in the ecology of the city. Only 25% of the population of Dhaka is served by a sewer network (Barkat et al 2011) and the slums are not connected with that system. Instead they have adopted different on-site options like pit latrines, septic systems, shared communal latrines, informal drainage and small-bore/simplified sewers that in total amount to only 8.5% sanitation coverage in the slums (MICS 2010).

The research looked at four slums, all built on vacant government land. Despite getting GO-NGO support, they represent deprived segments of society and the government is continuously facing serious challenges to address this situation (Barkat et al 2011). Two slums were selected in each of two categories: those with government interventions, and those with NGO interventions. The focus was on Dhaka City Corporation (DCC) as the government organization and Dushtha Shasthya Kendra (DSK) as the NGO. Gulshan City Colony (GCC) and Mohammadpur City Colony (MCC) were the GO-managed slums, where 3rd and 4th class[1] government employees live. Begun-Tila (BT) and Bagan-Bari (BB) represented the NGO-managed slums, situated in fringe locations around Dhaka City. Among the successes are MCC and BT, whereas GCC and BB are less successful. Initially the degree of success was

[1] Government employees in Bangladesh are categorised hierarchically. 3rd and 4th Class government employees are support personnel such as drivers, chefs, messengers, sweepers and cleaners.

conceptualised according to the length of the successful operation of sanitation infrastructures, with three years of continuous use being suggested as a key threshold by representatives of local benefactor organizations. However, some factors are common amongst the studied slums. The threat of eviction, the existence of a community-based organization (CBO), inadequate water and sanitation provision, high population density, complex power relations and filthy neighbourhood surroundings are the main similarities, whereas occupational status, infrastructure management, governance system and, most importantly, the project strategy of those slums, are different (Table 1). GO-managed slums are built as part of government's relocation scheme and have a readymade infrastructure support but NGO-managed slums originally emerged when vacant government land was occupied; they have not received any readymade infrastructure either from the GOs or NGOs. It is important to mention here that GO-managed projects tend to use a 'top-down' and 'supply driven strategy', while a 'participatory' and 'bottom-up' intervention strategy was adopted in the selected NGO-managed slums. The latter is often claimed to be more effective because it is people-orientated (Seraj and Sadeque 2005).

Over the last two decades in Bangladesh, a good number of WatSan studies have been undertaken by various donors and government agencies (LGD 2005). Methodologically these studies were exploratory and mostly based on representative samples of the population and on secondary data but they have been unable to offer sustainable solutions due to a lack of relevant information of the right quality. In the present paper we will hear the voices of both benefactors and beneficiaries as well as other actors in the WatSan field to identify the forces that shape and disrupt sanitation interventions. The focus will be on qualitative methodologies and a bottom-up analytical framework to uncover the key issues. An attempt will be made to compare and analyze the vibrant dynamics in GO and NGO-managed slums. Qualitative methodologies such as participant observation, informal discussions, in-depth interviews and focus-group discussions have been used to obtain 'first hand' qualitative data from the study areas. Besides, in-depth interviewing was used to obtain data from the GO-NGO sources.

Table 1: Existing social, technological, governance systems and other characteristics of the study areas

Issues of description	Government managed slum		NGO managed slum	
	Gulshan city colony	Mohammadpur city colony	Bagan Bari	Begun Tila
Year of establishment	2005	2006	1980	1999
Population	2500	750	2200	3500
Average household size	5 persons	5 persons	5 persons	6.5 persons
Number of dwelling	475 households	147 households	410 households	530 households
House type	Semi-*pucca*	Semi-*pucca*	Semi-*pucca & kutcha***	Semi-*pucca & kutcha*
Religion (majority)	Muslim	Muslim and Hindu	Muslim	Muslim
Ethnicity	Local	Local & *'Madrazi'* Indian	Local	Local
Occupation	Govt. 4th class employee	Govt. 4th class employee	Mixed	Mixed
House ownership type	Owners and tenants	Only owners	Owners and tenants	Owners and tenants
Political identity	Nationalist Party supporters	Awami League supporters	Mixed	Awami League supporters
Land tenure status	Govt. land & govt. recognized	Govt. land & govt. recognized	Govt. land & govt. recognized	Govt. land & govt. recognized
Locational factor	Flood affected	Flood affected	Low-lying area & flood affected	Flood free area
Service provider	Dhaka city corporation	Dhaka city corporation	DSK	DSK
Existing WatSan services	Latrine, water & bathroom	Latrine & water	Latrine & water	Latrine, water, waste bin & drainage
Commencement of service	2005	2006	2004	2005
Type of latrine provided	Communal cluster latrine (septic tank)	Communal cluster latrine	Communal cluster latrine; Household pit latrine; Communal pit latrine	Communal cluster latrine; Household pit latrine
Faecal sludge management	No	No	Vacuum Truck	Vacuum Truck
Source of water	Tubewell with water connection	Tubewell and community pump	Tubewell with water connection	Tubewell with water connection
Operation & management strategy	Lane-wise, shared	Shared, lock & key	Both shared and private	Shared, lock & key and private
Latrine-household ratio (for shared latrine only)	8 households/latrine	7 households/latrine	10 households/latrine	10 households/latrine
CBO	Yes	Yes	Yes	Yes
Project strategy	Supply driven	Supply driven	Cost recovery	Cost recovery
Eviction threat	Yes	Yes	Yes	Yes
Degree of project success	Less successful	Successful	Less successful	Successful

