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Value for Money and Sustainability in WASH Programmes VFM-WASH

Analysing the Value for Money of SHEWA-B in Bangladesh

Final report, short version

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Abstract

This report presents summary findings of a Value for Money (VFM) study of the Sanitation, Hygiene Education and Water Supply in Bangladesh (SHEWA-B) programme, specifically its rural component. SHEWA-B was a collaboration between the Government of Bangladesh, DFID and UNICEF. Findings are followed by an overview of the team's recommendations to improve VFM and programme management going forward. Five key VFM dimensions were analysed, namely economy, efficiency/cost-efficiency and effectiveness/cost-effectiveness.

A complete version of this analysis, including all underlying assumptions for the estimates is available on the project website at www.vfm-wash.org.

The VFM-WASH project

This note is an output of the VFM-WASH project, which stands for "Value for Money and Sustainability in WASH programmes". It is a two-year research project funded by DFID, which entails carrying out operational research into DFID's WASH programmes in 6 countries. A consortium of 5 organisations, led by OPM, has carried out the work. Research Partners include the University of Leeds, Trémolet Consulting, LSHTM and Oxfam.

The project has 2 main objectives:

1. To identify how VFM and sustainability can be improved in DFID-funded WASH programmes through operational research in six countries (Bangladesh, Ethiopia, Mozambique, Nigeria, Pakistan and Zambia). In each of these countries, the project team conducted a VFM analysis of a DFID-funded WASH programme. The focus programmes were implemented by the country's government, large organisations such as UNICEF or small NGOs;
2. To assess the sustainability of rural WASH services in Africa and South Asia by carrying out nationally representative household surveys in 4 countries (Bangladesh, Ethiopia, Mozambique and Pakistan), alongside gathering secondary data for a larger group of countries (e.g. existing surveys and Water Point Mapping initiatives).

See the project website for more information: http://vfm-wash.org

Acknowledgements

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List of Abbreviations

As	Arsenic
ASEH	Advancing Sustainable Environmental Health
BBS	Bangladesh Bureau of Statistics
BCC	Behaviour Change Communication
CAP	Community Action Plans
CHP	Community Hygiene/Health Promoters
CHT	Chittagong Hill Tracts
DFID	Department of International Development
DPHE	Department of Public Health Engineering
DPHE DPP-PA	DPHE –Development Project Proforma - Project Assistance
DPP	Development Project Proforma
DTW	Deep tube-well
GDP	Gross Domestic Product
GoB	Government of Bangladesh
EMA	External Monitoring Agency
HDRC	Human Development Research Centre
HH	Household
HIES	Household Income and Expenditure Survey
HIS	Health Impact Study
ICB	Institutional Capacity Building
ICDDR,B	International Center for Diarrhoeal Diseases Research, Bangladesh
ICWG	Inter Country Working Group
LGED	Local Government Engineering Division
LGD	Local Government Division
LGI	Local Government Institutions
LSHTM	London School of Hygiene and Tropical Medicine
MICS	Multiple Indicator Cluster Survey
MoLGRD&C	Ministry of Local Government, Rural Development and Cooperatives
NFWSS	National Forum for Water Supply and Sanitation
NGO	Non-Government Organizations
NILG	National Institute of Local Government
OPML	Oxford Policy Management Ltd
PCR	Project Completion Report
SACOSAN	South Asian Conference on Sanitation
SHEWA-B	Sanitation, Hygiene Education and Water Supply, Bangladesh
SocMob	Social Mobilizations
SSHE	School Sanitation and Hygiene Education

STW	Shallow tube-well
UNICEF	United Nations Children's Fund
VFM	Value for Money
WASA	Water and Sewerage Authorities
WASH	Water, Sanitation and Hygiene
WB	World Bank
WES	Water, Environment and Sanitation
WHO	World Health Organization
WinS	WASH in Schools
WSP	Water and Sanitation Program
XEN	Executive Engineer

1 Introduction

1.1 Objectives

The objective of this case study is to examine the value for money of a major rural water supply, sanitation and hygiene programme, SHEWA-B, in Bangladesh. The analysis is intended to provide pointers for improved design of future programmes including those funded by DFID and implemented by UNICEF.

The programme described in this study was implemented at a historic moment as Bangladesh moved from one phase of WASH development (increasing basic access) to the other (improving levels of service, sustainability and equity). It was also a programme which was subject to an almost-unprecedented degree of monitoring and evaluation. The usefulness of this may also be revealed in part through this analysis.

As a measure of the usefulness of the analysis, the consultants also worked with UNICEF during the fieldwork period to develop a monitoring framework for the next phase of planned DFID support to UNICEF's rural water supply, sanitation and hygiene programmes. The resultant framework is subject to ongoing discussion and is planned to be used to guide monitoring efforts of the new programme.

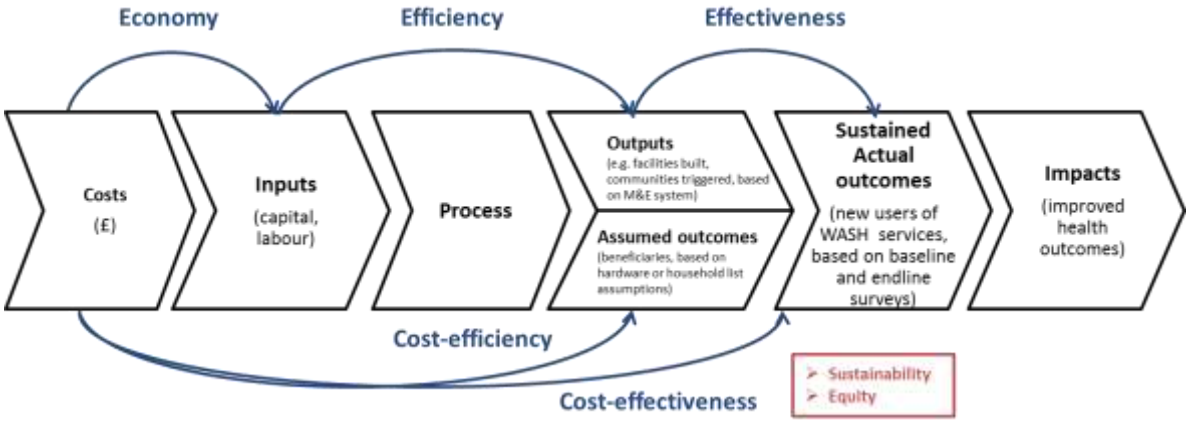
1.2 Overview of SHEWA-B Programme

The programme which is the subject of this analysis is the rural component of the Sanitation, Hygiene Education and Water Supply in Bangladesh (SHEWA-B) programme. SHEWA-B was a collaboration between the Government of Bangladesh, the United Kingdom Department for International Development and UNICEF. Launched in 2007, the goal of the programme was to reduce diarrhoeal disease and acute respiratory infection (ARI), the top two causes of post-natal under-five deaths in Bangladesh (Sayem et al, 2011). SHEWA-B had a strong programmatic focus on sanitation and hygiene behaviour change. Additional components include the provision of arsenic-free drinking water, school WASH, support to national policy development, and strengthening sub-national planning processes and implementation capacity. The programme was implemented over six years (2007-2013) and had a total DFID budget for its rural component of US$ 72million.

1.3 Methodology for the VFM analysis

Methodology. The present analysis follows a standard methodology for VFM analysis set out in the "How to do Value for Money analysis for WASH programmes" note released in May 2015 by the VFM-WASH consortium. This methodology explains how VFM can be evaluated along the WASH results value chain, as shown in Figure 1 below.

Figure 1. The WASH Results Chain



Source: Adapted by Authors from DFID WASH Portfolio Review (2013)

The WASH results chain uses the following definitions:

- An **output** is defined as an activity or product (infrastructure or software activity) that is the direct result of the programme and which can be counted as such (e.g. water points and small water supply systems constructed by the programme, number of CLTS campaigns conducted);
- An **assumed outcome** is the number of beneficiaries assumed to have gained access to WASH services as a result of the outputs of the programme's interventions;
- A **sustained actual outcome** measures the actual change in poor people's lives. It is the number of new people moving from using an unimproved water point to an improved one and who continue to use it over time.

A key step of the methodology consists of mapping out the programme results chain, as done in Section 3.2 below. The methodology then consists of computing VFM indicators across the five main dimensions of the VFM analysis, including economy, efficiency, cost-efficiency, effectiveness and cost-effectiveness. The way in which these indicators have been estimated in Bangladesh is explained in Section 4 below.

Moreover, the "How to do Value for Money analysis for WASH programmes"[1] note stresses that the output of the VFM analysis should not just be a series of quantitative indicators: the exercise in itself (and the associated discipline of identifying and analysing hard numbers) must engage with programme stakeholders in order to deliver learning for programme design and implementation.

1.4 Approach to the VFM analysis

The case study was conducted during two periods of field work.

- In February 2014 the consultants spent two weeks in Bangladesh, working with staff from UNICEF and the Department for Public Health Engineering (DPHE) to collect

[1] See section 1.3 specifically

key VFM information relating to the programme. An initial assessment of VFM indicators was presented during this visit.

- During the first visit the consultants also worked with UNICEF staff to develop the first cut of a VFM-focused results framework for the new round of DFID-supported rural water and sanitation programming.

- An interim report based on preliminary results was presented to DFID and UNICEF in July 2014. This report formulated recommendations to improve the tracking of expenditures and results in future programmes to enable easier analysis of value-for-money.

- During a follow up visit in February 2015 the consultants discussed the report in detail with UNICEF and DPHE and also finalised the proposed results framework for the new programme.

1.5 Report structure

The present report is organised as follows:

- Section 2 provides key elements of context on Bangladesh and the WASH sector;
- Section 3 provides an overview of the SHEWA-B programme;
- Section 4 presents key findings from the VFM analysis;
- Section 5 formulates recommendations to strengthen programme management systems in future to enhance the ability of the sector in Bangladesh to generate VFM metrics and use such metrics to inform programme management so as to generate efficiency improvements.

In addition, a list of key references has been provided. A full bibliography, a list of people interviewed and additional information on underlying assumptions used for the analysis are available in the longer version of this report, which can be provided upon request.

2 Country context

2.1 General characteristics

Geography: Bangladesh is situated in one of the largest deltas of the world with a total area of 147,570 sq. km. It is essentially a low plain containing the combined delta of the Ganges (Padma) and the Brahmaputra (Jamuna). Most of the delta is less than 150 feet above sea-level. The Barind upland in the north-west, the upper Surma Valley in the north, and the Chittagong Hill Tracts in the extreme south-east, rise to a height of 2,100 ft.

The climate is characterised by heavy monsoon rainfall and floods occur on an annual basis. With the exception of the relatively dry western region of Rajshahi, where the annual rainfall is about 1,600 mm (63.0 in), most parts of the country receive at least 2,300 mm (90.6 in) of rainfall per year. Monsoon rainfall often coincides with cyclones in the Bay of Bengal which cause sea levels to rise and increase the probability and severity of seasonal and catastrophic flooding. Rising sea levels coupled with increasing storm severities caused by climate change and increasing population density in the delta regions of the country are likely to result in increasing frequency, severity and impact of cyclone events in Bangladesh.

Economy and Poverty: Bangladesh became an independent and sovereign country in 1971. GDP per capita is estimated at US$ 848 (at 2011-12 prices) (SACOSAN-V, 2013). In the past decade, the economy has grown at nearly 6 percent per year (World Bank, 2008). During this period poverty incidence dropped by nearly a third; life expectancy increased and both literacy, and per capita food intake rose. Between 1992 and 2014 more than 15 million Bangladeshis have moved out of poverty.

