Environmental sanitation in participatory development approach: Experience of NGOs in Bangladesh

Abdullahel Hadi

Correspondence
Abdullahel Hadi
Senior Research Sociologist
Research and Evaluation Division
BRAC
75 Mohakhali
Dhaka, Bangladesh

Biography

Dr. Abdullahel Hadi has been with BRAC, Bangladesh, for over five years and is currently *Senior Research Sociologist* in the Research and Evaluation Division, Dhaka, Bangladesh. He served as *Consultant* to the Urban Health Programme of the International Centre for Diarrheal Diseases Research, Bangladesh (ICDDR,B), Dhaka, Bangladesh. He was also a *Research Associate* with University Research Corporation (URC) in the South Asia Region. Dr. Hadi holds a doctorate degree in Public Health from Columbia University, New York and is a member of the Global Applied Research Network (GARNET) for Water and Sanitation.

Introduction

The development planners have recently broadened to include essential public services such as water supply and waste disposal as part of economic growth (Kalbermatten, Julius and Gunnerson 1980). The availability of safe water supply and the sanitary disposal of human wastes is generally considered as two prerequisites of healthy life. However, a large proportion of the population living in the developing countries is still deprived of having access to hygienic and safe sanitary facilities. Among them, the poor suffer the most because they lack both the means to get such facilities and knowledge on how to minimise the negative effects of the unsanitary environment. Under this backdrop, the period 1981-1990 was declared by the United Nations as the *International Drinking Water Supply and Sanitation Decade* to promote safe water supplies and sanitation facilities to the poor of the developing countries (Larsimont 1995). The declaration reflects the commitment to improve water supply and sanitation coverage for the disadvantaged people lacking such services.

Bangladesh, with a very poor infrastructure and resources, has also committed to provide safe drinking water and sanitary facilities to its people by the year 2000 which was endorsed by the non-government organisations (NGOs), donors and media. During the 1980s, the provision of supplying safe drinking water received the priority and budget allocations over the construction of sanitary latrine for the poor people living in the rural areas (Dodge 1995). The performance of Bangladesh in providing safe drinking water has been very impressive but the sanitation coverage in the rural areas has been far behind the expectation. The sanitation coverage was only 2% in 1980-81 that reached to 35% in 1995 (Luong 1994; Hasan 1995). Given the rate of progress achieved in this period, sanitation services for all by the year 2000 appeared to be an unattainable dream for Bangladesh (Heijnen 1995).

Sanitation was usually understood to mean sewerage which was very expensive and not affordable to the poor (Marais 1973). But the awareness of the social dimension of hygiene practice has increasingly becoming popular among the policy makers. It is now widely believed that safe water supplies alone can do little to improve the health condition without similar progress in sanitation because unhygienic sanitation reduces the potential benefits of a safe water supply by transmitting pathogens from infected to healthy persons. Indiscriminate defecation leaves pathogen-rich faecal matters in the open and surface water. It has been reported that about 28,000 Metric Tons of human excreta are deposited into open areas everyday meaning that a mammoth faecal-oral transmission cycle continues in Bangladesh (Hasan 1995). Realising the importance of the co-ordinated efforts for environmental sanitation, the government of Bangladesh launched its *social mobilisation for sanitation project* in 1994 to make the people aware about the need of safe disposal of excreta and solid wastes at the community level. But the project achieved very little as neither the community nor the key officials of the local government participated in the mobilisation efforts (Hoque et al. 1995).

The promotion of environmental sanitation was always viewed by the policy makers of Bangladesh as a component of public health sector programme ignoring the potential scope of expanding with other development sectors. The role of community participation and private sector has remained ignored in the official policy in designing and implementing the programme and a supply driven approach with subsidies still is in place.

NGOs in sanitation sector in Bangladesh

The non-government development organisations or NGOs in Bangladesh is playing a significant role in implementing development programmes at the community level although the community development

programmes in Bangladesh began by the government itself in early 1960s. The approach adopted by NGOs, however, is considered highly successful because of their emphasis on the planned intervention at the grassroots level (Korten 1987; Uphoff 1993). Some of the NGOs have began to provide collateral-free credit support to the poor along with a package of support services such as group formation, skill training, adult literacy, health education and legal awareness. As a result, the process of transformation among the participants of such programmes has began, raises their literacy level and financial capacity, and improves consciousness towards their social and material well-being. Along with credit support, such targeted development interventions reduce social isolation and provide scope for wider exposure.

