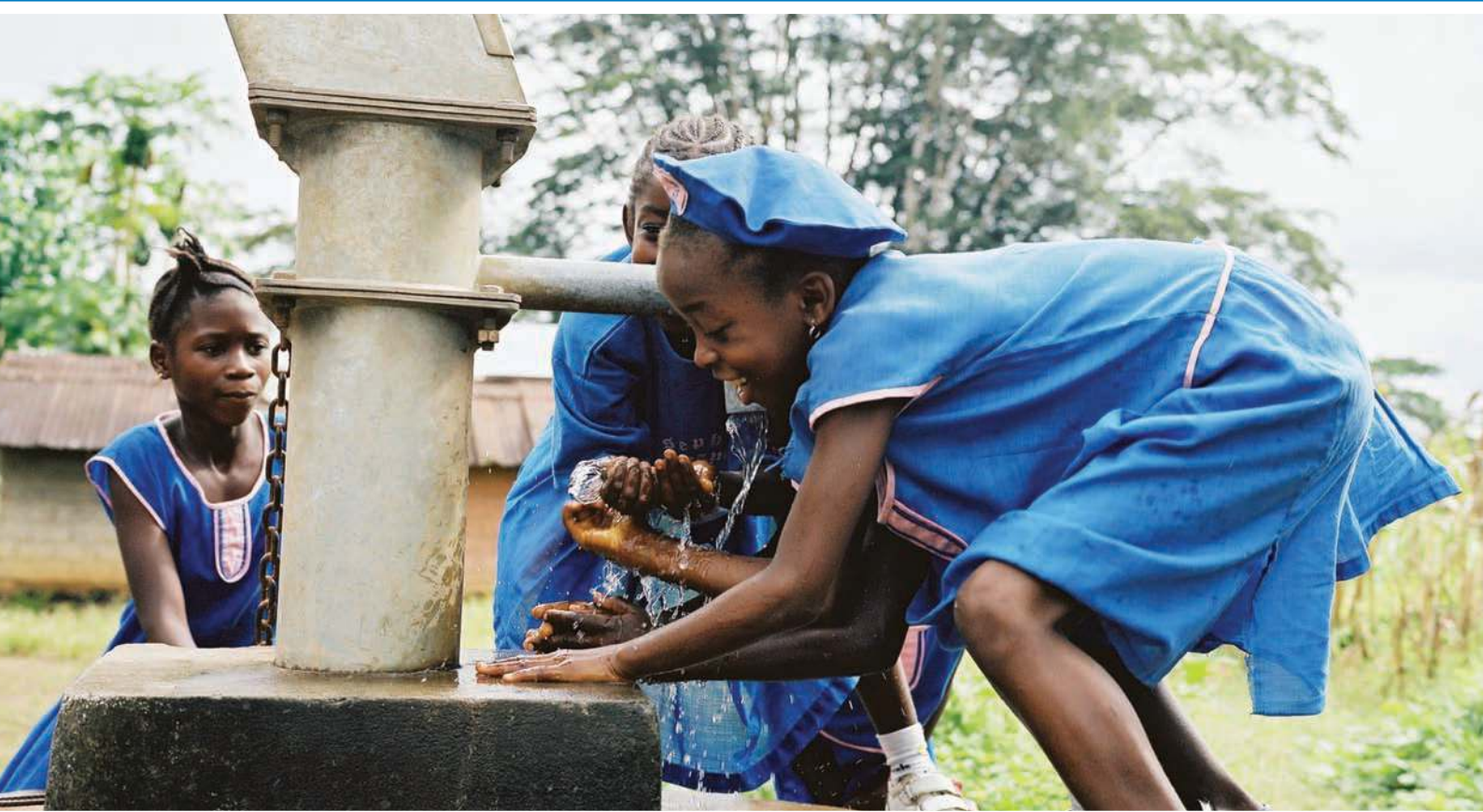


# Global Expenditure Review: Water Supply and Environmental Sanitation





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## Plan

# Global Expenditure Review: Water Supply and Environmental Sanitation

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## Acknowledgements

It was Plan's original intention to conduct this global review of Plan's WES expenditures to provide a relatively straightforward internal check on the cost efficiency of our investments, and to gauge Plan's intervention costs with those of other agencies. During the course of our investigation, however, we realised that many other agencies were grappling with similar issues: how to accurately track Water and Environmental Sanitation (WES) investments, how much is spent on programme support and 'software' activities, what approaches can reach more of the poor and do so in a cost effective manner, and so forth. We were therefore very pleased that in the process of completing this study, Plan was not only able to better understand its own WES investment patterns, but that we were also able to make a contribution towards answering some of the difficult questions facing the sector as a whole. Through this process, Plan also built ties with other agencies actively studying these issues. We sincerely hope that the work done during this study and our collaboration with these agencies will be furthered, so that Plan can continue to contribute to the global effort to find cost-effective, sustainable, and scalable ways of meeting global sanitation, water and hygiene challenges.

This WES expenditure review would not have been possible without the participation and support of a large number of individuals. Plan wishes to thank all of them for their time, energy and valuable contributions.

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Jim Emerson  
Chief Operating Officer  
Plan  
July 2009

## Glossary and abbreviations

<b>ARO</b>	Plan Asia Regional Office
<b>BCI</b>	Behaviour Change Information
<b>BI Online</b>	Business Intelligence Online (Plan's programme database and analysis tool)
<b>CBO</b>	Community-Based Organisation
<b>CSO</b>	Civil Society Organisation
<b>CLTS</b>	Community-Led Total Sanitation
<b>FY</b>	Plan Fiscal Year
<b>GDP</b>	Gross Domestic Product
<b>IEC</b>	Information, Education and Communication
<b>IRC</b>	International Water and Sanitation Centre (Netherlands)
<b>JMP</b>	WHO-UNICEF Joint Monitoring Programme for Water Supply and Sanitation
<b>MDG</b>	Millennium Development Goal
<b>ODF</b>	Open Defecation Free
<b>ROA</b>	Plan Region of the Americas
<b>PHAST</b>	Participatory Hygiene and Sanitation Transformation
<b>PPM</b>	Plan Programme and Projects Module
<b>PPP</b>	Purchasing Power Parity
<b>PU</b>	Programme Unit
<b>RESA</b>	Plan Region of East and Southern Africa
<b>UNICEF</b>	United Nations Children's Fund
<b>WARO</b>	Plan West Africa Regional Office
<b>WES</b>	Water and Environmental Sanitation
<b>WHO</b>	World Health Organization
<b>WS</b>	Water Supply
<b>WSP</b>	World Bank Water and Sanitation Program
<b>WSSCC</b>	Water Supply and Sanitation Collaborative Council

## Plan

Plan supports water and environmental sanitation programmes in 48 countries globally, and organises these country programmes into four regions. This expenditure review examined 45 of these country programmes (as detailed in the table below).

### Country codes used in tables and figures

#### ARO Asia

BGD	Bangladesh
KHM	Cambodia
CHN	China
TMP	East Timor
IND	India
IDN	Indonesia
NPL	Nepal
PAK	Pakistan
PHL	Philippines
LKA	Sri Lanka
THA	Thailand
VNM	Vietnam

#### RESA East and Southern Africa

ALB	Albania
EGY	Egypt
ETH	Ethiopia
KEN	Kenya
MWI	Malawi
SDN	Sudan
TZA	Tanzania
UGA	Uganda
ZMB	Zambia
ZWE	Zimbabwe

#### ROA Americas

BOL	Bolivia
BRA	Brazil
COL	Colombia
DOM	Dominican Rep.
ECU	Ecuador
SLV	El Salvador
GTM	Guatemala
HTI	Haiti
HND	Honduras
NIC	Nicaragua
PRY	Paraguay
PER	Peru

#### WARO West Africa

BEN	Benin
BFA	Burkina Faso
CMR	Cameroon
GHA	Ghana
GIN	Guinea
GNB	Guinea Bissau
MLI	Mali
NER	Niger
SEN	Senegal
SLE	Sierra Leone
TGO	Togo

## Executive summary

This report summarises the findings of a global review of Plan's water supply and sanitation (WES) expenditures during three fiscal years. This comprehensive global WES expenditure review arose following a number of smaller cost studies and activities, which found a large variation in unit costs and expenditures across the various Plan regions and country programmes.

The global WES expenditure review had three main objectives:

- Assess unit costs, cost-sharing schemes, and expenditure patterns
- Compare programme costs and cost-sharing schemes to those of other agencies
- Provide recommendations for improvements to Plan's WES programme policies, practices, and expenditure tracking systems

The Plan global WES expenditure review had two phases: the global WES expenditure survey, which assembled expenditure data from 45 Plan country programmes for three Fiscal Years: FY2005, FY2006 and FY2007; and the focus country expenditure survey, which looked in more detail at WES expenditures in eight Plan country programmes.

The expenditure review was based largely on financial data from Plan's information systems, and thus could not examine the effectiveness or sustainability of Plan's WES interventions. Cost-effectiveness data and annualised costs enable a more meaningful cost comparison, through recognition of the different benefit streams that arise from the various technologies and approaches under study. However, the huge challenge associated with pulling together and analysing expenditure data from 45 country programmes meant that this review was seen as the first step in a longer process. It is hoped that the basic cost-efficiency data presented in this report will inform and direct subsequent efforts by Plan to assess the cost-effectiveness of its WES investments.

### **WES expenditures**

The expenditure data take account of all programme expenditures by Plan, including hardware, software and support costs. In most cases, these Plan expenditures represent the total cost of the WES interventions.

However, there are exceptions: household toilet projects usually require a contribution from the beneficiary household, and some interventions are undertaken in partnership with others, for example Community-Led Total Sanitation (CLTS) projects implemented with local government support in Bangladesh and Cambodia. Therefore, the report highlights cases where Plan's expenditures have been supplemented by other external inputs, and also assesses user contributions to the WES interventions.

### ***Plan has become a significant stakeholder in the global WES sector***

In the three-year review period, Plan spent an average of US \$42 million annually on its WES programmes in 45 countries in Asia, Africa and Latin America.

UNICEF, which is likely the largest non-governmental implementer of rural water supply and sanitation programmes globally, invests approximately US \$140 million annually on WES development across 96 countries, spending roughly US \$1.5 million per country programme. Plan's average investment per country was US \$0.93 million, nearly two-thirds of that spent per country by UNICEF. Furthermore, Plan's average annual WES

investment proved to be higher than major agencies such as the World Bank's Water and Sanitation Program (WSP), which had a global budget of US \$35 million in 2007<sup>1</sup>.

***Plan spent over 40 per cent of its WES budget on sanitation***

Plan has a strong sanitation portfolio: 43 per cent of WES expenditures were on environmental sanitation interventions, which compares well within a sector that has, historically, allocated a small proportion of WES investments to sanitation. However, one of the reasons for the relatively high sanitation expenditure was the provision of heavily subsidised household toilets by some country programmes, notably those in the Americas region where Plan subsidised 80 to 95 per cent of household toilet costs.

***Plan spent one-third of its WES budget on software and support activities***

The review also confirmed the significance of software and support costs in Plan's WES interventions. One-third of all WES spending was on software and programme support activities, evenly split between the two categories, with little difference between the proportion of non-hardware expenditures on water supply (15 per cent software and 16 per cent support) and sanitation (18 per cent software and 15 per cent support).

While few previous studies provide an accurate accounting of WES software and support costs, there is increasing recognition within the sector of the importance of software and institutional support to the sustainability of WES outcomes. This finding confirms that, despite the size of its current WES programme, Plan continues to invest substantial amounts in community development, capacity building and hygiene promotion.

***Unit costs: water supply***

The unit cost analysis highlighted fairly consistent differences in regional costs for water supply. The average unit costs from the Plan Asia region were significantly lower than those in the three other regions in every category, while the Plan West Africa regional averages were the highest in every water supply category.

The magnitude of the cost differences remains significant. The average cost of a dug well in the West Africa region was about US \$7,000, compared to only US \$370 in the Asia region. While little detailed information was available to explain the large variations in unit water supply costs across Plan regions and country programmes, the following factors are considered significant:

- Lower material, service and personnel costs in Asia<sup>2</sup>
- Higher population density in Asia
- Physical factors (water-scarcity, groundwater depth, hard-to-access locations)
- Significant variations in the minimum acceptable level of service (e.g. higher standards required in more urban areas, e.g. Americas)

***Unit costs: environmental sanitation***

Plan's sanitation programmes built an average of 100,000 household toilets per year during the review period, at an average cost of US \$91 per toilet. More than half of these

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<sup>1</sup> WSP works in partnership with governments and support agencies to strengthen national policy, coordination, institutional development and service delivery options; thus little of its budget relates to direct implementation of WES programmes.

<sup>2</sup> IRC WASHCost finding that average personnel costs in India are 65 per cent of those in Africa, material and supply costs in India are only 50 per cent of those in Africa. Personal communication from Catarina Fonseca, IRC WASHCost.

toilets were built in Bangladesh, where the average Plan expenditure was less than US \$7 per toilet. Elsewhere, there were large variations in the cost per household toilet:

ARO (Asia excluding Bangladesh):	US \$114 per toilet
RESA (East and Southern Africa):	US \$132 per toilet
WARO (West Africa):	US \$297 per toilet
ROA (Americas):	US \$412 per toilet.

The expenditure review revealed that Bangladesh was not the only country with a low-cost sanitation programme. Six other Plan country programmes across Asia and Africa (Burkina Faso, China, Ethiopia, India, Malawi and Uganda) spent less than US \$100 per household toilet, including software and support costs, in building a total of more than 45,000 toilets. The two largest-spending sanitation programmes were in the Americas: Plan Colombia built more than 2,500 household toilets at an average cost of US \$1,090 per toilet, and El Salvador financed more than 5,500 toilets at US \$369 per toilet.

These dramatic differences in unit costs reflect different contexts (more urban, more developed), different sanitation approaches (behaviour-change focused CLTS vs. subsidy-driven development), and different technology levels (homemade dry latrines vs. flush toilets with showers). As noted earlier, additional assessment of the relative effectiveness and sustainability of these different sanitation technologies and approaches will be required before a meaningful comparison of cost-effectiveness can be made.

### ***Community-Led Total Sanitation***

The CLTS approach, which aims to achieve open defecation free communities, has highlighted the importance of community-wide sanitation outcomes to health benefits. If even a small number of households practice open defecation or use unhygienic toilets, then the wider community (neighbours and families) are at risk from multiple faecal-oral contamination routes.

The review found that, on average, Plan sanitation programmes provided only 31 household toilets per community, with as few as eight toilets per community provided in the West Africa region. While some country programmes provided an average of more than 60 toilets per community (Cambodia, Pakistan, Egypt, Ethiopia, Malawi, El Salvador, Paraguay, and Peru), the review suggests that many Plan project communities contain some households without toilets.

Since 2007, the last year examined by the review, the CLTS approach developed in Bangladesh has spread to six other Plan country programmes in Asia, and to another eight country programmes in the African and American regions. While the benefits of this spread are not captured by this expenditure review, it is anticipated that it will result in further reductions in the unit cost of Plan's household toilets, and in the scaling up of the community-wide sanitation improvements that are critical to health benefits.

### ***Subsidy: household contributions to toilet facilities***

The expenditure review found that household contributions to toilet construction ranged between US \$8 and US \$207 per toilet, with an average of US \$30 per toilet. On average, this suggests that user contributions to household toilets in the review country programmes amounted to 25 per cent of toilet costs.

The Plan Bangladesh sanitation programme is a special case, due to the unusual nexus of supportive factors and the additional contributions made by other stakeholders, which

have resulted in far greater scale and success than in other countries. External agencies (local government, national government and the WSP) financed approximately 14 per cent of the Plan Bangladesh CLTS programme through parallel incentive and subsidy schemes, with a further 62 per cent (US \$17 per toilet) contributed by user households. While these data suggest a relatively large financial burden on the household, the user contribution in Bangladesh is less than half of the US \$51 average household contribution to toilet construction found in other Plan sanitation programmes.

### ***Comparative costs: water supply***

Direct comparison of Plan's costs with those of other NGOs working in similar environments was not possible due to the paucity of cost data available. However, Plan's water supply costs were lower than the regional cost benchmarks compiled by the WHO-UNICEF Global Water Supply and Sanitation Assessment Report in 2000 (even when updated to 2005 prices), ranging from 68 per cent of the WHO costs in the West Africa region, down to only 10 per cent in the Asia region.

This comparison highlights the relative cost-efficiency of the Plan Asia WES interventions. The WHO unit costs highlight higher price factors in Africa and the Americas: WHO borehole costs per person are 37 per cent higher in Africa than in Asia, and 230 per cent higher in the Americas. Despite this, the Plan Asia water supply cost per person is only 10 per cent of the WHO benchmark for both boreholes and dug wells.

### ***Comparative costs: household toilets***

The cost per person for Plan's household toilets ranged from 16 per cent (Asia) to 75 per cent (West Africa) of the WHO unit costs, confirming the relative cost efficiency of the Plan Asia regional programme against the WHO regional benchmarks.

Plan's CLTS sanitation costs appear similar to recent expenditure data obtained from three WaterAid CLTS programmes, but Plan's global unit cost for household toilets (including subsidised toilets) was higher than the WaterAid average.

## **Recommendations: policy**

The following recommendations concern the implications of the expenditure review for WES policy and programme practice:

### ***A. Strategic approach to global WES programme***

The growing global significance of the Plan WES programme recommends a more strategic approach to its WES investments. The large variations in cost-efficiency (across regions and between country programmes) highlighted by this expenditure review recommend that Plan should examine the relative contributions that these programmes make to regional, national and corporate development objectives, with a view to improving policy alignment within regions and increasing value for money across the global WES programme. The first step in this process should be a detailed examination of WES costs in the country programmes identified by this review as having unusually high or low costs, and the compilation (or commissioning) of evaluations that enable reliable assessments of the relative cost-effectiveness and sustainability of WES outcomes in these countries.

***B. More cost-efficient promotion of household toilets***

The review findings confirm that some Plan country sanitation programmes are considerably more expensive than others, and that many of them fail to provide community-wide sanitation improvements.

Given the sanitation MDG to halve the proportion of people without access to basic sanitation by 2015, and increasing recognition that stopping open defecation is a critical first step on the sanitation ladder, the policy implication is that the less cost-efficient country programmes should examine whether they could achieve household sanitation objectives more cost effectively through:

- promotion of lower-cost toilets
- development of more cost-effective interventions to trigger demand for sanitation and sustainable behaviour change
- targeting of community-wide sanitation outcomes in all project communities

***C. Cost-efficiency of software and programme support***

In the review period, Plan allocated one-third of its total WES investments to software and programme support activities. In some cases, increased software and support efforts were offset by lower hardware expenditures across increased numbers of community interventions; in other instances, software and support expenditures were revealed to be as high as US \$20,000 per community.

While it is encouraging that more is being spent on activities to support and improve the sustainability of WES interventions, the added value of these software and support expenditures remains uncertain. The growing importance of software activities in WES programmes (Plan spent US \$43 million on WES software and programme support during the three-year review period) recommends that more attention and resources are given to regular assessments of the effectiveness and cost-efficiency of these intangible and difficult-to-measure activities.

**Recommendations: expenditure and output tracking**

The final section presents recommendations concerning Plan's expenditure tracking and reporting systems:

***D. Utilisation of the expenditure tracking systems for annual cost reviews***

Plan's information systems are already extensive and, judging by the number of entries made by each country programme annually, time-consuming for those that process and enter the data. WES interventions are particularly complex to track because of the myriad different technologies, approaches and software activities required by the wide range of community contexts, priorities, and demands found across the developing world.

Understanding of the cost (and effectiveness) of WES interventions is essential for evidence-based policy making and cost-effective programming. At present, the Plan expenditure tracking systems are not set up to monitor or report on unit costs; however, this review suggests that the quality, substance and focus of the tracking data would be greatly improved by more regular use and analysis, and that some relatively minor improvements would facilitate regular reviews. Therefore, it is recommended that Plan initiate an annual review of WES costs, which should be used to refine and update the expenditure, output and beneficiary data collected by the tracking systems.

Efforts to scale up the promotion and implementation of WES improvements have led to greater collaboration between Plan and other development partners: local governments, local NGOs, and external support agencies. It is recommended that the tracking systems are extended to capture these external contributions, and to record the contributions made by beneficiaries towards their own facilities and services.

### ***E. Introduction of more output codes***

While there is an argument for simplifying Plan's information systems and slimming down the data collection requirements, in order to lessen the load on the country programme staff, it appears that more sub-output codes would improve the usability (and comparability) of the output and cost data. This may seem counter-intuitive, but modern database systems make it easy to add additional output categories without complicating either the data entry process or the data analysis and reporting process.

Plan has already provided improved guidelines and training on the use of more appropriate and consistent output units, but this review found serious shortcomings in the current output codes (e.g. US \$100 handpump units aggregated with US \$30,000 borehole units, and mixed units for hygiene promotion, with number of days of training counted by some programme units, number of communities trained by others, and number of sub-district campaigns counted elsewhere).

The complexity of WES interventions and the continuing trend towards non-hardware interventions (whose outputs are harder to track) recommend that particular attention and care are given to these tracking systems. It is proposed that, at a minimum, Plan's output codes should be revised to match the JMP categories for improved water supply and improved sanitation facilities, which would improve the comparability of the cost data and the alignment of Plan's monitoring systems with the international MDG indicators.

### ***F. Monitoring and evaluation of programme outcomes***

The missing element from this study has been information on programme outcomes and impacts. Without information on what works (and what does not), it is hard to compare costs across country programmes or regions, or to comment on the policy implications of the cost findings.

Therefore, it is recommended that Plan institute more systematic monitoring and evaluation of its WES programme outcomes. Specifically, this monitoring should involve the annual review of the functionality of previously completed systems and facilities (in order to assess the actual lifespan, and thus the annualised cost of these investments) and the introduction of some common outcome indicators (number of open-defecation-free communities, number of households with functioning toilets, number of households using improved water supplies) and cost effectiveness indicators (cost per toilet in use, cost per ODF community, cost per household with access to improved water supply) into all WES evaluations.

Plan's Programme Accountability and Learning System (PALS) includes provision for an annual participatory programme review by each Plan country programme. Therefore, it is further recommended that the annual WES functionality and outcome survey (as proposed above) should be incorporated into this annual programme review process.

## Introduction

This report summarises the findings of a global review of Plan's water supply and sanitation (WES) expenditures during three fiscal years (FY2005, 2006, 2007). The global WES expenditure review arose following a number of studies of limited scope, which highlighted a large variation in unit costs and expenditures across the various Plan regions and country offices, as discussed below.

Representatives of Plan's global WES network met in Brazil in July 2005, and recommended a study on the costs of Plan's sanitation programmes to further enhance the organisation's policy framework<sup>3</sup>. In 2006-07, an internal study examined Plan's household sanitation expenditures using data from Plan's global project tracking database (the "Programme and Projects Module", or PPM). The study analysed PPM data on sanitation expenditures in 12 countries, as well as comparative information provided by a number of Plan WES advisors on subsidy levels, technology choice, and other programme attributes such as partner organisations and scaling up.<sup>4</sup> The study findings concluded that:

- Domestic toilet costs varied over a wide range from country to country and were often above "sustainable" or "replicable" levels.
- Some Plan country programmes, such as Plan Bangladesh (which was implementing the "Community-Led Total Sanitation" approach), had comparatively low costs per household toilet. Furthermore, the CLTS focus on behaviour-change and community-wide sanitation improvement stood out from other programme approaches.
- Field observations used to supplement the study analyses identified subsidy schemes that failed to account for family income or poverty level.

The next step taken by Plan was a desk review of Plan's WES programme approaches and progress. Researchers from Loughborough University's Water, Engineering and Development Centre (WEDC) completed this review in April 2007<sup>5</sup>, noting a number of areas where Plan's WES programme could be improved:

- *Value for money*: Plan's unit costs for household sanitation appeared higher than other similar organisations.
- *Programme focus*: virtually all of Plan's WES spending was for household or community water supply and sanitation facilities; little investment was being made on solid waste management, drainage, and vector control. More importantly, expenditures on hygiene promotion appeared to be very low.

Following the completion of the WEDC review, Plan carried out a global self-reporting survey to verify the unit domestic sanitation costs recorded in the PPM. Nearly all of Plan's programme countries reported on their average unit costs per constructed toilet, as well as how much of this cost was subsidised by Plan. The results confirmed a wide

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<sup>3</sup> Key Action Plans Emerging from 4th WES PAG/TAG meeting, Sao Luis, Brazil, 25-29 July 2005. [The footnotes in this page are not in the same style with the rest of the document]

<sup>4</sup> Baghri, S. and Heap, S. (2007). **"If Water is Life, Sanitation is Dignity": A Review of Plan's Programme Work on Basic Household Sanitation**. Woking, UK: Plan.

<sup>5</sup> Reed, R. and Jones, H. (2007). **Review of Plan's Water and Sanitation Programmes**. Loughborough: Water, Engineering and Development Centre.

range of unit sanitation costs across Plan's global profile, as well as differing approaches to 'subsidy' schemes. The survey also suggested that, in some cases, the PPM data were either hard to interpret or erroneous, and thus may have led to gross overestimates of unit costs as reported in the 2007 study.

These findings confirmed that Plan needed to do more to determine whether its WES (and other) programmes were cost-efficient and in line with industry best practices. In May 2007, Plan issued an 'Action Plan for Improving Plan's Programme Quality and Accountability'. Among other tasks, the Action Plan called for a more detailed analysis of Plan's WES programme costs.

This review represents the next step towards a more detailed understanding of Plan's WES programme costs. While an entirely desk-based study, which looked only at investments patterns and cost-efficiency, the findings point the way for more detailed and focused research, with the ultimate aim of examining the cost-effectiveness of Plan's WES interventions. In addition, the research has revealed some significant limitations in the Plan expenditure and output tracking systems. Thus the report closes with some recommendations for improvements to these systems.

A number of cost studies and research into WES costs are underway at the moment. Most significantly, in 2008 the International Water and Sanitation Centre (IRC) launched a five-year project entitled WASHCost<sup>6</sup> that will conduct a comprehensive examination of water, sanitation and hygiene costs in Burkina Faso, Ghana, India and Mozambique.

The World Bank's Water and Sanitation Program (WSP) is undertaking a sanitation financing study that will prepare and analyse six case studies of different models of sanitation implementation, and is currently implementing Phase 2 of its six-country Economics of Sanitation Initiative (ESI), which will collect primary data on the unit costs of different sanitation options in at least five different contexts in each of the six study countries. WaterAid UK is currently finalising a three-country study (Bangladesh, Nepal and Nigeria) of its CLTS programmes, which includes a cost analysis component that should be published in mid-2009. The initial findings from these studies have been incorporated into the comparative analysis in the closing sections of this report.

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<sup>6</sup> IRC WASHCost website: <http://www.washcost.info/>

## 1 Review objectives

Plan spends a significant and increasing amount on its WES programmes. A previous analysis found that, from a base of US \$10 million in 2002, core WES expenditures reached or exceeded US \$30 million per year during each of the last three fiscal years (see Table 2.1).

**Table 2.1 Plan Expenditures**

<b>Fiscal Year<sup>7</sup></b>	<b>WES Expenditure<sup>8</sup> (US \$ millions)</b>	<b>Water (%)</b>	<b>Sanitation (%)</b>
2002	10.4	55.6	44.4
2003	20.0	55.9	44.1
2004	23.7	58.0	42.0
2005	30.2	56.2	43.8
2006	33.2	55.2	44.8
2007	30.0	58.4	41.6

Note: these expenditure data exclude some software and programme support costs (see Section 5.1 for updated cost data).

The increasingly large Plan investment in WES activities raised a number of questions among both Plan staff and external stakeholders:

- By international and national standards, are Plan's WES programmes low-, medium- or high-cost?
- What are the key factors controlling Plan's WES programme costs?
- How can WES policies be improved to ensure that Plan's costs are in line with best practices and with Plan's overall organisational objectives?

Therefore, the global WES expenditure review had three core objectives:

1. To assess the unit costs, cost-sharing schemes, and expenditure patterns associated with Plan's WES programmes
2. To compare Plan's WES programme costs and cost-sharing schemes to those of other agencies operating in the same areas
3. To provide recommendations to Plan on how to update its programme policies, practices, and expenditure tracking for interventions, so as to ensure Plan's WES programmes are as cost-efficient as possible

<sup>7</sup> Plan's Fiscal Year runs from 1 July to 30 June.

<sup>8</sup> Source: BI Online, FY02-07, output codes 3F10-25 and 3G10-16 inclusive.

## 2 Key definitions and explanations

**Hardware expenditures:** capital investments in fixed assets, such as pumps, pipes, boreholes, wells, toilets and bio-gas units.

**Software expenditures:** investments in activities that support and promote the provision of WES services and facilities, such as media campaigns, community hygiene promotion sessions, community development training, and water management training.

**Direct support expenditures:** investments in the management and implementation of WES projects and programmes, such as staff salaries, relevant office costs, transport, fuel, allowances, per diems, National Organisation supervision, directly relevant training of project staff, and monitoring and evaluation.

**Indirect support expenditures:** investments in the support of WES projects and programmes, such as improving the enabling environment for these interventions, regional office support expenditures, capacity building of local government and partner agencies, advocacy and awareness-raising activities, development of national policies and guidelines, and non-project capacity building and training of Plan WES staff.

**PPM:** the “Programme and Projects Module” of Plan’s Corporate Planning, Monitoring and Evaluation (CPME) system. The PPM contains detailed information on the expenditures, outputs and beneficiaries of Plan interventions. The PPM is organised by output codes in six domains, with the majority of WES expenditures falling under the Habitat domain and its sub-headings, 3F (potable water) and 3G (environmental sanitation).