* A semi-*pucca* house is a structure of normal height and has walls made of bricks. The roof is made of any material other than cement and concrete.
** A *kutcha* house has a ceiling which is usually low height and is made of very cheap construction materials like straw, bamboo, *chhan* (grass), *golpata* (leaves), polythene sheets, old tins and gunny bags.

Social Dimensions and Sanitation

While talking about the social dimensions of urban slums, a pictogram appears in our mind about people's attitude, behaviour, the law and order situation, overpopulation, hunger and malnutrition, filthy neighbourhood environments, and so on. From the past, WatSan project experiences suggest that the presence of varied socio-political and cultural issues in the urban slum areas often obstruct project pathways. These complex social dynamics have often resulted from rapid migration from rural areas. In addition, many people are being priced out of legal land for housing (Hasan et al 2005) and are concentrating in deprived settlements where they have limited or no access to basic urban services. They do not have any alternative places to live and the desperate circumstances of their daily lives mean that WatSan services are not a top priority. One resident from BT emphasised this to us:

> *"We don't have food in our stomachs and you come here to talk about our shitting place. It sounds crazy and funny".*
>
> - (Field Survey, October 15, 2009; Begun Tila, Mirpur, Dhaka).

Their priority is to manage their next meal rather than a defecation place. As a result of poverty their working opportunities are limited and even their rights are not safeguarded. According to McFarlane (2008), "in the domain of citizenship, slum populations remain outside of the sphere of citizenship and rights and are living without any inherent moral claim on the state". Their residential status makes them vulnerable because government sees their settlements as illegal and this tenure insecurity shapes some of the social dimensions, often leading to user carelessness, non-responsiveness, and ignorance about the operation and maintenance (O/M) of WatSan infrastructures. Moreover, residents suffer from an 'identity crisis' since they are living under the threat of eviction and the poor see themselves as temporary settlers and are usually unwilling to invest money to improve their livelihoods. A representative of a local community based organization (CBO) from BT said:

> *"Simply, we can't solve WatSan-related problems by ourselves. We can try it if we get permission to live here permanently".*
>
> - (Field Survey, October 16, 2009; Begun Tila, Mirpur, Dhaka).

Another issue is to identify the ultra-poor in such settlements. Traditionally, some local *'mastaans'* or musclemen often take a leading role in controlling the social, economical, political and other dynamics. They sometimes build houses for rent and use the slums as 'money machines'. They ask GOs and NGOs to implement projects in their area so that they can get free infrastructure and create a situation where the rent can be increased. Besides, due to the presence of the musclemen and their activities, mainstream society considers slum areas to be crime zones, where the social atmosphere and urban setting are under threat given that they see slum dwellers as filthy and problematic people who should be out of sight of so-called civilized urban society. The built-up mainstream society around BT thinks that the appearance of slum residents in and around their locality may downgrade their own social status. They also think that:

> *"Durable latrine superstructure is a symbol of permanent residence".*
>
> - (Field Survey, October 16, 2009; Begun Tila, Mirpur, Dhaka).