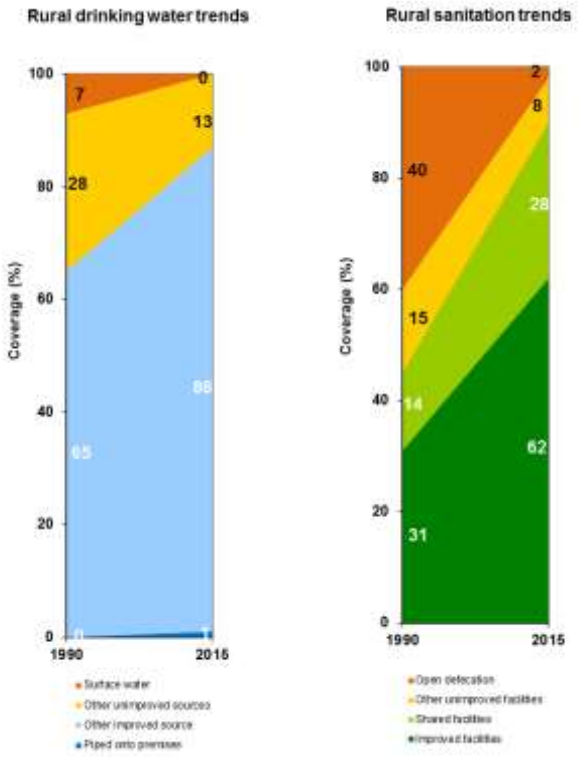
However the country remains predominantly rural (72% of the population live in rural areas). Out of the country's total population of 153.3 million (2010), 31.5% is categorized as poor, and 17.6% is hardcore poor (HIES 2010). Many people are considered vulnerable to either changes in the job market or natural disasters which could push them back into poverty (World Bank, 2014).

Current access to water and sanitation: Bangladesh has abundant groundwater in both shallow and deep aquifers as well as significant surface water resources. During the 1980s and 1990s the country made rapid progress in achieving high rates of access to 'safe' water supplies (primarily groundwater) which had much lower rates of contamination with infectious pathogens than the surface sources (primarily ponds) used up to that time. By 2009 close to ninety eight percent (97.8%) of the population used an "improved" drinking water source (MICS 2009).

However, MICS 2009 also estimated that 12.6% of households (6.2% in urban and 14.0% in rural areas) drink arsenic-contaminated water (that is water which exceeds the Bangladesh standard for acceptable level of arsenic content of 50 micrograms per litre). WHO applies a higher safety standard for arsenic (10 μg/L); 23.1% of the population (14.3% in urban areas and 25.1% in rural areas) of households were drinking water which exceeded the World Health Organization's (WHO) standard for arsenic.

Strong political commitment and a large number of government and non-governmental programmes have resulted in rapid progress in terms of access to sanitation. Open defection is estimated to have fallen to 2% in rural areas by 2015 (**Figure 2**)..

Figure 2: Trends in rural water and sanitation coverage (WHO/UNICEF, 2015)



This rapid progress has largely been achieved largely through roll out of Community-Led Total Sanitation campaigns by both government and several major NGOs. The government of Bangladesh has shown considerable commitment to allocating and spending budgets on sanitation, and has also had some success in targeting funds towards poor households and other disadvantaged groups.

Nonetheless, this impressive progress is challenged by quality of service provision issues particularly in the areas which are designated as “Hard to Reach” i.e. hilly regions, riverine islands (chars), swamps (beels and haors), water-scarce & climate vulnerable areas and the rapidly growing urban slums. In the “Hard to Reach Areas” only 36% families have improved sanitation facilities. Frequent floods, cyclones and other natural disasters have caused damage to sanitation facilities lowering the population coverage in these affected areas.

2.2 Rural water and rural sanitation sector overview

2.2.1 Legal and policy framework

The statutory responsibility for the water and sanitation sector is vested in the Ministry of Local Government, Rural Development and Cooperatives (MoLGRD&C). Within this Ministry, the Local Government Division (LGD), shares the responsibility of policy decisions, sectoral allocation and funding, as well as project appraisals, approval, evaluation and monitoring with the Planning Commission and the Ministry of Finance. LGD is also responsible for the administrative control of the agencies charged with implementation of water supply and sanitation which comprise:

- the three Water and Sewerage Authorities (WASAs) which are charged with responsibility for water supply and networked sewerage in Dhaka, Chittagong and Khulna cities;

- over two hundred municipalities (pourashavas) responsible for water supply, sanitation and drainage in small towns and cities;

- the Department for Public Health Engineering (DPHE) primarily responsible for public water supply and sanitation outside of the metropolitan areas and pourashavas as well as for capital investments carried out on behalf of Pourashavas;

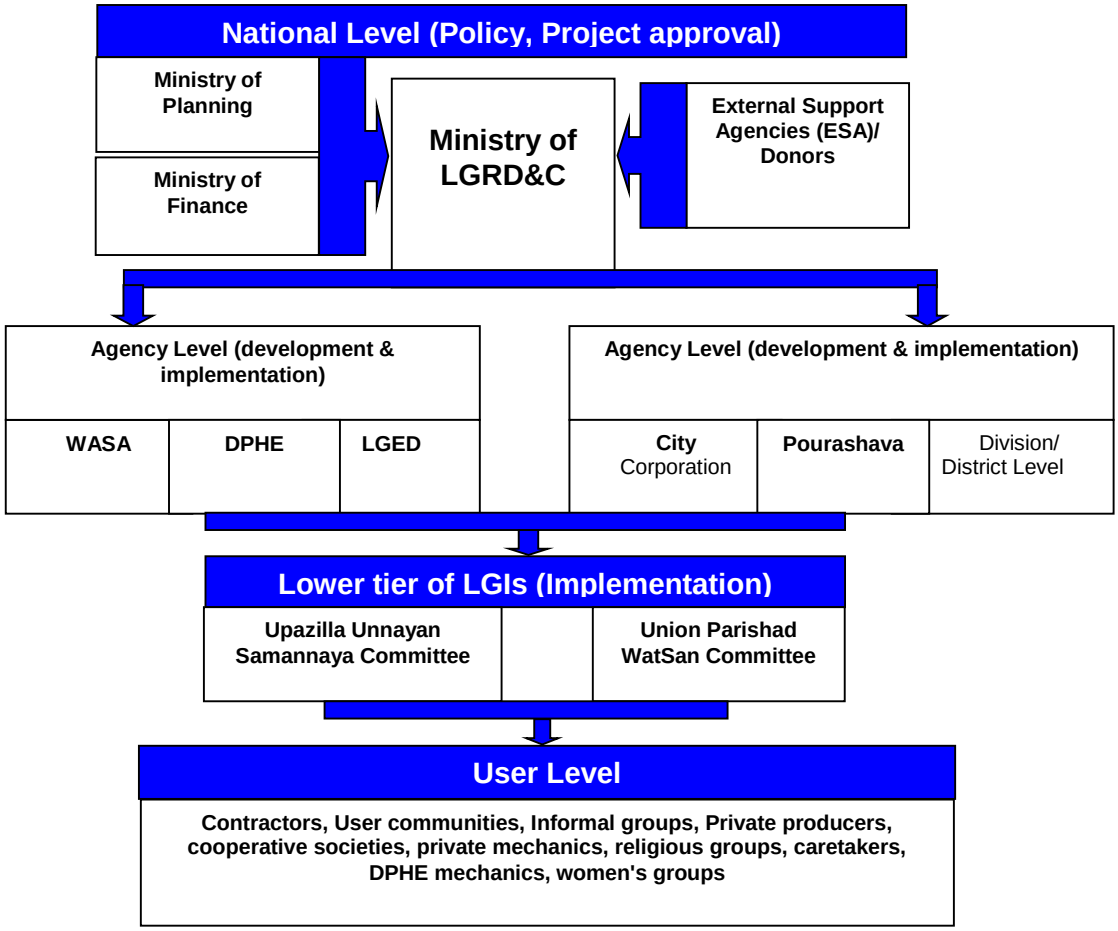
- the Local Government Engineering Division (LGED) which also carries out some water supply and sanitation programmes although at a much smaller scale and primarily provision of institutional water and sanitation systems for local government; and

- local government institutions (LGIs) who play a coordinating role in water supply provision at the local level and are responsible for non-networked sanitation and drainage.

Since 1962 DPHE has been the lead government agency in the sector. In addition to DPHE, the LGED, also implements sanitation & drainage projects mostly in urban areas and the National Institute for Local Government (NILG) carries out capacity development of local government bodies including municipalities. Ensuring the quality of services for all is the responsibility of the lowest tier of local government institutions (Union parishads & municipalities).

Coordination at the national level between government agencies, NGOs, development partners and the private sector is achieved through the National Forum for Water Supply and Sanitation (NFWSS) established by LGD. Coordination at the local level is undertaken by Water Supply and Sanitation Committees (*WatSan* Committees) established in the Local Government Institutions (upazila parishads, union parishads and pourashavas). The sector is also supported by multilateral agencies, development partners, international & national NGOs. The institutional set-up of the sanitation sector in Bangladesh is summarised in Figure 3**.**

Figure 3: Institutional arrangements in the WASH sector (SACOSAN, 2013)



2.2.2 Key non-governmental actors and programmes

During the last fiscal period (2007/8-2011/12 GoB reported spent US$ 541million (in 2011/12 prices) in the water sector. Of this US$ 96 million was spent in rural areas. This equates to an annual expenditure of around US$ 19million on rural water supply and sanitation. Additional expenditures on hygiene promotion may also be made through health and other budget lines.

Significant additional funding flows in to the sector from other sources. The sanitation and water sectors in Bangladesh are very dynamic, with numerous non-governmental partners and some large-scale NGO programmes. Two of the most significant NGO-led programmes in recent years were the Advancing Sustainable Environmental Health (ASEH) project led by WaterAid and the BRAC Water, Sanitation and Hygiene Programme.

ASEH was started in 2003 and ran for six years to 2009. It worked through 19 partner NGOs in 41 Upazilas as well as in urban pourashavas and slums. It was a large scale project which resulted in the construction of over 82,000 water facilities, over 1 million sanitation facilities and had over 6.5 million targeted beneficiaries for its hygiene promotion programme (ASEH/WaterAid. 2009). The project had a budget of GBP 17.5 million from DFID as well as contributions from local communities.

The BRAC WASH programme has been implemented in 150 Upazilas and had a target of 37.5 million beneficiaries. The total budget of the BRAC WASH Programme was US$ 76.1 million (excluding household contributions), including funding from the Dutch Government, BRAC and local communities.

Both these programmes have placed a strong emphasis on hygiene and sanitation behaviour change and the promotion of safe drinking water practices, plus limited funding for water supply hardware and for sanitation promotion and hardware.

The scale of these two projects is significant and is also set alongside a strong government-led sanitation programme and widespread ongoing investment in public water supplies by DPHE.

3 Overview of SHEWA-B

3.1 Programme objectives

The Sanitation, Hygiene Education and Water Supply in Bangladesh (SHEWA-B) programme was a collaboration between the Government of Bangladesh, the United Kingdom Department for International Development and UNICEF. Launched in 2007, the goal of the programme was to reduce diarrhoeal disease and acute respiratory infection (ARI), the top two causes of post-natal under-five deaths in Bangladesh (Sayem et al, 2011). SHEWA-B had a strong programmatic focus on sanitation and hygiene behaviour change. Additional components include the provision of arsenic-free drinking water, school WASH, support to national policy development, and strengthening sub-national planning processes and implementation capacity. The programme was implemented over six years (2007-2013). In 2012, it was substantially re-designed and an amended log frame was developed due to slower-than-expected progress.

3.2 Activities, programme components and results chain

The project had an 'objective' level aim of improving health. The project was therefore targeted at clusters which were known to be at risk from arsenic contamination of groundwater and where average poverty levels were more than 40%. Poverty incidence was used as a proxy for incidence of diarrhoea, pneumonia and overall rates of childhood death since these are more common among the poor.

Behaviour change (including water, sanitation and hygiene): The main route to behaviour change in the programme was via Community Health Promoters, employed by local Field Agencies working at upazila level. CHPs were trained to support communities to develop Community Action Plans (CAPs). In the CAP, members of target communities identified appropriate WASH technology for their area and selected appropriate sites for installation of public water points to ensure easy access.

CHPs were initially trained to deliver 11 key messages related to water sanitation and hygiene, plus a message on menstrual hygiene and provided with suitable equipment such as flash cards, sorting cards etc. In 2010 the hygiene package was redesigned to focus on a limited number of key messages. At the same time UNICEF appointed two national apex NGOs to provide support to FAs.

In addition to the CHP-based strategy, the programme also funded a mass media campaign which included radio spots across six regional channels from November 2011 to February 2012 and video spots on five television stations from November 2011 to February 2012 that encouraged handwashing with soap at key times. A second series of video spots on five television stations aired from October to November 2012 and encouraged testing of tubewells for the presence of arsenic, and using arsenic free water for both cooking and drinking.