**Plan Regions:** Plan divides its country programmes into four regions:

ARO = Asia Regional Office

RESA = Region of East and Southern Africa

ROA = Region of the Americas

WARO = West Africa Regional Office

### 3 Review methodology

The Plan global WES expenditure review had two phases: the global WES expenditure survey, which assembled expenditure data from 45 Plan country programmes for the Fiscal Years 2005, 2006 and 2007; and the focus country expenditure survey, which looked in more detail at the expenditures of eight Plan country programmes in order to understand better the relationship between hardware, software and support expenditures, and the various policies and implementation arrangements utilised by different country programmes.

The global WES expenditure survey was based on the WES expenditure and output data<sup>9</sup> contained in Plan's Business Intelligence (BI) Online information system. These data were assembled for 45 Plan country programmes for the three Fiscal Years 2005, 2006 and 2007, including a summary of WES expenditures under the main cost headings in the PPM system, and an analysis of the unit costs of four key outputs: new boreholes and handpumps, new community water supply systems, household toilets, and school toilets.

The 45 country programmes were then asked to examine the expenditure data obtained from the BI online system to verify the expenditure and output data, to explain any anomalies or inconsistencies, and to inform the study team of any important cost components or issues that were missing from the global survey.

The second phase of the study was the focus country expenditure survey. The selection of the focus countries (two from each region) was based on the size of the programmes (large country programmes were favoured), on the responsiveness and experience of the country programme WES adviser, and on any special features that were of interest to the review (e.g. the CLTS programme in Bangladesh). Following discussions with staff from Plan's International Headquarters and the regional WES advisers, the following country programmes were selected for the focus country expenditure survey:

- Bangladesh (Asia)
- Philippines (Asia)
- Ethiopia (East and Southern Africa)
- Uganda (East and Southern Africa)
- Colombia (Americas)
- Ecuador (Americas)
- Burkina Faso (West Africa)
- Ghana (West Africa)

A more detailed expenditure survey and analysis was drawn up for review by each of the eight focus countries. In addition, the focus countries were asked to export the PPM beneficiary data from each programme unit so that an estimate could be made of the total number of beneficiary households under each output code.

Collecting information from the global network of country programmes proved challenging and time-consuming. Forty-five of the 49 country programmes were

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<sup>9</sup> Output data refers to records of the number of specific outputs made in relation to each expenditure, such as the number of community water supply systems, household latrines, promotional campaigns, or people trained. A full list of Plan's output codes is provided in Annex A

contacted, but only 22 responses were received, and many of these were received late or were only partially completed. The slow, partial or non-responses received from many of the country programmes led to delays in completion of the review and, in some cases, limited the information on which the review findings were based. However, the central information systems were able to provide raw expenditure and output data for every country programme; thus unit costs were calculated in almost every case.

The focus country expenditure survey was used to elaborate methodologies for calculating unit costs, and for allocating software and support expenditures. These approaches were then used as templates to complete the analysis of the other country programme expenditure data.

### ***Calculation of software and support expenditures***

The information received from the focus country expenditure survey suggested that there were a limited number of elements of software and support expenditures, and that a fairly standard methodology would suffice for most country programmes. Where non-standard expenditures were apparent or highlighted by the country programme response, the calculations were tailored to the specific circumstances of the country programme.

Main software elements:

- Proportion of 3A habitat<sup>10</sup> general expenditures (excluding 3A10 community centres and 3A13 legal assistance)
- 3F24 water management training
- 3F23 water training materials
- 3G10 IEC hygiene

Main support elements:

- Proportion of 3D institutional development expenditures
- Proportion of 3B management, support and supervision expenditures
- Proportion of 3C research expenditures
- Proportion of Regional Office habitat expenditures

In each case, the proportion of each expenditure component allocated to a particular intervention was determined by the size of the intervention expenditures relative to the rest of the interventions utilising the same fund of software or support expenditures: (e.g. if boreholes comprised 50 per cent of the water supply expenditures, and water supply comprised 50 per cent of the WES expenditures, then 25 per cent of the WES software and support elements would be allocated to the borehole expenditures).

### ***Data analysis constraints***

A number of recurrent problems were discovered during the data processing and analysis:

- Data entry errors (mistyped or partial entries)
- Improper use of output codes (e.g. software activities entered under hardware codes)

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<sup>10</sup> Plan divides its activities between five cost centres: 1. Growing Up Healthy; 2. Learning; 3. Habitat; 4. Livelihood; 5. Building Relationships. Most expenditures relating to water and sanitation fall within the Habitat domain. Support costs that cut across all five domains are reported separately as Programme Support and Administration expenditures.

- Mixed output units (output units different across programme units, or varying from year to year)
- Group entries (large-scale activities entered across programme units or other geographical zones, with the entire population marked as beneficiaries)
- Limited beneficiary data (beneficiary data obtained from the Childlink database, which was not set up to record WES beneficiaries; thus every household in the community is counted as a beneficiary household even if only a few households were direct beneficiaries of the WES intervention)

Some of these data constraints were resolved following discussions with the country programme teams. However, if any doubt remained, the inconsistent or dubious data were excluded from the analysis. As a result, the total expenditures utilised in the review under some expenditure codes are lower than those reported in the PPM system.

An attempt was made to use beneficiary data from another Plan database (Childlink) in order to examine the cost per person and cost per household. It transpired that these beneficiary data were not suitable for this analysis, as in most cases, they included every household in the community rather than those that benefited from the WES intervention. Therefore, the focus of the review shifted to an examination of unit costs: for water supply, this represented the cost per borehole, community water supply system, or dug well; for sanitation this represented the cost per household toilet and school toilet.

In order to compare Plan's costs against those found by other cost studies, it was necessary to translate the unit costs into costs per person. Based on feedback from the focus country programmes, an average community size of 100 households was assumed, and an average household size of five persons. In most cases, these assumptions are thought to under-estimate the number of people served by the facilities, thus the costs per person would actually be slightly lower than those presented in this report.

Annex A includes a summary of Plan's output codes, and Annex B includes the detailed expenditure data used to calculate the expenditure patterns and unit costs for each country programme.

## 4 Investment patterns

The following analysis takes account of all Plan programme expenditures, including hardware, software and programme support (direct support, indirect support and regional office support). These expenditures will be broken down in more detail later in the report, where separate implementation and support expenditures will be reported. Expenditures by other development partners, including beneficiary households and communities, are not included in these programme expenditures.

### **Overall investment**

Further analysis of Plan's WES software and programme support costs suggests that Plan's official estimates of WES expenditures are considerably lower than the actual expenditures. The figures in earlier Plan cost studies and reports (see Table 2.1 above) suggest a total WES expenditure of US \$93.4 million during the three-year review period, with an average of US \$31.1 million per year. This amount includes only expenditures recorded under the (3F) potable water and (3G) environmental sanitation output codes, thus excludes relevant software activities (recorded under 3A); management, support and supervision (3B); research (3C); institutional development (3D); regional office support; and WES-related expenditures recorded under other accounting domains.

Factoring in these additional costs resulted in a 34 per cent increase in total WES expenditures over the three-year review period. The review found that Plan's total WES investment (in the 45 country programmes examined) was US \$125.1 million, which is an average of US \$41.7 million per year. These new data suggest that Plan's WES programmes account for 7.7 per cent of the total Plan expenditure (US \$1.635 billion over the three-year review period), and for 71 per cent of all expenditures in the Habitat domain.

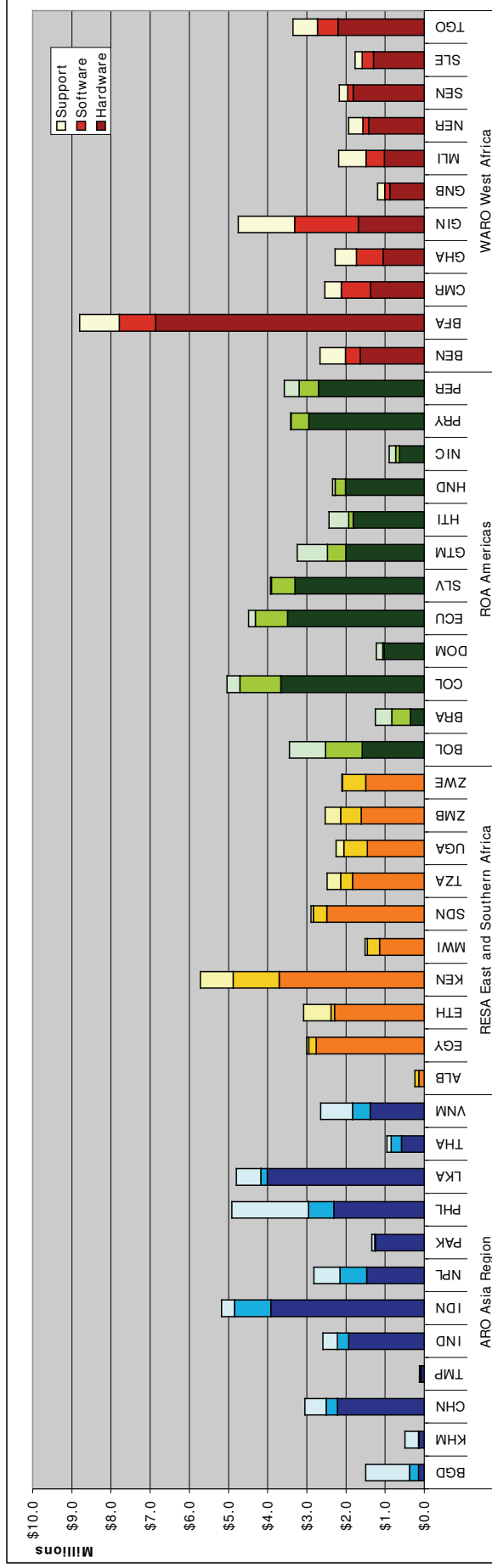
**Table 5.1 Plan Expenditures (US \$ millions)**

<b>Plan expenditures</b>	<b>Total FY2005-07</b>
<b>WES hardware</b>	<b>85.1 (66%)</b>
<b>WES software</b>	<b>20.1 (16%)</b>
<b>WES programme support</b>	<b>19.9 (16%)</b>
<b>Water and Env't. Sanitation</b>	<b>125.1</b>
Total expenditure (45 review countries)	1,143.6
Total expenditure (audited accounts)	1,635.5 <sup>11</sup>

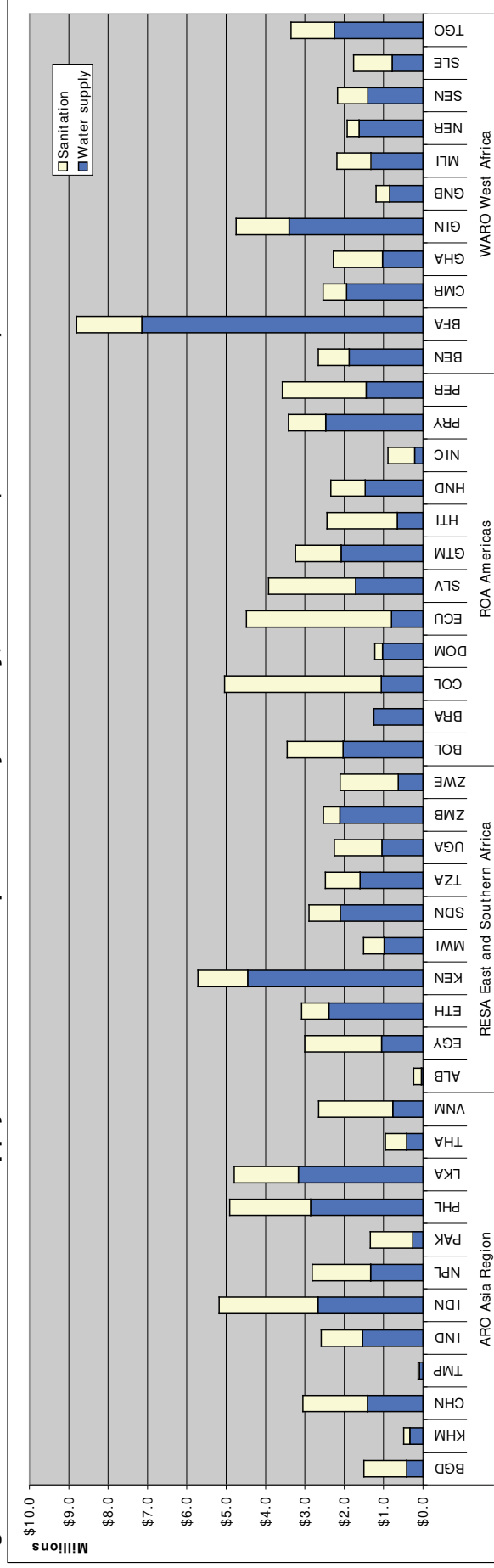
*Note: expenditure data in the rest of the report excludes the five countries that had no water and environmental sanitation expenditures (or extremely low Habitat expenditures) during the FY2005-07 review period: Lao PDR, Liberia, Mozambique, Rwanda, and South Sudan.*

<sup>11</sup> This total includes all expenditures for the International Headquarters, and National Organisations, and international-salaried staff expenditures, as well as end-of-year financial adjustments.

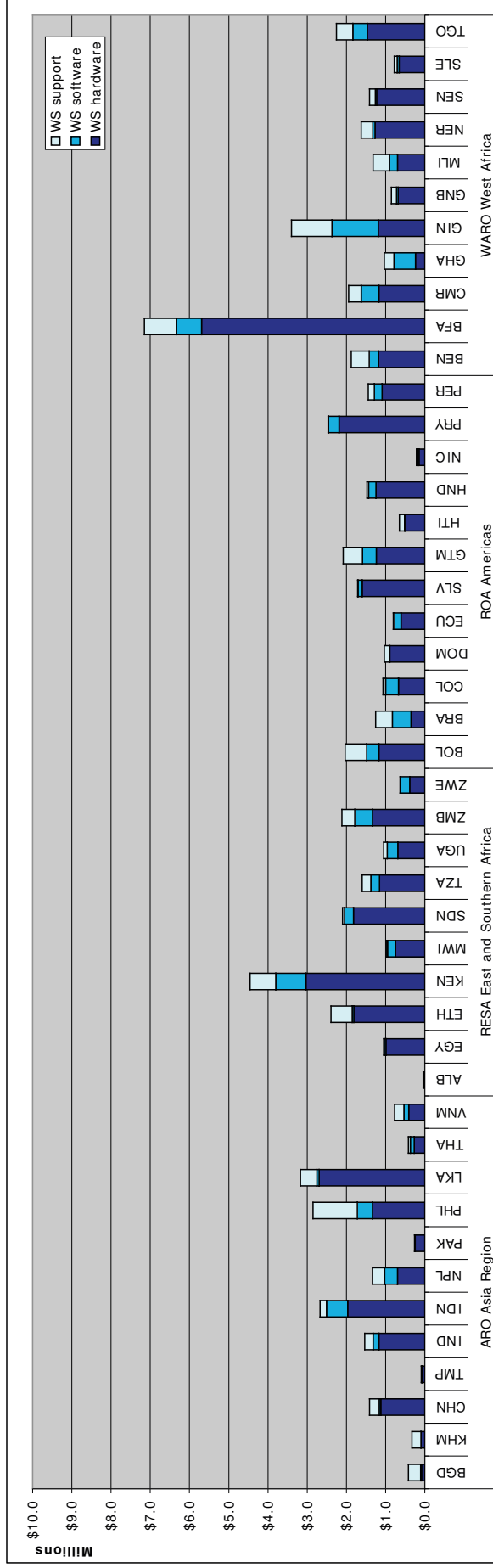
**Figure 5.1 Total WES: Hardware, software and support expenditure by country, FY 2005-07 (US \$ millions)**



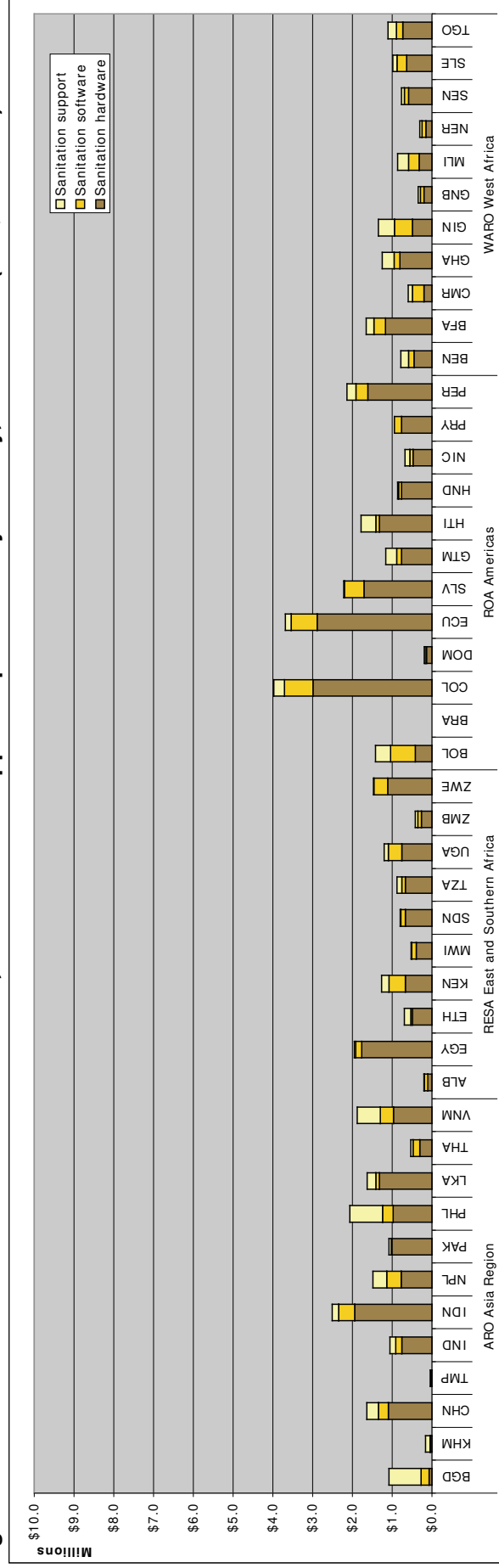
**Figure 5.2 Total WES: Water supply and sanitation expenditure by country, FY 2005-07 (US \$ millions)**



**Figure 5.3 Water supply: Hardware, software and support expenditure by country, FY 2005-07 (US \$ millions)**



**Figure 5.4 Environmental sanitation: Hardware, software and support expenditure by country, FY 2005-07 (US \$ millions)**



Hardware expenditures account for two-thirds of total WES investment (66 per cent), with the remaining third divided equally between software expenditures (16 per cent) and programme support expenditures (16 per cent). Few previous sector cost studies have managed to identify, quantify or report on non-hardware expenditures; thus this finding is a valuable contribution to WES sector expenditure analysis.

### **WES investment patterns**

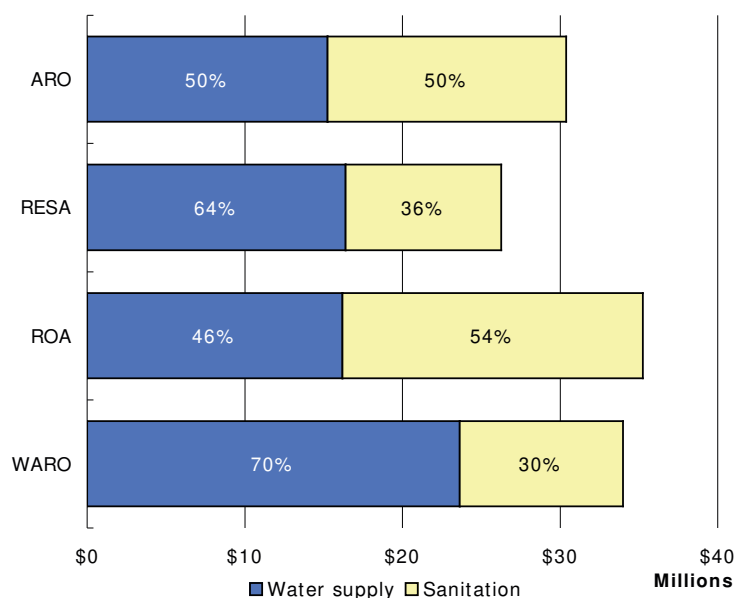
The Americas (ROA) and West Africa (WARO) regions have the highest WES expenditures at US \$35.3 million and US \$33.6 million respectively over the three-year review period. Overall, water supply investments are US \$17.9 million higher than sanitation investments, comprising 57 per cent of total WES expenditure.

**Table 5.2 WES expenditure by Plan region, FY2005-07 (US \$ millions)**

Region	Water	Sanitation	WES Expenditure	
			Total	Country average
ARO	15.3	15.1	30.4	2.53
RESA	16.4	9.4	25.8	2.58
ROA	16.2	19.1	35.3	2.94
WARO	23.6	10.0	33.6	3.06
<b>Totals</b>	<b>71.5 (57%)</b>	<b>53.6 (43%)</b>	<b>125.1</b>	<b>2.78</b>

Note: In the study, ARO = 12 countries, RESA = 10 countries, ROA = 12 countries, WARO = 11 countries.

**Figure 5.5 WES expenditure by Plan region FY 2005-07 (US \$ millions)**



In the Americas, slightly more is spent on sanitation (54 per cent) than water supply; the Asia region is evenly split with 50:50 invested in water supply and sanitation, while water supply dominates in both African regions (70 per cent in West Africa, 64 per cent in East and Southern Africa). The 12 countries in the Americas region spent more than twice as much on sanitation as the 10 countries in East and Southern Africa, and the 11 West

African countries invested almost 60 per cent more in water supply than the 12 Asian countries.

However, a glance at the country-by-country distribution of water supply and sanitation expenditures (see Figure 5.2) highlights the dominance of a few big country programmes, and reveals large variations within regions: 79 per cent sanitation investment in Colombia compared to only 16 per cent in the Dominican Republic, and 28 per cent water supply expenditures in Bangladesh against 66 per cent in Sri Lanka.

### ***WES grant investment patterns***

Plan finances approximately 70 per cent of its programme expenditures with funds raised through child sponsorship programmes; the remainder is financed by grants from donor agencies and corporations. Table 5.3 provides an overview of the role played by grant financing in Plan's WES programmes<sup>12</sup>.

**Table 5.3 WES grant expenditures FY 2005-07 (US \$ millions)**

Region	WES Grants	WES Total	WES Grant (%)
ARO	6.0	30.4	20
RESA	15.8	25.8	61
ROA	3.7	35.3	11
WARO	11.1	33.6	33
Total	36.7	125.1	29

The review estimates suggest that Plan's two African regions have higher than average grant financing for WES programmes. Grant financing plays an important role for WES and other Plan programmes, in that it helps Plan expand the geographic coverage and scale of its sponsorship-funded programmes. In addition, grants may be raised to fund new projects or to fill funding 'gaps' in existing programmes.

### ***WES investment categories***

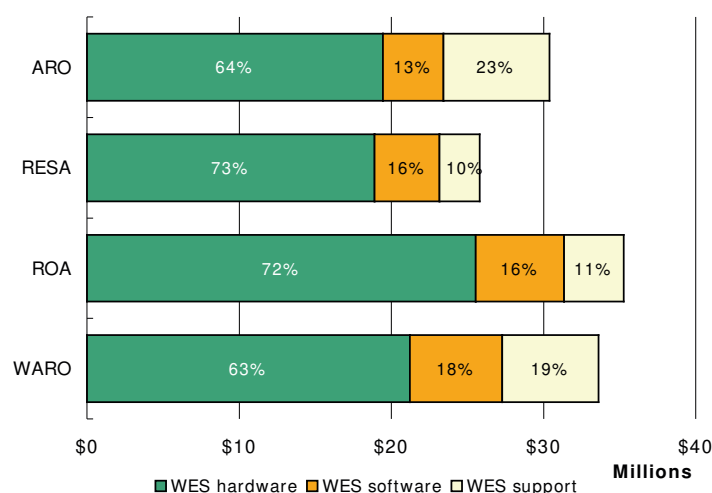
An analysis of the main WES investment categories shows that hardware expenditures account for 68 per cent of all WES expenditures, with the remaining third split evenly between software expenditures (16 per cent) and support expenditures (16 per cent).

**Table 5.4 WES expenditures by function FY 2005-07 (US \$ millions)**

Region	Hardware		Software		Support		Total WES
	Water	San	Water	San	Water	San	
ARO	10.2	9.3	1.7	2.3	3.4	3.6	30.4
RESA	12.0	6.9	2.5	1.8	1.9	0.7	25.8
ROA	11.7	13.9	2.5	3.3	2.1	1.8	35.3
WARO	15.5	5.8	3.8	2.3	4.4	2.0	33.6
<b>Total</b>	<b>49.3</b> <b>(69%)</b>	<b>35.8</b> <b>(67%)</b>	<b>10.5</b> <b>(15%)</b>	<b>9.6</b> <b>(18%)</b>	<b>11.7</b> <b>(16%)</b>	<b>8.1</b> <b>(16%)</b>	<b>125.1</b>

<sup>12</sup> Grant expenditure figures are estimates.

**Figure 5.6 WES hardware, software and support expenditure by Plan region FY 2005-07, (US \$ millions)**



### **Water supply hardware investments**

Water supply hardware investments amounted to US \$49.3 million during the three-year review period, averaging US \$16.4 million per year. More than three-quarters (78 per cent) of these hardware expenditures were lumped together in three out of the 16 Potable Water output codes<sup>13</sup> (see Table 5.5).

**Table 5.5 Water supply: hardware expenditures FY 2005-07 (US \$ millions)**

Outputs	ARO	RESA	ROA	WARO	Total
3F15 New boreholes/handpumps	0.75	3.52	0.22	9.96	14.49 (29%)
3F19 New community WS system	6.65	2.10	6.76	0.93	16.44 (33%)
3F20 Upgrade/extend WS system	1.13	1.92	2.64	1.72	7.41 (15%)
Other 3F codes (excluding 3F23-25)	1.57	4.44	2.06	2.85	10.92 (22%)
<b>Total</b>	<b>10.1</b>	<b>12.0</b>	<b>11.7</b>	<b>15.5</b>	<b>49.3 (100%)</b>
Average per country programme	0.84	1.2	0.98	1.4	1.1

The average country expenditure on water supply hardware during the review period was US \$1.09 million, equivalent to US \$365,000 per year. However, these expenditures were not evenly spread. Five countries (Indonesia, Sri Lanka, Kenya, Paraguay and Burkina Faso) each spent more than US \$2 million on water supply hardware during the review period, including Plan Burkina Faso expenditures of US \$5.1 million on handpumps; and a further six countries (Togo, Zambia, Indonesia, Honduras, Senegal and Sudan) spent more than US \$1 million under a single water supply output code.

### **Sanitation hardware investments**

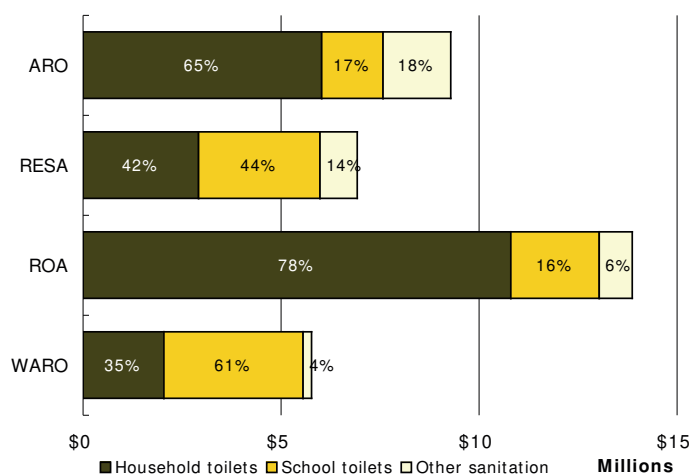
Sanitation hardware investments amounted to US \$35.8 million during the review period, at an average of US \$11.9 million per year. Ninety per cent of these hardware expenditures were on two outputs: household toilets (61 per cent) and school toilets (29 per cent).

<sup>13</sup> A complete list of Plan's Habitat output codes is provided in Annex A.

**Table 5.6 Sanitation: hardware expenditures FY 2005-07 (US \$ millions)**

Outputs	ARO	RESA	ROA	WARO	Total
3G11 Household toilets	6.0	2.9	10.8	2.0	21.8 (61%)
3G12 School toilets	1.6	3.1	2.2	3.5	10.4 (29%)
3G15 Sewerage systems	0.7	0.5	0.6	0.0	1.7 (5%)
3H18 Bio-Gas units	0.3	0	0	0	0.3 (1%)
Other 3G codes (excluding 3G10)	0.7	0.5	0.2	0.2	1.6 (4%)
<b>Total</b>	<b>9.3</b>	<b>6.9</b>	<b>13.9</b>	<b>5.8</b>	<b>35.8 (100%)</b>
Average per country	0.8	0.7	1.2	0.5	\$0.8

Half of the total household toilet expenditures were made in the the Americas, amounting to US \$10.8 million on household latrines during the review period at an average of US \$3.6 million per year; more than the total sanitation hardware expenditures in either of the African regions, which invested the bulk of their sanitation expenditures in school toilets.

**Figure 5.7 Sanitation: hardware expenditure by Plan region FY 2005-07 (US \$ millions)**

As in water supply, the sanitation hardware expenditures were concentrated in a few countries. Fifty per cent of household latrine expenditures were found in seven Plan country programmes: Ecuador and Colombia spent more than US \$2 million on household toilet interventions during the three-year review period, while five other Plan country programmes (El Salvador, Indonesia, Peru, Sri Lanka and Egypt) spent between US \$1.0 million and US \$1.6 million.

### **WES training investments**

One of the largest areas of software expenditure was under Plan's 3A (habitat general) expenditure heading, which includes community managed project training, community development plans, construction of community centres, and gender awareness training.