This was a BT resident commenting unfavourably on his neighbours' understanding. To prevent such permanence, mainstream society creates obstacles by pressurising the slum dwellers socially, politically or through abusing the infrastructure physically. Divisive issue-wise groupings among the residents may also unsettle initiatives. Arguments amongst users are common, particularly with regard to the fair use of latrines and water points. Despite having these difficulties, the benefactor organizations set up and direct small CBOs to deal with local issues, and, as we observed, these are helpful in BB in minimizing problems. Akbar et al (2007) also found a community participation scenario in their research where the residents are mostly eager to ensure safety and security to the service providers for their project operation.

The realization of poverty and associated everyday realities are important to assess people's responses and their willingness to pay for WatSan interventions. Superficially, it may seem that the poor residents are rationally incapable, helpless and totally dependent on external support, and that they might not be able to carry out extensive maintenance work without this support. In reality, people show their dependency and unwillingness because of their current

residential status, whilst many residents are eager to adopt self-help initiatives through managing and constructing their own WatSan infrastructures. From this discussion, it is clear that the poverty and dependency issues are transitory matters and that people could be motivated if they got assurances about their land. They do not want to take any risk investing money where they have no legal rights to build infrastructure. This kind of substantial and analogous societal response is important in policy planning where people's dreams, demands and realities could be addressed properly.

Sanitation Technology: Suitability and Responses

> *'Nobody can be found without access to a latrine but it is difficult to find any hygienic latrines'.*
>
> - (Field Survey, November 17, 2009; Department of Public Health Engineering, Kakrail, Dhaka).

This comment came from a government official who tried to define the slum situation during an interview. This is the real scenario of slum areas and the reason is often associated with inadequate and inappropriate technologies. Some argue that the system is not culturally and socially appropriate, while others question the efficiency of the technology (De Forest 1980; Murphy et al 2009). Generally, the technologies are developed to solve a particular problem but project failures are mostly in the urban slums. Therefore it is reasonable to ask why these urban WatSan projects are not sustainable. It is not easy to answer this question briefly but possible answers might be associated with inadequate infrastructures, lack of acceptance of systems and technologies introduced, ownership, financial sustainability, low-level of environmental wholesomeness and people's practices in these settlements. Inadequacies are not the fault of a particular technology but the number of users reduces their efficiency and expected service life. The technologies are always at the centre of WatSan-related discourses; unfortunately they get most of the blame even when they have proved their efficiency elsewhere. Our understanding is different as we found that both social and governance issues often rule the technology and project failure is not determined solely through technological setbacks. For instance, slum dwellers are generally not aware of the health and environmental

benefits of improved sanitation technologies as their priorities are different (Singh 2005) as indicated in the first quotation of the preceding section.

A general and emergent understanding about sanitation technology among the residents of slum areas is a kind of 'fixed defecation place' and they consider this place as a disgusting and unclean area of the neighbourhood. Community perceptions and responses concerning their sanitation technology are unclear in most cases. In this regard, one female respondent and a pit latrine user from BB said that:

> *"We don't want to know about the types of sanitation technology. We only need such a place where we can go for our natural call. Technology is not important for us as we don't have adequate facilities. It is the rich people who might think about various technologies but we can't think about those options. We just need basic things."*
>
> - (Field Survey, October 18, 2009; Bagan Bari, Mirpur, Dhaka).

Her argument supports Kar's (2012) contemporary principle of 'basics for all'. Finally, we often noticed while investigating the community perception about sanitation technology that the argument was often abstracted to ownership status, i.e. the single household facilities or communal facilities rather than their technical side such as pit latrines or septic systems, and it is evident that the household latrine users maintain their facilities with extra care. Despite this, it is possible to implement a benefactor's pre-planned technological agenda effectively in those areas, as poor people can be convinced. Where favourable it might be possible to think about durable but simple technology for long-term sustainability rather than low-cost solutions that cannot offer a long service life. Unfortunately the well-known Orangi pilot project (OPP 1995) from Pakistan, with its condominial/simplified sewerage system (Mara et al 2001; Mara 2012) would not be possible in the Dhaka slums because the unplanned layout of housing precludes the running of long, straight lengths of underground pipelines beneath lanes. But, regardless of the issues related to the type of technology, odour, levels of satisfaction, convenience, durability, aesthetics, the operation and maintenance activities, cost and financial sustainability (i.e. charging and collecting cost recovery tariffs) are the most vital issue in our study areas influencing project success. The O/M activities of sanitation

technologies are a major part of the bottom line governance, as presented in the following section.