Such NGO-led participatory development approach is expected to play a significant role in sanitation sectors as the NGOs have attempted to integrate water and sanitation with their credit based income and employment generating schemes (Hadi and Nath 1996). The role of the non-government organisations (NGOs) in expanding safe sanitation coverage has been remarkable in Bangladesh. As many as 300 NGOs such as BRAC, Grameen Bank, CARITAS, Proshika, etc. are now involved in promoting awareness, creating demand and implementing the sanitation programme nation-wide particularly among the poor households (Shailo 1995) as it has been realised that a demand driven approach can be more effective and contributes more to sanitation coverage than purely a supply driven approach (Cairncross 1992; Samata and van Wijk 1998).

The role of educational intervention in changing sanitation behaviour has been well documented (Toron 1982; Stanton et al 1987). The acceptance of the programme increases if community participation is ensured (Upadhya 1983). Unlike other development sectors, very little effort has been made to do systematic research in this sector in Bangladesh. Among the few studies conducted, most give very little emphasis to social or institutional aspects of sanitation programmes. This paper assesses the contribution of participatory development approach in improving environmental sanitation as well as creating the demand of safe sanitary system among the poor in rural Bangladesh.

Methodology

The data for this study were collected from a surveillance system[1] covering 70 villages located in ten regions of Bangladesh. The sample households were selected at random distributed probability proportionate to the households in each of ten regions of the country. A total of 1,556 household heads was interviewed in October 1995 that provided basic socioeconomic characteristics of the households and their involvement with NGO-led development programmes in the community. In our study design, all households were categorised into *participants, non-participants* and *not eligible* to be involved with the development programme. This allowed us to assess the programme impact on the sanitation behaviour of the community.

The study focuses on the sanitation behaviour[2] and the issues of unmet need[3] of sanitary latrine as a result of credit-based development programmes in rural Bangladesh. The unmet need of sanitary latrines is estimated by two measures: i) whether a household intends to buy or build a sanitary latrine, and ii) whether a household will procure one if credit is provided. The basic assumption to be examined in this study is that the participation of the poor in credit based development programmes brings a significant shift in the sanitation behaviour. There are other variables in the analytical framework such as education and occupation of household head, and amount of land that assume to modify the magnitude of impact of our main hypothesis of development intervention - behavioural change linkage.

The analysis begins with a description of the sample households. Then two estimates of sanitation behaviour (sanitary latrine use and safe disposal of solid waste) are presented with simple bivariate

relationships between the estimates and the independent socio-economic control variables to understand the variation among socio-economic sub-groups. Variations in issues of unmet needs by programme participation are also observed. To assess the relative influence of the credit-based development programmes and socio-economic factors, and to estimate the effects of socio-economic confounders, we undertake a multivariate analysis. The logit model is considered appropriate here because the dependent variables are dichotomous (Hanushek and Jackson 1977; Aldrich and Nelson 1984).

[Table 1 about here]

Results

Who participates in the development programmes?

Only poor are eligible to receive credit although any household can buy sanitary latrines from the programme. In our study villages, nearly 54% households were eligible although only 31% households actually participated in credit based development programmes. Table 1 shows that the socio-economic characteristics of study households were largely similar to the picture of rural Bangladesh found elsewhere (BBS 1991). Significant variations in education, land ownership and the occupational distribution of household head are evident among the three study cells. The non-participant households were the most disadvantaged compared to others in terms of literacy, land ownership and occupation. They were also least exposed to the media compared to other two groups. It is not clearly known whether most of the very disadvantaged households remained out of reach of the development programmes provided by the NGOs or such variation between the two groups was the outcome of the benefits received by the participants of non-governmental development organisations.

[Table 2 about here]

Sanitation and solid waste management

Despite of efforts of the government and other development agencies, only a quarter of the households[4] (24.8%) has been using sanitary latrines in rural Bangladesh (Table 2). Sanitation behaviour widely and significantly differed by socio-economic characteristics of the households. The prevalence of sanitary latrines was higher if the household head had higher education (Dieterich 1982), had formal employment in business or an office, was better exposed to the media than otherwise. Data also indicate that the amount of land owned, housing condition and religious belief had positive association ($p<0.01$) with safe sanitary practice.

Unlike urban areas, disposing solid wastes[5] in a hygienic manner in the villages is not very difficult. Table 2 shows that only 46% of the households maintained adequate standard in disposing hazardous and harmful solid wastes. Such a scenario indicates that, like sanitation behaviour, the importance of cleanliness and the concept of environmental hygiene were poorly received in the community. The situation, however, varied by such socio-economic characteristics as education, land ownership, occupation of the household head, religious belief, housing condition and media exposure although the differences in hygienic management of solid wastes were only found statistically significant ($p<0.01$) by religion and housing condition.