Almost three-quarters (73 per cent) of these general expenditures were for community managed project training and community development planning, both of which are directly relevant to community water supply and sanitation projects.

In the absence of any specific guidance on how these expenditures were implemented (with the exception of a couple of countries which provided details that confirmed the relevance of these expenditures to WES interventions), this analysis has assumed that a significant proportion of these expenditures should be allocated to WES interventions. In this initial analysis, the 3A expenditures have been distributed according to the proportion of total Habitat hardware expenditures that were for WES hardware.

For seven countries with 3A expenditures that ranged from US \$0.9 million to US \$1.8 million during the review period, this decision is important as it adds a significant proportion to their WES expenditures<sup>14</sup>. The seven country programmes affected are Kenya, Guinea, Zambia, Ecuador, India and Indonesia. While it appears that some of these expenditures relate to support to other sector interventions (food security, learning, HIV/AIDS, maternal and child health), it is recommended that further investigation is conducted in these countries to examine their 3A expenditures in more detail and confirm the proportion related to WES interventions.

Overall, an average of 59 per cent of the 3A training expenditures have been allocated to WES interventions: US \$6.67 million to water supply software expenditures, and US \$5.15 million to sanitation software expenditures.

### **Water management training**

The other significant training expenditure was recorded under water management training (3F24) and related water training materials (3F23), which include activities such as training of water user committees, training of handpump mechanics, purchase of toolkits for handpump mechanics, and awareness-raising activities relating to community management of water supply facilities<sup>15</sup>.

Global expenditure on water management training and water training materials during the review period amounted to US \$3.7 million, an average of US \$1.2 million per year, which comprised about a third of the total software expenditures associated with water supply interventions.

### ***Hygiene promotion expenditures***

Given Plan's increasing commitment and support to behaviour-change oriented approaches to sanitation and hygiene promotion such as CLTS, it was expected that the global expenditure review would find significant expenditures on sanitation and hygiene promotion, and would highlight a shift from hardware investments, such as household toilets, to software investments, such as sanitation and hygiene promotion. In practice, while many Plan country programmes have started to implement CLTS-based interventions, few of them were using the approach during the review period, thus the expenditure data do not reflect this ongoing trend. Global expenditure on BCI (Behaviour Change Information) -based hygiene promotion decreased in 2007, down from US \$1.64 million in 2006 to US \$1.38 million in 2007.

In addition, sanitation and hygiene promotion expenditures are becoming increasingly hard to track, due to the more innovative and multi-faceted approaches being introduced

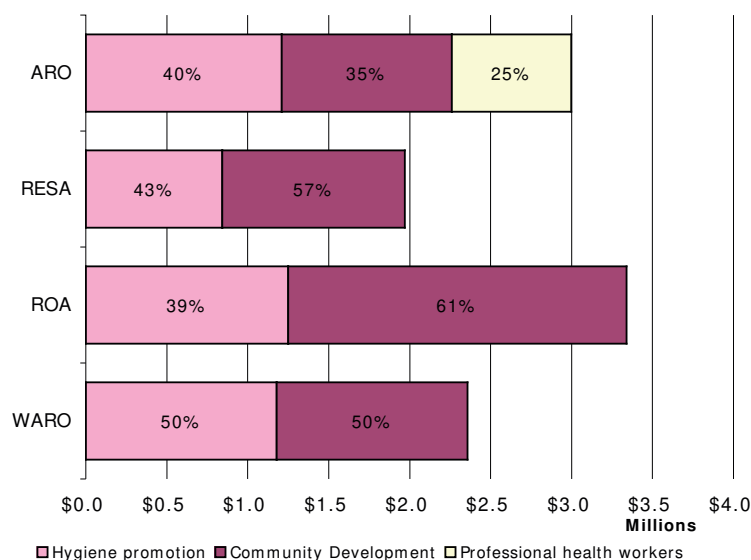
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<sup>14</sup> Plan Colombia spent US \$1.1 million in the 3A category but stated that these expenditures were part of a "women, community and state rights duty bearers" programme, thus were not related WES interventions.

<sup>15</sup> The activities listed here are based on information provided by Plan Uganda.

in the country programmes (which result in diverse recording and reporting practices). For instance, Plan Bangladesh utilises full-time Professional Health Workers in its CLTS programme to promote sanitation and hygiene improvement across its project areas, but the expenditures relating to their employment and support are recorded under the Health domain (rather than WES).

**Figure 5.8 Hygiene promotion expenditure by Plan region FY 2005-07 (US \$ millions)**



Expenditure on sanitation and hygiene promotion during the review period amounted to US \$5.3 million, with a further US \$5.4 million spent on community development activities in support of the sanitation interventions. These expenditures represent about 50 per cent of the amount spent on household toilet activities.

Expenditures on water supply software, including hygiene promotion and water management training, were slightly higher than those on sanitation: respectively US \$10.5 million and US \$10.4 million.

**Table 5.7 WES software expenditures by Plan region, FY 2005-07 (US \$ millions)**

	ARO	RESA	ROA	WARO	Total
<b>Water Supply</b>					
Water management training	0.8	0.9	0.7	1.3	3.7
BCI Hygiene	0.0	0.0	0.1	0.0	0.1
Community development	0.9	1.6	1.6	2.5	6.7
<b>Total</b>	<b>1.7</b>	<b>2.5</b>	<b>\$5</b>	<b>3.8</b>	<b>10.5</b>
<b>Sanitation</b>					
BCI Hygiene	1.2	0.8	1.2	1.2	4.5
Community development	1.0	0.9	2.1	1.1	5.1
Professional Health Workers	0.8	0.0	0.0	0.0	0.8
<b>Total</b>	<b>3.0</b>	<b>1.8</b>	<b>3.3</b>	<b>2.3</b>	<b>10.4</b>

Even in Bangladesh, home of Plan's largest CLTS programme, hygiene promotion expenditures are only 36 per cent higher than the average country programme expenditure of US \$101,000. However, the hygiene promotion expenditures in Bangladesh grew by 31 per cent between 2005 and 2007 (due to the expansion of the programme from two districts in FY2005 to five districts in FY2007).

As noted earlier, Plan Bangladesh also invested substantial amounts (US \$763,000 during the review period) in employing a cadre of Professional Health Workers that support sanitation, hygiene and water supply interventions at the community level. These expenditures, which appear unique to the Plan Bangladesh programme, included professional health worker salaries, housing, vehicles, as well as community health worker and community training programme.

Hygiene promotion expenditures are relatively well distributed across the regions, with the exception of the East and Southern Africa region, which spent an average of only US \$84,000 per programme country during the review period, compared to US \$100,000 to \$110,000 in the other regions. Above-average hygiene promotion expenditures, in the range of US \$207,000 to US \$477,000 during the review period, were recorded in Bolivia, El Salvador, Kenya, Cameroon and China.

### ***Solid waste and sewerage investments***

Expenditures on solid waste management (3G16) were low during the review period: US \$737,000 across the 45 country programmes reviewed. Nearly half of the country programmes recorded no solid waste management expenditures, and the other 24 country programmes only spent about US \$10,000 per year. Most solid waste management interventions appear to involve little more than the distribution of bins and materials for the collection and disposal of solid waste.

### ***Sewerage expenditures***

Thirteen country programmes recorded expenditures on sewerage systems, which totalled US \$1.72 million during the review period (average of US \$132,000 in these 13 countries). None of these country programmes were in the West Africa region. Spending on sewerage systems represented only 4 per cent of the global expenditure on sanitation hardware. Three-quarters of the sewerage expenditures were concentrated in just three countries: Pakistan, Egypt, and Colombia.

### ***School-related WES investments***

The Plan output tracking codes offer only a single choice for school WES interventions: (3G12) school toilets, with no output codes provided for school water supply, hygiene promotion in schools, or other school-related WES activities. As might be expected, the tracking of school WES expenditures varies from country to country. Some programmes track expenditures on school water supply separately from school sanitation (3G12 for school sanitation and a 'community' water supply code for the school water system, based on the type of hardware installed). Other programmes, for example Plan Colombia, incorporate school water supply expenditures into the school sanitation expenditures.

Distinctions among the level of service provided by the school facilities were not possible, as both high service levels, such as the inclusion of showers and wastewater treatment facilities<sup>16</sup>, and low service levels, such as the construction of dry pit toilets, are tracked under the same output code, which makes comparison of costs across country programmes difficult. Furthermore, there is no tracking mechanism to account for the number of toilet stalls or stances, quantity of water produced, or number and type of handwashing facilities provided at schools. Thus, a single school sanitation unit might represent a 3-stall pit toilet in one country, or a toilet block with up to 30 stalls/stances in another.

Plan's expenditure on school toilets totalled US \$13.5 million during the review period, an average of about US \$110,000 per year in the 41 country programmes that implemented school toilets. Four Plan country programmes from Africa spent more than US \$0.5 million during the review period on school toilets: Burkina Faso, Uganda, Sierra Leone and Togo.

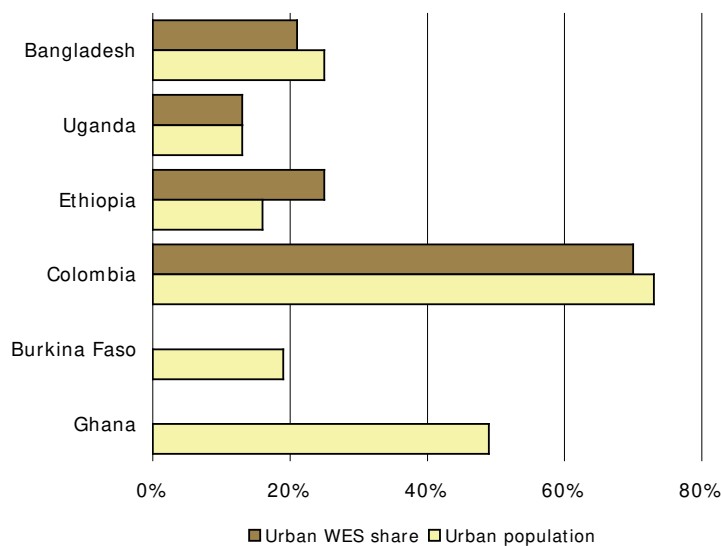
### ***Urban WES investments***

The Plan expenditure tracking systems do not distinguish between urban and rural expenditures; hence there are no ready indicators or database reports available on urban WES expenditures. Therefore, the eight focus country programmes were asked to report on the proportion and nature of their urban WES interventions.

Six of the eight focus country programmes provided information on their urban WES interventions. Of the six, two reported no urban interventions (Burkina Faso and Ghana); three estimated that urban interventions accounted for 13 per cent to 25 per cent of total WES expenditures. (Uganda, Bangladesh and Ethiopia). Plan Columbia reported that the majority of its WES programme (70 per cent) was conducted in urban or peri-urban areas.

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<sup>16</sup> Such as connection to an existing sewer or construction of an independent septic tank and anaerobic filter.

**Figure 5.9 Urban share: WES expenditure against population (per cent)**

Source: Urban population data from UN population statistics, 2008

The focus country data suggest that the rural-urban investment allocations by the Plan country programmes reflect national demographics reasonably well, with the notable exception of Ghana which reports no urban WES expenditures despite a 50 per cent urban population.

### ***Partner WES investments***

Plan often implements WES projects in collaboration with local NGO and government partners. Where these collaborations require Plan to pay its partners for specific services or support, the expenditures are sometimes recorded as institutional development costs (3D10), which is a 'capacity building' category; however, it was also reported that these partner costs are sometimes recorded elsewhere (such as under specific output codes for water supply or sanitation).

In addition, some partner expenditures (in support of WES interventions) such as the government and WSP expenditures in support of the Plan CLTS interventions in Bangladesh, are not captured by the Plan tracking systems.

For this reason, it has not been possible for this study to determine either the proportion of Plan's expenditures that were used to support external agencies, or the size of the contribution by external finance to Plan's WES programme. Further investigation will be required to assess the importance of these partnerships and external payments.

## 5 Unit costs

The following unit cost data include hardware expenditures, software expenditures and support expenditures (direct support, indirect support and regional office support), and are, on average, about 50 per cent higher than the hardware expenditures alone.

### ***Water supply: expenditure per output***

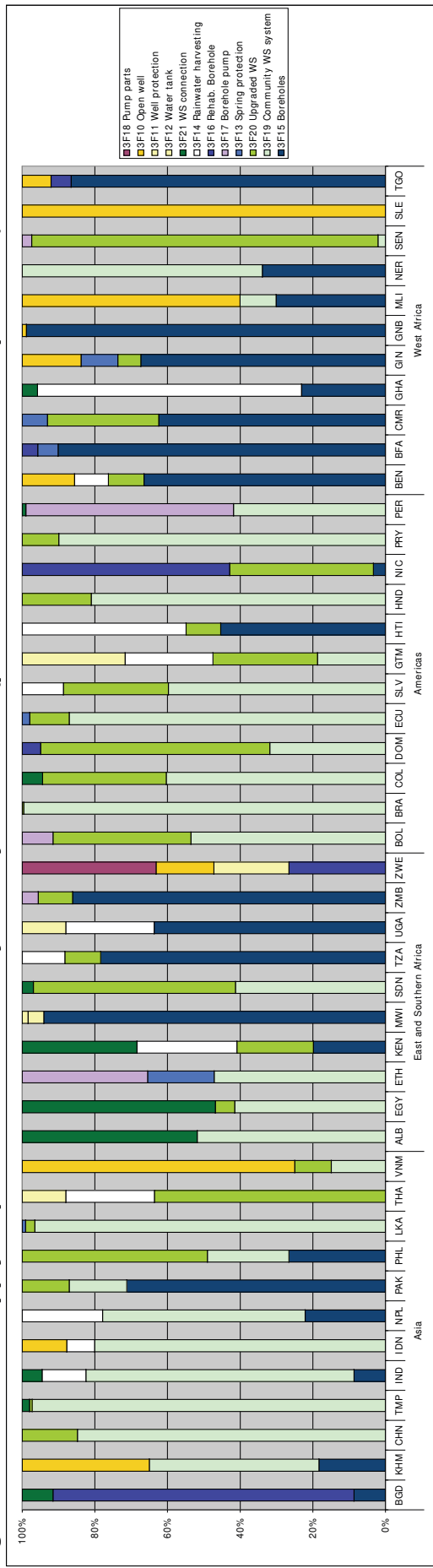
During the review period, three output codes accounted for 78 per cent of total hardware expenditures on water supply:

- 3F19 New community water supply systems US \$16.44 million (33 per cent)
- 3F15 New boreholes and handpumps US \$14.45 million (29 per cent)
- 3F20 Upgraded community water supply systems US \$7.41 million (15 per cent)

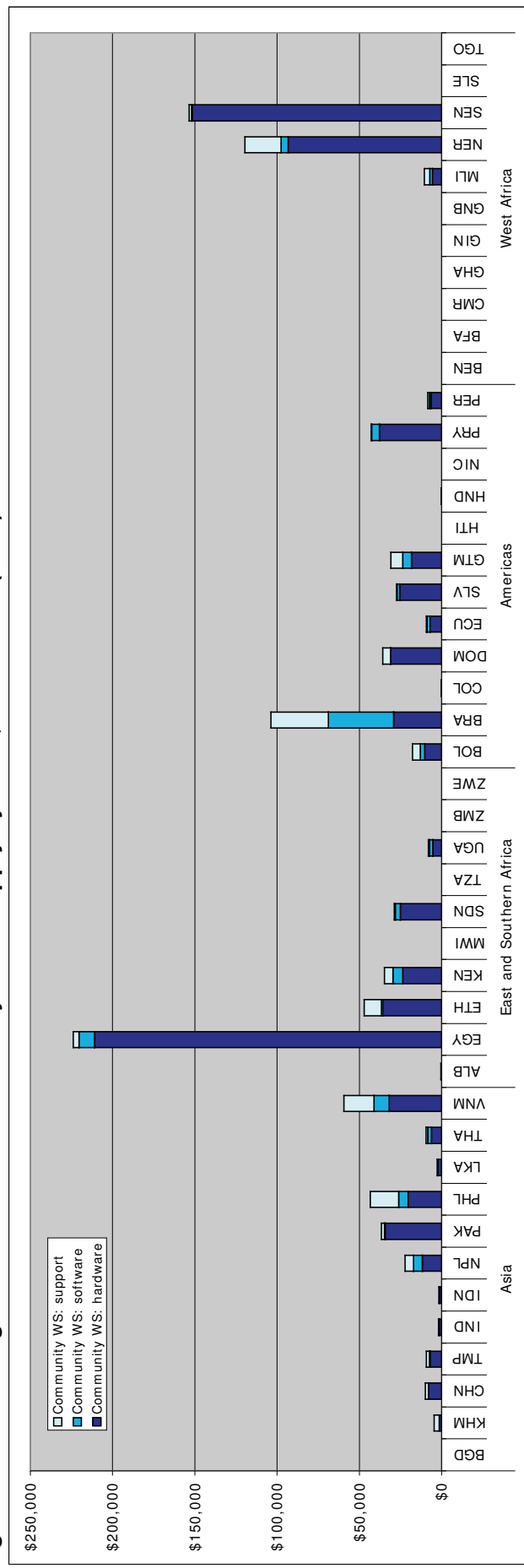
Details of the open well and borehole rehabilitation expenditures are provided in the cost tables in Annex B. The remainder of this section focuses on the three most significant water supply interventions:

- New community water supply systems
- New boreholes and handpumps
- Upgraded community water supply systems

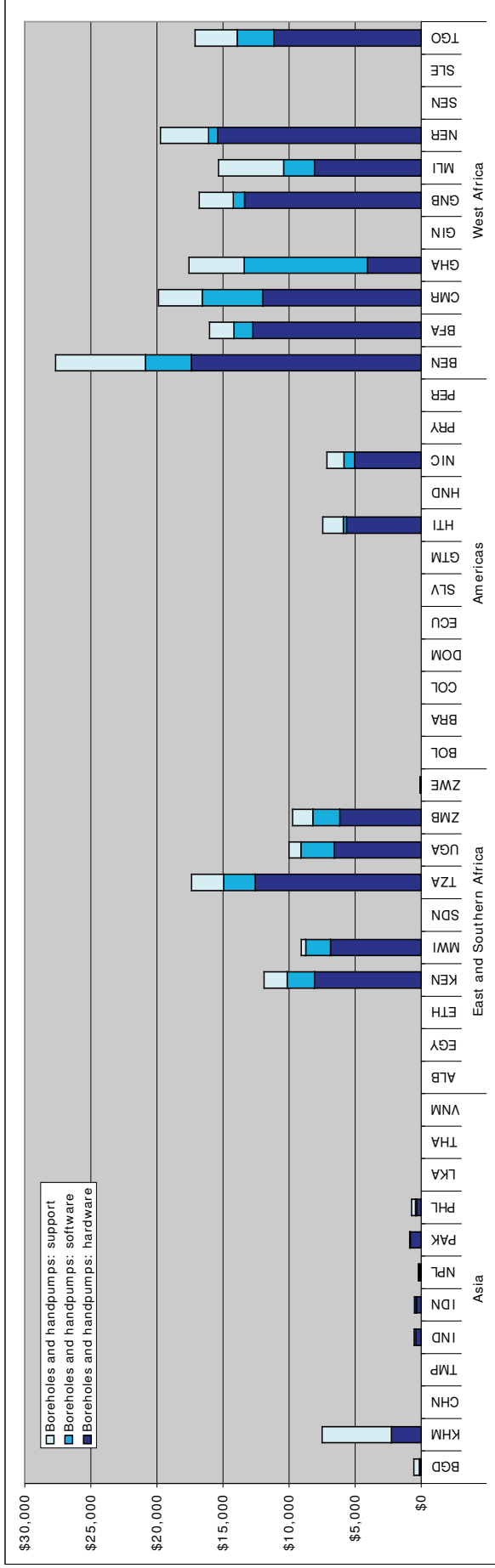
**Figure 6.1 Water supply: expenditure allocation by country, FY 2005-07 (per cent of total hardware expenditure)**



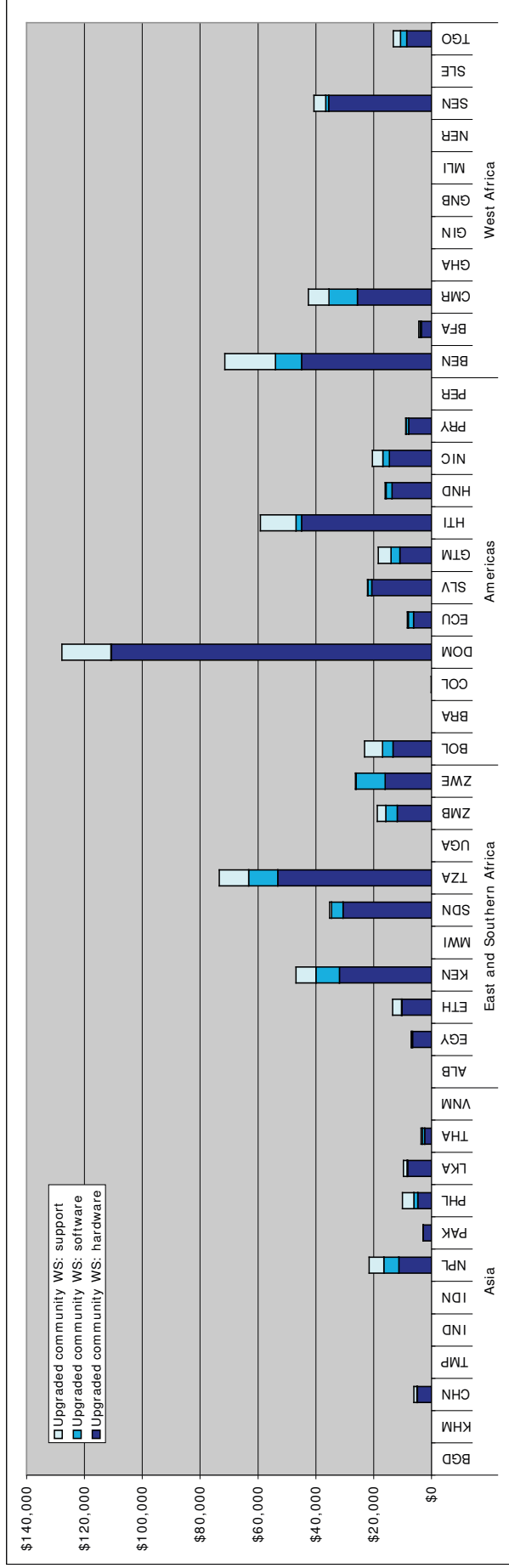
**Figure 6.2 Average unit cost: new community water supply systems, FY 2005-07 (US \$)**



**Figure 6.3 Average unit cost: new boreholes and handpumps, FY 2005-07 (US \$)**



**Figure 6.4 Average unit cost: upgraded community water supply systems, FY 2005-07 (US \$)**



### **Expenditure per output: new community water supply systems**

New community water supply systems (3F19) include a wide range of different schemes, from piped water supply systems to clusters of individual facilities such as household water tanks.

For example, Plan Colombia noted that its community water supply systems comprised household water tanks, used for rainwater harvesting and for storage where piped water supply is intermittent. Plan Ethiopia reported that its community water supply systems were piped water supply schemes that included abstraction systems, reservoirs, and distribution networks.

Given the futility of comparing the unit costs of such diverse water supply systems, an attempt was made to separate out the different types of system based on the characteristics available from the expenditure tracking systems. Three main categories were identified based on the number of water supply systems provided in each community:

- Systems for one or more households (more than 3 units per community)
- Community systems (0.5-2.0 units per community)
- Multi-village systems (one unit supplying several communities)

Two countries reported multi-village water supply system expenditures. Plan Senegal spent US \$307,000 on two water supply systems that supply 29 communities, at an average cost of US \$10,584 per community. Plan Uganda implanted two water supply systems that supply water to 17 communities, with a unit cost (including hardware, software and support expenditures) of US \$8,075 per system, which equates to an average expenditure of about US \$950 per community.

At the other end of the scale, three countries reported community water supply interventions with multiple systems in each community, which appear to supply numerous household facilities in each community:

- Albania: 48 WS systems in 2 communities (24 per community), unit cost US \$446
- Colombia: 4,253 WS systems in 53 communities (80 per community), unit cost US \$146
- Honduras: 5,377 WS systems in 31 communities (173 per community), unit cost US \$219

The remaining 25 country programmes, which provide about one unit per community, have an average unit cost of US \$6,191 (including hardware, software and support). The median unit cost is US \$25,478<sup>17</sup>, ranging from US \$1,715 per unit in Indonesia to US \$121,721 per unit in Niger (see Figure 7.2).

Overall, hardware expenditures account for 75 per cent of the new community water supply expenditures, with another 12 per cent spent on software activities and 13 per cent spent on support activities.

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<sup>17</sup> The average unit cost is significantly lower than the median country programme unit cost due to the large number of low-cost units implemented in Indonesia (1,032 units at US \$1,265 per unit).

The significant differences in the cost and nature of the community water supply systems recorded under this expenditure head suggest that the average expenditure per community would be a more useful comparator than the average expenditure per output. The water tanks supplied in Colombia cost US \$146 each, but supply only one household; whereas the multi-village water supply systems in Senegal cost US \$153,500 each, but supply 15 villages (around 1,500 households, with a cost of around US \$100 per household).

**Figure 6.5 Cost per community: water supply systems FY 2005-07 (US \$)**

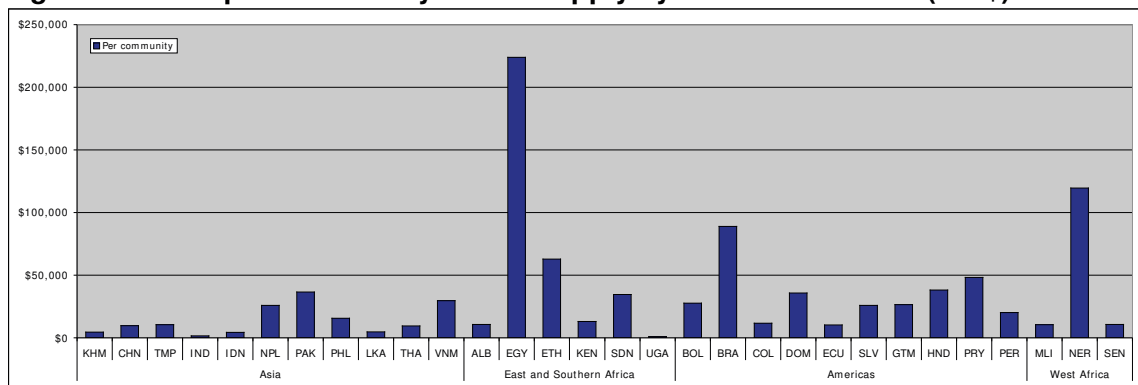
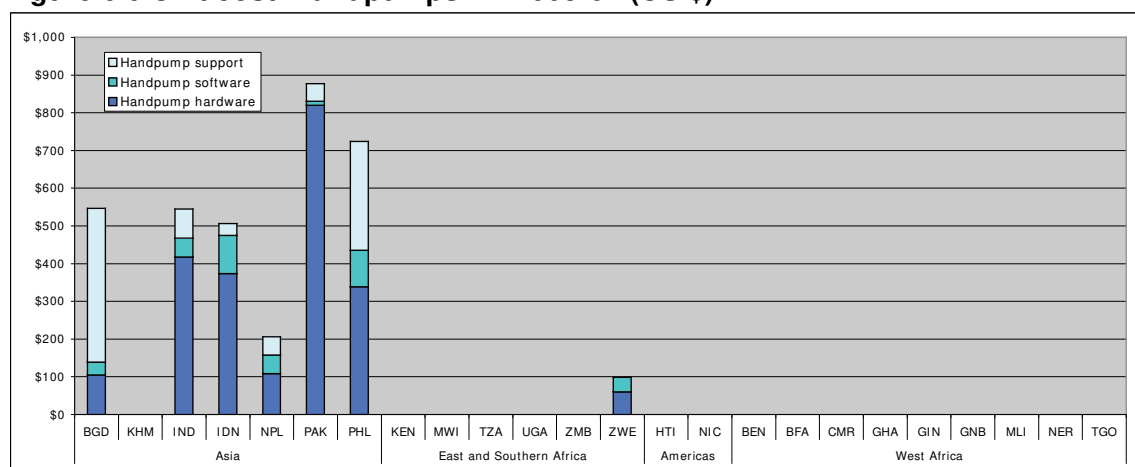
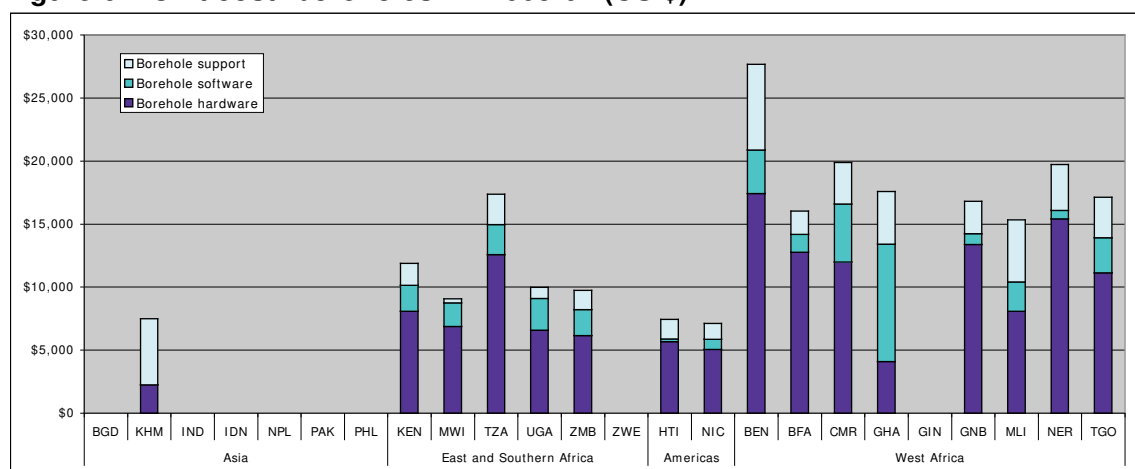


Figure 6.5 presents the average expenditure per community for water supply systems. While some of the country costs remain high in both the unit cost and community cost assessments (Niger, Egypt and Brazil), these data are more useful for comparison and will be utilised in the subsequent regional comparisons.