Governance Systems and Sanitation

> *"We don't want to engage ourselves in a formal system. We think that an informal water supply system is more reliable and hassle-free than a formal system".*
>
> - (Field Survey, October 11, 2009; Gulshan City Colony, Dhaka).

Water is an essential element in the management of sanitation system especially in the context of Bangladesh because all Bangladeshis are 'washers' not 'wipers' and they use water after defecation and urination. As water is scarce in the slums this creates problems in maintaining proper hygiene at the community level. Through the above quotation, a resident from GCC summarized a perception that is also addresses governance at different hierarchical levels. The governance process is described in this section from the viewpoint of several interconnecting issues – i.e. social, technological and institutional – which are vital in WatSan projects. We will explain how different actors or stakeholders behave in their own social or institutional settings and how these issues affect GO/NGO WatSan projects. For instance, as a part of social governance, benefactors must analyze the local power relations when choosing a project location. Both political ecology and political economy are involved in the slum selection process, as outlined in figure 2. It is evident that it is slums that are relatively better off that have been selected for WatSan interventions, whereas vulnerable slums are neglected for fear that a project would not be successful. NGOs are very opportunist in choosing project locations so that they can implement their projects successfully and so get further donor assistance and financial help. NGO interventions in the slums have a better record than GO interventions (Rahman, 2012) because the government's WatSan policy prevents the provision of even a minimum level of services to illegal settlements (LGD 2005). In contrast, we found that NGOs such as the DSK build close relationships with the community and empower them through CBOs to manage their project work. They also engage female members in each CBO to address gender issues. CBOs work for better governance at the community level and GOs and especially NGOs facilitate the CBOs to ensure the bottom-line governance. Project success

may depend on community practices – 'bottom-line governance' – such as the sharing and management of WatSan infrastructures and the management of financial matters such as collecting bills, monthly instalments, and O/M costs. The 'lock and key' system has been found effective in MCC and BT, for instance, in maintaining a clean infrastructure, because the users are specific and assigned among a number of families. Moreover, as mediators, CBOs have solved local community problems effectively because they can combine their local perceptions and institutional guidance towards a particular problem where most of the social, financial, managerial, behavioural and political issues have been addressed.

It has to be noted that political commitment and participation are rarely found in water supply development in the informal settlements of Dhaka city, because even "under the democratic political system in Bangladesh, political norms and processes do not ensure the accountability of politicians to the people" (Akbar et al 2007). People hold out an enormous amount of hope for the government's ability to tackle WatSan problems but governance is undermined by negative political practices and the cycle of conflict between the rulers and the opposition. For instance, the BNP (Bangladesh Nationalist Party) government (2001-2006) had sanitation as a priority in its agenda but the ruling party Awami League (2008 to present) have new sets of ideas and strategies. The BNP government set up WatSan task-force committees from national to union level but the activities of these committees are now hardly visible. Nevertheless, people's expectations of the political leaders are high and they hope to see them in the vicinity. Their non-appearance leads to distrustful comments about them. We observed some in the younger generation manoeuvring in neighbourhood politics. A *'Panchayet[2]'* member from the MCC mentioned that:

> *"Young adults are becoming crazy to show off as community leaders. This is not because they will deal with the local problems or they will devote themselves through giving different services to the residents but they have a desire to be a powerful member and to become a beneficiary".*
>
> - (Field Survey, January 22, 2010; Mohammadpur City Colony, Mirpur, Dhaka).

Another female respondent from BT added that:

[2] Local administration of various neighbourhoods or *Mohollas* of Dhaka city is known as '*Panchayet'*.

> *"Everyone with young adults in their family has at least one with a desire to be a community leader".*
>
> - (Field Survey, October 15, 2009; Begun Tila, Mirpur, Dhaka).

She also mentioned that this tendency creates small clusters that practice power to establish their rules and presence. From the above discussion it is understandable that the existing '*infra-power'* (Hansen and Verkaaik 2009) and different dimensions of power relations within a community often puzzle the residents and personalized clashes somehow destabilize the social environment and untie social bonds, so obstructing long-term development initiatives. The DSK introduces the bottom-line governance strategy through effective CBOs to minimize the local problems. Recently the DSK put effort into establishing a legal basis for a 'Citizens' Charter' and now all informal settlements are eligible to get a connection where the ownership and responsibility goes to the communities themselves (Jinnah 2007). This may be recognized as a milestone and a positive contribution on the pathway to better governance.