Water supply: In terms of hardware, the programme directly provided a number of public water points in areas of highest need. New public water points were allocated on the basis of poverty incidence, risk of arsenic exposure from existing sources and community needs' assessments. Procurement of public water points was managed at the district level by DPHE. The majority of new public water points were deep tubewells with Tara or Number 6 pumps. A small number of piped systems, pond sand-filters and rainwater harvesting systems were installed where there was no technical option which could ensure arsenic-

safe water production from groundwater. Some hardware was directly procured and supplied by UNICEF.

In addition households were encouraged to invest in private water supplies by themselves. CHPs were expected to provide advice and support to families choosing to make such investments.

Sanitation: In addition to promoting household investment in hygienic latrines, the programme also provided a small number of subsidies for the construction of latrines by the hardcore poor. CHPs were also expected to coordinate with LGIs to identify households who were eligible for subsidies for sanitation under the National Sanitation Programme. Most of the intervention areas had already been exposed to community-led total sanitation-type triggering and rate of open defecation are already relatively low, so the programme was focused on promoting the use of hygienic latrines rather than on eliminating open defecation.

Wash in Schools: The program provided hygiene promotional support in targeted schools including the provision of teaching materials and delivery of hygiene promotion activities. The Wash in Schools component also financed the rehabilitation or construction of new water points and latrines.

Institutional Capacity Building: Institutional capacity building focused mainly on the training and development of local government institutions to manage community-based WASH planning and delivery, and to develop and delivery action plans at the local level.

A summary of the results chain is shown in Table 1.

Table 1: Overview of SHEWA-B's results chain by project component

	Inputs / Activities	Outputs	Assumed Outcomes	Sustained Actual Outcomes	Impacts
Water	• Social mobilisation • National procurement of hardware for water access • Construction or rehabilitation of water points (public)	• New or rehabilitated water points (public) • New or rehabilitated water points (private) as a result of social mobilisation • Water quality testing for Arsenic	• Population in rural areas with access to safe water as a result of newly installed or repaired water points or switching after Arsenic (As) testing	• Population using safe water for drinking purposes.	• Reduction in incidence of diarrhoeal episodes and acute respiratory infection (ARIs) • Continued demand from communities for As testing
Sanitation	• Social mobilisation • Procurement of sanitation hardware for hard core poor and hard to reach areas • Construction or rehabilitation of latrines	• New or rehabilitated latrines for which HH have obtained fully or partially subsidised HW (and self-transported and installed the latrines) • New or rehabilitated latrines organised and paid for by HH	• Reduced number of people practicing OD in rural areas • Increased number of people in rural areas with access to latrines which are maintained appropriately	• Population with access to and use of sustainable technologies for environmental sanitation • People living in open-defecation free environments	• Reduction in incidence of diarrhoeal episodes and ARIs associated with reduced OD and safe disposal of excreta
Hygiene	• Hygiene promotion of safe sanitation and water messages in the project areas • National mass media campaign	• Population receiving Social Mobilisation (WASH education) • Population exposed to mass media campaign.	• Population having facilities to wash their hands after defecation	• Hygiene behaviours adopted and practiced in the community • Ability of population exposed to national mass media campaign to recall at least three key hygiene messages	• Reduction in incidence of diarrhoeal episodes and ARIs associated with increased hand washing after defecation by mothers
Wash In Schools	• School Sanitation and Hygiene Education • Construction or rehabilitation of latrines • Construction or rehabilitation of water points	• Number of schools receiving school hygiene sessions • New or rehabilitated latrines • New or rehabilitated water points • Number of schools with new access to a functional latrine. • Number of schools with new access to a clean latrine. • Number of water points in schools tested for As	• Number of children exposed to School Sanitation and Hygiene Education • Access for students to arsenic-safe water point	• Number of students retaining adequate knowledge of hygiene, sanitation and safe water messages • Hygiene behaviours adopted and practiced by students • Students gaining access to a functional toilet and a clean toilet • New access for students to arsenic-safe water and functional water points	• Reduction in incidence of diarrhoeal episodes and ARIs associated with access to and use of safe water, improved sanitation and increased hand washing after defecation by mothers
Institutional Capacity Building	• LGI project fund management for WASH improvements • Delivery of capacity building package	• Funds directed to LGIs for WASH improvement projects • Capacity development of field agencies, LGIs and school authorities) • Number of GOB officials, community members and others with increased capacity in WASH	• Enhanced government capacity through system strengthening in the areas of sanitation and water resources, with ability to manage integrated WASH Plan • Development of community maps and community action plans	• Sustained usage of sector monitoring WASH services • Application of learning into development of national strategies and policies	• Clear leadership of the LGI within the WASH sector • Continued and improved government financial allocation to WASH services

Note – assumption on hygiene and WinS outcome that one time observed handwashing reflects adopted behavioural change.

3.3 Geographical scope

At its inception, SHEWA-B was the largest WASH programme ever supported by DFID anywhere. The programme directly targeted 21.4 million people with hygiene promotion within the selected intervention areas, and indirectly targeted an additional 10 million people outside intervention areas, bringing the total number of targeted beneficiaries to 31.4 million (Table 2).

Table 2: SHEWA-B Target beneficiary coverage (2007-2012); (Source: UNICEF, 2013)

Area	Sub category	Target beneficiaries (million)	Targeted intervention areas
Rural	Low-land and plains	17.6	60 upazilas
	Chittagong Hill Tracts	0.1	600 paras in 16 target upazilas
Schools	Primary	2.4	8,800 schools (rural only)
	Secondary	0.3	650 schools (rural and urban)
Urban	Slums	1.0	18 Pourashavas
External/ beyond intervention areas	People within reach of mass media campaign	10	Non-intervention areas

The VFM analysis presented below is focused on the rural element of the programme only, along with the WASH in Schools component.

3.4 Programme institutional and implementation arrangements

Management and oversight: A key aspect of SHEWA-B is that it is largely implemented through the regular budgetary channels of DPHE. Overall supervision was the responsibility of UNICEF at the headquarters office in Dhaka. Funds were primarily transferred to DPHE at central level and channelled through the regular DPHE channels to district and upazila level. Funds flow was therefore subject to GoB standard audit and financial reporting procedures.

Procurement: Procurement of infrastructure was carried out by DPHE staff at district level using standard GoB procurement procedures. Oversight and management of procurement was provided by DPHE at the central level.

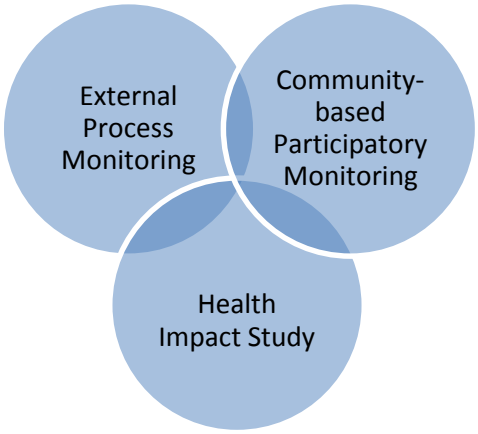
Community and social mobilisation: The programme had a very strong focus on community and social mobilisation approaches. Social mobilisation was carried out by Community Hygiene Promoters (CHPs). The CHPs were staff of local NGOs (known as Field Agencies - FAs). FAs were hired at the district level through competitive tendering, by District level DPHE staff. In 2010, in response to reported patchy performance of CHPs UNICEF appointed two apex NGOs (WaterAid and PLAN) to support the local NGO providers, train CHPs and promote standardised reporting. WaterAid estimate that around 1,300 CHPs were engaged by the project at any one time (Khairul Islam; personal communication). CHPs were tasked with promoting hygiene behaviour change, construction of household latrines and construction of private tubewells as well as supporting the development of water user groups for public tubewells[2].

[2] Another NGO Dhaka Ahsania Mission (DAM) was hired for capacity building ng of ICDP Para Workers in Chittagong Hill Tract districts. These workers carried out similar work to the CHPs but in a different context.

3.5 Programme management and monitoring systems

In addition to the regular monitoring and financial reporting of DPHE and UNICEF, there were three specific additional monitoring and evaluation elements of the programme (Figure 4).

Figure 4: SHEWA-B Monitoring and Evaluation System



External process monitoring was carried out in the rural areas by the consultancy firm Nielsen (Bangladesh)[3]. Process monitoring used surveys, spot checks, questionnaires and other monitoring tools to track progress against the programme log-frame on a large set of indicators ranging from physical infrastructure quality to the frequency and type of hand-washing promotion activities.

Community-based participatory monitoring was carried out by WASH committees and CHPs to provide regular updates on implementation of Community Action Plans, while the adolescent girl volunteers and the school brigades provided feedback on mobilization and hygiene promotion activities in schools.

The health impact study (HIS) was a flagship element of the programme and was carried out by the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr-b). The HIS was designed to fulfil four key objectives:

- to investigate the health-related impact in terms of hygiene, sanitation and water-related behaviour change, as well as in terms of changes in WASH-related disease morbidity in < 5 children,
- To examine detailed patterns of WASH practices in both intervention and control areas using statistically robust household surveys and sentinel surveillance[4],
- To independently measure project logframe results at goal, purpose, and output levels,
- To help address the knowledge gap on the effectiveness of large-scale WASH programming.

[3] HDRC were hired to carry out similar monitoring for urban areas.
[4] A standard methodological tool for measuring health impacts.

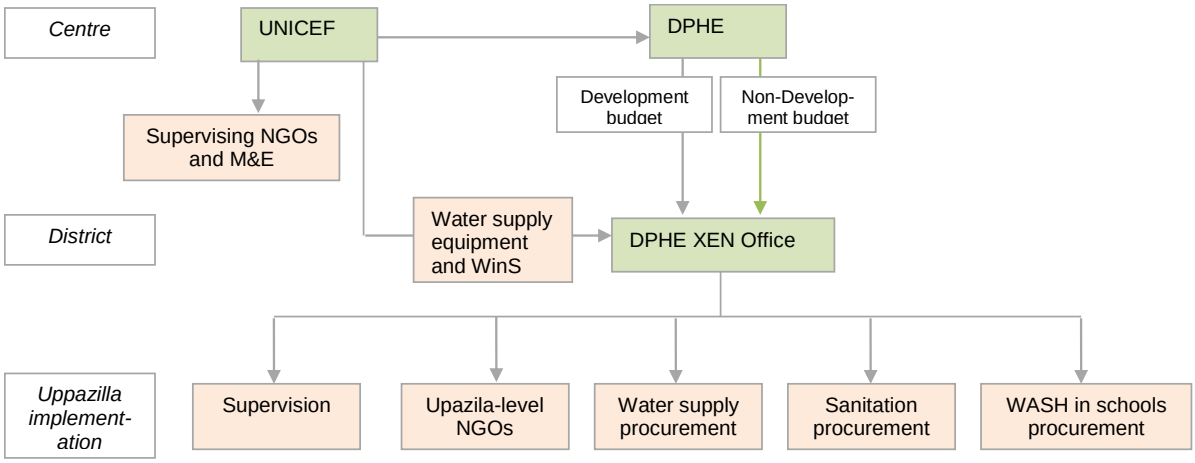
3.6 Programme's fund flows and expenditure

3.6.1 Fund flows

Under SHEWA-B DFID provided funds to UNICEF. UNICEF funds were then transferred to DPHE headquarters and from there to DPHE offices in the districts (to the office of the Executive Engineer or EE). Until 2010 this was done via the Development Project Proposal (DPP) Project-Assisted (DPP-PA) mechanism which is part of the regular annual budgeting process within DPHE. After the annual review in 2010, funds for rural water supply hardware were transferred directly to the EE in parallel to the DPP process while funds for software were transferred to the local government (Upazila) office (Monirul Islam, personal communication). A small portion of additional DPHE funds (i.e. GoB own resources) for 'development' were also allocated to water supply in project intervention areas. DPHE also directly contributed additional inputs in the form of staff and administrative time through its regular 'non-development' or establishment budget. Some procurement was handled directly by DPHE headquarters and UNICEF undertook some direct procurement of water supply equipment.

A summary of the fund flows for the rural component of the project is shown below in Figure 5.