### **Expenditure per output: new boreholes and handpumps**

Expenditures recorded as new boreholes and handpumps (3F15) also contained a mix of technologies. Twenty-four country programmes reported expenditures in this category, but a unit cost analysis demonstrated significantly lower unit costs (less than US \$1,000 per unit) in seven countries, whereas the remaining 17 countries demonstrate much higher unit costs: ranging from US \$7,124 to US \$83,969 per unit.

Further analysis confirmed that the majority of the low-cost interventions involve more than three units per community, thus these interventions are likely to involve the provision of low-cost handpumps; whereas most of the high-cost interventions provide an average of one unit per community, or supplying several communities, which suggests that these are deeper boreholes and more expensive pumps. Therefore, the unit costs for handpumps and boreholes have been presented separately in Figures 6.6 and 6.7 below and as combined data in Figure 6.3 above.

**Figure 6.6 Unit cost: handpumps FY 2005-07 (US \$)****Figure 6.7 Unit cost: boreholes FY 2005-07 (US \$)**

Overall, 3,928 new boreholes and handpumps were constructed during the period FY2005-07 at a total cost of US \$18.8 million, which equates to an average expenditure per borehole (or handpump) of US \$4,796, of which 71 per cent was spent on hardware.

### Expenditure per output: upgraded community water supply systems

On average, active country programmes averaged 17 interventions to upgrade community water supply systems (3F20) during the review period, except for Plan Colombia, which implemented 3,439 upgrades. Plan Colombia subsequently clarified that these interventions were to improve or extend household water tanks thus were considerably smaller and cheaper interventions that those made in the other countries.

The unit cost of Plan Colombia household water tank interventions was US \$102 per household, whereas the unit cost of community interventions in the other country programmes ranged from US \$3,000 to US \$127,800 per unit (see Figure 6.4), with an average unit cost of US \$18,900 (excluding Colombia interventions). High unit costs were noted in Tanzania (US \$146,860 for two upgraded systems) and in the Dominican Republic (US \$638,800 for five upgraded systems serving 15 communities).

As for the new community water supply systems, the cost per community is a more useful comparator for the upgraded community water supply systems (due to the range in the number of households and communities served by the different systems).

### ***Sanitation: expenditure per output***

This section presents the sanitation unit costs of household toilets and school toilets, which accounted for more than 90 per cent of sanitation expenditures in the 45 Plan country programmes reviewed.

#### **Expenditure per output: household toilets**

The methodology used to calculate software and support expenditures relies on the allocation of sanitation expenditures based on a standard implementation model, which assumes that the majority of the hygiene promotion expenditures are in support of the household sanitation interventions<sup>18</sup>, and that the other support expenditures are allocated proportionally based on the significance of the household sanitation expenditures (hardware and software) within the total WES expenditures.

At least 306,000 household toilets<sup>19</sup> were constructed as a result of Plan sanitation interventions during the review period, at an average expenditure of US \$94 per toilet. This unit cost includes allowances for software activities (notably hygiene promotion and community planning and development activities) and for support from Plan and its partners. The global expenditure per toilet includes:

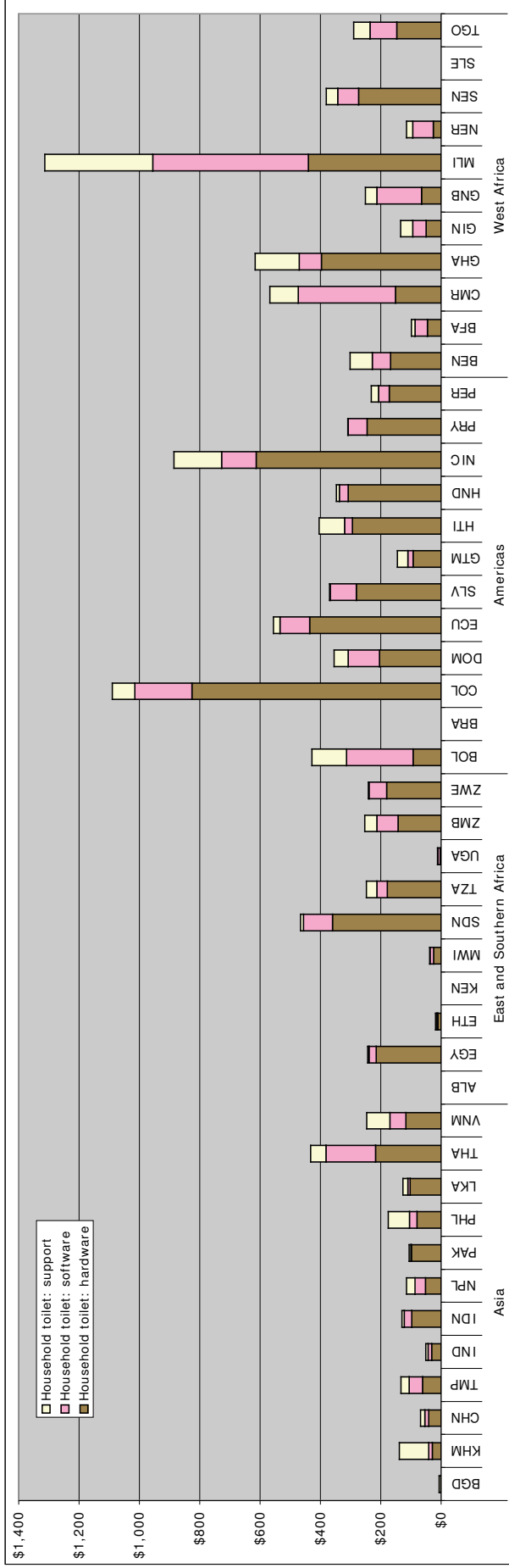
- Hardware expenditure US \$58 per toilet
- Software expenditure US \$18 per toilet
- Support expenditure US \$15 per toilet
- **Total expenditure US \$91 per toilet**

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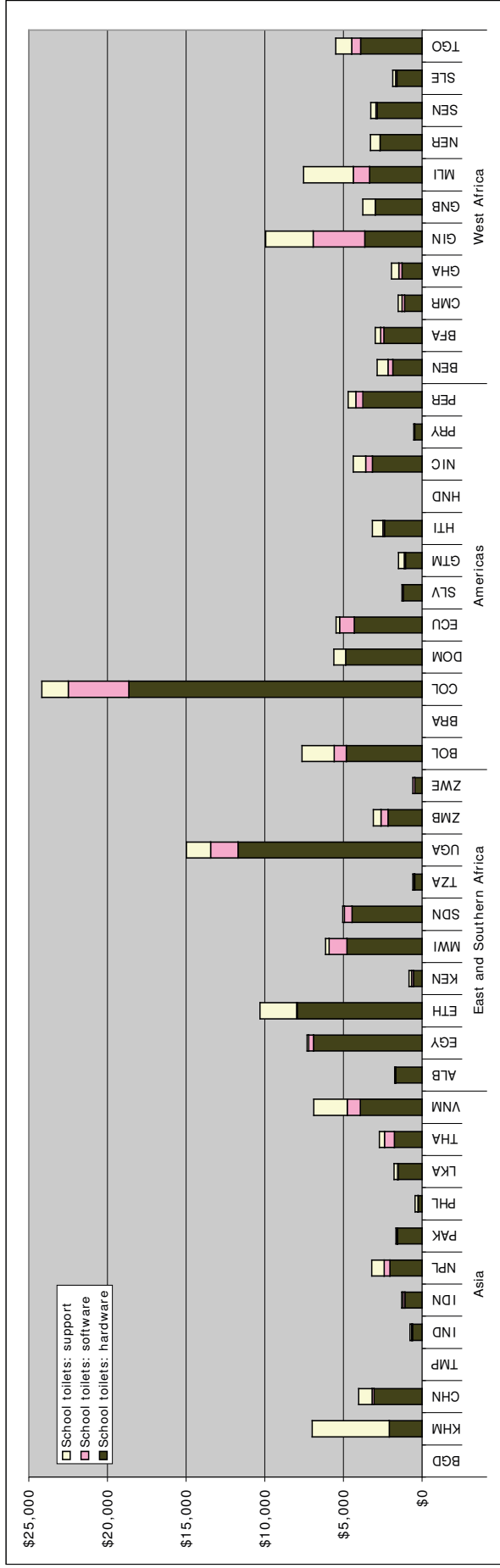
<sup>18</sup> Where the country programme provided information to confirm that its hygiene promotion expenditures also related to other interventions (e.g. water supply activities or school toilets), or where household toilet interventions comprised only a small part of the sanitation activities, the allocation of the hygiene promotion expenditures was adjusted accordingly

<sup>19</sup> This total does not include approximately 17 per cent of the overall number, as some were excluded from the analysis due to missing data entries (which prevented verification of the quantities and communities involved).

**Figure 6.8 Expenditure per household toilet, FY 2005-07 (US \$)**



**Figure 6.9 Expenditure per school toilet, FY 2005-07 (US \$)**



Several Asian country programmes have large-scale household sanitation programmes, which have a large influence on global unit costs:

- Bangladesh<sup>20</sup>: 161,862 household toilets; total expenditure US \$6.25 per toilet
- China: 19,771 household toilets; total expenditure US \$68 per toilet
- Sri Lanka: 11,317 household toilets; total expenditure US \$127 per toilet
- Indonesia: 11,237 household toilets; total expenditure US \$130 per toilet

### ***Shared household toilets in Bangladesh***

Plan Bangladesh reported that 280,126 households, out of a total population of 294,823 households in its project area, used hygienic toilets. While these data imply a toilet usage rate of 95 per cent, the usage data do not inform us of the number of new toilets that resulted from Plan's interventions in the project area. Two factors are critical: the baseline toilet coverage at the start of the interventions, and the number of shared toilets in use.

A recent WSP case study on the Dishari project<sup>21</sup> (which includes the five sub-districts where Plan Bangladesh implements its rural sanitation programme, as well as the three sub-districts where WaterAid Bangladesh implements its programme) suggests that there were 110,764 toilets in use across all eight sub-districts in mid-2004. Assuming that toilet coverage was similar across the project area, this implies that there were 62,238 existing toilets in the Plan working area at the start of the interventions.

Plan Bangladesh reported that 15 per cent of the toilet users in its working area share the toilet of a neighbour or relative, and that another 5 per cent of toilet users shared some form of public or community toilets. Assuming that an average of 2.5 households used shared toilets (including the owner household), these figures suggest the following outcomes in the Plan working area:

- 62,238 households with existing toilets (21 per cent)
- 130,349 households with new private toilets (44 per cent)
- 31,514 households with new shared toilets (11 per cent)
- 42,019 households using other people's toilets (14 per cent)
- 14,006 households using public or community toilets (4.8 per cent)
- 14,697 households practicing open defecation (5.0 per cent)

In total, this analysis suggests that the Plan interventions resulted in 161,862 new toilets, thus increasing toilet coverage by 55 per cent since the baseline survey. Based on an average of 2.5 households per shared toilet, this analysis suggests that the current toilet coverage remains at 76 per cent (despite a toilet usage rate of 95 per cent).

The Plan Bangladesh toilets comprise 54 per cent of the total number of household toilets constructed as a result Plan interventions during the review period. In other words, the toilets constructed in Bangladesh outnumber the combined total number of household toilets constructed under all the other Plan country programmes.

The very low unit cost of the Bangladesh toilets has a significant impact on average unit cost. Excluding these toilets from the unit cost analysis provides a more realistic picture

<sup>20</sup> Number of household toilets obtained from Plan Bangladesh based on its monitoring data, as the PPM system only reports outputs such as the number of hygiene promotion campaigns (rather than the outcomes of the sanitation promotion efforts), with these data then adjusted to make allowances for existing toilets at the start of the interventions, and for the prevalence of shared toilets.

<sup>21</sup> Draft case study produced as part of the forthcoming WSP Sanitation Financing study.

of Plan's toilet expenditures among the other country programmes, which between them provided 144,000 household toilets during the review period:

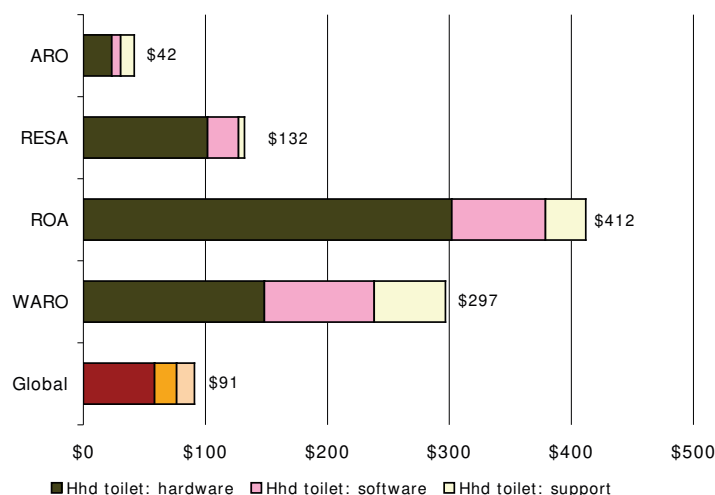
- Hardware expenditure US \$124 per toilet (67 per cent)
- Software expenditure US \$37 per toilet (20 per cent)
- Support expenditure US \$25 per toilet (13 per cent)
- **Total Plan expenditure US \$186 per toilet (excluding Bangladesh)**

The second lowest unit cost for household toilets was reported in Uganda (US \$12 per toilet). Plan Uganda noted that its software expenditures included a comprehensive package of activities: training of masons, establishment of *sanplat*<sup>22</sup> casting yards, marketing of subsidised *sanplats* (which were sold to households for only US \$2 per slab), training of community facilitators in the PHAST (hygiene promotion) methodology, and house-to-house promotional activities. Nevertheless, these expenditure data represent an old approach; Plan Uganda shifted to a CLTS-based approach with zero hardware subsidy in 2007, and expects lower unit costs for household toilets in the future.

### **Regional differences in unit costs**

The average regional expenditures per household toilet (see Figure 6.10) illustrate the cost-efficiency of the Asia region. The Asia unit costs are skewed by the Bangladesh interventions, which accounted for 67 per cent of household toilets in the Asia region. Excluding Bangladesh, the unit cost of household toilets in the Asia region was US \$114 per toilet.

**Figure 6.10 Unit costs by region: household toilets FY 2005-07 (US \$)**



Key: ARO = Asia, RESA = East and Southern Africa, ROA = Americas, WARO = West Africa

### **Level of service**

The Plan Colombia household toilets are among the most expensive, at US \$1,090 per toilet. However, as noted earlier, the household toilets built by Plan Colombia included a shower, flush toilet, washbasin, sewage and wastewater pipework, and either an individual septic tank system or, if available, a sewerage connection. The household contributed unskilled labour and, in some cases, locally available materials such as sand, stone and timber, while Plan Colombia provided US \$826 per toilet for the supply and transport of materials, skilled labour and technical supervision.

<sup>22</sup> *Sanplats* are small concrete latrine slabs with a pre-formed squat hole and tightly fitting lid.

Interestingly, a new national sanitation policy in 2007 sets the maximum hardware subsidy per family toilet at one million Colombian pesos (approximately US \$500), which has meant that Plan has recently had to change its approach and lower the level of service provided by its household toilets. Nevertheless, it is clear that these toilets provide a far higher level of service and are likely to last a lot longer than the simple pit latrines built following CLTS interventions in Bangladesh.

The Plan Bangladesh approach is based on the CLTS approach, which relies on community mobilisation and promotional activities to convince the beneficiary households to build their own simple household toilets. The promotional activities involve a comprehensive mix of participatory “ignition” sessions, monthly reflection sessions, and an annual sanitation month, with regular support and follow-up from Plan-paid professional health workers, local government officials and Plan staff. The resultant household-financed toilets range from homemade, earthen-floored toilets with flexi-pipe seals<sup>23</sup>, to toilets with concrete slabs, plastic or ceramic pour-flush pans, and toilet pits lined with concrete rings.

The CLTS approach used by Plan Bangladesh resulted in a unit cost of only US \$6.25 per household toilet, including all software and support expenditures. While both the level of service provided and the approach utilised are very different between the Colombia and Bangladesh country programmes, the expenditure data illustrate a dramatic difference in cost efficiency: a single household toilet in Colombia costs the same as Plan’s investment for 174 households in Bangladesh.

### **Urban toilets**

Another important issue concealed beneath the aggregate expenditure and output data is the different expenditures associated with urban toilets. The higher level of toilet service provided by Plan Colombia derives, in part, from the fact that 70 per cent of its WES interventions are in peri-urban or urban areas, where households are likely to have higher expectations and demands regarding their facilities and services.

**Table 6.1 Ethiopia: hardware costs for household toilets FY 2005-07**

Hardware costs	Toilets (no)	Communities (no)	Expenditure (US \$)	Unit cost (US \$)	Cost per household
Rural household toilets	3,884	30	44,552	11	11
Urban household toilets	95	20	104,882	1,104	44
<b>All household toilets</b>	<b>3,979</b>	<b>50</b>	<b>149,434</b>	<b>38</b>	<b>24</b>

Plan Ethiopia provided expenditure data to show the differences between its urban and rural sanitation hardware expenditures. These data (Table 6.1) demonstrated that the hardware cost of household toilets in urban areas, at US \$1,104 per toilet, is almost 100 times higher than the rural hardware expenditures, which average US \$11.20 per household toilet. However, further investigation revealed that the urban toilet units financed by Plan Ethiopia are community toilets with 4-6 seats per toilet; thus each urban community toilet serves about 25 households<sup>24</sup>. Therefore, the average hardware expenditure for the urban toilets works out to be about US \$44 per household, or roughly four times higher than the rural equivalents.

<sup>23</sup> A flexible plastic tube is used to form a seal between the toilet pit and the squat hole, designed so that a toilet flush causes it to flex open and then close again once the flush passes.

<sup>24</sup> These expenditures should really be reported under the 3G14 community bathroom and toilet block code in order to avoid the confusion caused by the aggregation of these different facilities.

**Sanitation coverage**

While detailed data on the average number of households in a project community (in each country programme) were not available, the numbers collected from the focus country programmes suggest that, with the exception of Bangladesh, none of the focus country programmes provided toilets to more than 18 per cent of the community (see Annex A for further details).

The global data on household toilets confirm the following ranges for the average number of toilets per community under each country programmes:

- ARO: 6-100 toilets per community, average 35 toilets per community
- RESA: 1-213 toilets per community, average 50 toilets per community
- ROA: 7-80 toilets per community, average 39 toilets per community
- WARO: 1-56 toilets per community, average 8 toilets per community

**Expenditure per output: school toilets**

Forty of the 45 country programmes implemented school toilet interventions. The average cost of a school toilet was US \$2,233:

- US \$1,614 hardware expenditure per school toilet (72 per cent)
- US \$253 software expenditure per school toilet (11 per cent)
- US \$366 support expenditure per school toilet (16 per cent)

The school toilet blocks built by the Plan country programmes varied significantly in design and size. Feedback from the focus country programmes (see below) confirmed that the number of seats or stances provided in a school toilet block can vary from 3 to 16, and other Plan programmes (e.g. Plan China) have supported construction of school toilets with 25 or more stances, resulting in significant variations in toilet block costs.

Plan Colombia reported that the size of a school toilet varies according to the number of students in the school, based on a Colombian building regulation that stipulates one toilet seat per 25 boys or girls. Thus a typical school toilet block will include eight toilet seats (four seats for boys and four seats for girls), two “chamber pots”, six washbasins, two showers, and either a septic tank system or a sewer connection. The school toilet expenditures in Colombia also include the cost of the water supply system (either connection to a piped system or a rainwater harvesting system), and hygiene and sanitation promotion through the Healthy School Strategy.

Plan Ethiopia reported that its school toilets include a 5-metre deep toilet pit and a plastered concrete block and slab toilet building containing 16 stances<sup>25</sup> (eight stances for boys and eight stances for girls).

Plan Uganda implements 6-stance school toilets, with lined toilet pits provided in order that the pits can be emptied and re-used when full. A girls’ school toilet block also includes a bathroom, while a boys’ school toilet block includes a urinal.

Plan Burkina Faso implements 3-stance Ventilated Improved Pit (VIP) toilets in schools, with one block provided for boys and another for girls. Each toilet block has doors, a roof and handwashing facilities.

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<sup>25</sup> A number of different terms are used to refer to individual school toilets: seats, holes, stances, toilets. In this report, seats and stances have been used to differentiate individual facilities from toilets and toilets (which could be either individual household facilities or larger communal facilities).

By chance, the three country programmes with the highest cost per school toilet block were among the focus country programmes that provided the details listed above:

- Colombia: 22 school toilets at US \$24,173 per toilet block (77 per cent hardware)
- Ethiopia: 24 school toilets at US \$10,313 per toilet block (77 per cent hardware)
- Uganda: 52 school toilets at US \$14,981 per toilet block (78 per cent hardware)

However, these expenditures appear more reasonable when the expenditure per seat or stance is examined:

- Colombia: US \$3,022 per seat (including water supply costs)
- Ethiopia: US \$1,256 per stance<sup>26</sup>
- Uganda: US \$2,497 per stance
- Burkina Faso: US \$989 per stance

Only five country programmes exhibited school toilet unit costs below US \$1,000. Each of these programmes was large (in terms of the number of school toilets reported to be constructed): Philippines, Paraguay, Tanzania, Zimbabwe and India.

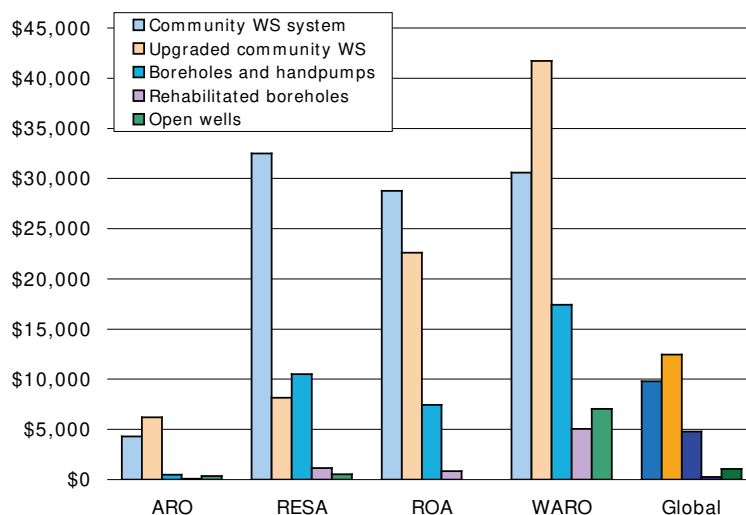
### ***Unit costs by region***

A comparison of the average unit costs<sup>27</sup> of the main water supply output codes across each of the four Plan regions is presented in Figure 6.11. In general, this comparison confirms that the water supply unit costs in the Asia region are considerably lower than those in the other regions. The water supply costs in the Asia region range from US \$104 to US \$6,225 per unit, compared to US \$5,049 to US \$41,730 per unit in the West Africa region.

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<sup>26</sup> Stance refers to a non-pedestal toilet (over which the user has to stand or squat); seat refers to a pedestal toilet (which the user can sit on).

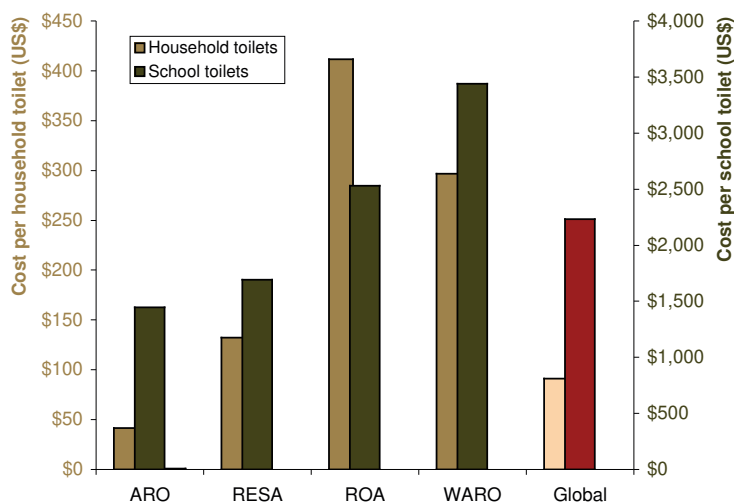
<sup>27</sup> For each output code, a simple average was calculated by dividing the total expenditure in the region by the number of units reported by each region.

**Figure 6.11 Water supply: unit costs by region<sup>28</sup> FY 2005-07 (US \$)**

Key: ARO = Asia, RESA = East and Southern Africa, ROA = Americas, WARO = West Africa

### **Sanitation unit costs by region**

The sanitation unit cost data<sup>29</sup> confirm the relative cost-efficiency of the Asia region interventions, which provide the lowest average unit costs for both household toilet and school toilet interventions.

**Figure 6.12 Sanitation: unit costs by region FY 2005-07 (US \$)**

Key: ARO = Asia, RESA = East and Southern Africa, ROA = Americas, WARO = West Africa

<sup>28</sup> Community water supply costs (new and upgraded) in this figure are costs per community (rather than unit costs) as this measure provides a more realistic comparator.

<sup>29</sup> For each output code, a simple average was calculated by dividing the total expenditure in the region by the number of units reported by each region.

### ***Factors that affect regional unit costs***

The cost differences apparent in the preceding sections highlight the difficulty of comparing costs across country programmes, particularly those in different regions. While little specific information was available to explain the large variations in unit costs across Plan regions and country programmes, the following factors are considered significant:

- Lower material, service and personnel costs in Asia
- Higher population density in Asia
- Physical factors (water-scarcity, groundwater depth, hard-to-access locations)
- Enabling environment (minimum levels of service, government subsidy policy)

The IRC WASHCost programme recently estimated<sup>30</sup> that average personnel costs in India are 65 per cent of those in Africa; while Indian material and supply costs are only 50 per cent of those in Africa. Population density is another significant factor affecting regional unit costs: the average population density in sub-Saharan Africa is 30 people per square kilometre, compared to 118 to 303 people per square kilometre across East and South Asia<sup>31</sup>. Lower population densities affect the accessibility of project sites (increasing transport costs and times); the number of facilities, pipes or water points needed to serve more scattered target populations; and market prices for water supply materials (due to lower and less concentrated demand).

In addition to the factors listed above, most of which are resistant to change, there are a number of additional cost factors that are driven largely by Plan's policies and programming in each country or region:

- Level of service provided
- Implementation approach (including hardware subsidies)
- Local conditions

### ***Level of service provided***

Some country programmes provide a higher level of service due to the more urban and developed nature of their target communities. However, the Plan tracking system records both highly subsidised household bathrooms (with showers, flush toilets, washbasins and septic tank systems) and non-subsidised simple pit latrines under the same output code, thus no distinction is made between the two units in the cost analysis.

### ***Implementation approach***

Implementation approach is another important cost factor: specifically, the level of hardware subsidy provided by the country programme; the software activities provided to improve the adoption and sustainability of new facilities and behaviours; and the level of follow-up, support, capacity building, monitoring and evaluation.

### ***Local context: inaccessible locations and material availability***

The local context of the WES interventions is also important. In water supply interventions, the depth to the water table, the soil or rock type, and relative water scarcity are all critical cost factors (affecting the drilling expenditure, the installation expenditure, the pump and pipe expenditures, and the lack of alternatives in some remote village locations). The unit cost will be substantially lower when a suction handpump is installed to draw water from only 2 to 3 metres below ground, as compared to drilling a borehole through rock 30 to 100 metres deep, then installing a rising main

<sup>30</sup> Personal communication from Catarina Fonseca, IRC WASHCost.

<sup>31</sup> Human Development Report 2006 - Beyond scarcity: Power, poverty and the global water crisis. United Nations Development Programme, 2006. World Development Report, 2006.

and high-lift pump (even if a similar level of service is provided at the end of the intervention).

The remoteness and inaccessibility of the community is also critical. Civil construction and material costs are unusually high in remote and conflict-affected parts of Africa due to the difficulties of obtaining and transporting goods (and personnel), whereas more densely populated and well-served parts of Asia have much lower material, transport and service costs.

### ***Plan WES subsidies***

Analysis of the financial subsidy that Plan's WES interventions provided to beneficiary households proved difficult, as data on the contributions made by partner agencies, and by beneficiary communities and households, are not recorded in the Plan expenditure tracking systems.

The information gleaned from discussions with Plan WES advisers (at both regional and country level), and from the survey responses, suggest that 100 per cent of the capital cost of water supply interventions and school sanitation interventions are usually financed by Plan. The exception is household toilet interventions, which almost always include some household contribution. Data on household contributions towards Plan household toilet interventions were available from 36 country programmes due to earlier research into toilet expenditures<sup>32</sup>. These toilet subsidy data were further interrogated as part of the global WES survey and form the basis for the discussions below.

### ***Toilet subsidy data***

In the 36 country programmes that provided toilet subsidy data in the previous survey, the reported Plan hardware subsidy ranged from US \$0 to US \$881 per toilet, with an average of US \$53 per toilet. These data compare reasonably well with the hardware expenditures in the expenditure review, which suggest a hardware expenditure range of between US \$0 and US \$826 per toilet, with an average of US \$58 (excluding US \$35 per toilet in software and support expenditures). The household contributions to toilet construction were reported as between US \$8 and US \$207 per toilet, with an average of US \$30 per toilet.