Key Challenges and Issues

Through the above discussion, several factors have been identified that eventually impact on WatSan projects. Firstly, it is obvious in the context of the Dhaka city slums that people living in those settlements basically consider themselves as temporary settlers always under the threat of eviction. This transitional and temporary characteristic is destabilizing and they are even unable to think about permanent livelihood settings in their current temporary settlements. Besides, local power structures, social norms, harmony and relationships between neighbours, together with inadequate basic amenities, complicate the social environment and even cause a fragmented society where people's behaviour is opportunist, self-centred and not sociable or responsive. Here we would say that a responsive social structure is necessary in WatSan projects where poorer or substandard communities could show the better results that we found in BT and MCC. In contrast, the '*infra-power'* and/or local power structures and their practices are just obstructing the residents to grow as functionalist, prompt and responsive.

Secondly, technologies facilitate sanitation programmes to a great extent but it is quite difficult to determine which technology is suitable for urban informal settlements as the local contexts are different in each slum. It is important to generalize the context of urban slums, which may help to evolve an appropriate sanitation technology that could be further modified considering local diversified contexts. But the major question is how to generalize the context and how to select a technology that also associates cost. Here our understanding is that the issues related to cost are not a principal worry for the community. Although most people are using the relatively expensive septic tank technology, they are paying for the service under the cost-recovery approach of DSK. Moreover, they approach the service provider to install even more convenient options such as a water tap inside the latrine. Regarding the technology, cleanliness and O/M issues are regularly reported as concerns impacting sanitation projects.

Third, there are a range of governance-related issues in the WatSan sector but not all are equally responsible for the current state of governance that is hampering project activities. It is clear that government contributions towards governance in the low-income urban settlements are not progressive, although the DSK claims that their working strategies unite the urban poor, empower the people especially women, and create employment opportunities. The empirical evidence from the fieldwork clearly demonstrates that the local people get more benefits and services from NGOs than public institutions. Political turmoil and violence, the politicization of the public administration and concerns that corruption obstructs private sector investment and public service delivery, are key elements of what is widely deemed a 'crisis of governance' (Hasan et al 2006) in Bangladesh. Here, we would argue that governance in a formal sense does not seem to work in the context of GO-managed slums as people living in those slums seem to have no understanding of the benefits of it and, on the other hand, the government institutions are also not keen to help them understand its necessity. In contrast, the DSK did gain the trust of the community through their participatory governance strategy; and nowadays residents can share their problems spontaneously with DSK personnel. Considering the local contexts, we would argue that the presence of this participatory governance strategy has better implications for the improvement of the water and sanitation situation in Dhaka.

It has been realized that the STG systems are positively and negatively impacting WatSan projects locally and globally, especially in the urban areas of developing countries. In the case of Dhaka city, the problems are so vast that a sustainable solution seems a very long way off. For instance, from the current study several social issues such as poverty, level of responsiveness, residential status, lack of knowledge, power relations, societal disharmony, and the law and order situation have been identified as factors obstructing WatSan projects. However, it is not often clear whether benefactor organizations are considering these local contextual issues when they implement sanitation projects in the slums. It is also questionable whether their intervention strategies are enough or are even accepted by the community. In a similar vein it could also be asked how the poor can be helped. Our fieldwork experience suggests that the slum dwellers prefer continuous support and/or longer-term intervention where they might expect a close relationship with the service providers. It is widely recognized that the participatory approach and getting in touch with the community essentially strengthens the WatSan projects and we did hear positive stories from individuals living in successful sanitation project areas like MCC and BT.

Institutional politics often emphasize the rural sanitation sector and it is evident that bigger organizations in the field of sanitation are keeping their distance from urban sanitation projects. Moreover the government institutions are not dealing directly with illegal informal settlements. Current thinking is that international agencies need to go beyond projects: 'no more projects but more partnerships', while Satterthwaite (2003) recommends that the concept will strengthen the capacity of the urban authorities to develop appropriate responses and participation which ultimately will ensure better governance. Finally, it is worth explaining the issue of land-tenure further because we would argue that this is the greatest influence and obstructing factor that hinders the WatSan project pathways. The solution to this particular land-tenure issue may revolutionize this sector and we are raising this argument because fieldwork experience suggests that the state of preference amongst most residents of the study areas is for permanent land-tenure or ownership of the land rather than sanitation. A change in tenure could revive their aspirations for creating a healthy living environment as well as enabling the STG systems in their neighbourhood. However, while their responses seem genuine, it cannot be guaranteed that some people would not sell their land to get

immediate benefits. This should be a matter of concern that needs to be tackled with specific terms and conditions.