Figure 5: SHEWA-B Simplified funds flow for rural component



3.6.2 Programme expenditure

The original budget for DFID expenditures for the rural component of the project was US$ 56 million. The mid-term review authorised a cost extension of US$ 13 million primarily for additional software activities including the mass media campaign. With a further marginal cost extension for the final year, the final budget for DFID support to the rural component was just over US$ 72 million.

The project was effective at expending its full budget from the mid-term review onwards. The Project Completion Report sates "As of 31 October 2013, the programme had expended 99% of its budget and was within two months of completion. Plans have been made by UNICEF to fully expend the balance by late November."

Of the DFID funds:

- US$ 60.8 million flowed through the Development Project Proposal – Project Assisted mechanism (DPP-PA) of DPHE;
- US$ 14.6 million was spent by UNICEF on direct procurement; and
- US$ 4.7 million constituted the 7% UNICEF overhead.

3.6.3 Contributions from other stakeholders

Total expenditure on the project was just under US$ 162 million of which just over US$ 72 million was provided by DFID [5]. The DFID funds thus leveraged an additional 125% of funding from other sources as follows:

- US$ 16.3 million was contributed by GoB through the DPP mechanism;
- Nearly US$ 2.5 million was a direct contribution from UNICEF;
- just under US$ 2 million is the estimated value of DPHE staff time at the district level (which is transferred to the district via the 'non-development' budget line of DPHE); and
- just over US$ 66 million is estimated to comprise direct contributions by households to the construction of private water supplies and sanitation along with water user group contributions to public water points.

Excluding household contributions the total project expenditure was US$ 93 million.

3.6.4 Programme expenditure by types

This section of the report presents programme expenditures in terms of the main project components: water supply, sanitation, hygiene, Wash in Schools and Institutional Capacity Building. Figure 6 shows the expenditure breakdown with indirect programme costs shown as a separate item while Figure 7 shows the breakdown once indirect programme costs have been allocated to each component.

Indirect programme costs were made up of:

- UNICEF Overhead (7% of DFID funds at source);
- UNICEF management costs in Dhaka;
- DPHE supervision at Dhaka, district and upazila level;
- the cost of apex national NGOs to supervise and support FAs; and
- monitoring and evaluation.

[5] Data on expenditures, inputs and outputs were obtained from UNICEF WASH Section in Dhaka, DPHE headquarters, the DPHE District (XEN) office in Pabna and DPHE Upazilla (sub-district) office in Pabna. In addition there is useful data available in the DRAFT VFM Study report on SHEWA-B prepared by the Human Development Research Centre (HDRC). The HDRC report includes an analysis of actual receipts and statements of expenditures and annual reports of DPHE and the UNICEF WES financial data supplemented with qualitative surveys (interviews, focus group discussions) with HH members and informant stakeholders. The HDRC report has been submitted to UNICEF in draft form but has not yet been approved. Some discrepencies in data have been noted and the conclusions have not been agreed. For the purposes of the current VFM analysis reported here, selected information from HDRC were used where relevant and triangulated with DPHE sources and with the Project Completion Report prepared by UNICEF.

Indirect costs comprise 27% of the total project costs and 24% of the DFID contribution. This relatively high percentage for indirect costs is influenced in part by the very high level of expenditure on monitoring and evaluation associated with this project. US$ 17 million was spent on the wide range of evaluation and monitoring studies that were an integral part of the program design.

In addition the program explicitly set out to make use of GoB management systems. Establishment costs (primarily the costs of project supervision at district and upazila level) made up a significant proportion of DPHE contributions to the project.

Figure 6: Project expenditure by component

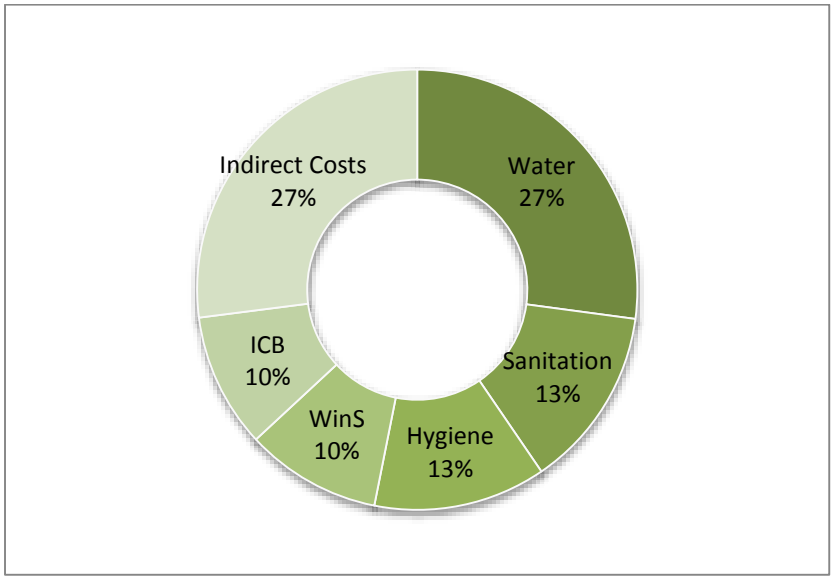


Figure 7: Project expenditure by component –indirect costs assigned to components

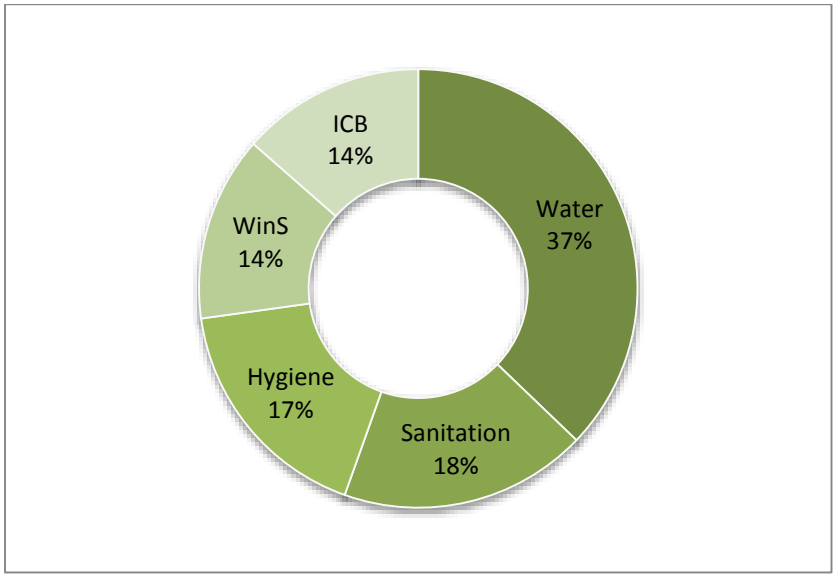


Figure 9 below shows how total expenditure on the project breaks down between cost categories. Household and community contributions to hardware make up 41%of the total expenditure on the project. When project expenditure alone is considered just over half of the expenditure (51%) was spent on social mobilisation/ software activities, primarily the Community Hygiene Promoters programme and the mass media campaign. The share of DFID funds spent on social mobilisation is 63%.

Figure 8 Expenditure by type of costs

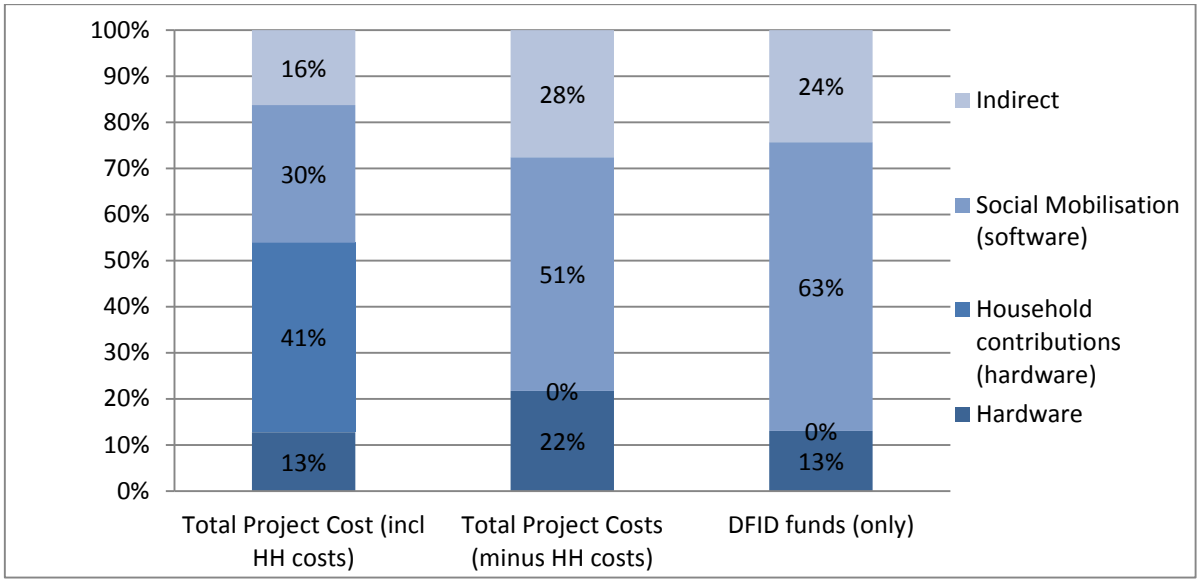
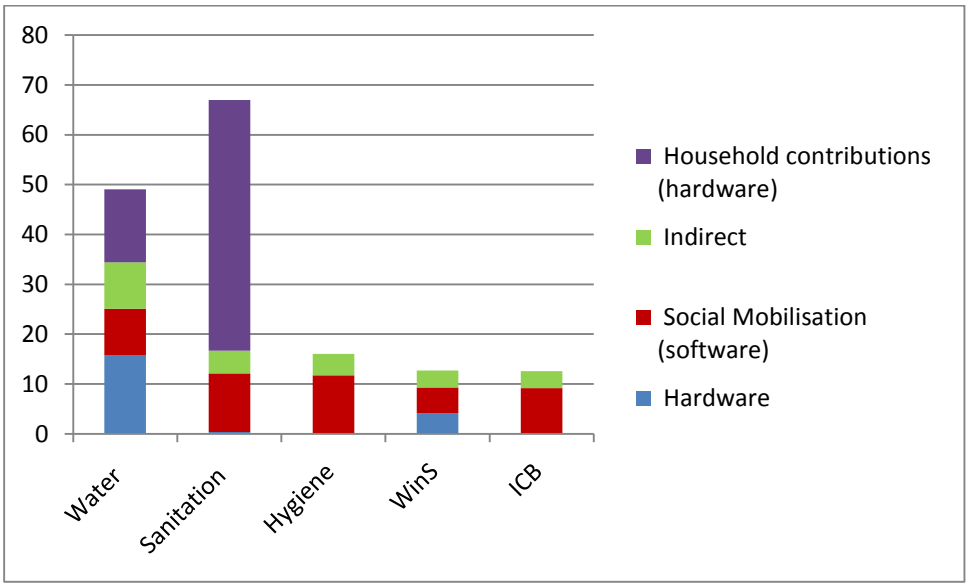


Figure 9 shows costs for each component broken down between different types of costs, based on cost categories. Household contributions dominate expenditure on sanitation while social mobilisation expenditure is most significant for Wash in Schools and Institutional Capacity Building.

Figure 9 Expenditure by main components and type of costs



3.7 Key results

3.7.1 Water

Outputs: The project financed the construction or rehabilitation of 19,579 public water points. These were primarily deep tubewells with Tara Dev pumps along with a small number of piped systems, pond sand-filters and rainwater harvesting systems. The majority of the tubewells were tested for the presence of arsenic and e-coli as part of the

DPHE surveillance programme in addition to the usual testing required in DPHE installation contracts. In addition, an estimated 64,800 new private water points were installed in the intervention area during the project period by private households.

For **Public Water Points** DPHE assume that each public water point serves 13.5 families. Thus each new public water point has a theoretical output of 59.4 people gaining access (assuming 4.4 people per family) and a total of 1,372,140 people could gain access via these water points provided all water were arsenic-safe.

DPHE carried out project-specific surveillance on the SHEWA-B public water points and their data indicate that 99.7% of SHEWA-B public rural water points meet the Government of Bangladesh Arsenic Standard and are thus providing water suitable for drinking purposes.

The total number of people potentially benefiting from arsenic-safe water through new public water points under SHEWA-B was therefore 1,159,504 people[6].