A complete valuation of the household contribution to toilet construction should include the following expenditure elements:

- Cash cost of market-purchased materials
- Cash cost of transport of materials (and/or skilled labour)
- Imputed cost of locally available materials (e.g. non-purchased materials)
- Cash cost of skilled and unskilled labour (e.g. masons to build toilet)
- Imputed cost of self-provided labour (e.g. digging of pit, building superstructure)

Whilst a detailed investigation was beyond the scope of this study, the household contribution data provided by the subsidy survey appear based on direct expenditures (cash, materials and labour expenditure) with little or no allowance for imputed material, transport and labour costs.

Plan Burkina Faso reported that the household toilet contribution included: labour to dig the toilet pit, labour and materials to make bricks, provision of sand and water, and any unskilled labour needed in the construction of the toilet. Similarly, Plan Uganda reported

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<sup>32</sup> Conducted as part of a review of Plan's household sanitation programme (Baghri and Heap, 2007), and a follow-up survey conducted by Peter Feldman (Plan Asia Regional WES Adviser).

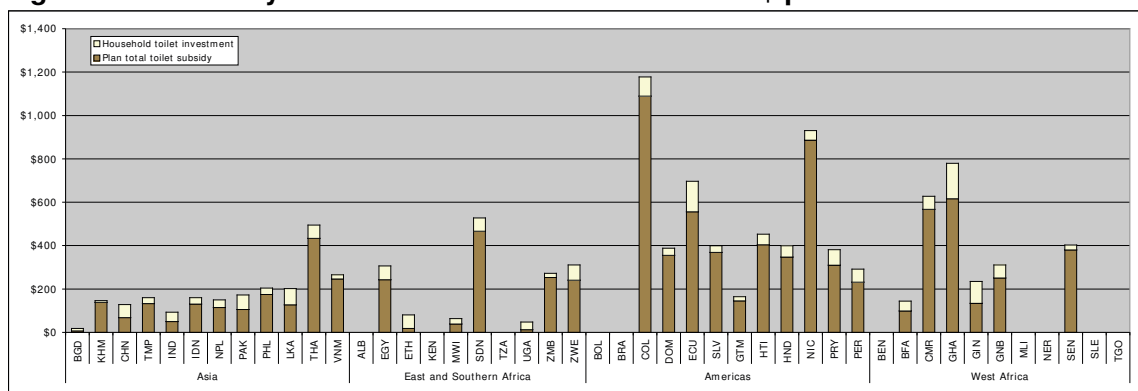
that each household contributed the labour to dig the toilet pit, provided sand and stones, and constructed the toilet superstructure using its own materials and labour.

Given the considerable debate over the different methods that economists use to value imputed labour (and other imputed costs), no further adjustment has been made to the household contributions.

Based on an average toilet subsidy of US \$91 (including software and support costs) and an average household contribution of US \$30, the average cost per toilet is US \$121 comprising:

- 75 per cent Plan toilet subsidy
- 25 per cent household toilet contribution

**Figure 6.13 Subsidy: household toilets FY 2005-07 US \$ per toilet**



Note: this chart only includes Plan country programmes that responded to the toilet subsidy survey.

### **Targeting of toilet subsidies**

The global WES review asked the country programmes to report on the targeting of toilet subsidies. Specifically, whether the toilet subsidy was available to the entire target community; or, if the subsidies were rationed (to a limited number of households within the community), how the beneficiary households were selected.

Most of the country programmes reported that toilet interventions aimed to reach the entire community, but that the requirement for some voluntary counterpart funding and contribution (e.g. the digging of toilet pits and provision of some materials) limited the number of households that constructed toilets.

As detailed earlier, the average number of toilets provided per community confirms that, with the exception of one or two large sanitation programmes that have adopted CLTS or similar community-wide approaches to sanitation improvement, the Plan household toilet interventions reach a fairly small proportion of the community.

Overall, the Plan household toilet interventions during the review period resulted in 306,000 toilets in 9,614 communities, at an average of 32 toilets per community. However, as noted earlier, the majority of these toilets were implemented in Bangladesh. If the Bangladesh data are excluded, the remaining 41 Plan country programmes that undertook household toilet interventions resulted in 144,000 toilets in 5,743 communities, an average of only 25 toilets per community.

Unfortunately, the limited information available on the typical community size in each country prevents the calculation of the overall proportion of households in each community that constructed toilets as a result of the Plan interventions. In addition, no data are available on the income level or characteristics of the beneficiary households and, therefore it is not possible to verify whether the interventions reached the poor and disadvantaged households that Plan WES investments aim to reach.

### ***Programme support by other agencies***

Another important set of factors in assessing the efficiency and effectiveness of WES interventions are the support, capacity building and complementary interventions undertaken by other agencies (government, external support agencies, international NGOs, local NGOs, private enterprises and CBOs/CSOs). In particular, advocacy activities, health and hygiene behaviour change campaigns, and sanitation awareness-raising events can have a significant impact on the efficacy and effectiveness of interventions.

Several examples are available from Bangladesh, where Plan's involvement in the Dishari rural sanitation project has been aided by a US \$100,000 investment by the World Bank's Water and Sanitation Program (WSP). In addition, the Government of Bangladesh instructed local governments to earmark 20 per cent of their Annual Development Plan (ADP) budget towards rural sanitation. The 2005 Bangladesh National Sanitation Strategy stipulated that the 20 per cent ADP allocation should be used to:

- subsidise household toilets to the hardcore poor<sup>33</sup> (75 per cent)
- finance promotional activities such as public meetings and campaigns (25 per cent)

A forthcoming WSP case study on the Dishari rural sanitation project<sup>34</sup> estimates that US \$278,528 ADP funds were spent on subsidies to the hardcore poor and awareness-raising activities in the 8 Dishari sub-districts, plus a further US \$115,942 of the general block allocation from the Ministry of Local Government. The five sub-districts that Plan Bangladesh works in comprise 57 per cent of the Dishari target population, which suggests that approximately US \$225,000 of the ADP and block funds were spent in the Plan working area. The estimated total Plan Bangladesh expenditure on household toilet interventions during the period FY2005-07 was US \$1.065 million and, therefore, the ADP and block funds are equivalent to about 21 per cent of the Plan expenditures.

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<sup>33</sup> Each hardcore poor household that met the ADP criteria received a toilet materials package worth about Bangladesh Taka 450-500 (equivalent to US \$6.50-\$7.25).

<sup>34</sup> This case study is part of the forthcoming WSP sanitation financing study. The draft case study was provided to the author for review, but has not yet been published. Note: the Dishari project is a collaboration between Plan Bangladesh, WaterAid Bangladesh, WSP Bangladesh and the Dhaka Akhsania Mission (DAM).

### **Local government contributions in Bangladesh**

The WSP case study also highlights the importance of local government contributions to the Dishari project. It was estimated that union council members and other local government staff worked intensively for about 4.5 months over a total period of one year in order to achieve 100 per cent ODF status within their jurisdiction. The cost of these efforts has been estimated at about US \$2,200 per successful union based on 24 staff contributing their time during the CLTS campaign, suggesting a total expenditure of US \$143,000 in the 65 Union Parishads that achieved ODF status under the Dishari project. Forty-nine of the successful ODF unions were in the Plan working area, which implies local government expenditures of US \$107,800 in support of the Plan interventions.

### **ODF reward scheme in Bangladesh**

Another important cost factor is the ODF reward scheme introduced by the Government of Bangladesh. This scheme offered US \$2,900 to each Union Parishad that achieved ODF status, and a further US \$7,250 to each sub-district that achieved ODF status across its entire jurisdiction. The WSP case study estimates that these rewards amounted to US \$289,855 within the Dishari project area. Based on the ratio of 49 out of the 65 successful ODF unions being in the Plan working area, this suggests that the local governments in the Plan working area received about US \$218,500 in financial rewards.

The WSP case study also notes that some local NGOs, CBOs and CSOs offer a variety of toilet subsidies and micro-credit options to rural households in the area. The WSP Dishari data suggest that 0.8 per cent of the completed toilets were financed through these local subsidies, which amounts to 1,295 toilets in the Plan working area. Assuming an average subsidy of US \$7 (as per the ADP standard), these additional NGO subsidies amount to US \$9,065.

**Table 6.2 Plan Bangladesh: household toilet costs FY 2005-07**

	<b>Expenditure (US \$)</b>	<b>Toilets (no.)</b>	<b>Expenditure (% total)</b>
Plan expenditures: household toilets	1,011,000	-	<b>23.3</b>
ADP + Block expenditures	225,000	17,559	<b>5.2</b>
WSP expenditure	57,000	-	<b>1.3</b>
Household contributions:			
Non-subsidised toilets	2,585,000	143,008	<b>59.7</b>
Subsidised toilets	119,000	18,854	<b>2.7</b>
Local government expenditures	107,800	-	<b>2.5</b>
ODF reward scheme	218,500	-	<b>5.0</b>
Local NGO subsidies	9,000	1,295	<b>0.2</b>
<b>Total expenditure</b>	<b>4,332,300</b>	<b>161,862</b>	<b>100</b>
<b>Total cost per toilet</b>	<b>26.8</b>		

The detailed expenditure data presented in Table 6.2 suggest that, on average, beneficiary households contributed about 62 per cent of the cost of their new toilet (US \$16.80), while Plan contributed about 23 per cent (US \$6.24) through software and support; other development partners contributed the remaining 14 per cent (US \$3.81).

## 6 Comparative costs

### ***WES expenditure reviews by other sector agencies***

One of the main objectives of this global WES expenditure review was to compare Plan's WES expenditures against those of other sector agencies in order to evaluate the relative cost efficiency of Plan's interventions.

A number of other agencies were either planning or had already begun similar expenditure studies when this expenditure review was initiated. Therefore, it was hoped that a wide range of comparable expenditure data would be available on completion of the research for this study.

Two of the most directly relevant expenditure studies, the WSP sanitation financing study and the WaterAid Three-Country CLTS study, are not yet complete at the time of writing in early May 2009. Both studies are due to be completed shortly, and in the interim, WSP has supplied expenditure data from its draft Bangladesh case study; and WaterAid has supplied expenditure data from its Nigeria case study, as well as some initial expenditure data from its Bangladesh case study.

### ***IRC WASHCost***

The most comprehensive current undertaking on WES expenditures is the IRC Water, Sanitation and Hygiene Cost (WASHCost) project "Quantifying the cost of delivering safe water, sanitation and hygiene services". The WASHCost project was launched in 2008 with a five-year time frame, based on a continuous process of capacity building and learning in four countries: Burkina Faso, Ghana, India, and Mozambique. The design of this long-term project derives from previous experiences of the difficulties in obtaining reliable and comparable WES expenditure data, which informed a project approach that aims to develop and use common definitions, methodologies and modes of analysis for WES expenditures.

### ***WHO water and sanitation cost data***

The World Health Organization (WHO) has published a series of studies and reports on the cost-effectiveness and cost-benefit analysis of water and sanitation interventions. Most of these studies are based on original cost data from the 2000 Global Water Supply and Sanitation Assessment Report (GWSSAR 2000) produced by the WHO-UNICEF Joint Monitoring Programme on Water Supply and Sanitation (JMP). These data were derived from a survey of WES unit costs completed by WHO and UNICEF country programme staff during the late 1990s. Apparently not all countries were able to provide information on costs; thus regional costs per capita were calculated based on the weighted data from the individual country responses. Table 7.1 presents the cost per capita data as presented in the GWSSAR Report.

**Table 7.1 Initial investment cost per capita 1990-2000 (US \$)**

<b>Water supply improvement</b>	<b>Africa</b>	<b>Asia</b>	<b>LAC</b>
House connection	102	92	144
Standpost	31	64	41
Borehole	23	17	55
Dug well	21	22	48
Rainwater	49	34	36
<b>Sanitation improvement</b>	<b>Africa</b>	<b>Asia</b>	<b>LAC</b>
Sewer connection	120	154	160
Small bore sewer	52	60	112
Septic tank	115	104	160
Pour-flush latrine	91	50	60
VIP latrine	57	50	52
Simple pit latrine	39	26	60

Source: JMP (2000). Key: LAC = Latin America and Caribbean

These cost data have been reproduced and reused in many different reports and studies. Despite noting that the country estimates of unit capital investment costs contain weaknesses, Hutton and Bartram<sup>35</sup> concluded that the average regional estimates are reasonable, and updated the GWSSAR costs to 2005 prices by applying an average gross domestic product (GDP) deflator of 10 per cent per annum as in Table 7.3 (which results in a 61 per cent increase in unit costs in all regions, with no allowance made for differential regional inflation).

**Table 7.2 Updated initial investment cost per capita, 2005 (US \$)**

<b>Water supply improvement</b>	<b>Africa</b>	<b>Asia</b>	<b>LAC</b>
House connection (treated)	164	148	232
Standpost	50	103	66
Borehole	37	27	89
Dug well	34	35	77
Rainwater	79	55	58
<i>Average of non-piped options</i>	<i>50</i>	<i>55</i>	<i>72</i>
<b>Sanitation improvement</b>	<b>Africa</b>	<b>Asia</b>	<b>LAC</b>
Sewer connection (partial treatment)	193	248	258
Septic tank	185	167	258
Pour-flush latrine	147	81	97
VIP latrine	92	81	84
Simple pit latrine	63	42	97
<i>Average of non-sewer options</i>	<i>122</i>	<i>93</i>	<i>134</i>

Source: Hutton & Bartram (2008). Key: LAC = Latin America and Caribbean

The data are presented as *per capita* costs. However, there is a suspicion that some of the country costs supplied to the WHO may actually have been *per household* costs. The original survey questionnaire requested “an estimate of the overall national average ... approximate cost (expressed in equivalent US dollars) of construction, **per person served**”. Interestingly, the UNEP 2004 report also noted that “it is often not clear whether costs published have been calculated on a per person basis or merely to reflect the average cost of construction per person for the community or household as a whole”.

<sup>35</sup> Hutton, G. and Bartram, J. (2008) **Regional and global costs of attaining the water supply and sanitation target (Target 10) of the Millennium Development Goals**. Geneva: WHO.

Hutton and Bartam (2008) also note that an exhaustive costing of water and sanitation interventions should account for “programme” costs, which they define as expenditures incurred at a level other than the delivery point of an intervention, and which should include expenditures incurred at district, province or central administrative levels. They confirm that the GWSSAR estimates did not include programme costs, and suggest that sector programmes typically allow between 10 per cent and 20 per cent of project budget for management costs<sup>36</sup>.

This global WES expenditure review has confirmed that Plan WES expenditures include non-hardware programme costs that amount to 32 per cent of total expenditures, including 16 per cent support costs.

### ***IRC WASH cost review***

As part of the preparation for the IRC WASHCost study, the IRC compiled a review of existing WASH cost studies in March 2007 (summarized in Figure 7.3). This review provided the most comprehensive source of information on water supply and sanitation costs to date.

The review drew on data from a number of sources:

- WHO-UNICEF (JMP) GWSSAR 2000
- DWAf (South Africa Department of Water Affairs and Forestry), 2002
- UN Millennium Project Needs Assessments, 2004
- WSP Kenya, 2005
- WSSCC Vision 21, 1999
- WaterAid Nepal, 2004
- SNNPR Ethiopia, 2005

An initial investigation of these sources (e.g. WSP Kenya study, 2005) suggests that some of the unit cost data are based on budget costs rather than actual expenditures, and that government involvement in the programmes and procurement processes may have led to increased prices.

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<sup>36</sup> Although their sensitivity tests also included a scenario based on 30 per cent programme costs.

**Table 7.3 IRC WASH investment cost per capita, 2004 (US \$)**

<b>Water supply improvement</b>	<b>Minimum</b>	<b>Maximum</b>
House connection (treated)	99	214
Standpost	33	69
Borehole	18	199
Dug well	9	82
Rainwater	36	229
<i>Non-networked options</i>	<i>1.00</i>	<i>229</i>
<b>Sanitation improvement</b>	<b>Minimum</b>	<b>Maximum</b>
Sewer connection (partial treatment)	24	260
Septic tank	107	799
Pour-flush toilet	27	163
VIP toilet	10	172
Simple pit toilet	11	54
<i>Non-networked options</i>	<i>0.80</i>	<i>911</i>

Source: IRC review spreadsheet, March 2008.

Whilst the IRC review purports to include some implementation support expenditures (office overheads, transport expenditures) in the capital investment costs, many of the data sources used to provide the investment costs, such as the GWSSAR unit cost data, do not include programme expenditures. Software expenditures are included in the review as “direct support costs”, but very few of the data sources examined by the review provide any data on direct support expenditures. Therefore, the original sources should be used for any cost comparisons in order to avoid any false assumptions concerning the constitution of the unit costs.

### ***Inflation and purchasing power parity***

The IRC review highlighted a number of serious issues concerning unit cost comparisons, many of which are relevant to this expenditure review. In particular, the IRC review noted the importance of using a GDP deflator and Purchasing Power Parity (PPP) values when comparing expenditures from different countries at different dates. A GDP deflator is used to bring expenditures to a value at a common date to negate the effects of price inflation on the comparison. PPP dollars are used to allow for the different pricing of goods and services across countries.

The Plan expenditure tracking systems report all financial transactions in US dollars, with the conversions from local currency into US dollars made automatically based on the current exchange rate at the time the transaction is recorded. As a result, the local currency values for the Plan expenditures were not available through the central expenditure tracking system used to provide data for this review. Considerable additional work would have been required to collect the local currency expenditure data needed for PPP adjustments from each of the 45 country programmes reviewed; thus no PPP corrections were made in this review.

The expenditure data from each of the fiscal years reviewed were aggregated without any allowance for inflation or price variation. In general, the expenditure analyses were based on the aggregated data for the three-year period, which made it hard to revisit the data in order to make allowances for price inflation. However, given the ready availability of GDP inflators for each country from the World Bank, any further unit cost research by Plan should include allowances for price inflation.

***Capital maintenance expenditures***

The IRC review also noted that infrastructure cost assessments should allow for capital maintenance expenditures (asset renewal and replacement costs). Given that capital maintenance expenditures are usually based on annualised depreciation costs, an analysis of capital maintenance expenditures will highlight the role that the expected life of WASH facilities and services has on the capital investment cost. For instance, a durable pour-flush toilet may cost more than twice as much to build as a simple, low-cost toilet, but if it lasts more than twice as long as the low-cost alternative, and requires fewer repairs during this period, then it may be a more cost-effective solution.

An examination of the design life (and actual lifespan) of WES facilities and services, and the related capital maintenance expenditures, was not part of the terms of reference for this review. However, once the basic unit costs for water supply and environmental sanitation interventions are established and become more regularly and reliably monitored, it is clear that the next stage should involve the compilation of evaluation data on the average lifespans of WES services and facilities, and an examination of the related capital maintenance issues.

***Operational expenses***

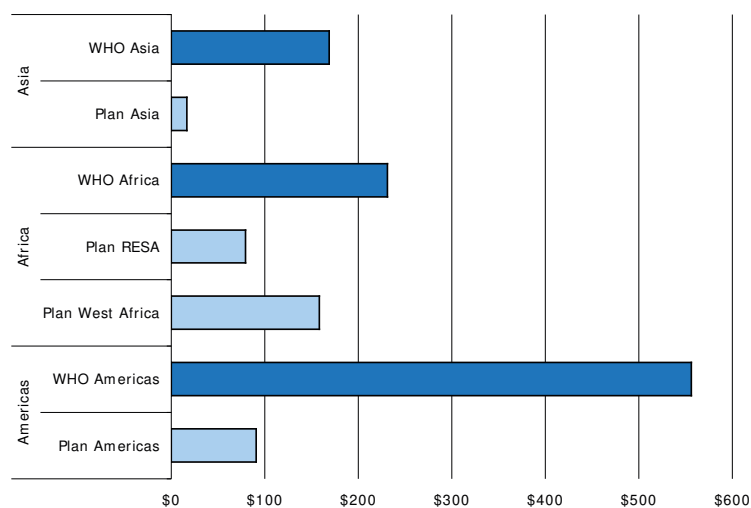
The focus of the expenditure review has been on Plan's capital investments in water and environmental sanitation; thus little attention has been paid to the cost of operating and undertaking routine maintenance on the resulting WES facilities and services. In most cases, Plan provides non-networked water and sanitation facilities with relatively low operating expenses. Plan also encourages community or household management of the facilities and services. In addition, the Plan expenditure tracking systems do not record data on operational expenses financed by the community. However, given the well-recognised problems with the community management of WES services, it may be worth investigating this issue further in any subsequent research.

***Water supply: comparative expenditures***

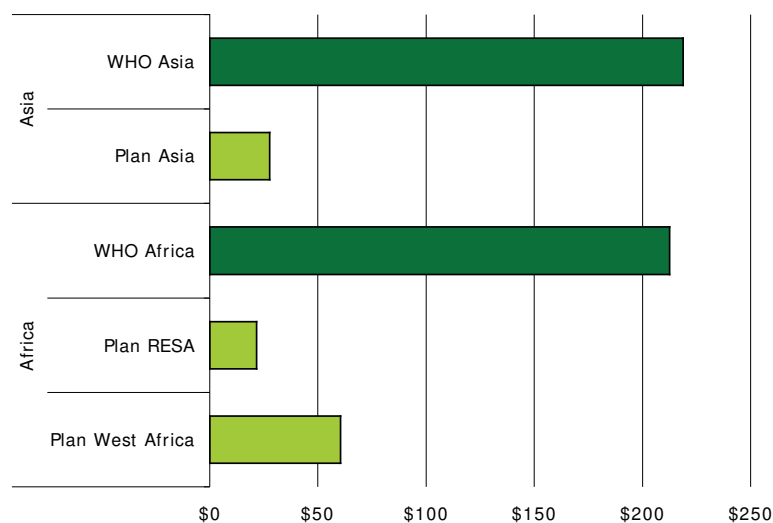
The WHO unit water supply costs (adjusted to 2005 prices as stated in Hutton and Bartram, 2008) were compared against the Plan water supply unit costs. No information was available on either external support expenditures or community contributions to the water supply interventions; thus only hardware, software and support expenditures were examined.

The Plan expenditure data analysed by this review provided comparable data on borehole and dug well costs. The average borehole and dug well expenditures per household were calculated for each region by multiplying the unit cost (per borehole or dug well) by the average number of units per community (i.e. if there was an average of four boreholes per community in the Asia region, then the cost per community was equal to four times the unit cost), and then dividing by the average number of households in a community.

Data from the focus country programmes suggested that the average number of households in a Plan project community was about 200 households. However, some country programmes (e.g. Plan Bangladesh) work with much smaller communities; thus a conservative estimate of 100 households per community was assumed. These household expenditures should be recalculated once more detailed and reliable population data are available from the country programmes.

**Figure 7.1 Boreholes: total cost per household (US \$)**

The WHO costs in Figures 7.1 and 7.2 are based on the adjusted 2005 costs per capita for boreholes and open (dug) wells, multiplied by five to produce a per household cost. An addition of 20 per cent was also made to the WHO costs to allow for software and support expenditures<sup>37</sup>.

**Figure 7.2 Open wells: total cost per household (US \$)**

In general, the cost comparisons suggest that Plan water supply interventions were considerably less costly than the updated WHO/GWSSAR cost estimates. In part, these differences reflect the age and nature of the WHO cost data, which were extrapolated from information gathered in the late 1990s when higher cost interventions were more common; whereas Plan's water supply interventions generally involve appropriate technologies and community-managed facilities.

<sup>37</sup> These software and support additions remain relatively low, when compared against the Plan global averages of 14 per cent software and 16 per cent support expenditures in borehole interventions (total 30 per cent), and 17 per cent software and 23 per cent support expenditures in dug well interventions (total 40 per cent).

## ***Sanitation: Comparative expenditures***

This section examines detailed sanitation expenditure data from other studies and compares them against the Plan expenditure review data.

### ***WSP sanitation financing study***

The data provided in the WSP case study of sanitation financing in the Dishari project in Bangladesh match the Plan data well. The Plan expenditure data suggest a project cost of US \$6.24 per new household toilet, whereas the WSP data for the wider Dishari project (which includes WaterAid interventions in three sub-districts) suggest an average project expenditure of US \$7.03 per household toilet.

The WSP case study provides detail of external expenditures (see Table 7.4) by other agencies and government that were not available from the Plan expenditure data. Furthermore, Plan Bangladesh estimated that the typical household contribution was US \$12 per household toilet, whereas the WSP estimate was US \$18.07 per toilet based on the following components:

- Toilet materials (three concrete rings, concrete slab, plastic pan, plastic water seal and vent pipe) - approximately US \$9.00
- Labour cost for digging toilet pit and constructing toilet - approximately US \$3.01
- Transport of materials to the home - approximately US \$1.51
- Superstructure materials (bamboo poles, walls and roof) - approximately US \$4.52

A wide range of toilet types has been implemented within the Dishari project area, with costs ranging from less than US \$1 up to US \$145. However, the WSP case study suggests that the US \$18 valuation is the median household contribution. It appears that the previous Plan estimates of household toilet contributions excluded the labour and transport elements; thus the increased figure of US \$18 per toilet has been utilised here.

**Table 7.4 Bangladesh: comparative household toilet costs (US \$)**

Expenditure categories	Plan Bangladesh	WSP Bangladesh <sup>38</sup>
Project hardware expenditure	-	-
Project software expenditure	\$205,417	\$1,732,065
Project support expenditure	\$805,263	\$263,937
<b>Total project expenditure</b>	<b>\$1,010,680</b>	<b>\$1,856,373</b>
External expenditures	\$617,076	\$848,505
Household contributions	\$2,712,264	\$4,435,483
<b>Total expenditure</b>	<b>\$4,340,019</b>	<b>\$7,140,362</b>
Number of new toilets	161,862	263,937
<b>Project cost per toilet</b>	<b>\$6.24</b>	<b>\$7.03</b>
<b>External cost per toilet</b>	<b>\$3.81</b>	<b>\$3.21</b>
<b>Household cost per toilet<sup>39</sup></b>	<b>\$16.76</b>	<b>\$16.81</b>
<b>Total cost per toilet</b>	<b>\$26.81</b>	<b>\$27.05</b>

Source: Plan cost data; draft WSP sanitation finance study.

### **WaterAid three-country CLTS study**

WaterAid is in the process of finalising a study of the sustainability and equity of its CLTS interventions in Bangladesh, Nepal and Nigeria. The study design included a component on costs in order to assess the relative cost-effectiveness of the different country programmes and compare the findings against those from other agency studies.

**Table 7.5 WaterAid Nigeria: household toilet costs FY 2007-08 (US \$)**

Activities	Annual cost	Cost per community	Cost per toilet
Hardware (sani-centre)	\$24,198	\$448	\$7.90
Software (IEC, CLTS and follow-up)	\$95,467	\$1,768	\$31.00
Support costs (training, support)	\$100,058	\$1,853	\$32.50
<b>Total project costs</b>	<b>\$219,724</b>	<b>\$4,069</b>	<b>\$71.40</b>
External support (UNICEF, local govt) <sup>40</sup>	\$22,000	\$400	\$7.10
Household contribution	\$61,560	\$1,140	\$20.00
<b>Totals</b>	<b>\$301,284</b>	<b>\$5,609</b>	<b>\$ 98.50</b>

According to the WaterAid Nigeria accounts, support costs account for 47 per cent of the project sanitation expenditures, project software costs for 43 per cent, and project hardware<sup>41</sup> costs for 11 per cent of the total sanitation expenditure. In terms of cost-efficiency, the project cost per CLTS household toilet is currently US \$71, supported by

<sup>38</sup> WSP cost data have been adjusted to allow for shared toilets (which were not factored into the original case study calculations).

<sup>39</sup> The average household cost per toilet is lower than US \$18.07 as the hardware cost of some toilets are subsidised (either ADP subsidies to hardcore poor households or NGO subsidies).

<sup>40</sup> No data was available on external support costs; therefore it was assumed that an additional 10 per cent expenditure was financed by external agencies (UNICEF, local government).

<sup>41</sup> Hardware expenditures financed the establishment of sani-centres in each community, which produced low-cost toilet slabs for sale alongside a range of other sanitary wares.

another US \$7 in external (local government and UNICEF) expenditures, which totals about US \$80 per household toilet. This unit cost from Nigeria compares well with the Plan average expenditure of US \$96 per household toilet, but is considerably lower than the average cost of US \$310 per toilet recorded in the Plan West Africa region<sup>42</sup>.

**Table 7.6 WaterAid programme costs: household toilets (2008) (US \$)**

Expenditure	Bangladesh <sup>43</sup>		Nepal		Nigeria
	VERC	UST	Hills	Terai	
Per household <sup>44</sup>	\$7	\$6	\$58	\$84	\$30
Per toilet	\$12	\$42	\$61	\$126	\$71
Per toilet in use	n/a	n/a	\$108	\$122	\$77

Note: these costs exclude household contributions and external support costs

The WaterAid Nigeria toilet costs fall in between the unit costs assessed for the WaterAid sanitation programmes in Bangladesh and Nepal (see Table 7.7). These cost data are less comprehensive than the Plan Bangladesh data reported earlier, as they exclude household contributions and external support costs (e.g. local government assistance, ADP subsidies to hardcore poor households, ODF rewards), but suggest that WaterAid's expenditures in Bangladesh are in the range of US \$12 to US \$42 per household toilet. WaterAid Nepal's costs were in the range of US \$61 to US \$126 per household toilet, with higher costs found in the western Terai areas.

The WaterAid study collected household outcome data from 8 to 12 communities in each country, which enabled an assessment of the relative cost-effectiveness of its rural sanitation interventions. The cost per "toilet in use" was assessed based on total programme costs divided by the number of toilets verified to be in use (by observation).

