Advancing Sustainable Environmental Health (ASEH): Impact Study

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EXECUTIVE SUMMARY

INTRODUCTION

WaterAid, one of the international NGOs working in Bangladesh, has implemented the project *"Advancing Sustainable Environmental Health (ASEH)"* focusing on the provision of basic water and sanitation services using empowering approaches and is guided by core principles of participation, equity, gender sensitivity, governance and a livelihoods approach to poverty reduction.

The general objective of the study is to assess the impact of ASEH project (in 2008) comparing with the baseline (2004) and impact study (2007) findings using the log frame indicators at goal and purpose level; and the specific objectives are to assess: (i) reduction in expenditure by households on water and sanitation related diseases in ASEH project areas, and (ii) increase in disposable income especially for women and girls due to time savings, savings in household expenditure on curative medical treatment of water, sanitation and hygiene related diseases, increased mobility and increase in livelihood opportunities in ASEH project areas.

METHODOLOGY

The present study belongs to the category of "Impact Study against Baseline Information and Mid-term Assessment without Control Design". Primary and secondary data/ information have been generated for assessment of the impact at the time of phasing out of the project. A three-staged random sampling procedure has been adopted with Union as primary sampling unit (PSU) for rural universe, and slum as PSU for urban at 95% confidence level and at 2% precision level. At the first stage, PSUs have been chosen, and one ASEH cluster from within selected sample unit has been chosen at the second stage. The respondents were selected at the third stage. A total of 852 respondents (529 rural from 40 villages and 181 urban from 20 slums households) have been visited during the data/information collection (95% confidence level and 8% precision level). In addition, 142 adolescent girls have been interviewed. A total of 13 instruments have been administered for data/information collection. The field operations for the study have taken place in November and December, 2008.

Findings

A. RURAL COMPONENT

Background Characteristics

The randomly drawn 540 sample rural households constitute both male-headed and female-headed households (90% and 10% respectively) as well as poor and non-poor households (49% vs. 52%). About 97% of households in rural clusters are currently having own house (87% during the baseline). Most socio-economic characteristics of the sample households of the three studies (baseline study, impact study 2007 and impact study 2008) have been found mostly similar and thus the samples are comparable.

According to the *direct calorie intake (DCI)* method, around 49% surveyed rural households are currently absolute poor which in 2007 was about 48%. Furthermore, 31% of the households at present are hardcore poor (20% in 2007).

The average monthly household income has increased overtime from Tk. 3,786 in baseline to Tk.5,326 in 2007, to Tk.6,363 in the impact study 2008. The present average monthly household expenditure is Tk.4,819, which was Tk.3,506 in baseline (2004) and Tk.3,563 in 2007.

Benefits of Water-Sanitation and Hygiene Intervention

A total of 55 distinct benefits categorized into 10 broader groups have been derived from the project activities. The benefit stream scenario in both the impact studies (2007 and 2008) has remained mostly similar. Among the broader groups of benefits, at present the highest reportedly benefit producing area is the sanitation (98.9%) followed by reduced incidence of diseases (98.7%) and improved employment and linkage (98.3%). Improved hygiene knowledge and practice has been reported by 97.4% households. About 81% households have reported of safe water collection as benefit.

Changes in Water, Sanitation and Hygiene Practices

At present the main sources of drinking water are either green marked (arsenic free) shallow tube-well (46%) or deep tube-well/tara pump II (35%). The current use of deep tube-well/tara pump has been increased by more than 2 times as compared to baseline (2004) and about 7 percentage points as compared to impact study 2007. In a nutshell, household use of safe drinking water is 91% at present which was 82% in impact study 2007 and 41% in baseline survey 2004.

There is a meaningful reduction in distance between household and prime sources of drinking water. The said distance during impact study 2008 is 21 yards, while the same during baseline and impact study was 90 yards and 27 yards respectively.

Ownership of main source of drinking water by the household has increased from 27% during the baseline to over 75% during the impact studies in 2007 and 2008.

Over 50% households reported storing water for consumption. About 90% of them keep water in a clean and covered earthen pitcher over a place higher than the floor. Besides almost all the respondents (97%) keep foods covered before serving.

Use of sanitary latrine nowadays in the project's rural clusters is as high as 82% against 69% during the impact study 2007 and 21% in baseline. Moreover, around 40% children (<5 years old) currently use latrine, while it was 16% during baseline and 38% during impact study 2007. With respect to disposal of under 5 children's excreta, a substantial improvement is currently evident over the base (2004) and impact study (2007).

Nearly three-fifth latrines are moderately or almost clean; however, half of these are located within 20 meter of water points.