Private water points are generally assumed to serve only one family. Thus the total number of people potentially gaining access to water by means of private water points was 285,494[7].

In general private water points are shallow, and therefore more prone to arsenic contamination (GoB, 2009). This may help to explain data elsewhere in literature, where ICDDR-B reported only 21% of water points in the SHEWA-B communities were As-safe (including non-project and project water points) (iccdr,b, 2013). In the absence of detailed As data for the SHEWA-B-related private tubewells we can assume that the rate of arsenic contamination in private shallow tubewells lies between 0.3% and 79%. Thus the number of people gaining access to arsenic-safe water by means of new private tubewells lies between 59,917 and 284,462[8].

Sustained actual outcomes: Information in the DPHE database relating to SHEWA-B water points showed that 82.2% were both meeting the national As standard and were functional when they were tested after commissioning but during the project period. The wider DPHE database, which looks at all public water points installed between 2006 and 2011, shows that typical functionality rates for both deep and shallow public tubewells is around 85% after six years of operation. In terms of numbers of users our Objective 2 survey data suggested, for the country as a whole that the number of users of public water points ranges from 15 to 491 with a median of 70 and a mean of 104 which is slightly higher than the assumptions used by DPHE for project planning purposes. Private water points may have slightly higher functionality but performance in terms of arsenic will tend to dominate sustained actual outcomes.

The project is estimated to have had a sustained actual outcome of 959,469, people with access to arsenic-safe *public* water points and between 50,929 and 241,793 with access to arsenic-safe *private* water points (a total of between 1,010,398 and 1,201,262 people with access to arsenic-safe water supplies).

3.7.2 Sanitation

Outputs: In SHEWA-B intervention areas during the project period a total of 1.14 million new latrines were constructed or existing latrines repaired. Of these 228,000 (20%)

[6] Calculated as 19,579*13.5*4.4*99.7%
[7] Calculated as 4.4*64,885
[8] Calculated as 64,845*4.4 *21% = 59,917 and 64,845*4.4*99.7% = 284,462

received public subsidy (not funded by the project), and 912,000 were wholly funded by households themselves (UNICEF data)

Assumed Outcomes: Assuming a standard family size of 4.4 and no sharing, just over 5 million people have potentially gained access to a private latrine in the SHEWA-B programme areas during the project period (Table 7). Self-financing of latrines is considered to have been influenced by the social mobilisation elements of SHEWA-B although direct attribution of these latrines solely to SHEWA-B activities is not in fact certain as other factors are likely to have influenced household investment decisions..

Sustained actual outcomes: Various evaluations were carried out to assess the extent to which people lived in open-defecation-free environments as result of the SHEWA-B project intervention. The most conservative data from the iccdr-b endline report shows an estimated 612,000 people who moved to living in an ODF environment during the project period.

In terms of use of an improved sanitation facility, outcome data is available for the sanitation intervention as the functionality of latrines was observed and recorded as part of the M&E of the project. The Nielsen Process Monitoring Endline Report (Dec, 2012) reports 66.5% functionality of observed latrines in the project areas in 2012. Assuming equal functionality rates across the entire 1.14 million subsidised and privately funded latrines built under SHEWA-B, this translates into 667,128 people gaining sustained access to a new subsidised and functional latrine[9] and 2,668,512 people gaining sustained access to a privately funded functional latrine[10] yielding a total of just over 3.3 million people.

3.7.3 Hygiene

Outputs: An estimated 20,400,000 people lived in communities receiving social mobilisation interventions during the project. A further 10 million people were estimated to have received exposure to the mass media campaign

Assumed Outcomes: Assumed outcomes from the hygiene promotion component of the project predominantly relate to the increased awareness of key water, sanitation and hand washing messages. No information was available to show what assumptions were made about how this knowledge would translate into actual behaviour change. At baseline, iccdr-b reported that 47% of the population in project intervention areas were able to state at least 1 key message from each of the water, sanitation and hand washing messages. Assuming this awareness would have risen to 100% the total number of additional people with ability to recall one of each of the key messages could have been as high as 10,812,000 (53% of 20.4 million).

The endline report also provided information on the numbers of households who had constructed or otherwise acquired handwashing stations at appropriate locations. These are summarised in Table 4.

[9] Calculated as 4.4*228000*66.5%
[10] Calculated as 4.4*912000*66.5%

Sustained actual outcomes: Key outcomes in terms of numbers of people practicing key behaviours were reported by iccdr,b as part of the endline report. These data are summarised in Table 3.

3.7.4 Wash in Schools

Outputs: The programme worked in 8,331 schools. 4,532 schools received either new or rehabilitated water points, toilets or both. A total of 1,548 new or rehabilitated water points were provided which provided water which met the Bangladesh national standard for arsenic. .

Assumed outcome: With an average 250 pupils per school, the SHEWA-B project potentially reached just over 2 million school-age children with SSHE interventions. Just over a million children are in schools where access to either water supply, sanitation or both was improved. 38,625 children are in schools where water supply was either newly installed or rehabilitated and has been shown to be arsenic safe.

Sustained actual outcomes: WaterAid estimated that just over a million children who had received SSHE were able to recall key messages at the close of the project. Just under a million children gained access to clean functional latrines and just over a quarter of a million to new reliable water supplies.

3.7.5 Institutional Capacity Building

Outputs: The project worked with a total of 53 Union Parishads, provided training to 191,558 people, including 129,000 members of WATSAN committees and assisted local government institutions and communities to prepare Community Action Plans in all participating communities (Table 10).

Assumed outcome: The potential impact of improved capacity the local level would have affected a total population of 600,000 people living in the areas where training was undertaken. A total of 133,000 community maps and action plans were produced.

Table 3. SHEWA-B outputs, assumed outcomes and sustained actual outcomes

Water			
Indicators		**Result**	**Comments**
Output	Number of public water points constructed	19,579	99.7% of SHEWA-B public water points met the national standard for arsenic.
	Number of private water points constructed	64,845	21% of SHEWA-B water points met the national standard for arsenic
Assumed outcomes	Estimated number of people who gained access to As-safe water via new or rehabilitated public water points	1,159.504	Each assumed to serve 13.5 families and 99.7% provide As-safe water
	Estimated number of people who gained access to As-safe water via new or rehabilitated private water points	59,917-284,462	Each assumed to serve 1 family and between 21 and 99.7% provide As-safe water
Sustained actual outcomes	Estimated actual number of people who are using the new water points constructed	1,010,398 - 1,201,262	Based on DPHE data on functionality and As status of public SHEWA-B water points and this project Objective-2 data on numbers of users of public water points. Marginal changes over the baseline have not been assessed (ie some of these users may have already had access to improved As-safe water supplies)
Sanitation			
Indicators		**Result**	**Comments**
Output	Number of partly – subsidised latrines	228,000	Subsidies are provided through local government to hardcore poor households and are not included in project costs
	Number of privately funded latrines	912,000	
Assumed outcomes	People gaining access to latrines	5,016,000	Assume no sharing of new SHEWA-B latrines. In absence of baseline not possible to know how many of these are new users
Sustained actual outcomes	People using a functional latrine	3.3 million	Based on Nielsen Process Monitoring Report (2012) and author's estimates (functionality of latrines is around 66%)
	People living in an open-defecation free environment	612,000	Based on Nielsen process Monitoring Report (2012) Pathways Consulting report 92012) and Project Completion Report.
Hygiene			
Indicators		**Result**	**Comments**
Output	Number of people receiving social mobilisation intervention including both targeted community	**20,400,000**	Estimated number of people living in communities targeted under the project.

	support and mass media						
	Number of people exposed to national mass media campaign only	10,000,000					Assuming saturation in districts covered by the mass media campaign.
Assumed outcomes	People have soap / ash facilities and water to wash their hands	480,000					Not statistically significant based on iccdr,b endline evaluation
	People have water only to wash their hands after defecation	1,428,000					Statistically significant based on iccdr,b endline evaluation
	People have a wash station in a convenient place after defecation	1,020,000					Statistically significant based on iccdr,b endline evaluation
Sustained actual outcomes	**Key behaviours changed**	Before food prep	Before eating	Before feeding child	After child defecation	After defecation	
	People over five years of age practice key hygiene behaviours	285,600	489,600	448,800	3,264,000	3,060,000	Statistically significant based on iccdr,b endline evaluation
	Female care givers practice key hygiene behaviours	1,468,800	714,000	448,800	3,264,000	3,468,000	Statistically significant based on iccdr,b endline evaluation
	People able to recall at least one of each of the key water, sanitation and hygiene messages	10,812,000					Assumed additional people with knowledge of the key messages above the baseline incidence based on iccdr-b baseline study.
Wash in Schools							
Indicators		**Result**					**Comments**
Output	Schools received School Sanitation and Hygiene Education (SSHE)	**8,331**					
	Schools with new or rehabilitated water points and/or latrines	4,532					4,211 primary and 321 secondary schools
	Schools with new water points that meet the national standard for As	1,545					
Assumed outcomes	School-age children exposed to SSHE messages	2,082,750					
	School age children gained access to arsenic-safe water and/or sanitation	1,113,000 (of which 38,625 gained access to As-safe water)					
Sustained actual outcomes	Children have adequate knowledge of SSHE	1,387,112					Based on data from WaterAid (2012)
	Children gained access to a functional clean latrine at school	974,389					Project Completion Report
	Children gained access to and use of safe and functional water points	275,500					Project Completion Report

	Children were in schools where soap/ash and water were available for handwashing after defecation	1,320,000	Project Completion Report
Institutional capacity building			
Indicators		**Result**	**Comments**
Output	Union Parishads engaged in managing SHEWA-B project funds	**53**	17 by 2011 and 36 by 2012
	People received training including members of WATSAN committees	191,558	
	Technical assistance provided to Union Parishads to prepare community action plans		
Assumed outcomes	People living in Union Parishads where government capacity has increased	600,000	
	Community maps and action plans prepared	133,000	

Source: Estimated by authors from project reports

4 Key results of the VFM Analysis

In this section, we present the main results of the VFM analysis of SHEWA-B. The methodology calls for computing VFM indicators across five dimensions of VFM, including economy, efficiency and cost efficiency, effectiveness and cost effectiveness.

These indicators were estimated based on the expenditure and results data of the SHEWA-B (presented in Section 3). Indicators are presented in terms of programme expenditures alone (ie excluding household contributions which are estimated rather than actual expenditures). However, VFM indicators including estimates of household contributions have also been calculated for the water supply and sanitation where these contributions are significant.

Overall, efficiency and cost efficiency indicators were estimated for all components. Data were insufficient to calculate economy, effectiveness and cost effectiveness indicators. In some cases cost-effectiveness was estimated using Objective 2 survey results.

Error! Reference source not found. below summarises the key VFM indicators presented in this section.