In Nigeria, the WaterAid study found that the toilet usage rate was 94 per cent of the toilet coverage, which increases the effective cost to US \$77 per toilet in use. In Nepal, the toilet usage rate had dropped in the Hills project areas, resulting in a 77 per cent increase in the effective cost to US \$108 per toilet; whereas the effectiveness data made little difference to the cost per latrine in the Terai project area. Unfortunately, similar outcome data was not available for the Plan sanitation interventions; thus a comparison of cost-effectiveness could not be made.

<sup>42</sup> There is no Plan country programme in Nigeria.

<sup>43</sup> VERC and UST are the two partner NGOs responsible for implementation of the WaterAid interventions that were evaluated in Bangladesh.

<sup>44</sup> Programme cost per community spread across every household (assessing the cost of achieving collective outcomes, such as ODF, that may benefit the whole community).

### Comparative expenditure data for household toilets

The WHO Asia costs included in Table 7.8 are based on the adjusted 2005 costs per capita for simple pit toilets, multiplied by five to produce a per household cost. An additional expense of 20 per cent has been allowed for software and support expenditures, which increases the average cost to US \$262 for a *simple pit latrine*.

The software and support additions made to the WHO cost data remain relatively low at 20 per cent in total, when compared against the Plan global average of 20 per cent software and 16 per cent support expenditures, or the Plan Bangladesh case (where all of Plan's programme expenditures are on software and support).

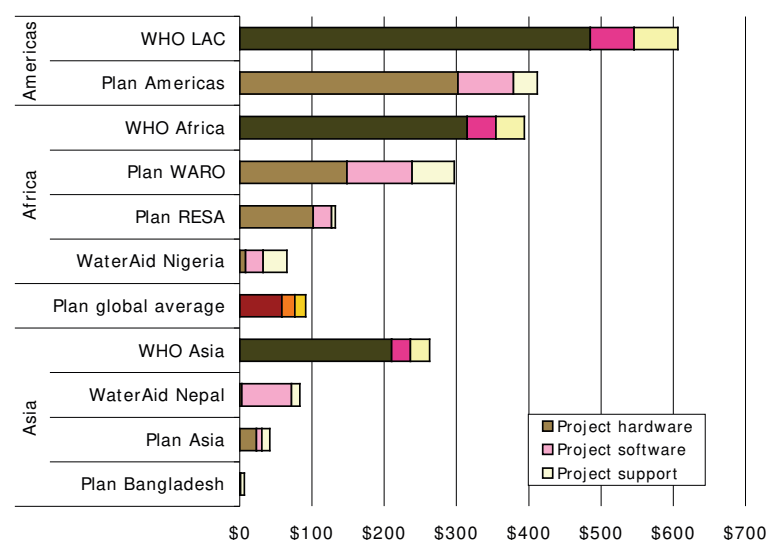
**Table 7.7 Comparative household toilet costs (US \$)**

Expenditure per toilet	Plan Bangladesh	WaterAid Nigeria	Plan Global Costs <sup>45</sup>	WHO Asia <sup>46</sup>
Project hardware	-	\$8	\$58	\$210
Project software	\$1	\$31	\$18	\$26
Project support	\$5	\$33	\$15	\$26
<b>Project expenditure per toilet</b>	<b>\$6</b>	<b>\$71</b>	<b>\$91</b>	<b>\$262</b>
External expenditure	\$4	\$7	-	-
Household contribution	\$17	\$20	\$30	-
<b>Total toilet cost</b>	<b>\$27</b>	<b>\$98</b>	<b>\$121</b>	<b>\$262</b>

Sources: draft WaterAid study; Hutton & Bartram (2008).

These data differences reflect the age of the WHO cost data, which were drawn from interventions that took place between 1990-2000, when the approach to sanitation improvement was generally more supply-driven and hardware-based. In addition, the WHO cost data were based on large-scale programmes with significant government involvement, which one might expect to have higher hardware expenditures and a more supply-driven approach than NGO projects using a more participatory approach.

**Figure 7.3 Comparative expenditure per household toilet (US \$)**



<sup>45</sup> Excluding the low-cost Bangladesh cost data.

<sup>46</sup> WHO unit cost for simple pit toilet in Asia adjusted to 2005 prices (Hutton & Bartram, 2008) and adjusted to per household costs (assuming an average household size of five persons).

The comparative data on household toilet expenditures presented in Figure 7.3 highlight significant differences in regional costs: In almost all cases, Asian toilets are cheaper than African toilets, which are cheaper than Latin American toilets. While this hierarchy reflects the different price factors and levels of service found in these regions, the ratios between Plan and WHO costs in each region illustrate the relative cost-efficiency of the Plan Asia sanitation programmes (as the WHO costs already recognised substantial price differences between regions).

The average expenditure of US \$42 per household toilet found in the Plan Asia country programmes, where many of the country programmes have adopted a low-cost approach to sanitation improvement, was only 16 per cent of the WHO toilet cost for a simple pit latrine.

In Africa and the Americas, Plan toilet costs are closer to the WHO costs: The RESA unit costs are 34 per cent of the WHO cost; the Plan West Africa costs are 75 per cent of the WHO cost; and the Plan Americas costs are 68 per cent of the WHO costs (for pour-flush toilets). Given that these comparisons are against costs that already allow for price factors, the WHO Africa toilet cost is 50 per cent higher (US \$394 per toilet) than the Asia unit cost (US \$263 per toilet), and the WHO Americas toilet is 130 per cent more expensive, this analysis further illustrates the cost-efficiency of the Plan Asia sanitation programmes.

## 7 Conclusions

This report highlights some shortcomings in the Plan expenditure tracking and data collection systems. However, these points should not detract from the impressive scale and scope of Plan's information systems, which are far more advanced and comprehensive than those of any other sector stakeholder (according to the survey and verbal responses collected from key informants in other agencies).

Furthermore, Plan's decision to examine WES expenditures across its global programme, to compare these expenditures against those of other sector stakeholders, and to publish the findings, are evidence of a commitment to improving programme policy and increasing cost effectiveness, and a willingness to contribute to wider sector efforts in these areas.

### ***Plan has become a significant stakeholder in the global WES sector***

In the three-year review period, Plan spent an average of US \$42 million annually on its WES programmes in 45 countries in Asia, Africa and Latin America.

UNICEF, which is likely the largest non-governmental implementer of rural water supply and sanitation programmes globally, invests approximately US \$140 million annually on WES development across 96 countries, spending roughly US \$1.5 million per country programme. Plan's average investment per country was US \$0.93 million, nearly two-thirds that were spent per country by UNICEF. Furthermore, Plan's average annual WES investment proved to be higher than major agencies such as the World Bank's Water and Sanitation Program (WSP), which had a global budget of US \$35 million in 2007<sup>47</sup>.

### ***Plan spent over 40 per cent of its WES budget on sanitation***

Plan has a strong sanitation portfolio: 43 per cent of WES expenditures were on environmental sanitation interventions, which compares well with a sector that has, historically, allocated a small proportion of WES investments to sanitation. However, one of the reasons for the relatively high sanitation expenditure was the provision of heavily subsidised household toilets by some country programmes, notably those in the Americas region where Plan subsidised 80 to 95 per cent of household toilet costs.

### ***Plan spent one-third of its WES budget on software and support activities***

The expenditure review also confirmed the significance of software and support costs in Plan's WES interventions. One-third of all WES spending was on software and programme support activities, evenly split between the two categories, with little difference between the proportion of non-hardware expenditures on water supply (15 per cent software and 16 per cent support) and sanitation (18 per cent software and 15 per cent support).

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<sup>47</sup> WSP works in partnership with governments and support agencies to strengthen national policy, coordination, institutional development and service delivery options; thus little of its budget relates to direct implementation of WES programmes.

While few previous studies provide an accurate accounting of WES software and support costs, there is increasing recognition within the sector of the importance of software and institutional support to the sustainability of WES outcomes. This finding confirms that, despite the size of its current WES programme, Plan continues to invest substantial amounts in community development, capacity building and hygiene promotion.

### ***Unit costs: water supply***

The unit cost analysis highlighted fairly consistent differences in regional costs for water supply. The average unit costs from the Plan Asia region were significantly lower than those in the three other regions in every category, while the Plan West Africa regional averages were the highest in every water supply category.

The magnitude of the cost differences remains significant. The average cost of a dug well in the West Africa region was about US \$7,000 compared to only US \$370 in the Asia region. While little detailed information was available to explain the large variations in unit water supply costs across Plan regions and country programmes, the following factors are considered significant:

- Lower material, service and personnel costs in Asia<sup>48</sup>
- Higher population density in Asia
- Physical factors (water-scarcity, groundwater depth, hard-to-access locations)
- Significant variations in the minimum acceptable level of service (e.g. higher standards required in more urban areas, e.g. Americas)

### ***Unit costs: environmental sanitation***

Plan's sanitation programmes built an average of 100,000 household toilets per year during the review period, at an average cost of US \$91 per toilet. More than half of these toilets were built in Bangladesh, where the average Plan expenditure was less than US \$7 per toilet. Elsewhere, there were big variations in the cost per household toilet:

ARO (Asia excluding Bangladesh):	US \$114 per toilet
RESA (East and Southern Africa):	US \$132 per toilet
WARO (West Africa):	US \$297 per toilet
ROA (Americas):	US \$412 per toilet.

The expenditure review revealed that Bangladesh was not the only country with a low-cost sanitation programme. Six other Plan country programmes across Asia and Africa (Burkina Faso, China, Ethiopia, India, Malawi and Uganda) spent less than US \$100 per household toilet, including software and support costs, in building a total of more than 45,000 toilets. The two largest spending sanitation programmes were in the Americas: Plan Colombia built more than 2,500 household toilets at an average cost of US \$1,090 per toilet, and El Salvador financed more than 5,500 toilets at US \$369 per toilet.

<sup>48</sup> IRC WASHCost finding that average personnel costs in India are 65 per cent of those in Africa, and material and supply costs in India are only 50 per cent of those in Africa. Personal communication from Catarina Fonseca, IRC WASHCost.

These dramatic differences in unit costs reflect different contexts (more urban, more developed), different sanitation approaches (behaviour-change focused CLTS vs. subsidy-driven development), and different technology levels (homemade dry latrines vs. flush toilets with showers). As noted earlier, additional assessment of the relative effectiveness and sustainability of these different sanitation technologies and approaches will be required before a meaningful comparison of cost-effectiveness can be made.

### ***Community-Led Total Sanitation***

The CLTS approach, which aims to achieve open defecation free communities, has highlighted the importance of community-wide sanitation outcomes to health benefits. If even a small number of households practice open defecation or use unhygienic toilets, then the wider community (neighbours and families) are at risk from multiple faecal-oral contamination routes.

The expenditure review found that, on average, Plan sanitation programmes provided only 31 household toilets per community, with as few as 8 toilets per community provided in the West Africa region. While some country programmes provided an average of more than 60 toilets per community (Cambodia, Pakistan, Egypt, Ethiopia, Malawi, El Salvador, Paraguay, and Peru), the review suggests that many Plan project communities contain some households without toilets.

Since 2007, the last year examined by the expenditure review, the CLTS approach developed in Bangladesh has spread to six other Plan country programmes in Asia, and to another eight country programmes in the African and American regions. While the benefits of this spread are not captured by this expenditure review, it is anticipated that it will result in further reductions in the unit cost of Plan's household toilets and in the scaling up of the community-wide sanitation improvements that are critical to health benefits.

### ***Subsidy: household contributions to toilet facilities***

The expenditure review found that household contributions to toilet construction ranged between US \$8 and US \$207 per toilet, with an average of US \$30 per toilet. On average, this suggests that user contributions to household toilets in the review country programmes amounted to 25 per cent of toilet costs.

The Plan Bangladesh sanitation programme is a special case, due to the unusual nexus of supportive factors and the additional contributions made by other stakeholders, which have resulted in far greater scale and success than in other countries. External agencies (local government, national government and the WSP) financed approximately 14 per cent of the Plan Bangladesh CLTS programme through parallel incentive and subsidy schemes, with a further 62 per cent (US \$17 per toilet) contributed by user households. While these data suggest a relatively large financial burden on the household, the user contribution in Bangladesh is less than half of the US \$51 average household contribution to toilet construction found in other Plan sanitation programmes.

**Comparative costs: water supply**

Direct comparison of Plan's costs with those of other NGOs working in similar environments was not possible due to the paucity of cost data available. However, Plan's water supply costs were lower than the regional cost benchmarks compiled by the WHO-UNICEF Global Water Supply and Sanitation Assessment Report in 2000 (even when updated to 2005 prices), ranging from 68 per cent of the WHO costs in the West Africa region, down to only 10 per cent in the Asia region.

This comparison highlights the relative cost-efficiency of the Plan Asia WES interventions. The WHO unit costs highlight higher price factors in Africa and the Americas: WHO borehole costs per person are 37 per cent higher in Africa than in Asia, and 230 per cent higher in the Americas. These price allowances are built in to the WHO regional costs: The Asia unit costs are lower than those in other regions, yet the Plan Asia water supply cost per person is only 10 per cent of the WHO benchmark for both boreholes and dug wells.

**Comparative costs: household toilets**

The cost per person for Plan's household toilets ranged from 16 per cent (Asia) to 75 per cent (West Africa) of the WHO unit costs, confirming the relative cost-efficiency of the Plan Asia regional programme (against the WHO regional benchmarks). Plan's CLTS sanitation costs appear similar to recent expenditure data obtained from three WaterAid CLTS programmes, but Plan's global unit cost for household toilets (including subsidised toilets) was higher than the WaterAid average.

## 8 Recommendations: policy

The following recommendations concern the implications of the expenditure review for WES policy and programme practice:

**A. Strategic approach to the global WES programme**

The growing global significance of the Plan WES programme recommends a more strategic approach to its WES investments. Plan's WES expenditures have grown from a relatively small base, initially as support to child sponsorship programmes; thus have tended to focus on the particular priorities of the country programme, or priorities driven by other aspects of Plan's child and community development programmes.

The large variations in cost-efficiency (across regions and between country programmes) highlighted by this expenditure view recommend that Plan should examine the relative contributions that these programmes make to regional, national and corporate development objectives, with a view to improving policy alignment within regions and increasing value for money across the global WES programme.

For instance, the latest data from the WHO-UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP)<sup>49</sup> highlight that sanitation lags behind water supply in almost every region, and that Asia and Sub-Saharan Africa contain by far the most people without access to improved sanitation: 1.75 billion in South and East Asia, 0.55 billion in sub-Saharan Africa, and only 0.12 billion in Latin America and the Caribbean.

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<sup>49</sup> JMP. (2008). Progress on drinking water and sanitation: special focus on sanitation, Joint Monitoring Programme for Water Supply and Sanitation, UNICEF and World Health Organization, 2008.

.(Full reference?)

The first step in this process should be a detailed examination of WES costs in the country programmes identified by this review as having unusually high or low costs, and the compilation (or commissioning) of evaluations that enable reliable assessments of the relative cost-effectiveness and sustainability of WES outcomes in these countries.

Given the unit cost information provided by this expenditure review, Plan should also be able to set relevant cost-efficiency targets for each region, with matching assessments of the increased access to water supply and sanitation that would result from the achievement of these targets.

### ***B. More cost-efficient promotion of household toilets***

The review findings confirmed that some Plan country sanitation programmes are considerably more expensive than others, and that many of them fail to provide community-wide sanitation improvements.

Given the sanitation MDG to halve the proportion of people without access to basic sanitation by 2015, and the increasing recognition that stopping open defecation is a critical first step on the sanitation ladder, the policy implication is that the less cost-efficient country programmes should examine whether they could achieve household sanitation objectives more cost effectively through:

- promotion of lower-cost toilets
- development of more cost-effective interventions to trigger demand for sanitation and sustainable behaviour change
- targeting of community-wide sanitation outcomes in all project communities.

### ***C. Cost-efficiency of software and programme support***

In the review period, Plan allocated one-third of its total WES investments to software and programme support activities. In some cases, increased software and support efforts were offset by lower hardware expenditures across increased numbers of community interventions; in other instances, software and support expenditures were revealed to be as high as US \$20,000 per community.

While it is encouraging that more is being spent on activities to support and improve the sustainability of WES interventions, the added value of these software and support expenditures remains uncertain. The growing importance of software activities in WES programmes, (Plan spent US \$43 million on WES software and programme support during the three-year review period) recommends that more attention and resources are given to regular assessments of the effectiveness and cost-efficiency of these intangible and difficult-to-measure activities.

## 9 Recommendations: expenditure tracking

The final section presents recommendations concerning Plan's expenditure tracking and reporting systems:

### ***D. Utilisation of the expenditure tracking systems for annual cost reviews***

Plan's information systems are already extensive and, judging by the number of entries made by each country programme annually, time-consuming for those that process and enter the data. WES interventions are particularly complex to track because of the myriad different technologies, approaches and software activities required by the wide range of community contexts, priorities and demands found across the developing world.

Understanding of the cost (and effectiveness) of WES interventions is essential for evidence-based policy making and cost-effective programming. At present, the Plan expenditure tracking systems are not set up to monitor or report on unit costs; however, this review suggests that the quality, substance and focus of the tracking data would be greatly improved by more regular use and analysis, and that some relatively minor improvements would facilitate regular reviews. Therefore, it is recommended that Plan initiate an annual review of WES costs, which should be used to refine and update the expenditure, output and beneficiary data collected by the tracking systems.

Efforts to scale up the promotion and implementation of WES improvements have led to greater collaboration between Plan and other development partners: local governments, local NGOs, and external support agencies. It is recommended that the tracking systems are extended to capture these external contributions, and to record the contributions made by beneficiaries towards their own facilities and services.

### ***E. Introduction of more output codes***

While there is an argument for simplifying Plan's information systems and slimming down the data collection requirements, in order to lessen the load on the country programme staff, it appears that more sub-output codes would improve the usability (and comparability) of the output and cost data. This may seem counter-intuitive, but modern database systems make it easy to add additional output categories without complicating either the data entry process or the data analysis and reporting process.

Plan has already provided improved guidelines and training on the use of more appropriate and consistent output units, but this review found serious shortcomings in the current output codes (e.g. US \$100 handpump units aggregated with US \$30,000 borehole units, and mixed units for hygiene promotion, with number of days of training counted by some programme units, number of communities trained by others, and number of sub-district campaigns counted elsewhere).

The complexity of WES interventions and the continuing trend towards non-hardware interventions (whose outputs are harder to track) recommend that particular attention and care are given to these tracking systems. It is proposed that, at a minimum, Plan's output codes should be revised to match the JMP categories for improved water supply and improved sanitation facilities, which would improve the comparability of the cost data and the alignment of Plan's monitoring systems with the international MDG indicators.

### ***F. Monitoring and evaluation of programme outcomes***

The missing element from this study has been information on programme outcomes and impacts. Without information on what works (and what does not), it is hard to compare costs across country programmes or regions, or to comment on the policy implications of the cost findings.

Therefore, it is recommended that Plan institute more systematic monitoring and evaluation of its WES programme outcomes. Specifically, this monitoring should involve the annual review of the functionality of previously completed systems and facilities (in order to assess the actual lifespan, and thus the annualised cost of these investments) and the introduction of some common outcome indicators (number of open defecation free communities, number of households with functioning toilets, number of households using improved water supplies) and cost effectiveness indicators (cost per toilet in use, cost per ODF community, cost per household with access to improved water supply) into all WES evaluations.

Plan's Programme Accountability and Learning System (PALS) includes provision for an annual participatory programme review by each Plan country programme. Therefore, it is further recommended that the annual WES functionality and outcome survey (as proposed above) should be incorporated into this annual programme review process.

## References

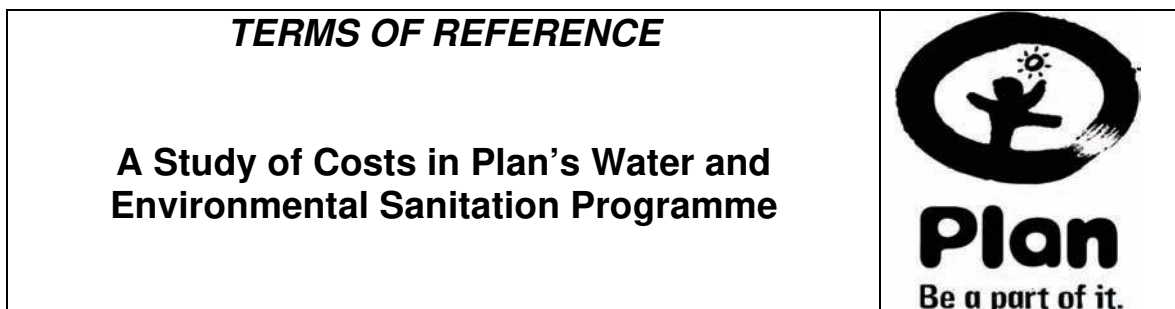
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## Annex A Plan's output codes: habitat domain

3A Habitat General: including community centres, general	3A10	Community Centre Construction	
	3A11	Comm Managed Project Training	
	3A12	Comm Development Plans	
	3A13	Legal Assistance	
	3A14	Gender Awareness	
3B Habitat intervention management, support & supervision	3B10	Mgt, Support & Supervision	
	3B11	Feasibility Study	
	3B12	Evaluation	
3C Research and Policy and Practice Development on Ha	3C10	Research	
	3C11	Policy & Practice	
3D Institutional development support for partner organisations	3D10	Institutional Development	
3E Home and neighbourhood construction and improvements	3E10	Home Land Tenure	
	3E11	Home Construction/Improvement	
	3E12	Solidarity Groups Savings/Credit	
	3E13	Home Loan Funds	
	3E14	Home Institutional Develop	
3F Potable water	3F10	Open Well Constr/Improvement	
	3F11	Shallow Well Protection	
	3F12	Tank Construction/Upgrade	
	3F13	Spring Protection	
	3F14	Rainwater Catchment	
	3F15	New Tube well/Borehole - Hand Pump	
	3F16	Rehab/Upgrade TW/BH/Hand Pump	
	3F17	Borehole - power pump	
	3F18	Pump/Water System spare parts	
	3F19	New Comm Water System	
	3F20	Upgrade/Extend Comm Water System	
	3F21	Connect to water system	
	3F22	Dam Const/Upgrade	
	3F23	Water Training Materials	
	3F24	Water Management Training	
	3F25	Water quality monitoring and surveillance	
	3G Hygiene and waste disposal	3G10	BCI on Hygiene/Water
		3G11	Home latrine Const/Upgrade
		3G12	School Latrine Const/Upgrade
		3G13	Latrines - Other Public Buildings
		3G14	Comm Bathroom/Toilet Blocks
		3G15	Sewage Systems Constr/Upgrade
		3G16	Waste/Rubbish Disposal/recycle
		3H Natural resources management, including erosion control	3H10
	3H11		Erosion Control
3H12	Land Reclamation		
3H13	Flood Control		
3H14	Forest/Woodland Mgt		

	3H15 Tree Nurseries
	3H16 Provide Tree Seedlings
	3H17 Land Tenure & Resource Rights
	3H18 Bio-Gas Units
3J Communications infrastructure: urban streets, rural	3J10 Rural Access Road Const/Upgrade
	3J11 Urban Street Const/ Upgrade
	3J12 Bridge Constr/ Upgrade
3K Electrification and street lighting	3K10 Electricity Installation
	3K11 Street Lighting Installation
3L Disaster reconstruction	3L10 Disaster Relief Assistance
3Q No description	3Q10 Habitat Related Disaster Response
3X Regional Office Habitat-related Program Management	3X10 HAB Regional Office Support

## Annex B Terms of reference for the WES expenditure review



### Background

Plan's global technical network for Water and Environmental Sanitation (WES) met in Brazil in July 2005 and recommended a study on the costs of Plan's sanitation programmes to further enhance the organisation's policy framework<sup>50</sup>. Consequently in 2006-07, an internal study was conducted on Plan's domestic sanitation programme expenditures using data from Plan's global project tracking database known as the "Programme and Projects Module", or PPM. The report analysed PPM data on sanitation expenditures in 12 countries, as well comparative information provided by a number of "country" WES advisors on subsidy levels, technology choice, and other programme attributes such as partner organisations and scaling up<sup>51</sup>. The report's findings included:

- 1) Domestic latrine costs varied over a wide range from country to country and were often above sustainable or replicable levels.
- 2) Some Plan programmes, such as Bangladesh's (which was implementing the "Community Led Total Sanitation" approach) had comparatively low costs per household latrine. Further, the CLTS focus on behaviour-change and 'total' community adoption of sanitation stood out from many other programme approaches.
- 3) Field observations used to supplement the analyses identified subsidy schemes that failed to account for family income or poverty level.

Though the data used in this study had a number of limitations, it was clear that further analysis of Plan's WES cost profiles was warranted, along with a comparison of Plan's costs with other organisations working in this sector.

The next step taken by Plan was to carry out a desk review of Plan's WES programme approaches and progress. The review, conducted by researchers from Loughborough University, was completed in April 2007<sup>52</sup>. The review found a number of areas where Plan's WES programme could be improved, including:

- *Value for money.* Plan's unit cost for domestic sanitation (as reported in the previously cited study) appeared higher than other similar organisations.
- *Programme focus.* Virtually all of Plan's WES spending was for domestic/community water supply and sanitation. Solid waste management,

<sup>50</sup> Key Action Plans Emerging from 4th WES PAG/TAG meeting, Sao Luis, Brazil, 25-29 July 2005.

<sup>51</sup> Baghri, S. and Heap, S. (2007), "If Water is Life, Sanitation is Dignity": A Review of Plan's Program Work on Basic Household Sanitation, Plan, Woking, UK.

<sup>52</sup> Reed, R. and Jones, H. (2007) Review of Plan's Water and Sanitation Programmes. Loughborough: Water, Engineering and Development Centre.

drainage, and vector control were largely ignored. More importantly, expenditures on hygiene promotion appeared to be very low.

Following completion of the Loughborough review, Plan carried out a global self-reporting survey to verify the unit domestic sanitation costs recorded in PPM. Nearly all of Plan's programme countries reported on their average unit costs per constructed latrine, as well as how much of this cost was subsidised by Plan. The results did confirm that there was a wide range of unit sanitation costs across Plan's global profile, as well as differing approaches to 'subsidy' schemes. The survey also showed that in some cases the PPM data were hard to interpret, and in some cases led to gross overestimates of actual unit costs.

These findings suggested that there was more that Plan needed to do to determine whether its WES (and other) programmes were cost-efficient and in line with industry best practices. In May, 2007 Plan issued an 'Action Plan for Improving Plan's Programme Quality and Accountability'. Among other tasks, the Action Plan called for a more detailed analysis of Plan's WES programme costs.

### Research Focus

Plan spends a significant amount of money on its WES programmes, reaching or exceeding \$30 million per year during the past three years. By international and by country-specific standards, are Plan's WES programmes low-, medium- or high-cost? What are the key factors controlling Plan's WES programme costs? Importantly, what policies should be developed to ensure that Plan's costs are in line with best practices and with Plan's overall organisational objectives?

<b>Fiscal Year<sup>53</sup></b>	<b>Total Expenditure (million US \$)<sup>54</sup></b>	<b>Water (per cent of total)</b>	<b>Sanitation (per cent of total)</b>
2002	10.4	55.6	44.4
2003	20.0	55.9	44.1
2004	23.7	58.0	42.0
2005	30.2	56.2	43.8
2006	33.2	55.2	44.8
2007	30.0	58.4	41.6

### Objectives

- To assess the unit costs, cost-sharing schemes, and expenditure patterns associated with Plan's WES programmes.
- To compare Plan's WES programme costs and cost-sharing schemes to those of other agencies operating in the same country/ies.
- To provide recommendations to Plan on how to update its programme policies, practices, and expenditures tracking for water and environmental sanitation interventions, so as to ensure Plan's WES programmes are as cost-efficient as possible.

<sup>53</sup> Plan's 'Fiscal Year' runs from 1 July to 30 June.

<sup>54</sup> Source: BI Online, FY02-07, output codes 3F10-25 and 3G10-16 inclusive.

## Research Questions

### Overall Investment Patterns

1. How much does Plan invest in WES programmes globally and within each Plan "Region"<sup>55</sup>?
2. What per cent of Plan's total programme investments does this represent?
3. What are the geographic and temporal trends in overall WES investment?
4. What are the geographic and temporal trends in grant income/expenditures for WES?
5. How much of the total WES expenditure is generally for 'hardware' vs. 'software'? What are the specific expenditure trends for water supply, household sanitation, hygiene promotion, community management training, and other significant categories (e.g., drainage & vector control, waste management, and integrated water resource management)?
6. How much of total WES expenditures are for Programme Support? Institutional development of local NGOs, CBOs, and local authorities? Policy, practice, and advocacy? Trends?
7. How much of total WES expenditures are for school-related sanitation, water and hygiene promotion? Trends?
8. How much of the total WES expenditure is spent in urban and peri-urban (vs. rural) areas? Trends?
9. How do Plan's cost and progress tracking indicators compare with those of other agencies/industry standards?