What Works and Why?

From our analysis of the dynamics of STG systems, it is quite understandable that the situation of those informal settlements is complex because of local issues and different development initiatives, and it is not possible to draw a unique blue-print solution to address a particular problem. In reality, when we add the notion of 'informal settlements' and/or 'developing countries', then a situation seems unmanageable due to its local circumstances and diverse STG systems. Despite this, different GOs and NGOs are always concerned about promoting and improving sanitation services to the urban poor in developing countries with the help of the local or international donor agencies. In existing sanitation debates the major concern is that a single approach or a unique technology is not appropriate in all instances, as there are varied socio-political as well as environmental settings in the real world, including people's practices, which are known to be crucial in sanitation projects. Therefore, 'generalization' should be based upon considering the practicalities of local phenomena such as physical settings (location, geology, weather and climate, and ground water level), socio-economic status, availability of land, settlement pattern, population density, political, environmental issues, and so on, which can be considered as internal settings of the informal settlements and Casey et al (2006) define them as active determining factors. Apart from this, some external inputs, mainly technology and governance, should be taken into account in establishing a generalized model for sanitation intervention. Moreover, the local contextual matters are undeniably important for the sustainability of the programme, as the communities themselves are not homogeneous; there are rich and poor, the powerful and the powerless, the articulate and the silent, responsive and non-responsive. A new system, which benefits a poor section of the community, can threaten old systems of community organization (Chauhan 1983). Therefore sanitation should be considered as a holistic issue in every spatial and social setting. The severity of the so-called 'brown agenda' (Gandy 2004; Roy 2009) issue, i.e. sanitation, will require a planning support system in fast growing cities like Dhaka. In this regard, recently the Dhaka Metropolitan Development Planning Support System

(DMDPSS) has been developed and piloted with the aim of providing local planners with a tool to construct alternative land-use planning scenarios and compare them using a set of sustainability criteria (Roy 2009).

Conclusion

Derived from the above discussion we would argue that change is achievable when people change their previous unhygienic practices and our understanding of people's perceptions about WatSan technology is that it cannot solve the entire problem. Rather, strong and effective social institutions such as CBOs can play a vital role in managing the infrastructures, where the service provider's role will be that of promoting sanitation technologies, motivational activities and necessary follow up/monitoring programmes. Our experience in Dhaka suggests that in some cases (particularly slums with very transient populations e.g. Bagan Bari slum) CBOs struggle to provide services effectively in the long-run due to changing residents, memberships and politics inside the community. In this situation, ensuring better governance is the key to WatSan project success. However, we would suggest that the government needs to do more to put sanitation on the political agenda and arrange a phase by phase construction of a conventional sewerage system in the un-reached area in different parts of the city. This would eventually bring sustainable and longer-term benefits to the citizens but will take at least a couple decades before slums are connected with the main system through small-bore sewers. Meanwhile, an urgent solution needs to be found in the slums such as communal latrines, faecal sludge management of different on-site sanitation systems, simplified or small-bore sewers, which are all already recognized as potential, safe and effective alternatives to conventional sewerage systems. To do this, a mixed approach, for instance consultation using the well-recognized 'participatory' method, should be introduced and used in a way where the service provider will take the final decision in technology selection considering opinions at the grassroots level. We think that the users should be consulted, especially groups without much of a voice at the moment, but people are presently short of information and giving them the ultimate decision-making power does carry risks in project planning and implementation. However, it is understood that responsibility lies with both parties, the benefactors and beneficiaries, as they are affected by varied socio-political,

spatio-temporal, organizational culture and governance systems. The governance system in the DSK project areas at present performs more like a small-scale enterprise than a voluntary service delivery system and this kind of intervention strategy in the urban low-income settlements will eventually reduce the burden on government and decrease the trend of making illegal water connections and using unhygienic latrines. Overall, from the grassroots reality it can be said that, despite some limitations, the NGOs are still playing a better role in the development of the urban low-income settlements than the public institutions through offering a participatory governance strategy.