Credit programme and sanitation behaviour

Overcoming human barriers in changing traditional attitudes, values and habits of people is not only difficult but have endured for generations (Hoff 1982). It has been reported that safe latrine campaigns by the government in developing countries resulted very little except the experience that the promotion of rural sanitation needed enforcement instead of advice (Cairncross 1992). Table 2 shows that the sanitary latrine use was significantly higher ($p<0.01$) among the households involved with development programmes than the comparable non-programme target households. Similarly, safe disposing of solid wastes was higher among households involved with credit based development programme than others.

The impact of socio-demographic and involvement of development programme variables on the use of sanitary latrine are examined by using logit regression analysis (Table 3). The analysis provides a richer and more complex picture of the linkages between development programme and the sanitary latrine use while also providing evidence of the influence of other socio-economic factors on the outcome. The participation in micro-credit based development programmes has a strong and statistically significant positive effect on the use of sanitary latrine regardless of the role of socio-economic position of the households. Model I shows that households involved in the credit based development programme were nearly 3.5 times more likely to use sanitary latrines than comparable non participants controlling for education and amount of land owned by the household head.

[Table 3 about here]

Model II indicates that adding occupation and religious belief in the Model I strengthen the positive effects of development programmes on safe sanitary practice. Model III shows that the positive impact of development programme weakens when the socio-economic variables are controlled. This weaker relationship between development programmes and safe sanitary practice after controlling for socio-economic variables could be explained by the existence of socio-economic differences among study households as we have found earlier. The data supports our earlier finding that the credit-based participatory development intervention had strong and statistically significant relationship with safe sanitary practice. The association of development programmes with sanitary latrine use remained strong and significant when such socio-economic variables as the amount of land owned, religious belief, housing condition and level of media exposure are added to the equation (Models II and III). This apparent strong pattern of relationship between development programme and sanitary latrine use, after controlling for socio-economic effect, could be explained by the existence of significant socio-economic variation in the rural community in terms of education, occupational distribution and ownership of land among others.

Role of micro-credit in demand creation

Most of the households have not been using safe sanitary latrine primarily because they do not own or have access to sanitary latrine facilities. Nearly 40.3% of the households showed their intention to build a latrine for their members while the others did not want any better facilities or were not sure what to do about it (Table 4). When asked whether they should accept credit with a low interest rate to buy and install a slab latrine for them, nearly 46.7% showed their interest to be involved in such a scheme and a large proportion expressed their regrets to receive credit. When asked whether they should build a latrine jointly with their neighbours, only 13.5% agreed to buy jointly. While a large proportion of households wanted to procure a safe latrine, only a few (21.5%) of them had correct knowledge about the cost to buy or build a slab latrine.

[Table 4 about here]

It is not known why a sizeable proportion of economically better off households preferred not to build or buy sanitary latrines. One possible reason is the lack of knowledge about the minimum cost involved in building a latrine. It is quite possible that the expected benefit to them for using safe latrines was negligible or not cost effective in terms of expected improvement of health condition. Moreover, buying a sanitary latrine means building a toilet on his land or house, at his expense and most importantly its use requires a change in some of their most intimate habits.

However, an unmet need to build or buy safe and hygienic latrines exists among those who do not own a sanitary latrine. Table 4 reveals also that an inherent need or intention to buy a safe latrine was significantly higher among credit programme participants than households not involved with any development programme. Such latent need could be raised further if supervised credit and other supports are provided to them. The concept of community managed or jointly owned latrine was not very attractive to them regardless of their involvement in development programmes.

[Table 5 about here]

Table 5 presents log odds ratios of selected explanatory variables to predict unmet need issues of buying sanitary latrine among sample households. Data suggest that the intention to buy or procure a safe latrine among households involved with credit-based development programmes was 1.81 times ($p<0.01$) higher than comparable non-programme households when such socio-economic characteristics as education and occupation of the household head, land ownership and religious belief were controlled. If credit were provided, the probability to buy or build safe latrines among the programme participants would increase to 2.04 times ($p<0.01$). As found earlier, both the programme participants and the non eligible better-off households were significantly less likely to agree to jointly buy or build latrines with their neighbours.

Conclusions

This study demonstrates that the role of the participation of rural households in credit-based development activities in raising safe hygiene practices is significant. One implication of this conclusion is that although the safe sanitation coverage has remained very poor in rural areas, ample scope is still there to improve the coverage if appropriate measures are taken. Credit recipients were women and the health education messages such as the need of safe sanitation or safe disposal of solid wastes was disseminated to the household members through women. While the role of women in the household decision making in Bangladesh villages is very negligible, this study indicates that the decision to buy or build safe latrines by the husbands, to a large extent, might have been influenced by their spouse as only women had the access to credit. The economic and motivational aspects of the credit programmes in Bangladesh is helping to create demand for safe latrines and making the hardware available at the community to sustain that demand although private initiatives should also be encouraged to allow adjustment to the varying needs of the public.