Table 4 SHEWA-B VFM indicators

		SHEWA-B (PROJECT COSTS ONLY (excluding household contributions except where noted)			Comments
Water points		**Public**	**Private**	**All**	
Economy					
Costs for construction of water points (includes HH contributions)	US$	1,071	248	n/a	Average cost across all technology types. Cost range depending on technology type. Includes contribution from water user groups for public. For private includes hh payment of full hardware costs..
Efficiency					
Percentage of planned water points constructed	%	100			
Percentage of constructed water points providing arsenic-safe water	%	99.7	21 – 99.7	n/a	Based on DPHE arsenic testing. For private based on iccdr-b and DPHE data. Rates of arsenic contamination vary by district and technology type.
Cost-efficiency					
Total project cost per new or rehabilitated water point (including IPS)	US$	**1,223**	**126**	**n/a**	Hardware costs for private water points carried by the household
Hardware cost	US$	993	0	n/a	
Hardware cost and direct software support cost	US$	1,113	108	n/a	
Total project cost per person who gained access to an arsenic-safe water point (including IPS)	US$	**21**	**29-136**	22- US$ 26	These costs have been estimated based on an assumed number of 13.5 families per public water point and rate of arsenic-safety of 99.7%. For private water points ranges are due to the uncertainty in the data relating to the rate of arsenic contamination in private tubewells.
Hardware cost	US$	16	0	13- US$15	
Hardware cost and direct software support cost	US$	18	25-117	19-23	
Effectiveness					
Percentage of constructed water points which are functional and providing arsenic-safe water	**%**	**82**	**18-85**	**n/a**	Estimated based on DPHE database and Objective 2 survey results
Cost-effectiveness					
Total project cost per person who gained access to a water point and uses it (including IPS)	US$	**25**	**34-160**	**27-32**	
Hardware cost	US$	19	0	15-18	
Hardware cost and direct software support cost	US$	22	29-138	23-27	

		SHEWA-B (PROJECT COSTS ONLY (excluding household contributions except where noted)		Comments
Sanitation		**Toilets**	**ODF Environment**	
Economy				
Unit costs for toilets (HH contribution)	US$	48.50	n/a	Full cost is covered by households which may include local government subsidy for hardcore poor (non-project costs).
Efficiency				
Percentage of toilets going in to use at household level	**%**	100	n/a	Project completion report – initial uptake/use of latrines is high
Cost-efficiency				
Total project cost per new toilet (including IPS)	US$	**20**	**n/a**	Hardware costs for toilets carried by the household with the exception of a very small number of targeted subsidised latrines.
Hardware cost	US$	0.6	n/a	
Hardware cost and direct software support cost	US$	11	n/a	
Total project cost per person who gained access to a toilet or lived in OD environment (including IPS)	US$	**4.5**	**37**	
Hardware cost	US$	0.1	n/a	
Hardware cost and direct software support cost	US$	2.5	20	
Effectiveness				
Percentage of latrines remaining functional at project close or reduction in rates of OD	**%**	**67**	**n/a**	Based on Nielsen process monitoring end line report and iccdr-b endline report.
Cost-effectiveness				
Total project cost per person who gained access to a sanitation and uses it (including IPS)	US$	**6.9**	**n/a**	
Hardware cost	US$	0.2	n/a	
Hardware cost and direct software support cost	US$	3.7	n/a	
Hygiene				
Economy				
Costs per person targeted with community-based behaviour change messages	US$	0.68		Costs of intensive community-based promotional techniques in target communities only.

		SHEWA-B (PROJECT COSTS ONLY (excluding household contributions except where noted)			Comments
Cost-efficiency					
Cost per person with water at a convenient location for handwashing after defecation	US$	**10**			
Cost per person with handwashing station at a convenient location for handwashing after defecation	US$	**13**			
Cost-effectiveness		**Before food preparation**	**Before eating**	**After defecation**	
Cost per person with observed handwashing behaviour with soap and water	US$	**61**	**36**	**6**	
Cost per female care giver with observed handwashing behaviour with soap and water	US$	**12**	**25**	**5**	
Cost per person able to recall at least one each of the key water, sanitation and hygiene messages	US$	**1.27**			Includes costs of both intensive and mass media promotional approaches.
Wash in Schools					
Economy					
Cost of SSHE package per school	US$	714			
Cost-efficiency		**Receiving SSHE**	**Receiving hardware**	**Receiving SSHE AND hardware**	
Total project cost per student (including IPS)	US$	**2.9**	**4.2**	**5.1**	Hardware includes new and rehabilitated water points and/or toilets. Assumes that all schools have water and sanitation at the close of the project.
Hardware cost and direct software support cost	US$	2.5	3.6	4.4	
Cost per school where clean functional toilets were available at endline	US$	**2,700**			Neilsen end line report
Cost per school where soap available for use at endline	US$	**1,865**			Falls to US$ 980 if soap or ash are considered.
Cost-effectiveness		**Retaining key SSHE messages**	**Gain access to clean functional latrine**	**Gain access to functional safe water**	
Total project cost per school age child (including IPS)	US$	**7.7**	**10.9**	**38.7**	

		SHEWA-B (PROJECT COSTS ONLY (excluding household contributions except where noted)			Comments
Hardware cost	US$	2.9	4.2	14.9	
Hardware cost and direct software support cost	US$	6.7	9.5	33.6	
Institutional Capacity Building					
Economy					
Cost per Union Parishad receiving ICB	US$	235,452			
Cost per community action plan	US$	94			
Cost-efficiency					
Cost per person trained including WATSAN committee members	US$	**65**			
Cost per person living in a Union Parishad with enhanced capacity	US$	**21**			

4.1 Construction of water points

4.1.1 Economy

The project resulted in the construction of both public and private water points.

Most private water points, were shallow tube wells with either a Tara Dev head pump (average cost US$ 375) or a No. 6 pump (average cost over the period of the project US$ 175).

Amongst public water points, a range of technologies were used. The average cost of installation for each of the 19,579 public water points was US$ 1,071. The cost of public water points is significantly higher than for private water points since all the public water points use more costly technology to ensure the provision of arsenic-free water. So for example, almost all the public water points which use groundwater are deep tubewells with more expensive pumps installed. Some of the public water points also use piped systems, pond sand-filters or rainwater harvesting installations.

The cost of most types of water points have increased steadily over the period of the project. The hardware costs, including drilling, purchasing of equipment and installation of two types of shallow tubewells (Tara and No 6) are shown in Figure 10 for example over the period of the project. These can be compared with a range of average unit costs for installation of tubewells in different hydrogeological zones across Bangladesh as reported by HDRC. This suggests that SHEWA-B costs are in line with national norms although very slightly higher than average rates.

Figure 10: Unit costs of shallow tubewells (US$)

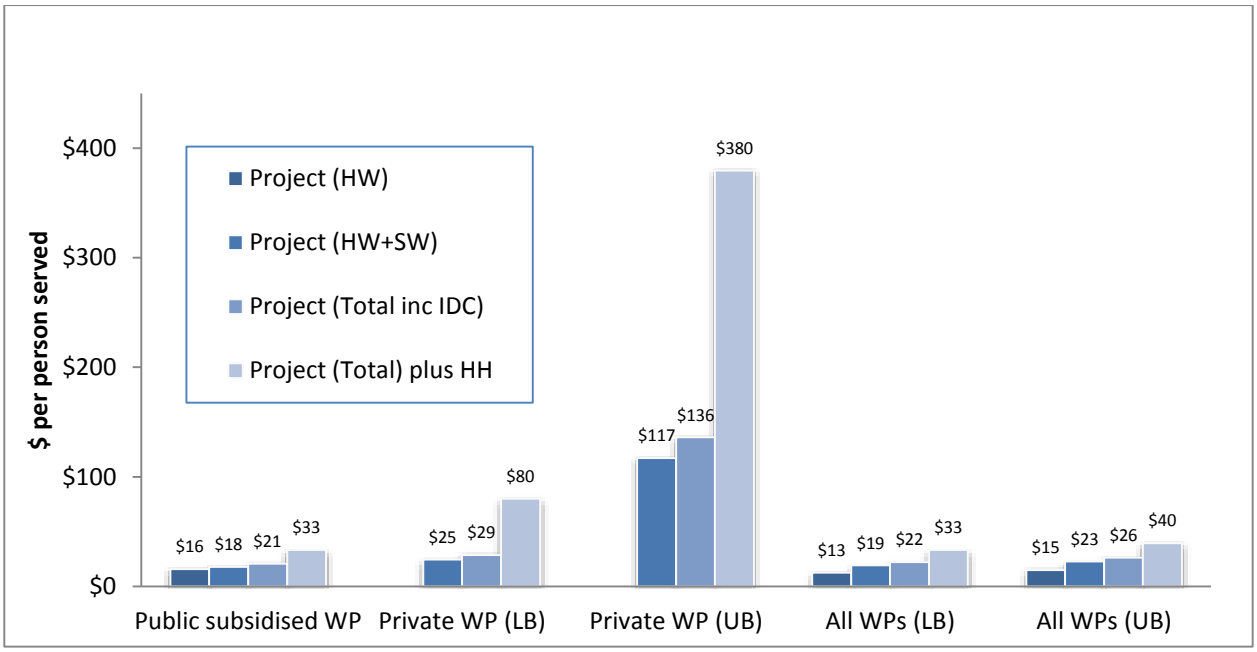
4.1.2 Efficiency and cost-efficiency

The main driver of efficiency in the water supply component is the extent to which new tubewells yielded water which met the required standards for Arsenic contamination. In the case of public tubewells the rate of arsenic contamination is low – in part because public tubewells can be drilled

to deeper depths where the aquifer is less affected by arsenic. There is some uncertainty about the prevalence of arsenic in private tubewells which means that efficiency rates can only be estimated within a range.

The cost-efficiency of development of both public and private water points is shown below on Figure 11.

Figure 11: Cost-efficiency (US$ per person served with arsenic-safe water)



LB – lower – bound estimate assuming lower rates of arsenic contamination; UB – upper-bound estimate assuming higher rates of arsenic contamination; HW-hardware; SW-social mobilisation; As test – Arsenic testing; IDC – indirect costs

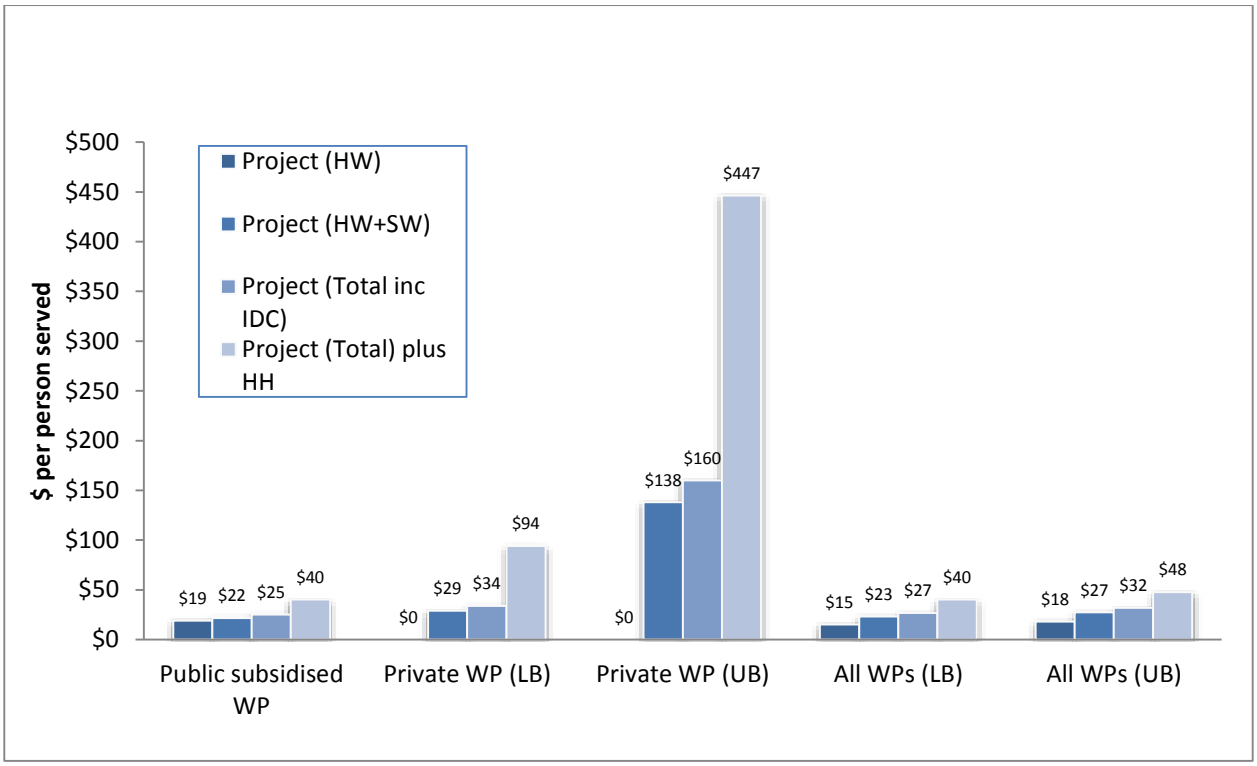
Taking public and private wells together, and looking at the project costs alone, excluding household contributions, the project expended between US$ 22 and US$ 26 per person gaining potential access to arsenic-safe water, rising to between US$ 33 and US$ 40 when households' contributions are included.

Some of the SHEWA-B systems are expensive piped systems (in areas where this is the only effective way to eliminate the risk of severe arsenic contamination.) Therefore these costs cannot be directly compared with programmes which are limited to the use of point sources and/or groundwater.

4.1.3 Effectiveness and cost-effectiveness

In addition to arsenic, the functionality of water points is also driven by other technology and operational factors such as the management of maintenance of pumps. DPHE estimate that 85% of deep tubewells remain in service after six years. Taking into account both functionality and rates of arsenic contamination, cost-effectiveness of water points is shown in Figure 12.