Inclusion and Participation of Women in ASEH

Almost all (96%) respondents have mentioned that opinion was sought from the female members of the households about selection of latrine location. The responses in this regard were at the similar level during the impact study 2007.

In 2008, the participation of women in different committees is much higher than the male (81.4% vs. 17.6%) as compared to impact study of 2007 (31% vs. 21%).

Medical Expenditure and Disposable Income

Incidences of *Water-borne* diseases over time have decreased in the rural ASEH clusters. *Water-borne* disease as percent of total incidence of diseases has reduced to 15% at present from 28% in baseline (2004) and 19% in 2007.

The average per household monthly medical expenditure due to incidence of water-hygiene related diseases at present has reduced to Tk. 56 while the adjusted value for the same at the base was Tk. 237 and at the time of impact study 2007 was Tk. 96. Thus, currently, the "expenditure saving" (disposable income gain) per beneficiary household due to decrease in the incidence of *water-borne* diseases have been estimated as Tk.2,184 which during the impact study was Tk.1,729 (adjusted in current price). The estimated annual saving in rural areas due to ASEH mediated reduced incidences of water-borne diseases in 2008 would be Tk.722 million which is equivalent to (US $ 10.3 million) (US $ 1=BDT.70). The same estimated for 2007 was Tk.328 million (US $ 4.7 million).

On the other hand, reported amount of average disposable income earned from utilization of saved time in water collection is Tk. 79 per month per household. Therefore, estimated gain of annual disposal income in rural areas of the project is Tk. 313, 495,068 or US $ 4.5 million. Lion share (Tk. 299,387,790 or US $ 4.25 million) of this can be attributed to women and children as in 95.5% households, water is collected by them.

Thus, the total amount of disposal income gained from reduced medical expenditure and saved time in water collection in rural areas of AESH project would be Tk. 1,035,723,422 or US $ 14.8 million per anum.

Time Saved in Water Collection

The estimated total time saved by a household for collecting drinking and cooking water taken together between baseline and at present (2008) is about 104 minutes and the same between baseline and impact study 2007 is 71 minutes.

Mobility of Women

Although ASEH project concentrates on water, sanitation, hygiene issues and does not focus directly on women mobility but it is evident that after their successful interventions, women's mobility towards different institutions (both Government and private) has been increased significantly. Now, women can freely go to Union Parishad, attend CBO meetings at Union Parishad, visit Banks, NGO offices etc.

Livelihood Opportunity

The ASEH project has notably contributed in improving the livelihood opportunities (in terms of water, sanitation, hygiene issues) of the beneficiary households. The estimated composite livelihood opportunity score for rural beneficiaries currently constitute 80 points compared to 61 during 2007 impact study and 43 points at the base.

B. URBAN COMPONENT

Background

The randomly drawn sample of 182 urban households constitute both male-headed and female-headed households (91% vs. 9%); as well as poor and non-poor households (65% vs. 42%). By and large, the sample households at the three reference points of time have been found mostly similar in terms of most socio-economic characteristics.

According to the *direct calorie intake (DCI)* method, around 65% surveyed urban households are currently absolute poor, while in 2007 the same was 73%. Furthermore, 42% of the households at present are hardcore poor, which was 52% in 2007.

The average monthly household income has increased overtime from Tk. 4,531 and Tk. 4,928 respectively in baseline and 2007 impact study to Tk. 6,836 at present. The present average monthly household expenditure is Tk.6, 379 which was Tk. 4,167 during the baseline and Tk. 5,165 during impact study 2007.

Benefits of Water-Sanitation and Hygiene Intervention

The benefit stream scenario in both the impact studies (2007 and 2008) has remained mostly similar. Among ten broad groups the reported highest benefit is reduced incidence of diseases (100%) followed by sanitation (95%). Benefits in hygiene education, improved knowledge and practice have been reported by 92% urban households.

Changes in Water, Sanitation and Hygiene Practices

At present the main sources of drinking water for 42% households is pipeline supplied community based water point, while in baseline tube-well was the main source for the highest proportion of slum dwellers (37%). However, during impact study 2007, highest proportion of respondents (45%) reportedly mentioned pipeline supplied roadside water point as the main source of drinking water. Regarding household use of safe drinking water, it is more than 90% at present as compared to 54% in baseline.

There is a substantial reduction in distance between household and prime sources of drinking water. Currently the distance is only 4.6 meters, while the same during baseline and 2007 impact study were 57.6 meters and 24.7 meters respectively.

Usage of sanitary latrine in project slums has increased substantially. At present almost all the households (96%) use sanitary latrines as compared to only 20% at the time of baseline. Moreover, around 76% children (<5 years old) currently use sanitary latrine, while it was 36% during baseline and 67% during impact study 2007.