The problem of poor sanitation system and solid waste management should not be viewed as technical or economic one ignoring the social and institutional aspects. The role of community involvement through NGO-led development activities in modifying sanitation behaviour particularly in identifying their need and priority is likely to enhance the sustainability of the programme (Isely 1981). NGOs have the scope

to offer a range of choices and are capable to carry on a strong demand creation strategy. Such approach, if sustained, has the potential to expand the existing level of unmet need for safe sanitation that could be met if supervised credit is provided to them. The study concludes that the social mobilisation aspects of credit programmes can play a significant positive role in improving environmental sanitation in rural Bangladesh.

Endnotes

1. The demographic and health surveillance system, known as *Watch*, that covers 70 villages in 10 districts in Bangladesh where BRAC, Grameen Bank, Proshika, BRDB and other local development organisations have been operating credit-based income generating activities.

2. Sanitation behaviour of a household is considered safe if the adult members of that household use either slab or sanitary latrines and if the latrines are not located in the household compound.

3. Unmet need of safe latrines is defined by the *expressed intention to buy or build* sanitary latrines by the households who do not currently have one.

4. Sanitary latrine use is estimated at the household level. If all adult members (aged 10 years or more) of the household use sanitary latrine, the household is considered as sanitary latrine user.

5. The investigators physically examined the rooms, the compound and the toilet facilities of each of the sample households. A household was considered to practice safe disposing of solid wastes if the household was not found to have kitchen wastes, and excreta of poultry and livestock at the time of observation.

Acknowledgements

The author wishes to thank the senior researchers of the Research and Evaluation Division at BRAC for their constructive criticisms and comments of the earlier version of the draft.

References

Aldrich JH, and Nelson FD. 1994. *Linear Probability, Logit and Probit Models*. Beverly Hills: Sage Publication.

BBS. 1991. *The Population Census, 1991: Preliminary Report*. Dhaka: Bangladesh Bureau of Statistics.

Cairncross S. 1992. *Sanitation and water supply: practical lessons from the decade.* Water and sanitation discussion paper 9. Washington DC: UNDP/World Bank Water and Sanitation Program.

Dieterich B. 1982. Health education indispensable to the success of the international decade of drinkable water and sanitation. *International Journal of Health Education* 1(2): 17-20.

Dodge CP. 1995. Rural water and particularly sanitation: Progress and promise in Bangladesh. *Watsan* Special Issue, June 1994 - March 1995.

Hadi A, Nath SR. 1996. *Raising sanitary latrine use in rural Bangladesh: can BRAC play any role?* Watch Report no. 22. Dhaka: BRAC.

Hanushek EA, Jackson JE. 1977. *Statistical Methods for Social Sciences*. New York: Academic Press.

Hasan QM. 1995. Sanitation: The first choice for progress of nation. *Watsan* Special Issue, June 1994 - March 1995.

Heijnen H. 1995. Innovation in water supply and environmental sanitation. *Watsan* Special Issue, June 1994 - March 1995.

Hoff W. 1982. Overcoming barriers to sanitary improvements: a primary health care project in the Gilbert Islands. *International Quarterly of Community Health Education* 3(2): 195-201.

Hoque BA et al. 1995. *Partnership for improving water, sanitation, solid waste and hygiene education system in rural Bangladesh*. Special publication no. 43. Dhaka: International Centre for Dirrhoeal Disease Research, Bangladesh.

Isley RB. 1981. Facilitation of community organization: an approach to water and sanitation programs in developing countries. In: *The training and support of primary health care workers: Proceedings, 1981*. International Health Conference, June 15-17. Washington, DC: National Council for International Health.

Kalbermatten JM, Julius DS and Gunnerson CG. 1980. *Appropriate Technology for Water Supply and Sanitation. Technical and Economic Options*. Research Project RPO 671-46. Washington DC: World Bank.

Korten DC. 1991. *Bangladesh Rural Advancement Committee. Strategy for the 1990s*. New York: PACT.

Larsimont CH. 1995. Water supply and sanitation in Bangladesh. *Watsan* Special Issue, June 1994 - March 1995.

Luong TV. 1994. Towards universal sanitation: Bangladesh. Paper presented at the second meeting of the Collaborative Council Working Group on Promotion of Sanitation, Hilterfingen, 3-5 October.