Figure 12: Cost-effectiveness (US$ per person effectively served) Water



LB – lower – bound estimate assuming lower rates of arsenic contamination; UB – upper-bound estimate assuming higher rates of arsenic contamination; HW-hardware; SW-social mobilisation; As test – Arsenic testing; IDC – indirect costs

The expenditure of the project was US$ 25 per person served with a public water point and between US$ 34 and US$ 160 for private water points depending on arsenic prevalence. Total expenditures are higher as households made significant contributions.

4.2 Sanitation

4.2.1 Economy

The average cost of a new household latrine in SHEWA-B is estimated to be US$ 48.50.

By comparison, BRAC WASH data for Baghera Upazila in Jessore District indicate hardware costs of BRAC latrines vary from US$ 41 for the ultra poor, to US$ 104 for poor, and US$ 479 for non-poor households. The bulk of the capital costs are provided by the households, although of the 15,900 BRAC latrines provided in this Upazila 31% were directly provided by BRAC. These higher costs may be indicative of the fact that all BRAC latrines utilise concrete rings or brick lining and have permanent superstructures.

4.2.2 Efficiency and cost-efficiency

The project monitoring data suggest that the sanitation component was highly efficient both in terms of constructed latrines being used and in terms of leveraging household contributions to construction of latrines. The average project expenditure for each new latrine constructed under the project was US$ 20 of which US$ 11 was in software support. This expenditure leveraged a further US$ 48.50 from each household constructing a new latrine.

The total cost to the project for each person gaining access to a new latrine was thus US$ 4.5. In terms of people moving into living in an open-defecation-free environment the cost to the project was US$ 37 per person.

4.2.3 Effectiveness and cost-effectiveness

Project monitoring suggests that 67% of latrines remained functional at the end of the project. This may under-estimate effectiveness since the data do not capture households who constructed temporary latrines which they later converted or replaced with more permanent facilities.

The average cost to the project per person gaining sustained access to a latrine is therefore estimated to be US$ 6.9.

4.3 Hygiene

4.3.1 Economy

SHEWA-B spent US$ 0.68 per person targeted with intensive community-based promotional interventions

4.3.2 Efficiency and cost-efficiency

The efficiency of the hygiene component could not be estimated. However it is possible to look at costs per person who moved into a situation where they had water and/or a handwashing station at a convenient location for handwashing after defecation. This is an important measure of the efficiency of the SHEWA-B hygiene promotional efforts since handwashing with soap at the place of defecation was a key message. The project expended US$ 10 per person who later was found to have water at a convenient location for handwashing after defecation rising to US$ 13 when considering people who had a handwashing station available.

4.3.3 Effectiveness and cost-effectiveness

Cost effectiveness can be expressed in two dimensions based on evaluation data from iccdr,b collected as part of the project. The evaluation endline report looked at handwashing behaviours including the use of soap at critical times. These costs per person lie in a range from US$ 6 to US$ 61 depending on the critical handwashing behaviour being observed.

In addition, the endline report estimated the numbers of people who could recall at least one each of the key water, sanitation and hygiene messages which were an integral part of the project. Rates of recall were found to be very high, and the average per-person cost just US$ 1.27.

4.4 Wash in Schools

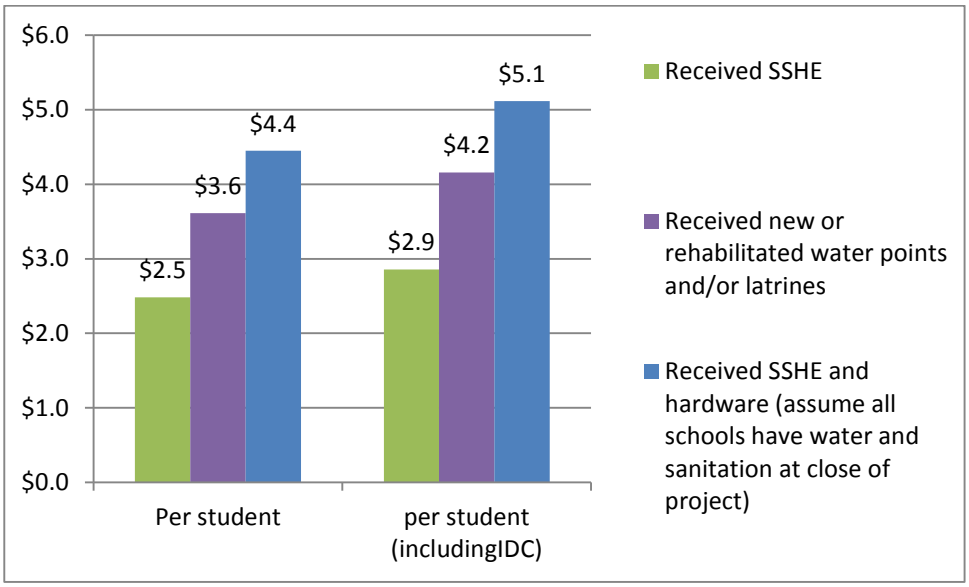
4.4.1 Economy

The project spent an average of US$ 714 per school on School Sanitation and Hygiene Education packages which included the provision of teaching resources and the delivery of hygiene promotion activities in schools. Hardware was provided under separate contracts for which detailed cost breakdowns were not available at the time of this analysis.

4.4.2 Efficiency and cost-efficiency

The cost-efficiency of the Wash in Schools component can be calculated on the basis of the number of students in schools which received the SSHE package, or separately the number of students who are in schools which received hardware interventions. The cost-efficiency of this component could also be computed by assuming that hardware was only provided where it was needed and that all project schools therefore had adequate water supply and sanitation facilities by the end of the project. The results are shown in Figure 13 below. SHEWA-B also collected information on the extent to which boys and girls had access to separate

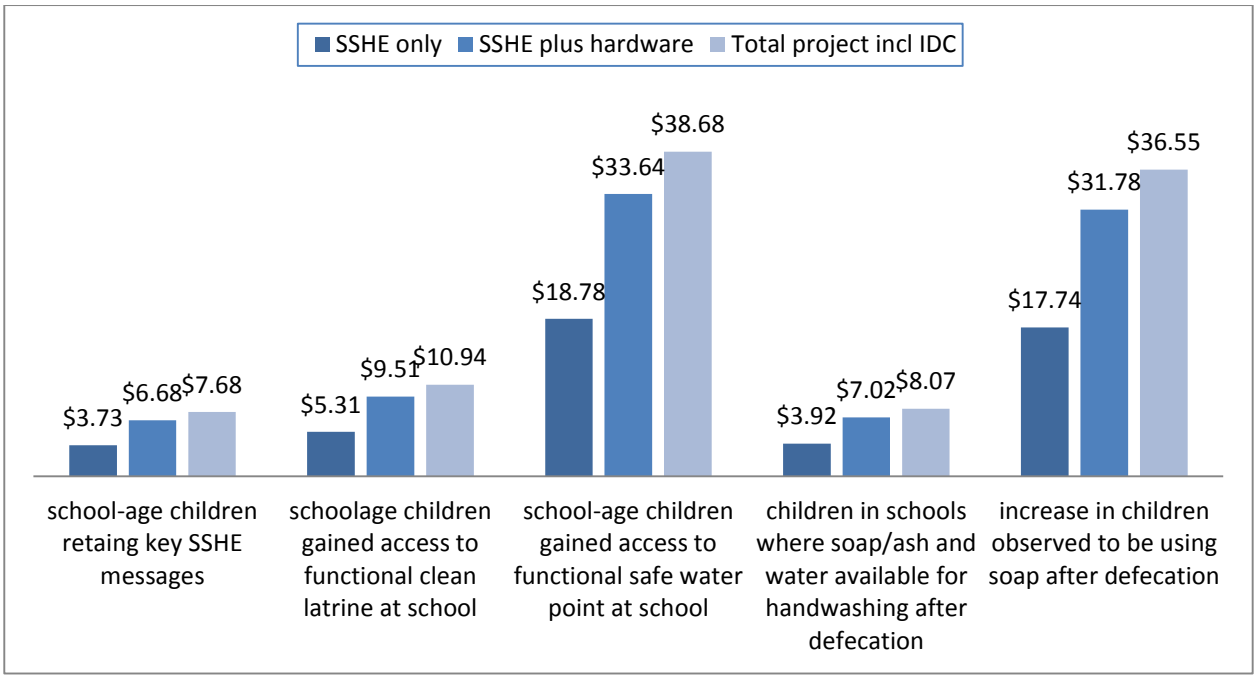
Figure 13: Cost-efficiency (US$ per school-age child) WASH in Schools



4.4.3 Effectiveness and cost-effectiveness

The cost of translating Wash in Schools outputs in to outcomes requires the effective combination of infrastructure investment and behaviour change. Because of the range of possible outcome measures, cost-effectiveness can be expressed in several ways (see Figure 14).

Figure 14: Cost-effectiveness (US$ per school-age child) WASH in Schools



4.5 Institutional Capacity Building

4.5.1 Economy

The cost of institutional capacity building in terms of the total costs of contracts to deliver the package at union parishad level and their oversight and management was US$ 235,452. This expenditure can also be translated into a cost of US$ 94 per community action plan prepared.

4.5.2 Efficiency and cost-efficiency

However the project trained a significant number of people including local government institutions staff and community-based organisers and the cost per person trained, including WATSAN committee members was just US$ 65.

4.5.3 Effectiveness and cost-effectiveness

Taking into account the numbers of people living in communities where trained officials are working the cost-effectiveness of the institutional capacity building can be expressed in terms of a cost of US$ 21 per person.

5 Summary findings and recommendations

5.1 Summary findings of the VFM analysis

Table 7 below summarizes the findings of the VFM analysis by component and by type of indicators and lists the main VFM drivers that could have impacted these VFM indicators. The last column presents the team's assessment to identify priority areas where programme managers need to invest additional efforts in order to generate VFM gains. This would require changes in the way the programmes are implemented and conducting VFM analysis on a routine basis in order to track the impact of those changes. Symbol-coding has been defined as follows:

- Three stars: a high-priority area for programme managers, where additional focus on measuring and improving VFM could yield substantial gains;

- Two stars: a high-priority area for programme managers, or where VFM improvements would only have a marginal impact on the overall programme, including because programme managers have limited influence over VFM drivers,

- One star: a low-priority area where VFM is already satisfactory compared to other components and programmes and no immediate changes are needed.

A summary of the VFM analysis suggests the following:

Unit costs for water are in line with comparators: SHEWA-B costs are marginally higher than reported national averages. This could be because of focus on arsenic-prone areas but may also be due to inefficient procurement. The underlying reasons behind these higher unit costs could be investigated by interrogation of the DPHE national database on public water points, coupled with an analysis of procurement records and technical assessment of selected public water points.

Unit costs for sanitation are in line with typical programmes in Bangladesh: Nonetheless there is an urgent need to develop more reliable national benchmark data on sanitation costs in Bangladesh as the country transitions from a focus on elimination of open defecation towards promotion of sustainable, well managed safe and hygienic latrines. Costs of sanitation programmes in general are likely to rise, and in view of this, the relatively economic costs achieved in SHEWA-B are encouraging.

Unit cost of the hygiene promotion programme was relatively low compared to international benchmarks: The intensive hygiene promotion campaign appears to have been relatively good at reaching a large audience which has resulted in relatively low unit costs.

Unit costs of the Wash in Schools component cannot be compared due to the absence of reliable comparator data either at national or international level.

Overall the programme shows reasonable effectiveness but there is limited information on the equity of outcomes and impacts.

The main conclusion when comparing SHEWA-B with other programmes in Bangladesh is that the country has reached nearly 100% access to safe water and basic sanitation. SHEWA-B was implemented during a period when significant access benchmarks were achieved across the country. New programmes will need to increasingly focus on equity, and long run management of chronic public health challenges such as arsenic and faecal sludge management and the metrics

of value for money will have to focus much more strongly on outcome level achievements in terms of improved levels of service, economic benefits and health impacts.