Inclusion and Participation of Women in ASEH

During impact studies in 2007 and 2008, about 97% respondents have reported that female member's opinion was sought in selection of latrine location. During the impact study 2008, over 80% of the adolescent girls have reported about existence of sanitary latrine at their school or college, while this was reported by about 51% during the impact study 2007.

Medical Expenditure and Disposable Income

Incidences of *water-borne* diseases over time have decreased among households of ASEH slums. *Water-borne* disease as percent of total incidence of diseases has reduced to 20% at present from 25% in baseline (2004) and 23% during 2007 impact study.

The average per household monthly medical expenditure due to incidence of water-hygiene related diseases at present has reduced to Tk. 165 while the adjusted value for the same at the base was Tk. 470 and at the time of impact study 2007 was Tk. 173. The estimated "expenditure saving" (disposable income gain) per urban slum household due to decrease in the incidence of *water-borne* diseases have been estimated as Tk. 3,897 (US $ 1=BD.Tk.70) which during the impact study was Tk. 3,564 (adjusted in current price). The annual savings in all project slums due to ASEH mediated reduced incidences of water-borne diseases in 2008 has been estimated as Tk.105 million which is equivalent to US $ 1.5 million (US $ 1=Bd. Tk.70). The same during 2007 was Tk. 102 million (US $ 1.46 million).

The average disposable income earned in urban areas due to saved time in water collection is Tk. 294 per household per month, which is estimated to Tk. 106,390,368 or US $ 1.5 million per anum. Alike rural areas, share of women and children to this annual gain of disposable income from time saved in water collection is Tk. 101,602,801 or US $ 1.45 million in urban areas.

Thus, the total amount of disposal income gained from reduced medical expenditure and saved time in water collection in rural areas of AESH project would be Tk. 1211,695,120 or US $ 3.0 million million per anum.

Time Saved in Water Collection

The estimated total time saved by each household for collecting drinking and cooking water taken together between baseline and at present (2008) is about 86 minutes and the same between baseline and impact study 2007 is 74 minutes.

Mobility of Women

The women mobility towards different institutions by the participating women have been increased as compared to the time point before the project. Now more women can go and visit to children's schools, health centers, NGO offices, banks, etc. More women are at present participating in CBO meetings.

Livelihood Opportunity

The ASEH project has substantially contributed in improving the livelihood opportunities (in terms of water, sanitation, hygiene issues) of the beneficiary

households. The estimated composite livelihood opportunity score for urban slum dwellers currently constitute 77 points compared to 67 points during 2007 impact study and 33 points at the base.

RECOMMENDATIONS

On the basis of the key findings, following three categories of recommendations are in order:

Towards future design of the programme

- In all future design, potential role of ASEH related programme in reducing economic and human poverty should be incorporated according to MDG as well as one of the major national poverty reduction and economic development strategies. This is fully in line with the Governments Vision 2021.

- In all future design, more efforts should be looked-for to ensure more pro-active participation of people, especially women, children and poor in planning and implementation of all ASEH programme components.

- ASEH related programme needs to be designed in such way to ensure that most women can properly utilize their saved time in water collection towards income generation activities and thereby to improve livelihood further.

Towards understanding the true impact of ASEH

- In order to understand the true benefit/impact of ASEH, as well as to explore the poverty reduction role of this model – a comprehensive socio-economic cost-benefit and cost efficiency study is recommended.

Towards the necessity of continuation of ASEH like programme

- In view of robust, high livelihood opportunity score and disposable income gain, programme like ASEH should be continued with all of its current components together with inclusion of more pro-poor insights.

- Considering its high annual saving due to reduction of medical expenditure, programme like ASEH should be continued as one of the key health-poverty reduction strategies in both urban and rural communities in Bangladesh.