Marais GR. 1973. Sanitation and low cost housing. In: *Water Quality Management and Pollution Control Problems.* Oxford: Pergamon Press.

Samanta BB, van Wijk CA. 1998. *Criteria for successful sanitation programmes in low income countries.* Health Policy and Planning **13**(1): 78-86.

Shailo I. 1995. Water and sanitation in Bangladesh: An overview. *Watsan*, Special Issue, June 1994 - March 1995.

Stanton BF et al. 1987. An educational intervention for altering water-sanitation behaviours to reduce childhood diarrhoea in urban Bangladesh: formulation, preparation and delivery of educational intervention. *Social Science & Medicine* **24**(3): 275-83.

Tonon MA. 1982. A longitudinal study of the impact of village health education on environmental sanitation. *International Quarterly of Community Health Education* **2**(4): 311-27.

Upadhya DP. 1983. Community participation in improving environmental sanitation -- a case study of Panchkal. *JOICFP Review* **Spring**(6): 25-31.

Uphoff N. 1993. Grassroots organizations and NGOs in rural development: Opportunities with diminishing states and expanding markets. *World Development* **21**(4): 515-530.

Table 1. Background characteristics of the household head by the participation of spouse in micro credit programme

Background variables	Credit programme participation			All
	Non participants	Programme participants	Not-eligible to participate	
Mean years of schooling	0.88	1.86	3.80	2.52
Percent literate	17.8	31.4	54.9	38.9
Mean land (in decimal)	4.4	33.5	152	81.1
Percent landless	82.2	60.9	23.9	49.0
Percent labour	93.6	64.2	36.3	58.3
Percent non-Muslim	9.7	15.4	9.9	11.6
Percent exposed to media	12.8	21.9	37.0	26.7
N	360	488	708	1556

Table 2. Safe sanitation behaviour and disposal of solid waste by household characteristics

Socio-economic characteristics	Safe sanitation behaviour	Safe disposal of solid waste
All	24.8	45.8
Credit programme		
Never participated	6.7	44.0
Participated	23.0	47.0
Not eligible	35.3	45.9
Education		
No school	15.7	44.7
I - V	30.3	44.6
VI +	48.8	50.7
Land ownership		
Landless	17.2	48.5
1 - 199 dec	26.6	40.1
200 + dec	48.5	52.5
Occupation		
Labour	18.5	44.3
Agriculture	28.9	46.4
Service/business	39.2	50.4
Religion		
Muslim	23.3	43.6
Non-Muslim	36.7	62.6
Housing condition		
Poor	19.7	41.3
Good	41.2	60.2
Exposure to media		
Poor	19.0	45.6
Better	40.7	46.4

Table 3. Odds ratios of selected explanatory variables to predict the use of sanitary latrine

Predictors	Model		
	I	II	III
Credit programme			
Never participated	1.0	1.0	1.0
Participated	3.51***	3.54***	3.27***
Not eligible	4.44***	4.75***	4.44***
Education			
No school	1.0	1.0	1.0
I - V	1.81***	1.65***	1.55***
VI +	3.44***	2.99***	2.62***
Land			
Landless	1.0	1.0	1.0
1 - 199 dec	1.04	1.22	1.19
200 +	1.90***	2.67***	2.17***
Occupation			
Labour		1.0	1.0
Agriculture		0.65**	0.63**
Service/business		1.19	1.11
Religion			
Muslim		1.0	1.0
Non-Muslim		1.73***	1.70***
Housing condition			
Poor			1.0
Good			2.11***
Exposure to media			
Poor			1.0
Better			1.64***

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table 4. Household responses regarding the need and intention to buy or build safe latrines by participation in credit-based development programme

Issues relevant to unmet need	Credit programme participation			All
	Non participants	Programme participants	Not eligible to participate	
Intend to buy	32.1	49.7	38.6	40.3
Will buy if get credit	46.1	62.0	34.5	46.7
Agree to buy jointly	20.0	12.3	9.6	13.5
Knowledge about the cost	13.6	19.5	26.8	21.5

Table 5. Odds ratios of selected explanatory variables to predict the issues of unmet need of safe sanitation controlling for education, religious belief and land ownership

Credit programme participation	Unmet need issues		
	Intend to buy	Will buy if credit is given	Agree to buy jointly
Credit programme			
Never participated	1.0	1.0	1.0
Participated	1.81***	2.04***	0.64**
Not eligible	1.01	0.71*	0.63*
Occupation			
Labour	1.0	1.0	1.0
Agriculture	1.49**	0.79	0.81
Service/business	1.38*	0.81	1.05

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$