Table 5 Summary findings on VFM indicators and potential VFM drivers

VFM indicators	Key findings from the VFM analysis	Potential VFM drivers	Priority area for PM?	Recommendations for PM to improve VFM
Water				
Economy	• Costs of water point development in SHEWA-B are in line with typical costs at the national level	• Costs of development of water points in arsenic-affected areas are high due to the need to use deep tubewells or more expensive surface-water systems • Cost of water supply hardware may be lowered due to vibrant local market for manufacturing of equipment	★	Cost of development of public water points is likely to remain a significant portion of the costs of water supply investment. Critical to collect real-time data on costs
Efficiency	• 99.7% of public water points constructed were found to produce arsenic-safe water • For private water points data are unclear – between 21-99.7% of water points produced arsenic-safe water	• Arsenic in groundwater is one of the drivers of efficiency. In the case of shallow tubewells (mostly privately financed) the project included efforts to increase awareness of arsenic but the extent to which this resulted in changes in the procurement and development of shallow tubewells is unclear	★ ★ ★	Further work is needed to improve the planning and development of water supplies in arsenic-affected areas. In particular ongoing efforts to monitori water quality and production in public water points could be extended to private water points
Cost Efficiency	• Cost-efficiency for private water points is high due to the approach of the project – to invest in promotional activities to encourage household hardware investments • Household investments in private water points and as contributions to public water points from water user groups are estimated to total over US$ 14.5 million. Each dollar of project funding leveraged a further US$ 0.60 of household investment	• The quality of the promotional work has a high impact on the extent to which households invest. • Uncertainty over arsenic means that household decisions need to be supported with appropriate information	★	The project has been successful in stimulating household investments. The approaches used should be documented and extended to other programmes
Effectiveness	• Functionality of public water points is just over 80% after six years. Data on functionality of private water points is not available • The number of users of public water points is slightly higher than national norms at 104	• DPHE has invested in improved monitoring of the functionality and water quality produced in public water points. Improved surveillance could be improving responsiveness of operational support for public systems which would improve sustained actual outcomes • Bangladesh has high access rates to 'improved' water sources, cost-effectiveness is dependent on good targeting to ensure new users gain access to water of high quality (particularly arsenic-safe)	★ ★	Improved baselines to understand household use of water points prior to project interventions would improve the quality of estimates of marginal gains in access and service levels
Cost-Effectiveness	• Cost effectiveness has been estimated based on use of new project water points			
Sanitation promotion				
Economy	• The average cost of a new household latrine in SHEWA-B is estimated to be US$ 48.50 • By comparison, BRAC WASH data for Baghera Upazila in Jessore District indicate hardware costs of BRAC latrines vary from US$ 41 for the ultra poor, to US$ 104 for poor, and US$ 479 for non-poor households	• SHEWA-B has focused on promoting household investment in latrines which may explain that the latrines constructed are at the lower-price range for Bangladesh	★	Promotion of investment in private latrines remains an important strategy to increase the use of private latrines in Bangladesh. Given the high rates of latrine use this may be the most appropriate approach as compared to CLTS for example

VFM indicators	Key findings from the VFM analysis	Potential VFM drivers	Priority area for PM?	Recommendations for PM to improve VFM
Efficiency	• Initial usage rates of latrines constructed in project communities is estimated to be 100%	• The project focuses on demand-creation and all latrines require household investments of most or all fo the cost which results in targeting of latrines in households where there is high demand	★	
Cost Efficiency	• Cost-efficiency for sanitation is high due to the approach of the project – to invest in promotional activities to encourage household hardware investments • Household investments in sanitation are estimated to total over US$ 50 million. Each dollar of project funding leveraged a further US$ 4 of household investment	• The quality of promotional work has a direct impact on cost-efficiency • High rates of latrines usage at baseline mean that well-targeted promotional messages are needed to ensure investments focus on high-impact items (ie increased access to private latrines, better quality infrastructure and ease of emptying)	★	The project has been successful in promoting household investment. Elements of the communitiy –based promotional interventions should be used in future projects
Effectiveness **Cost-Effectiveness**	• 67% of latrines are estimated to remain in use at the end of the project.	• Long term usage is likely to be influenced by support to communities to manage latrines as they fill up. Where support is not provided this may result in latrines being abandoned	★ ★ ★	Improve long-term management straegies for rural sanitation
Hygiene				
Economy	• The cost of community-based hygiene promotion interventions was US$ 0.68 per person targeted at the community level • This included the costs of CHPs carrying out day-to-day hygiene promotion, demonstration facilities at markets and hygiene related R&D studies • Including the mass media campaign (costs and targeted beneficiaries) the costs rise to US$ 1.27 • Not available.	• The quality of behaviour-change interventions. The project made several adjustments in mid-course to improve the impact of hygiene interventions • Availability and capacity of NGOs at district and local level • Prevailing rates of pay (salaries) for NGO and support organisation staff at the local level which in turn are driven by what other development programmes are ongoing in the programme area	★ ★	Collect a detailed break down of costs of specific community-based interventions and mass media interventions across multiple projects to enable benchmarking of economy
Efficiency	• No data	• Ability of NGOs/ support organisations to attract and retain high quality staff • Consistency and predictability of contracts for field-based NGOs and support organisations	★ ★ ★	For future programmes attention needed to the capacity of local NGOs and support organisations and budgeting to allow appropriate salaries to be paid
Cost Efficiency	• Cost efficiency can be expressed using a number of output/ assumed outcome indicators • SHEWA-B has collected some good information on availability of facilities for key hygiene behaviours	• Balance of community-based and mass-media interventions and their relative efficiency at prompting hardware investments to support behaviour change	★ ★	Mulitple interventions were used and there is an opportunity to examine the relative impact of community-based and mass media approaches
Effectiveness **Cost-Effectiveness**	• Cost effectiveness of hygiene promotion in terms of people able to recall key messages is good at US$ 1.27 per person. • Cost effectiveness lower when expressed in terms of observed hygiene behaviours	• Effectiveness of blend of behaviour change interventions drives cost-effectiveness • Linkage with other aspects of the project (investments in water and sanitation) may drive cost-effectiveness as households are making simultaneous investments including provision of handwashing facilities	★ ★	Make use of learning from iccdr,b impact evaluation to standardise approaches to measure sustained actual hygiene outcomes in future programming
Wash in Schools				

VFM indicators	Key findings from the VFM analysis	Potential VFM drivers	Priority area for PM?	Recommendations for PM to improve VFM
Economy	• Detailed breakdown of costs is not readily available. Economy can be expressed in terms of the per-school cost of SSHE interventions	• Availability and quality of existing water and sanitation facilities in schools • Arsenic in groundwater can significantly raise costs	★★★	Assessment of economy of Wash in Schools across multiple programmes would improve planning for government Wash in Schools interventions
Efficiency	• No data available.	• Capacity and priority for water and sanitation from staff in schools • Availability of reliable safe water sources	★★	Improved monitoring and evaluation
Cost Efficiency	• Cost efficiency for SSHE package alone is better than for schools receiving hardware where costs are significantly higher	• Range of combinations of hardware and software interventions • Size and type of school	★★	
Effectiveness **Cost-Effectiveness**	• An estimated 37% of children exposed to key SSHE messages have retained them at endline • 40% of schools which received a hardware investment had clean functional toilets at endline • Cost effectiveness is better for schools receiving sanitation investments compared to water supply investments	• Management capacity and budgets to maintain toilets and water points • Reliability of water sources (and electricity where water is pumped) • High costs of development of deep tubewells and pumping.	★★★	Data on the costs and effectiveness of Wash in Schools interventions are not generally available. Improved monitoring and evaluation of these components could improve programme management
Institutional capacity building				
Economy	• .Costs of institutional capacity building at the level of the Union Parishad appear high	• Baseline capacity of Local Government • Availability of high quality NGOs and support organisations	★★	
Cost Efficiency	• Costs for training are US$ 65 per person trained • No comparators available	• Quality of trainers • External drivers and incentives for local government staff and NGO staff to engage with training	★★	
Cost-Effectiveness	• Institutional capacity building has high apparent cost-effectiveness because of the large numbers of people who potentially benefit • However planned outcomes such as the sustained usage of sector Monitoring and Evaluation systems or improved programming based on learning could not be assessed.	• Stability of staff (ie trained staff staying in programme areas) • Potential for local government to actively manage WASH programmes and budgets within the constraints of local government systems and processes	★★★	Improve the design and targeting of insittutional capacity building based on learning from SHEWA-B – particularly when designing results framework Continue to strengthen the linkage between sector Monitoring and Evaluation and local government deicison making.
Key:	★★★ High priority	★★ Medium priority	★ Low priority	

5.2 Key challenges in conducting the analysis

While SHEWA-B was subject to a significant degree of monitoring and evaluation, the data available is of variable quality, methodologies are not always clear and there are often conflicting data presented in different locations. In particular, the following key limitations have been encountered which have limited our ability to apply the methodology as initially envisaged:

- **Input and output data for the programme are tracked through a number of different systems and have not been consolidated.** Because the programme is primarily implemented by a Government Department much of the detailed financial information has to be extracted from GoB financial reporting systems. These are not particularly well designed for tracking expenditures against detailed project components. UNICEF staff in Bangladesh reported that they had experienced challenges in reconciling financial data and output data.

- **Data on GoB expenditure is only reported by type of expenditure** (on capital goods, services, salaries etc.). A reconciliation process has been carried out with support from UNICEF and inputs from other consultants also working on VFM analysis for this programme but the results are tentative.

- **Data on outcomes is preliminary.** This is primarily due to the short period of time which has elapsed which limits the potential to examine sustainability of the outcomes. It is worth noting here that, despite a significant spend on impact evaluation, process monitoring and community monitoring, long term evaluation of the *outcomes* of SHEWA-B focused primarily on hygiene behaviours and detailed information on sanitation or water outcomes are difficult to estimates. Of note here however is the recent commitment of the Department of Public Health Engineering to establish reliable historical tracking of public water point functionality and arsenic-status with strong support from UNICEF. This initiative, while in its early days, has provided invaluable inputs to the VFM analysis.

5.3 Recommendations to improve VFM analysis

The VFM analysis revealed several Programme Management issues which could usefully be addressed in future programming.

Financial management in SHEWA-B was not entirely transparent in part due to multiple agencies handling funds and the challenges of reconciling DPHE and UNICEF financial reporting systems. Neither DPHE nor UNICEF could readily link expenditures to project components rendering it challenging to link expenditure to outputs or outcomes. A new UNICEF financial coding system recently put in place should help with this aspect of management in future programmes.

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The existing national monitoring systems used by DPHE and other GoB agencies are not particularly strong and lack a focus on outcome monitoring. Recent efforts to improve and modernise surveillance of water points at DPHE are significant and will help improve monitoring of outputs in future provided that DPHE maintain funding of their new GIS team. UNICEF support to DPHE in this regard has been critically important in building capacity to track functionality and water quality performance of the thousands of public water points for which DPHE remains responsible. This may be particularly important in Bangladesh which

faces the very specific challenge of arsenic contamination in groundwater. The science of arsenic in groundwater is complex and the arsenic status of tubewells can change unpredictably. Where groundwater sources are used constant surveillance is the only way to ensure that the public are not inadvertently exposed to dangerous levels of arsenic.

In SHEWA-B by contrast there was a **strong commitment to monitoring**. However, multiple monitoring processes and tasks resulted in some 'information overload' so monitoring information could not be used as effectively as it should have been. This is particularly a problem for DPHE whose staff do not all have strong M&E or management capacity.

The project showed a **particularly strong commitment to evaluation**. However, while there was a strong commitment to measuring hygiene outcomes and health impacts, there was little or no attention to water and sanitation outcomes. There remains a lack of reliable detailed information on the numbers of families actively using new water points installed under the project or time savings due to additional water supplies becoming available – estimates of the total numbers of people benefiting from the investment and the marginal gains in time through reduced distances and increased reliability of supply must therefore remain uncertain. Of particular concern are anecdotal reports that public water points may often be captured by a small number of influential families. If this were true it would significantly reduce the estimates of effectiveness of SHEWA-B and all other DPHE programmes.

In addition it would be useful in future to focus impact evaluation on a wider range of benefits including non-diarrhoea health impacts, and to take into account the rapidly changing context within Bangladesh.

Linked to this there is limited information which can be used to judge the effectiveness of the targeting approach of the project. Stronger focus on targeting interventions to ensure access for the highly excluded and real marginal improvements in time to collect water, reliability and quality of water could have improved the effectiveness of the interventions

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