### Water Supply, Sanitation, and Hygiene Promotion Costs

10. What are the global and regional trends in unit costs (per household and beneficiary) for key WES interventions (e.g., sanitation, water supply, and hygiene promotion) carried out by Plan?
11. What per cent of these total costs is provided by Plan (subsidy level)? What per cent provided by beneficiaries (cash or in-kind)? Government? Others?
12. Are subsidies specially targeted to poor or marginalised households, or are they available to all?
13. How do Plan's subsidies compare with any existing Government subsidies? To what extent are government policies and programmes, including subsidy schemes, related to Plan's approach?
14. Does Plan provide 'indirect' subsidies, incentives, or rewards (such as promises to fund other community projects) to help ensure participation? (Especially regarding sanitation programmes.)
15. Does Plan or do its partners make use of any non-financial incentives programmes, such as environmental certification, or other community recognition programmes?
16. What cost and subsidy variations exist between countries and regions, and what are likely reasons for those differences?
17. How many beneficiaries have been reached and in what time frame?
18. What per cent of target area populations are reached by key WES interventions (i.e., are intervention end-points 100 per cent 'access' or some other level)?
19. What are the average costs per beneficiary for sanitation projects? For water supply?<sup>56</sup> For other WES projects?
20. How do Plan's costs compare with other agencies operating in the WES sector? What are the likely reasons for any differences?

<sup>55</sup> In FY 2007, Plan was operational in 49 developing countries in four "Regions": the Americas, West Africa, East and Southern Africa, and Asia.

<sup>56</sup> For water supply projects, the amount of water provided per person per day may need to be considered to enable more meaningful comparisons.

## Methodology

### A. Data collection and analysis

#### **1. Qualitative and Background data: literature review**

Review of Key internal Plan documentation:

1. Plan's approach to Water and Environmental Sanitation, Working Paper, October 2004.
2. Water and Environmental Sanitation, Plan's Position Paper Series # 2.
3. Key Action Plans emerging from 4th WES PAG/TAG meeting, July 2005, Sao Luis, Brazil.
4. "If Water is Life, Sanitation is Dignity": Baghri, Sohrab and Heap, Simon. A Review of Plan's Programme Work on Basic Household Sanitation". Internal Draft report. March 2007.
5. Review of Report "If Water is Life, Sanitation is Dignity", Internal working document, March 2007.
6. *Review of Plan's Water and Sanitation Programmes*. Reed, R. and Jones, H. Loughborough University Water, Engineering and Development Centre, April 2007.
7. "Plan's Response to the Reed Report," Bode, Paul, May 2007.
8. Selected WES "Country Programme Outlines".
9. Selected Country Programme Progress Reports.
10. Selected recent WES programme evaluation reports.

#### **2. Quantitative data from "Business Intelligence" (BI) Online**

Gather global programme cost data (mainly from 2004-07) by output code, region, country and programme unit (PU). Calculated average unit costs. Prepare comparative tables. Have data reviewed and verified by country WES advisors. As far as possible, use data from 2005 onwards.

#### **3. Qualitative data verification: Country level survey**

The Plan COs will be surveyed by questionnaires<sup>57</sup> (sent to WES advisors). The survey will be used to vet results of the PPM/BI data gathering exercise, as well as to solicit basic information regarding WES programme expenditures at the country level.

#### **4. In-depth expenditures analysis at Country Level** (Eight countries – 2 per region).

Carry out detailed expenditures analyses to i) verify/correct information gathered from BI/PPM; ii) determine actual expenditures on hard-to-track items such as behaviour change communication and other 'software'; and iii) identify other significant trends in WES expenditures not evident from global data. [Note: these in-depth analyses will largely be carried out by CO WES advisors and other in-country Plan staff].

#### **5. Comparative analysis of Plan's costs (and cost tracking) with other agencies**

Gather data through correspondence, telephone or in-person interviews with representatives of the other international organisations who carry out WES programmes (or who regularly evaluate WES programmes) similar to those of Plan's, such as: WSSCC, World Bank WSP, UNICEF, WaterAid, World Vision, CARE, Oxfam, and/or others.

<sup>57</sup> Including French and Spanish versions (translation to be done by Plan).

## B. Interviews

Conduct interviews with key Plan informants by phone or in person, including:

1. International Headquarters Programme Department – management and key staff including: Alasdair Unwin, Programme Policy and Practice Manager; Simon Heap, Global Research Portfolio Co-ordinator.
2. Regional level: Amsalu Negussie, Regional Water and Sanitation Advisor, RESA (and Interim WES Network Leader); Peter Feldman, Regional Water and Sanitation Advisor, ARO; and Raul Rodriguez, RPSM in ROA (formerly, Regional WES Advisor).
3. National Organisations: Selected programme department staff (2 pax).
4. Country level: a selection of 1 or 2 CO WES advisors per region.

## Outputs

1. **Detailed report** of findings and recommendations (in English) of up to 30 pages, with an Executive Summary of 2 pages. Supporting information (including tabulated data and methodologies) provided in Annexes.
2. **Presentation** (approx. 30 minutes) on the findings of the study prepared and delivered to Plan senior management.

## Annex C Global WES expenditure tables



## Annex C Global WES Expenditure tables

Table C1 WES expenditures FY 2005-06-07, US dollars

Expenditure patterns	MWI	SDN	TZA	UGA	ZMB	ZWE	Americas	BRA	COL	DOM	ECU	SJV	GTM	HTI	HND
Key expenditure areas	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07
<b>Hardware</b>															
Water supply (excluding software codes: 3F23 and 3F24)	\$744,116	\$1,818,942	\$1,156,782	\$690,430	\$1,338,957	\$383,096	\$1,168,292	\$351,272	\$669,323	\$890,983	\$603,312	\$1,594,674	\$1,236,331	\$493,704	\$1,246,437
WS hardware	\$744,116	\$1,818,942	\$1,156,782	\$690,430	\$1,338,957	\$383,096	\$1,168,292	\$351,272	\$669,323	\$890,983	\$603,312	\$1,594,674	\$1,236,331	\$493,704	\$1,246,437
Sanitation hardware	\$395,253	\$668,876	\$673,309	\$904,442	\$269,580	\$1,115,211	\$418,883	\$0	\$2,994,736	\$138,294	\$2,886,237	\$1,709,778	\$787,993	\$1,319,537	\$788,323
Bio-Gas units (recorded under 3H)	\$395,253	\$668,876	\$673,309	\$904,442	\$269,580	\$1,115,211	\$418,883	\$0	\$2,994,736	\$138,294	\$2,886,237	\$1,709,778	\$787,993	\$1,319,537	\$788,323
<b>WES hardware</b>	\$1,139,368	\$2,487,819	\$1,830,091	\$1,594,872	\$1,608,536	\$1,498,307	\$1,587,175	\$351,272	\$3,664,060	\$1,029,277	\$3,491,549	\$3,304,453	\$2,004,324	\$1,813,241	\$2,014,760
<b>Software</b>															
Water supply share of habitat software (3A-3A.0-3A.13)	\$181,254	\$200,444	\$86,290	\$105,270	\$314,292	\$125,535	\$201,881	\$380,047	\$153,930	\$0	\$139,041	\$106,015	\$109,013	\$20,249	\$125,724
Water management training (3F24)	\$22,798	\$31,683	\$131,558	\$151,792	\$130,385	\$116,062	\$65,250	\$85,603	\$106,888	\$0	\$28,885	\$0	\$197,600	\$224	\$59,156
Water training materials (3F23)	\$0	\$0	\$1,167	\$142,750	\$0	\$496	\$48,865	\$2,022	\$66,885	\$0	\$0	\$0	\$43,762	\$0	\$0
Other software activities (e.g. proportion of 3G10 allocated to water)	\$204,052	\$232,128	\$219,015	\$407,326	\$444,656	\$242,034	\$315,996	\$477,971	\$327,704	\$1,724	\$166,926	\$106,015	\$350,375	\$20,473	\$184,800
<b>WS software</b>	\$97,080	\$76,457	\$47,612	\$120,758	\$61,943	\$293,225	\$141,022	\$0	\$613,782	\$0	\$634,497	\$137,268	\$60,780	\$55,690	\$73,987
Sanitation share of habitat software (3A-3A.0-3A.13)	\$15,508	\$37,025	\$38,203	\$70,310	\$20,008	\$51,745	\$476,927	\$0	\$100,328	\$28,218	\$17,615	\$355,006	\$55,893	\$38,856	\$0
Hygiene promotion (3G10 allocated to sanitation)	\$112,688	\$113,482	\$85,816	\$191,067	\$81,951	\$344,970	\$617,949	\$0	\$714,110	\$28,218	\$652,112	\$492,274	\$116,673	\$94,545	\$73,987
<b>WS software</b>	\$316,640	\$345,610	\$304,830	\$594,383	\$526,608	\$587,003	\$933,845	\$477,571	\$1,041,814	\$29,942	\$819,038	\$588,288	\$467,047	\$115,018	\$258,867
3A comm. development	\$278,333	\$276,902	\$133,803	\$226,027	\$376,255	\$418,760	\$342,903	\$360,047	\$767,713	\$0	\$775,539	\$243,282	\$169,793	\$75,939	\$199,711
WS direct support (share of 3D institutional support costs)	\$0	\$0	\$16,486	\$24,102	\$0	\$895	\$0	\$0	\$0	\$0	\$0	\$0	\$285,893	\$2,376	\$0
WS indirect support (share of 3B-3C-RO support)	\$35,118	\$44,761	\$205,559	\$68,543	\$330,607	\$4,680	\$210,811	\$45,037	\$66,941	\$135,275	\$30,445	\$9,286	\$29,810	\$12,377	\$40,457
<b>WS support</b>	\$35,118	\$44,761	\$222,044	\$92,645	\$330,607	\$4,680	\$545,081	\$420,445	\$66,941	\$135,806	\$31,330	\$9,286	\$494,893	\$135,252	\$40,457
San direct support	\$18,809	\$17,074	\$0	\$9,097	\$27,847	\$0	\$233,500	\$0	\$0	\$584	\$4,070	\$0	\$148,299	\$6,541	\$0
San indirect support	\$18,809	\$17,074	\$113,421	\$78,627	\$65,159	\$10,884	\$147,259	\$0	\$266,921	\$24,747	\$139,939	\$12,024	\$127,628	\$365,429	\$23,809
<b>San support</b>	\$18,809	\$17,074	\$122,517	\$106,275	\$65,159	\$10,884	\$390,760	\$0	\$266,921	\$25,331	\$144,008	\$12,024	\$275,827	\$371,969	\$23,809
<b>WES Support</b>	\$3,927	\$51,835	\$344,561	\$198,920	\$395,766	\$15,543	\$925,840	\$420,445	\$333,862	\$161,137	\$175,338	\$21,310	\$770,819	\$507,222	\$64,266
<b>Total WES expenditures</b>															
<b>Water Supply Expenditures</b>	\$744,116	\$1,818,942	\$1,156,782	\$690,430	\$1,338,957	\$383,096	\$1,168,292	\$351,272	\$669,323	\$890,983	\$603,312	\$1,594,674	\$1,236,331	\$493,704	\$1,246,437
WS hardware	\$744,116	\$1,818,942	\$1,156,782	\$690,430	\$1,338,957	\$383,096	\$1,168,292	\$351,272	\$669,323	\$890,983	\$603,312	\$1,594,674	\$1,236,331	\$493,704	\$1,246,437
WS software	\$204,052	\$232,128	\$219,015	\$407,326	\$444,656	\$242,034	\$315,996	\$477,971	\$327,704	\$1,724	\$166,926	\$106,015	\$350,375	\$20,473	\$184,800
WS support	\$35,118	\$44,761	\$222,044	\$92,645	\$330,607	\$4,680	\$545,081	\$420,445	\$66,941	\$135,806	\$31,330	\$9,286	\$494,893	\$135,252	\$40,457
<b>WS total</b>	\$983,285	\$2,095,831	\$1,597,841	\$1,190,401	\$2,114,220	\$629,790	\$2,029,369	\$1,249,289	\$1,069,668	\$1,028,512	\$801,559	\$1,709,975	\$2,081,599	\$649,429	\$1,471,774
WS share of spend	65%	72%	64%	50%	84%	30%	59%	100%	21%	84%	18%	44%	64%	27%	63%
<b>Sanitation Expenditures</b>	\$395,253	\$668,876	\$673,309	\$904,442	\$269,580	\$1,115,211	\$418,883	\$0	\$2,994,736	\$138,294	\$2,886,237	\$1,709,778	\$787,993	\$1,319,537	\$788,323
San hardware	\$395,253	\$668,876	\$673,309	\$904,442	\$269,580	\$1,115,211	\$418,883	\$0	\$2,994,736	\$138,294	\$2,886,237	\$1,709,778	\$787,993	\$1,319,537	\$788,323
San software	\$15,508	\$37,025	\$38,203	\$70,310	\$20,008	\$51,745	\$476,927	\$0	\$100,328	\$28,218	\$17,615	\$355,006	\$55,893	\$38,856	\$0
San support	\$18,809	\$17,074	\$113,421	\$78,627	\$65,159	\$10,884	\$147,259	\$0	\$266,921	\$24,747	\$139,939	\$12,024	\$127,628	\$365,429	\$23,809
<b>San total</b>	\$526,650	\$799,432	\$881,642	\$1,201,784	\$416,690	\$1,471,064	\$1,417,591	\$0	\$3,975,767	\$191,843	\$3,684,357	\$2,214,076	\$1,160,592	\$1,786,052	\$866,119
San share of spend	35%	28%	36%	50%	16%	70%	41%	0%	79%	16%	82%	56%	38%	73%	37%
<b>WES Expenditures</b>	\$1,139,368	\$2,487,819	\$1,830,091	\$1,594,872	\$1,608,536	\$1,498,307	\$1,587,175	\$351,272	\$3,664,060	\$1,029,277	\$3,491,549	\$3,304,453	\$2,004,324	\$1,813,241	\$2,014,760
WES hardware	\$1,139,368	\$2,487,819	\$1,830,091	\$1,594,872	\$1,608,536	\$1,498,307	\$1,587,175	\$351,272	\$3,664,060	\$1,029,277	\$3,491,549	\$3,304,453	\$2,004,324	\$1,813,241	\$2,014,760
WES software	\$395,927	\$61,835	\$394,561	\$198,920	\$395,766	\$15,543	\$925,840	\$420,445	\$333,862	\$161,137	\$175,338	\$21,310	\$770,819	\$507,222	\$64,266
WES support	\$1,509,339	\$2,889,263	\$2,479,468	\$2,392,184	\$2,330,810	\$2,100,884	\$3,446,960	\$1,249,289	\$5,039,339	\$1,220,395	\$3,498,928	\$3,924,031	\$3,252,191	\$2,435,481	\$2,337,898

## Annex C Global WES Expenditure tables

Table C1 WES expenditures FY 2005-07, US dollars

Expenditure patterns	West Africa				East Africa				South Asia				Latin America				Global	
	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	2005-07	
Key expenditure areas	NIC	PRY	PER	SEN	BEA	CMR	GHA	GIN	GNB	MLI	NER	SEN	SLE	TCO	Global			
<b>Hardware</b>																		
Water supply (excluding software codes: 3F23 and 3F24)	\$150,925	\$2,183,689	\$1,091,472	\$1,181,850	\$5,690,363	\$1,170,623	\$239,152	\$1,189,081	\$676,169	\$696,634	\$1,267,852	\$1,228,335	\$656,841	\$1,465,296	\$49,302,485	\$49,302,485		
<b>WS hardware</b>	\$150,925	\$2,183,689	\$1,091,472	\$1,181,850	\$5,690,363	\$1,170,623	\$239,152	\$1,189,081	\$676,169	\$696,634	\$1,267,852	\$1,228,335	\$656,841	\$1,465,296	\$49,302,485	\$49,302,485		
Sanitation hardware	\$477,962	\$768,532	\$1,615,986	\$450,674	\$1,172,802	\$199,536	\$809,130	\$494,604	\$288,783	\$320,551	\$150,121	\$590,595	\$640,625	\$737,208	\$35,735,511	\$35,735,511		
<b>WS hardware</b>	\$628,887	\$2,952,221	\$2,707,458	\$1,632,524	\$6,863,165	\$1,370,159	\$1,048,282	\$1,683,685	\$964,953	\$1,017,185	\$1,417,973	\$1,818,930	\$1,297,466	\$2,202,503	\$36,065,461	\$36,065,461		
<b>Software</b>																		
Water supply share of habitat software (3A-3A.0-3A.13)	\$20,686	\$276,999	\$134,627	\$191,655	\$465,191	\$213,027	\$103,412	\$1,123,325	\$5,256	\$38,074	\$5,256	\$34,048	\$32,804	\$229,712	\$6,667,433	\$6,667,433		
Water management training (3F24)	\$2,204	\$0	\$0	\$42,880	\$172,220	\$237,033	\$427,943	\$57,470	\$43,313	\$46,276	\$46,032	\$2,576	\$12,705	\$135,059	\$3,495,429	\$3,495,429		
Water training materials (3F23)	\$914	\$0	\$6,064	\$1,237	\$0	\$0	\$14,912	\$0	\$87,751	\$16,517	\$5,206	\$0	\$0	\$1,057	\$192,784	\$192,784		
Other software activities (e.g. proportion of 3G10 allocated to water)	\$23,803	\$276,999	\$198,436	\$235,582	\$637,410	\$450,240	\$546,267	\$1,100,795	\$131,004	\$200,867	\$56,494	\$36,624	\$45,509	\$365,828	\$10,082,054	\$10,082,054		
<b>Sanitation software</b>	\$66,059	\$106,129	\$199,340	\$80,131	\$107,384	\$66,238	\$125,320	\$445,711	\$983	\$80,190	\$983	\$18,568	\$41,164	\$112,389	\$5,149,510	\$5,149,510		
Environmental sanitation (excluding software code: 3G10)	\$13,968	\$85,122	\$94,610	\$61,208	\$180,256	\$631,188	\$17,358	\$0	\$2,372	\$175,510	\$96,456	\$80,704	\$199,560	\$46,301	\$4,249,848	\$4,249,848		
Hygiene promotion (3G10 allocated to sanitation)	\$80,027	\$174,250	\$299,950	\$141,339	\$287,620	\$296,427	\$142,678	\$445,711	\$2,372	\$265,700	\$97,439	\$99,273	\$240,724	\$158,690	\$9,398,358	\$9,398,358		
<b>Support</b>	\$103,831	\$451,249	\$492,385	\$376,921	\$925,031	\$746,667	\$688,845	\$1,626,606	\$133,436	\$466,567	\$153,933	\$135,696	\$286,233	\$524,518	\$20,081,412	\$20,081,412		
3A comm. development	\$86,745	\$383,128	\$333,967	\$271,966	\$572,555	\$278,445	\$228,732	\$1,569,036	\$0	\$228,264	\$6,239	\$52,616	\$73,968	\$342,101	\$11,816,944	\$11,816,944		
WS direct support (share of 3D institutional support costs)	\$29,096	\$0	\$0	\$1,051	\$16,296	\$16,999	\$37,840	\$525,993	\$6,950	\$10,491	\$0	\$0	\$0	\$39,093	\$3,402,071	\$3,402,071		
WS indirect support (share of 3B-3C-RO support)	\$8,946	\$7,467	\$149,881	\$350,689	\$794,324	\$306,035	\$206,052	\$56,444	\$122,986	\$413,908	\$289,280	\$140,003	\$79,326	\$397,826	\$8,945,260	\$8,945,260		
<b>Sanitation support</b>	\$38,031	\$7,467	\$150,732	\$460,741	\$819,560	\$322,484	\$243,893	\$1,031,542	\$129,815	\$424,339	\$289,285	\$140,003	\$79,326	\$419,830	\$11,744,331	\$11,744,331		
San direct support	\$92,884	\$0	\$2,741	\$44,629	\$7,209	\$5,018	\$45,856	\$208,464	\$2,776	\$6,853	\$0	\$0	\$0	\$15,657	\$2,980,754	\$2,980,754		
San indirect support	\$121,451	\$2,861	\$223,185	\$192,436	\$189,151	\$88,679	\$295,561	\$409,293	\$27,049	\$277,220	\$55,945	\$76,353	\$99,543	\$205,407	\$5,138,672	\$5,138,672		
<b>WES Support</b>	\$159,482	\$10,328	\$373,917	\$653,177	\$1,008,710	\$421,173	\$539,453	\$1,440,834	\$182,348	\$701,619	\$355,230	\$216,357	\$176,870	\$625,237	\$19,963,736	\$19,963,736		
<b>Total WES expenditures</b>																		
<b>Water Supply Expenditures</b>	\$150,925	\$2,183,689	\$1,091,472	\$1,181,850	\$5,690,363	\$1,170,623	\$239,152	\$1,189,081	\$676,169	\$696,634	\$1,267,852	\$1,228,335	\$656,841	\$1,465,296	\$49,302,485	\$49,302,485		
WS hardware	\$23,803	\$276,999	\$198,436	\$235,582	\$637,410	\$450,240	\$546,267	\$1,100,795	\$131,004	\$200,867	\$56,494	\$36,624	\$45,509	\$365,828	\$10,082,054	\$10,082,054		
WS software	\$38,031	\$7,467	\$150,732	\$460,741	\$819,560	\$322,484	\$243,893	\$1,031,542	\$129,815	\$424,339	\$289,285	\$140,003	\$79,326	\$419,830	\$11,744,331	\$11,744,331		
<b>WS total</b>	\$212,759	\$2,468,155	\$1,440,640	\$1,878,173	\$7,147,333	\$1,943,357	\$1,029,312	\$3,401,512	\$937,049	\$1,321,600	\$1,623,631	\$1,404,362	\$781,676	\$2,260,954	\$71,728,871	\$71,728,871		
WS share of spend	24%	72%	40%	71%	81%	77%	45%	72%	73%	60%	84%	65%	44%	67%	57%	57%		
<b>Sanitation Expenditures</b>	\$477,962	\$768,532	\$1,615,986	\$450,674	\$1,172,802	\$199,536	\$809,130	\$494,604	\$288,783	\$320,551	\$150,121	\$590,595	\$640,625	\$737,208	\$35,735,511	\$35,735,511		
San hardware	\$80,027	\$174,250	\$299,950	\$141,339	\$287,620	\$296,427	\$142,678	\$445,711	\$2,372	\$265,700	\$97,439	\$99,273	\$240,724	\$158,690	\$9,398,358	\$9,398,358		
San software	\$121,451	\$2,861	\$223,185	\$192,436	\$189,151	\$88,679	\$295,561	\$409,293	\$27,049	\$277,220	\$55,945	\$76,353	\$99,543	\$205,407	\$5,138,672	\$5,138,672		
<b>San total</b>	\$679,440	\$945,643	\$2,133,121	\$784,449	\$1,649,574	\$584,642	\$1,247,369	\$1,349,607	\$343,668	\$863,471	\$303,505	\$266,221	\$980,893	\$1,101,305	\$53,584,244	\$53,584,244		
San share of spend	76%	28%	60%	29%	19%	23%	65%	28%	27%	40%	16%	35%	56%	33%	43%	43%		
<b>WES Expenditures</b>	\$628,887	\$2,952,221	\$2,707,458	\$1,632,524	\$6,863,165	\$1,370,159	\$1,048,282	\$1,683,685	\$964,953	\$1,017,185	\$1,417,973	\$1,818,930	\$1,297,466	\$2,202,503	\$85,387,946	\$85,387,946		
WES hardware	\$103,831	\$451,249	\$492,385	\$376,921	\$925,031	\$746,667	\$688,845	\$1,626,606	\$133,436	\$466,567	\$153,933	\$135,696	\$286,233	\$524,518	\$20,081,412	\$20,081,412		
WES software	\$159,482	\$10,328	\$373,917	\$653,177	\$1,008,710	\$421,173	\$539,453	\$1,440,834	\$182,348	\$701,619	\$355,230	\$216,357	\$176,870	\$625,237	\$19,963,736	\$19,963,736		
<b>WES total</b>	\$892,400	\$3,413,789	\$3,975,761	\$2,689,622	\$8,196,608	\$2,937,999	\$2,278,681	\$4,791,028	\$1,280,736	\$2,189,371	\$1,927,137	\$2,171,183	\$1,764,969	\$3,392,269	\$125,313,113	\$125,313,113		

## Annex C Global WES Expenditure tables

Table C1 WES expenditures FY 2005-06-07, US dollars

Expenditure patterns	ARO 2005-07	RESA 2005-07	ROA 2005-07	WARO 2005-07	Global 2005-07
<b>Key expenditure areas</b>					
<b>Hardware</b>					
Water supply (excluding software codes: 3F23 and 3F24)	\$10,167,259	\$11,992,617	\$11,680,415	\$15,462,195	\$49,302,485
<b>WS hardware</b>	<b>\$10,167,259</b>	<b>\$11,992,617</b>	<b>\$11,680,415</b>	<b>\$15,462,195</b>	<b>\$49,302,485</b>
Sanitation hardware	\$8,951,841	\$7,060,777	\$13,868,262	\$5,854,630	\$35,735,511
Environmental sanitation (excluding software code: 3G10)	\$329,951	\$0	\$0	\$0	\$329,951
Bio-Gas units (recorded under 3H)	\$9,281,792	\$7,060,777	\$13,868,262	\$5,854,630	\$35,065,461
<b>WES hardware</b>	<b>\$19,448,050</b>	<b>\$19,053,394</b>	<b>\$25,548,677</b>	<b>\$21,316,825</b>	<b>\$85,367,946</b>
<b>Software</b>					
Water supply share of habitat software (3A-3A10-3A13)	\$921,640	\$1,561,699	\$1,647,212	\$2,536,882	\$6,667,433
Water management training (3F24)	\$768,691	\$897,167	\$603,454	\$1,223,116	\$3,492,429
Water training materials (3F23)	\$36,000	\$16,126	\$101,328	\$38,930	\$192,784
Other software activities (e.g. proportion of 3G10 allocated to water)	\$0	\$142,750	\$98,907	\$87,751	\$323,408
<b>WS software</b>	<b>\$1,726,732</b>	<b>\$2,607,742</b>	<b>\$2,450,901</b>	<b>\$3,886,679</b>	<b>\$10,682,054</b>
<b>Sanitation software</b>					
Sanitation share of habitat software (3A-3A10-3A13)	\$1,049,481	\$924,418	\$2,088,552	\$1,087,059	\$5,148,510
Hygiene promotion (3G10 allocated to sanitation)	\$1,209,940	\$699,451	\$1,249,543	\$1,090,914	\$4,249,848
<b>San software</b>	<b>\$2,259,421</b>	<b>\$1,623,869</b>	<b>\$3,338,095</b>	<b>\$2,177,973</b>	<b>\$9,398,358</b>
<b>WES software</b>	<b>\$3,986,153</b>	<b>\$4,241,611</b>	<b>\$5,788,996</b>	<b>\$6,064,652</b>	<b>\$20,081,412</b>
3A comm. development	\$1,971,121	\$2,486,117	\$3,735,764	\$3,623,941	\$11,816,944
<b>Support</b>					
WS direct support (share of 3D institutional support costs)	\$1,057,105	\$193,892	\$543,899	\$757,072	\$3,409,071
WS indirect support (share of 3B-3C-RO support)	\$1,497,743	\$1,815,977	\$1,431,790	\$3,609,817	\$8,342,260
<b>WS support</b>	<b>\$3,557,847</b>	<b>\$1,939,873</b>	<b>\$2,075,722</b>	<b>\$4,376,889</b>	<b>\$11,744,331</b>
<b>Sanitation support</b>					
San direct support	\$2,083,659	\$72,015	\$488,618	\$336,462	\$2,980,764
San indirect support	\$1,517,796	\$645,690	\$1,359,627	\$1,616,658	\$5,138,672
<b>San support</b>	<b>\$3,601,455</b>	<b>\$717,605</b>	<b>\$1,848,245</b>	<b>\$1,952,121</b>	<b>\$8,119,425</b>
<b>WES Support</b>	<b>\$6,959,303</b>	<b>\$2,657,477</b>	<b>\$3,923,967</b>	<b>\$6,323,010</b>	<b>\$19,863,756</b>
<b>Total WES expenditures</b>					
<b>Water Supply Expenditures</b>	<b>\$10,167,259</b>	<b>\$11,992,617</b>	<b>\$11,680,415</b>	<b>\$15,462,195</b>	<b>\$49,302,485</b>
<b>WS hardware</b>	<b>\$10,167,259</b>	<b>\$11,992,617</b>	<b>\$11,680,415</b>	<b>\$15,462,195</b>	<b>\$49,302,485</b>
<b>WS software</b>	<b>\$1,726,732</b>	<b>\$2,607,742</b>	<b>\$2,450,901</b>	<b>\$3,886,679</b>	<b>\$10,682,054</b>
<b>WS support</b>	<b>\$3,357,847</b>	<b>\$1,939,873</b>	<b>\$2,075,722</b>	<b>\$4,376,889</b>	<b>\$11,744,331</b>
<b>WS total</b>	<b>\$15,251,838</b>	<b>\$16,550,232</b>	<b>\$16,207,038</b>	<b>\$23,719,763</b>	<b>\$71,728,871</b>
<b>WS share of spend</b>					
Sanitation Expenditures	\$9,281,792	\$7,060,777	\$13,868,262	\$5,854,630	\$38,065,461
San hardware	\$2,259,421	\$1,623,869	\$3,338,095	\$2,177,973	\$9,398,358
San software	\$3,601,455	\$717,605	\$1,848,245	\$1,952,121	\$8,119,425
<b>San support</b>	<b>\$15,142,668</b>	<b>\$9,402,251</b>	<b>\$19,054,602</b>	<b>\$9,984,723</b>	<b>\$53,584,244</b>
<b>San share of spend</b>					
<b>WES Expenditures</b>	<b>\$19,448,050</b>	<b>\$19,053,394</b>	<b>\$25,548,677</b>	<b>\$21,316,825</b>	<b>\$85,367,946</b>
<b>WES hardware</b>	<b>\$19,448,050</b>	<b>\$19,053,394</b>	<b>\$25,548,677</b>	<b>\$21,316,825</b>	<b>\$85,367,946</b>
<b>WES software</b>	<b>\$3,986,153</b>	<b>\$4,241,611</b>	<b>\$5,788,996</b>	<b>\$6,064,652</b>	<b>\$20,081,412</b>
<b>WES support</b>	<b>\$6,959,303</b>	<b>\$2,657,477</b>	<b>\$3,923,967</b>	<b>\$6,323,010</b>	<b>\$19,863,756</b>
<b>WES total</b>	<b>\$30,394,506</b>	<b>\$25,952,483</b>	<b>\$35,261,640</b>	<b>\$33,704,487</b>	<b>\$125,315,115</b>