ASEH Fact Sheet: RURAL

Indicators	Baseline (2004)	Impact (2007)	Impact (2008)
Average family size (number)	4.9	4.9	4.7
Average age (years)	43.3	44.4	37
Own house (%)	87.2	93.6	96
Average landownership (decimal)	99.4	49.3	29.6
Household monthly net income (Tk.)	3,786	5,297	6,363
Household monthly expenditure (Tk.)	3,506	3,563	4,819
Electricity Connection (% households)	26.8	35.8	37.8
Hard core poor (<=1805 k.calorie) (% households)	-	20.3	30.7
Absolute poor (<=2122 k.calorie) (% households)	-	48.3	48.7
Below lower poverty line (<= Tk. 879) (% households)	-	80.0	48.7
Below upper poverty line (<= Tk. 1,186) (% households)	-	85.3	69.8
Prevalence of any disease (% HH) (3 months)	48.1	65.0	42.6
Water-borne disease as a % of total disease incidence (%)	27.7	18.9	15.4
Duration of sickness (person-days, all diseases)	-	11.6	6.7
Duration of sickness (person-days, water hygiene related diseases)	-	7.0	1.7
Duration of sickness in water hygiene related diseases as % of all diseases	-	60.5	28.8
Mean medical expenditure (Tk.) (3 months)	868	677	543
Adjusted mean medical expenditure (Tk.) (3 months)	1,137	748	543
Adjusted mean expenditure on water-borne disease (Tk.) (3 months)	711	290	166
Work days lost (in days, in all diseases)	19.7	5.9	3.3
Work days lost (in water hygiene related diseases)	-	3.5	1.4
Work days lost in water hygiene related diseases as % of all diseases	-	59.5	37.4
Time required for collection of drinking water (minutes/days)	60.9	24.03	5.8
Time required for collection of cooking water (minutes/days)	54.4	20.4	5.0
Time saved for collection of water (drinking + cooking, minutes/day)	-	70.87	104.5
Composite livelihood score	43	61	80
Access to hygienic latrine in own house (%)	21.4	69	82
Open defecation (% household reported)	28.8	0.6	0.92
Spend time frequently for caring HH members sick with *water-borne* diseases (% reported)	31.7	6.7	4.8
Spend time occasionally for caring HH members sick with *water-borne* diseases (% reported)	41.4	60.3	60.4
Annual savings due to reduced incidences of water-borne diseases	-	Tk.328 million (US $ 4.7 million)	Tk.722 million (US $ 10.3 million)
Annual gain of disposable income due to time saved in water collection	-	-	Tk. 313 million (US $ 4.5 million
Share of women and girls in disposable income earned from time saved in water collection	-	-	Tk. 299 million (US$ 4.25 million)
Total annual savings due to reduced medical expenditure and time saved in water collection	-	-	Tk. 1035.7 million (US$ 14.8 million)

ASEH Fact Sheet: URBAN

Indicators	Baseline (2004)	Impact (2007)	Impact (2008)
Average family size (number)	4.9	5.3	5.1
Average age (years)	37.7	37.3	37.0
Own house (%)	19.1	57.5	48.9
Average landownership (decimal)	12.4	1.7	8.4
Household monthly net income (Tk.)	4,531	4,928	6,836
Household monthly expenditure (Tk.)	4,167	5,165	6,379
Electricity Connection (% households)	90.4	85.8	97.0
Gas connection (% households)	5.4	4.2	7.1
Hard core poor (<=1805 k.calorie) (% households)	-	51.7	42.3
Absolute poor (<=2122 k.calorie) (% households)	-	73.3	64.8
Below lower poverty line (<= Tk. 977) (% households)	-	64.2	25.1
Below upper poverty line (<= Tk. 1,206) (% households)	-	84.2	50.0
Prevalence of any disease (% HH) (3 months)	-	79.2	65.9
Water-borne disease as a % of total disease incidence (%)	-	23.0	19.9
Duration of sickness (person-days, all diseases)	-	14.4	9.1
Duration of sickness (person-days, water hygiene related diseases)	-	13.9	6.7
Duration of sickness in water hygiene related diseases as % of all diseases	-	98.2	74.4
Workdays lost (in days , in all diseases)	10.4	8.1	7.0
Workdays lost in water-hygiene related diseases (in days)	-	5.3	3.0
Workdays lost in water-hygiene related diseases as % of all diseases)	-	65.5	42.8
Mean medical expenditure (Tk.) (3 months)	1,202	451	816
Adjusted mean medical expenditure (Tk.) (3 months)	1,575	496	816
Adjusted mean expenditure on water-borne disease (Tk.) (3 months)	1,411	459	520
Time needed for collection of drinking water (minutes/days)	47.2	7.8	1.1
Time needed for collection of cooking water (minutes/days)	42.39	7.62	2.5
Time saved for collection of water (drinking + cooking, minutes/day)	-	74.2	86
Composite livelihood score	33	67	77
Access to safe drinking water (% households)	91	100	100
Access to hygienic latrine in own house (%)	20.0	98.0	98.0
Open defecation (% reported)	5	1.7	1.1
Annual savings due to reduced incidences of water-borne diseases	-	Tk. 102 million (US $ 1.4 million	Tk.105 million (US $ 1.5 million
Annual gain of disposable income due to time saved in water collection	-	-	Tk. 106.39 million (US $ 1.5 million)
Share of women and girls in disposable income earned from time saved in water collection	-	-	Tk. 101.60 million (US $ 1.45 million)
Total annual savings due to reduced medical expenditure and time saved in water collection			Tk. 211.7 million (US $ 3.0 million)