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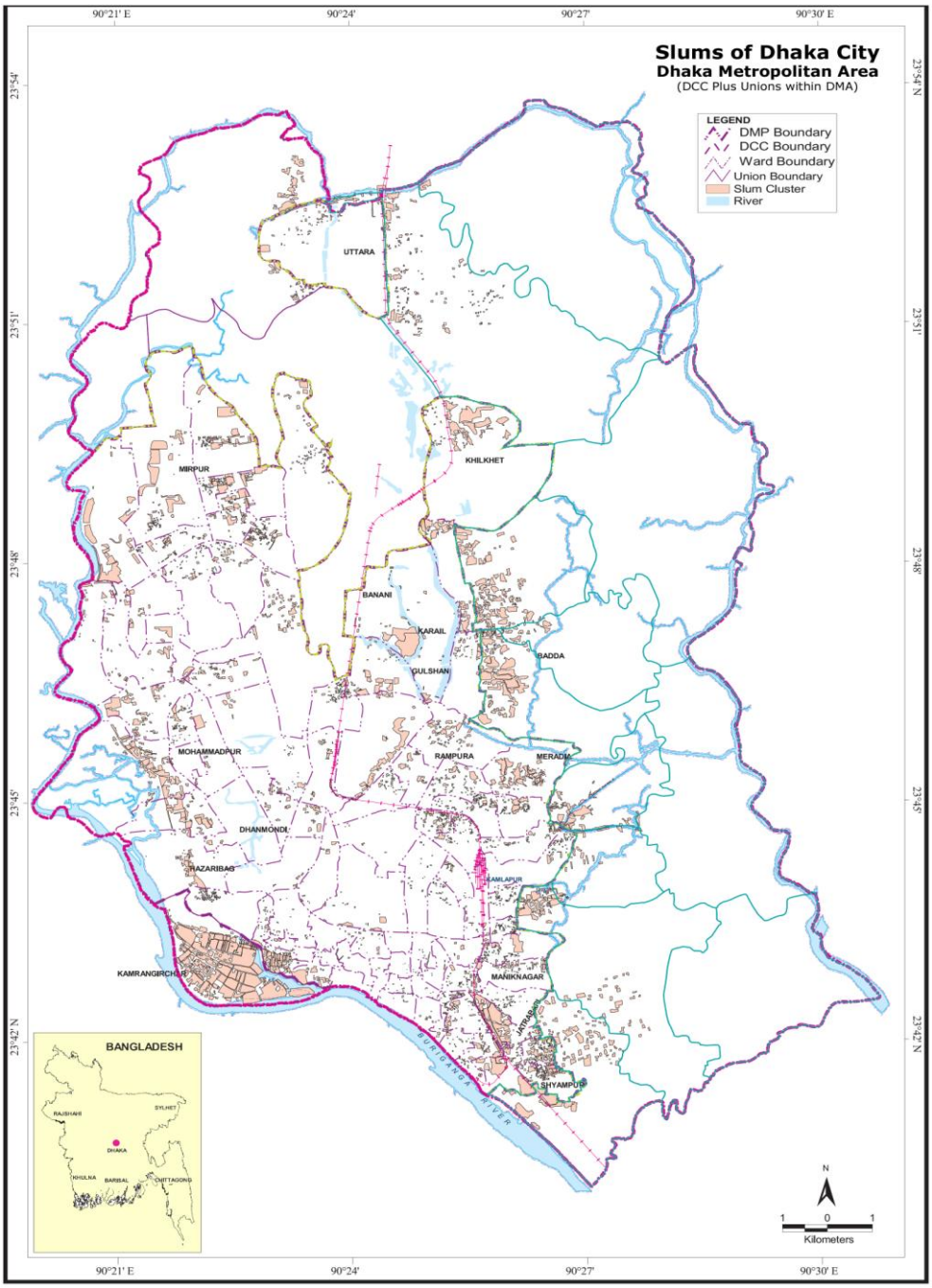
Figure 1: Location of slums in Dhaka city



Source: CUS, NIPORT and Measure Evaluation, 2006 (Modified by author)

Figure 2: Issues considered for the selection of DSK project locations