Annex C Global WES Expenditure tables

Table C2 Water supply unit costs FY 2005-06-07, US dollars

Water Supply Unit Costs		West Africa										Global Totals					
	NIC	PRY	PER	BEN			BFA	CMR	GHA	GIN	GNB	MLI	NER	SEN	SLE	TGO	Global Totals
<b>3F15 New tubewell/borehole/ handpump</b>																	
Hardware (corrected)	\$5,053	\$0	\$0	\$766,011	\$5,101,616	\$730,837	\$4,083	\$0	\$0	\$668,501	\$185,951	\$431,489	\$0	\$0	\$0	\$1,259,266	\$13,295,655
Software (corrected)	\$797	\$0	\$0	\$152,691	\$71,461	\$281,091	\$9,326	\$0	\$0	\$128,578	\$53,617	\$19,227	\$0	\$0	\$0	\$314,390	\$2,720,791
Support (corrected)	\$1,273	\$0	\$0	\$298,628	\$74,785	\$201,338	\$4,164	\$0	\$0	\$128,343	\$113,284	\$101,856	\$0	\$0	\$0	\$360,800	\$2,895,560
<b>Borehole expend</b>	<b>\$7,124</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,217,330</b>	<b>\$6,407,842</b>	<b>\$1,213,265</b>	<b>\$17,573</b>	<b>\$0</b>	<b>\$0</b>	<b>\$926,421</b>	<b>\$352,852</b>	<b>\$552,572</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,934,456</b>	<b>\$19,006,006</b>
Nr. units (corrected)	1	1	1	44	400	61	1	1	1	50	23	28	1	1	1	113	3,928
<b>Unit cost</b>	<b>\$7,124</b>	<b>\$0</b>	<b>\$0</b>	<b>\$27,677</b>	<b>\$16,020</b>	<b>\$19,680</b>	<b>\$17,573</b>	<b>\$0</b>	<b>\$0</b>	<b>\$18,528</b>	<b>\$15,341</b>	<b>\$19,735</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$17,119</b>	<b>\$4,839</b>
Community cost	\$7,124	\$0	\$0	\$15,007	\$16,395	\$20,221	\$17,573	\$0	\$0	\$20,140	\$16,039	\$7,467	\$0	\$0	\$0	\$16,394	\$6,604
Units per community	1.0	1.0	1.0	0.6	1.0	1.0	1.0	1.0	1.0	1.1	1.0	0.4	1.0	1.0	1.0	1.0	1.8
<b>3F19 Community Water Supply system</b>																	
Hardware (corrected)	\$0	\$1,963,775	\$259,855	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$61,091	\$840,049	\$303,271	\$0	\$0	\$0	\$14,614,688
Software (corrected)	\$0	\$249,103	\$47,243	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,432	\$759	\$0	\$0	\$0	\$0	\$2,429,537
Support (corrected)	\$0	\$6,715	\$35,886	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$37,218	\$199,299	\$2,900	\$0	\$0	\$0	\$2,551,545
<b>WS system expend.</b>	<b>\$0</b>	<b>\$2,219,594</b>	<b>\$342,984</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$115,924</b>	<b>\$1,075,780</b>	<b>\$306,930</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$19,595,750</b>
Nr. units (corrected)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Unit cost</b>	<b>\$0</b>	<b>\$42,864</b>	<b>\$6,365</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$10,539</b>	<b>\$119,531</b>	<b>\$153,465</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$12,175</b>
Community cost	\$0	\$48,252	\$20,176	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,539	\$119,531	\$9	\$0	\$0	\$0	\$1,997
Units per community	1.0	1.1	2.4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.1	1.0	1.0	1.0	6.2
<b>3F20 Upgrade or extend Water Supply system</b>																	
Hardware (corrected)	\$58,054	\$219,914	\$0	\$44,989	\$7,038	\$356,552	\$0	\$0	\$0	\$0	\$0	\$711,250	\$0	\$0	\$0	\$8,589	\$6,413,562
Software (corrected)	\$9,156	\$27,696	\$0	\$8,964	\$789	\$137,995	\$0	\$0	\$0	\$0	\$0	\$21,206	\$0	\$0	\$0	\$2,146	\$1,121,407
Support (corrected)	\$14,659	\$752	\$0	\$17,931	\$1,014	\$98,777	\$0	\$0	\$0	\$0	\$0	\$1,067	\$0	\$0	\$0	\$5,463	\$1,275,710
<b>Upgrade WS expend.</b>	<b>\$81,839</b>	<b>\$248,962</b>	<b>\$0</b>	<b>\$71,464</b>	<b>\$8,841</b>	<b>\$595,233</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$813,524</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$13,207</b>	<b>\$8,670,686</b>
Nr. units (corrected)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
<b>Unit cost</b>	<b>\$20,460</b>	<b>\$61,740</b>	<b>\$0</b>	<b>\$17,861</b>	<b>\$2,210</b>	<b>\$148,808</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$203,381</b>	<b>\$0</b>	<b>\$0</b>	<b>\$3,302</b>	<b>\$3,302</b>	<b>\$2,167</b>
Community cost	\$20,460	\$10,357	\$0	\$71,464	\$4,420	\$49,603	\$0	\$0	\$0	\$0	\$0	\$40,676	\$0	\$0	\$0	\$13,207	\$12,480
Units per community	1.0	1.2	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	5.5
<b>3F16 Rehabilitation of boreholes and handpumps</b>																	
Hardware (corrected)	\$44,389	\$0	\$0	\$24,411	\$240,757	\$0	\$0	\$0	\$0	\$0	\$0	\$37,751	\$0	\$0	\$0	\$79,677	\$739,027
Software (corrected)	\$7,001	\$0	\$0	\$4,868	\$26,989	\$0	\$0	\$0	\$0	\$0	\$0	\$10,885	\$0	\$0	\$0	\$19,892	\$184,960
Support (corrected)	\$1,775	\$0	\$0	\$1,675	\$1,675	\$0	\$0	\$0	\$0	\$0	\$0	\$2,286	\$0	\$0	\$0	\$5,264	\$10,404
<b>Borehole expend</b>	<b>\$53,165</b>	<b>\$0</b>	<b>\$0</b>	<b>\$30,954</b>	<b>\$270,421</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$50,922</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$122,833</b>	<b>\$1,338,100</b>
Nr. units (corrected)	69	69	69	4	71	71	71	71	71	71	71	71	71	71	71	71	71
<b>Unit cost</b>	<b>\$920</b>	<b>\$0</b>	<b>\$0</b>	<b>\$9,698</b>	<b>\$4,259</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$10,233</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$5,100</b>	<b>\$273</b>
Community cost	\$62,575	\$0	\$0	\$9,698	\$5,400	\$0	\$0	\$0	\$0	\$0	\$0	\$7,163	\$0	\$0	\$0	\$6,120	\$1,743
Units per community	68.0	1.0	1.0	1.3	1.3	1.0	1.0	1.0	1.0	1.0	1.0	0.7	1.0	1.0	1.0	1.2	6.4
<b>3F10 Open wells</b>																	
Hardware (corrected)	\$0	\$0	\$0	\$105,805	\$11,959	\$0	\$2,085	\$182,739	\$0	\$0	\$69,983	\$3,475	\$0	\$0	\$656,841	\$29,754	\$1,897,724
Software (corrected)	\$0	\$0	\$0	\$41,309	\$1,722	\$0	\$2,126	\$168,526	\$0	\$0	\$10,885	\$825	\$0	\$0	\$1,126	\$1,126	\$1,126
Support (corrected)	\$0	\$0	\$0	\$41,348	\$1,722	\$0	\$2,126	\$168,526	\$0	\$0	\$10,885	\$825	\$0	\$0	\$1,126	\$1,126	\$1,126
<b>Open wells</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$168,144</b>	<b>\$15,021</b>	<b>\$0</b>	<b>\$8,974</b>	<b>\$522,732</b>	<b>\$0</b>	<b>\$0</b>	<b>\$702,062</b>	<b>\$4,450</b>	<b>\$0</b>	<b>\$0</b>	<b>\$781,676</b>	<b>\$45,708</b>	<b>\$3,331,055</b>
Nr. units (corrected)	8	8	8	3	3	3	1	56	56	1	153	1	1	87	11	3,162	3,162
<b>Unit cost</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$21,018</b>	<b>\$5,007</b>	<b>\$0</b>	<b>\$8,974</b>	<b>\$9,335</b>	<b>\$9,335</b>	<b>\$0</b>	<b>\$4,589</b>	<b>\$4,450</b>	<b>\$0</b>	<b>\$0</b>	<b>\$8,985</b>	<b>\$4,155</b>	<b>\$1,053</b>
Community cost	\$0	\$0	\$0	\$28,024	\$7,511	\$0	\$8,974	\$4,667	\$0	\$0	\$4,875	\$4,450	\$0	\$0	\$8,142	\$4,571	\$4,289
Units per community	1.0	1.3	1.5	1.1	1.5	1.0	1.0	0.5	0.5	1.0	1.1	1.0	1.0	0.9	1.1	1.1	4.1

### Annex C Global WES Expenditure tables

Table C2 Water supply unit costs FY 2005-06-07, US dollars  
Water Supply Unit Costs

	ARO	RESA	ROA	WARO	Global
<b>3F15 New tubewell/borehole/ handpump</b>					
Hardware (corrected)	\$737,037	\$3,190,697	\$220,168	\$9,147,753	\$13,296,655
Software (corrected)	\$172,861	\$1,006,630	\$9,717	\$1,631,382	\$2,726,791
Support (corrected)	\$426,546	\$559,632	\$60,205	\$1,943,176	\$2,989,560
<b>Borehole expend</b>	<b>\$1,336,445</b>	<b>\$4,757,160</b>	<b>\$290,090</b>	<b>\$12,622,311</b>	<b>\$19,006,006</b>
Nr. units (corrected)	2,724	443	39	720	3,926
<b>Unit cost</b>	<b>\$491</b>	<b>\$10,890</b>	<b>\$7,438</b>	<b>\$17,531</b>	<b>\$4,839</b>
Community cost	\$1,677	\$8,090	\$9,065	\$15,937	\$26,771
Units per community	3.4	0.8	1.2	0.9	1.8
<b>3F19 Community Water Supply system</b>					
Hardware (corrected)	\$4,972,331	\$2,053,750	\$6,384,175	\$1,204,411	\$14,614,668
Software (corrected)	\$690,902	\$178,832	\$1,503,998	\$55,805	\$2,428,537
Support (corrected)	\$1,064,759	\$271,352	\$977,018	\$238,417	\$2,551,545
<b>WS system expend.</b>	<b>\$6,727,992</b>	<b>\$2,503,934</b>	<b>\$8,865,191</b>	<b>\$1,498,633</b>	<b>\$19,597,750</b>
Nr. units (corrected)	2,068	306	22	52	2,448
<b>Unit cost</b>	<b>\$3,254</b>	<b>\$8,185</b>	<b>\$40,065</b>	<b>\$68,179</b>	<b>\$7,997</b>
Nr. communities	1,563	1,771	303	49	1,997
Community cost	\$4,305	\$32,519	\$28,783	\$30,584	\$9,813
Units per community	1.5	1.4	32.2	0.4	6.2
<b>3F20 Upgrade or extend Water Supply system</b>					
Hardware (corrected)	\$790,063	\$1,895,100	\$2,597,991	\$1,130,407	\$6,413,562
Software (corrected)	\$176,537	\$332,800	\$441,060	\$171,010	\$1,121,407
Support (corrected)	\$377,897	\$209,533	\$487,427	\$200,852	\$1,275,710
<b>Upgrade WS expend.</b>	<b>\$1,344,497</b>	<b>\$2,437,433</b>	<b>\$3,526,479</b>	<b>\$1,502,269</b>	<b>\$6,810,618</b>
Nr. units (corrected)	66	66	66	66	66
<b>Unit cost</b>	<b>\$6,930</b>	<b>\$31,249</b>	<b>\$983</b>	<b>\$39,533</b>	<b>\$2,260</b>
Nr. communities	216	298	156	36	706
Community cost	\$6,225	\$8,179	\$22,606	\$41,730	\$12,480
Units per community	0.9	0.3	23.0	1.1	5.5
<b>3F16 Rehabilitation of boreholes and handpumps</b>					
Hardware (corrected)	\$126,215	\$199,404	\$69,812	\$392,596	\$738,027
Software (corrected)	\$40,894	\$73,268	\$7,087	\$62,612	\$183,660
Support (corrected)	\$1,060	\$1,569	\$1,569	\$1,569	\$3,767
<b>Rehab expend</b>	<b>\$168,169</b>	<b>\$274,241</b>	<b>\$78,468</b>	<b>\$596,777</b>	<b>\$925,454</b>
Nr. units (corrected)	4,470	191	138	106	4,905
<b>Unit cost</b>	<b>\$104</b>	<b>\$1,170</b>	<b>\$825</b>	<b>\$5,049</b>	<b>\$273</b>
Nr. communities	480	191	7	90	768
Community cost	\$870	\$1,170	\$16,265	\$6,947	\$11,743
Units per community	9.3	1.0	19.7	1.2	6.4
<b>3F10 Open wells</b>					
Hardware (corrected)	\$550,351	\$84,132	\$0	\$1,362,641	\$1,997,724
Software (corrected)	\$2,062	\$8,792	\$0	\$1,362,641	\$1,373,495
Support (corrected)	\$253,989	\$8,792	\$0	\$517,696	\$780,487
<b>Open wells</b>	<b>\$950,432</b>	<b>\$131,956</b>	<b>\$0</b>	<b>\$2,248,767</b>	<b>\$3,331,055</b>
Nr. units (corrected)	2,587	255	-	320	3,162
<b>Unit cost</b>	<b>\$367</b>	<b>\$517</b>	<b>\$0</b>	<b>\$7,027</b>	<b>\$1,063</b>
Nr. communities	343	61	-	372	776
Community cost	\$2,771	\$2,162	\$0	\$6,045	\$4,283
Units per community	7.5	4.2	-	0.9	4.1

### Annex C Global WES Expenditure tables

Table C3 Sanitation unit costs FY 2005-06-07, US dollars

Environmental Sanitation Unit Costs	Asia										East and Southern Africa			KEN		
	BGD	KHM	CHN	TMP	IND	IDN	NPL	PAK	PHL	LKA	THA	YMM	ALB		EGY	ETH
3611 Household toilet																
Hardware (corrected)	\$1,040	\$23,531	\$821,213	\$14,100	\$280,686	\$1,091,149	\$479,356	\$513,783	\$785,621	\$1,156,484	\$139,684	\$303,422	\$1,044,474	\$119,805	\$44,552	\$0
Software (corrected)	\$205,417	\$9,470	\$242,483	\$10,266	\$108,501	\$279,580	\$318,047	\$11,484	\$252,307	\$92,745	\$137,478	\$137,478	\$0	\$119,805	\$11,027	\$0
Support (corrected)	\$805,263	\$76,884	\$279,932	\$6,288	\$65,513	\$91,824	\$255,551	\$29,452	\$686,018	\$187,087	\$33,785	\$33,785	\$0	\$18,801	\$16,282	\$0
Household toilet	\$1,011,720	\$109,895	\$1,343,608	\$30,655	\$454,700	\$1,462,552	\$1,052,855	\$554,719	\$1,723,646	\$1,436,317	\$278,779	\$637,413	\$0	\$1,183,080	\$71,840	\$0
Nr. units (corrected)	161,862	796	19,771	230	9,036	11,237	9,164	5,237	9,872	11,317	4,863	644	\$0	4,863	3,979	\$0
Unit cost	\$6.25	\$138	\$68	\$133	\$50	\$130	\$115	\$106	\$175	\$127	\$433	\$246	\$0	\$243	\$18	\$0
Nr. communities	3,874	119	392	47	216	947	155	46	30	30	77	446	\$0	15	30	\$0
Units per community	\$13,797	\$32	\$4,379	\$4,379	\$1,663	\$274	\$633	\$11,921	\$2,652	\$4,089	\$3,274	\$1,446	\$0	\$26,281	\$1,797	\$0
3612 School toilet																
Hardware (corrected)	\$0	\$14,660	\$15,318	\$0	\$172,584	\$352,120	\$197,351	\$42,337	\$89,156	\$162,074	\$37,040	\$220,257	\$68,965	\$165,442	\$190,425	\$388,444
Software (corrected)	\$0	\$0	\$609	\$0	\$14,632	\$40,698	\$36,857	\$325	\$5,174	\$3,691	\$13,158	\$46,388	\$828	\$7,347	\$1,059	\$84,734
Support (corrected)	\$0	\$34,158	\$4,192	\$0	\$31,514	\$26,315	\$75,059	\$2,392	\$62,348	\$24,825	\$1,616	\$118,846	\$1,616	\$2,780	\$56,026	\$124,804
School toilet	\$0	\$48,818	\$20,119	\$0	\$218,730	\$419,132	\$309,267	\$45,054	\$156,678	\$190,591	\$56,951	\$385,492	\$71,409	\$175,579	\$247,510	\$617,992
Nr. units (corrected)	7	5	7	5	282	324	97	27	354	107	21	56	41	24	24	739
Unit cost	\$0.00	\$6,974	\$4,024	\$0	\$76	\$1,284	\$3,168	\$1,669	\$443	\$1,781	\$2,712	\$6,894	\$1,742	\$7,16	\$10,313	\$836
Nr. communities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Units per community	\$0	\$48,818	\$20,112	\$0	\$419	\$1,089	\$2,786	\$1,408	\$722	\$2,611	\$965	\$1,089	\$5,493	\$8,779	\$8,535	\$1,581
Global latrine survey																
Plan latrine subsidy	\$0	\$0	\$42	\$53	\$32	\$20	\$30	\$83	\$70	\$125	\$123	\$60	\$187	\$63	\$12	\$64
Household contribution	\$12	\$8	\$60	\$27	\$43	\$30	\$35	\$67	\$63	\$75	\$61	\$20	\$63	\$62	\$62	\$207
Toilet cost	\$12	\$8	\$101	\$80	\$75	\$50	\$65	\$150	\$100	\$200	\$74	\$80	\$250	\$74	\$74	\$271
Plan hardware cost	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plan hardware reference	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total hhd contribution	\$1,942,348	\$6,368	\$1,181,317	\$6,265	\$388,548	\$337,110	\$320,740	\$350,879	\$296,160	\$848,275	\$39,509	\$51,820	\$306,369	\$306,369	\$246,638	\$0
Total toilet expand.	\$2,954,098	\$116,263	\$2,524,925	\$36,920	\$843,248	\$1,795,682	\$1,373,695	\$905,598	\$2,020,106	\$2,285,992	\$319,289	\$689,233	\$1,489,449	\$1,489,449	\$318,538	\$0
Nr. toilets	161,862	796	19,771	230	9,036	11,237	9,164	5,237	9,872	11,317	4,863	644	\$0	4,863	3,979	\$0
Plan cost per toilet	\$6	\$138	\$68	\$133	\$50	\$130	\$115	\$106	\$175	\$127	\$433	\$246	\$0	\$243	\$18	\$0
Hhd cost per toilet	\$12	\$8	\$60	\$27	\$43	\$30	\$35	\$67	\$63	\$75	\$61	\$20	\$63	\$62	\$62	\$207
Total cost per toilet	\$18	\$146	\$128	\$161	\$93	\$160	\$150	\$173	\$205	\$202	\$494	\$266	\$306	\$306	\$80	\$0
Hhd contribution	65%	5%	47%	17%	46%	19%	23%	39%	15%	17%	12%	8%	21%	77%	77%	1.9

## Annex C Global WES Expenditure tables

Table C3 Sanitation unit costs FY 2005-06-07, US dollars

Environmental Sanitation Unit Costs	Americas													
	SDN	TZA	UGA	ZMB	ZWE	BOL	BRA	COL	DOM	ECU	SLV	GTM	HTI	HND
<b>3611 Household toilet</b>														
Hardware (corrected)	\$62,210	\$258,722	\$190,382	\$85,310	\$891,553	\$117,875	\$0	\$2,103,288	\$54,357	\$795,676	\$1,564,278	\$277,534	\$637,615	\$688,160
Software (corrected)	\$31,004	\$69,058	\$36,612	\$42,536	\$288,679	\$278,683	\$0	\$533,424	\$27,612	\$179,822	\$482,601	\$53,284	\$55,680	\$67,230
Support (corrected)	\$3,452	\$7,153	\$36,635	\$23,697	\$6,797	\$145,629	\$0	\$188,563	\$16,470	\$39,588	\$11,176	\$103,182	\$182,969	\$21,834
<b>Household toilet</b>	<b>\$96,667</b>	<b>\$334,833</b>	<b>\$263,629</b>	<b>\$151,543</b>	<b>\$1,189,029</b>	<b>\$542,187</b>	<b>\$0</b>	<b>\$2,825,275</b>	<b>\$94,439</b>	<b>\$1,013,096</b>	<b>\$2,068,055</b>	<b>\$434,000</b>	<b>\$875,664</b>	<b>\$787,025</b>
Nr. units (corrected)	2,542	719	1,067	600	4,939	1,265	-	2,547	266	1,822	5,574	2,895	2,167	2,266
<b>Unit cost</b>	<b>\$38</b>	<b>\$466</b>	<b>\$247</b>	<b>\$12</b>	<b>\$241</b>	<b>\$429</b>	<b>\$0</b>	<b>\$1,109</b>	<b>\$355</b>	<b>\$556</b>	<b>\$369</b>	<b>\$145</b>	<b>\$404</b>	<b>\$347</b>
Nr. communities	12	13	8	12	192	46	-	32	12	46	121	16	93	16
Units per community	\$2,462	\$55,34	\$62,726	\$1,783	\$62,557	\$20,463	-	\$54,322	\$2,985	\$27,331	\$98,997	\$21,7	\$9,26	\$7,155
	60.5	55.3	213.4	18.8	25.7	48.7	-	43.0	7.0	49.2	78.5	24.8	23.3	20.6
<b>3612 School toilet</b>														
Hardware (corrected)	\$306,325	\$320,347	\$242,297	\$170,315	\$200,258	\$188,745	\$0	\$410,261	\$85,742	\$185,213	\$60,892	\$280,322	\$385,639	\$0
Software (corrected)	\$72,397	\$34,697	\$16,214	\$91,017	\$50,319	\$26,564	\$0	\$64,704	\$0	\$40,442	\$4,048	\$19,205	\$15,810	\$0
Support (corrected)	\$14,027	\$7,748	\$41,722	\$36,322	\$1,868	\$71,724	\$0	\$36,936	\$12,587	\$9,179	\$355	\$87,184	\$105,600	\$0
<b>School toilet</b>	<b>\$392,749</b>	<b>\$382,793</b>	<b>\$300,232</b>	<b>\$245,068</b>	<b>\$252,445</b>	<b>\$287,033</b>	<b>\$0</b>	<b>\$531,801</b>	<b>\$98,329</b>	<b>\$234,833</b>	<b>\$65,295</b>	<b>\$366,711</b>	<b>\$507,049</b>	<b>\$0</b>
Nr. units (corrected)	64	72	517	79	425	35	-	22	17	43	51	246	161	-
<b>Unit cost</b>	<b>\$6,137</b>	<b>\$5,059</b>	<b>\$581</b>	<b>\$3,102</b>	<b>\$594</b>	<b>\$7,630</b>	<b>\$0</b>	<b>\$24,173</b>	<b>\$5,606</b>	<b>\$5,461</b>	<b>\$1,280</b>	<b>\$1,491</b>	<b>\$3,139</b>	<b>\$0</b>
Nr. communities	1	1	1	1	1	1	-	1	1	1	1	1	1	1
Units per community	\$24,547	\$6,596	\$30,923	\$11,670	\$1,298	\$7,630	-	\$25,324	\$4,766	\$5,337	\$1,555	\$4,264	\$18,109	\$0
	4.0	11.3	51.7	3.8	2.2	1.0	-	1.0	0.9	1.0	1.2	2.9	5.9	-
<b>Global latrine survey</b>														
Plan latrine subsidy	\$50	\$12	\$15	\$30	\$180	\$881	\$881	\$881	\$287	\$350	\$270	\$180	\$372	\$468
Household contribution	\$25	\$62	\$85	\$30	\$140	\$70	\$88	\$88	\$33	\$140	\$30	\$20	\$48	\$52
<b>Toilet cost</b>	<b>\$75</b>	<b>\$74</b>	<b>\$100</b>	<b>\$60</b>	<b>\$250</b>	<b>\$959</b>	<b>\$969</b>	<b>\$969</b>	<b>\$320</b>	<b>\$490</b>	<b>\$300</b>	<b>\$200</b>	<b>\$420</b>	<b>\$520</b>
Plan hardware cost	\$24	\$20	\$24	\$12	\$61	\$30	\$30	\$30	\$10	\$36	\$21	\$13	\$24	\$28
Plan latrine conference	\$24	\$24	\$24	\$12	\$61	\$30	\$30	\$30	\$10	\$36	\$21	\$13	\$24	\$28
Total hhd contribution	\$63,500	\$44,578	\$239,540	\$12,000	\$345,730	\$224,391	\$224,391	\$224,391	\$8,778	\$245,080	\$167,220	\$59,900	\$104,666	\$117,832
Total toilet expand.	\$160,217	\$379,511	\$324,519	\$163,543	\$1,534,759	\$1,534,759	\$1,534,759	\$3,049,666	\$103,217	\$1,268,176	\$2,225,275	\$493,900	\$990,330	\$904,857
Nr. toilets	2,542	719	6,844	600	4,939	1,265	-	2,547	266	1,822	5,574	2,895	2,167	2,266
Plan cost per toilet	\$38	\$466	\$247	\$12	\$241	\$429	\$0	\$1,109	\$355	\$556	\$369	\$145	\$404	\$347
Hhd cost per toilet	\$25	\$62	\$85	\$30	\$140	\$70	\$88	\$88	\$33	\$140	\$30	\$20	\$48	\$52
<b>Total cost per toilet</b>	<b>\$63</b>	<b>\$528</b>	<b>\$311</b>	<b>\$42</b>	<b>\$311</b>	<b>\$528</b>	<b>\$528</b>	<b>\$528</b>	<b>\$165</b>	<b>\$696</b>	<b>\$399</b>	<b>\$165</b>	<b>\$452</b>	<b>\$399</b>
Hhd contribution	40%	12%	74%	7%	23%	7%	7%	7%	9%	20%	8%	12%	11%	13%



## Annex C Global WES Expenditure tables

Table C3. Sanitation unit costs FY 2005-06-07, US dollars

Environmental Sanitation Unit Costs	ARO	RESA	ROA	WARO	Global
<b>3.G11 Household toilet</b>					
Hardware (corrected)	\$5,610,017	\$2,598,404	\$7,582,880	\$2,024,808	\$17,816,108
Software (corrected)	\$1,773,849	\$655,075	\$1,978,712	\$1,223,276	\$5,630,912
Support (corrected)	\$2,713,382	\$122,321	\$826,303	\$798,923	\$4,460,940
<b>Household toilet</b>	<b>\$10,097,268</b>	<b>\$3,375,800</b>	<b>\$10,387,895</b>	<b>\$4,047,007</b>	<b>\$27,907,969</b>
Nr. units (corrected)	241,757	25,553	25,107	13,639	306,056
<b>Unit cost</b>	<b>\$42</b>	<b>\$132</b>	<b>\$414</b>	<b>\$297</b>	<b>\$91</b>
Nr. communities	6,895	475	640	583	8,593
Nr. units per community	\$1,450	\$717	\$1,640	\$509	\$2,499
Units per community	35.3	53.8	39.2	8.3	31.8
<b>3.G12 School toilet</b>					
Hardware (corrected)	\$1,302,897	\$2,670,727	\$1,990,222	\$3,464,146	\$9,427,992
Software (corrected)	\$161,533	\$405,044	\$243,569	\$665,187	\$1,476,333
Support (corrected)	\$386,402	\$369,024	\$356,623	\$1,026,615	\$2,140,664
<b>School toilet</b>	<b>\$1,850,831</b>	<b>\$3,444,795</b>	<b>\$2,592,414</b>	<b>\$5,155,948</b>	<b>\$13,043,989</b>
Nr. units (corrected)	1,280	2,037	1,025	1,489	5,841
<b>Unit cost</b>	<b>\$1,446</b>	<b>\$1,691</b>	<b>\$2,529</b>	<b>\$3,440</b>	<b>\$2,233</b>
Nr. communities	1,049	3,840	\$6,015	\$2,098	\$2,666
Community cost	\$1,049	\$3,840	\$6,015	\$2,098	\$2,351
Units per community	0.7	2.3	2.4	0.6	1.1
<b>Global latrine survey</b>					
Plan latrine subsidy					
Household contribution					
<b>Toilet cost</b>					
Plan hardware cost					
Reference					
Total hhd contribution	\$5,769,840	\$1,258,465	\$1,334,159	\$578,176	\$8,940,640
Total toilet expand.	\$15,867,098	\$4,370,636	\$11,799,866	\$3,043,517	\$34,461,117
Nr. toilets	241,757	24,486	23,842	8,944	299,029
Plan cost per toilet	\$42	\$127	\$413	\$276	\$85
Hhd cost per toilet	\$24	\$51	\$56	\$65	\$30
<b>Total cost per toilet</b>	<b>\$66</b>	<b>\$178</b>	<b>\$469</b>	<b>\$340</b>	<b>\$115</b>
Hhd contribution	36%	29%	12%	19%	



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