

Cambodia

Rural Water Supply and Sanitation Sector Review

Final Report



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- Provincial Departments of Rural Development
- District Offices of Rural Development
- National NGOs
- International NGOs
- UNICEF
- Donors

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Abbreviations

ADB	Asian Development Bank
AFD	Agence Francaise de Developpement
CfD	Centre for Development
CIPS	Cambodia Inter-Census Population Survey
CMDG	Cambodia's Millennium Development Goal
CSES	Cambodia Socio-Economic Survey
DAC	Disability Action Council
D&D	Decentralisation and Deconcentration
DDSP	Disability Development Services
DFID	Department for International Development
DHS	Demographic and Health Survey
DORD	District Office of Rural Development
DRA	Demand Responsive Approach
DTW	Development Technology Workshop
ERM	Environmental Resources Management Ltd.
GRET	Group Recherche et Technologie
IDE	International Development Enterprise
ITC	Institut de Technologie du Cambodge
IRC	International Reference Centre for Water Supply & Sanitation, The Netherlands
IRITWG	Technical Working Group on Infrastructure and Regional Integration
KAP	Knowledge, Attitude and Practice
MDG	Millennium Development Goal
MEF	Ministry of Economy and Finance
MIME	Ministry of Industry Mines and Energy
MIREP	Mini Réseau d'Eau Potable
MoEYS	Ministry of Education, Youth & Sport
MoH	Ministry of Health
MOWRAM	Ministry of Water Resources and Meteorology
MRD	Ministry of Rural Development
NGO	Non-government organisation
NPRS	National Poverty Reduction Strategy
O&M	Operation and Maintenance
OPM	Oxford Policy Management
PAR	Participatory Action Research
PCB	Policy and Capacity Building Project
PDRD	Provincial Department of Rural Development
PMC	Project Management Committee
PLAN	PLAN International
PPTA	Project Preparation Technical Assistance (of ADB)
PRASAC	
PRDC	Provincial Rural Development Committee
PSCU	Policy and Strategy Coordination Unit
RGC	Royal Government of Cambodia
RWSS	Rural water supply and sanitation
SEACAP	South East Asia Community Access Programme (primarily funded by DFID)
SoS	Secretary of State
SSHE	School Sanitation and Hygiene Education
SSTA	Small Scale Technical Assistance (of ADB)
TSO	Technical Support Official
UNDG	United Nations Development Group
VLOM	Village Level Operation and Maintenance

WEDC	Water, Engineering and Development Centre, Loughborough University
WSP	Water and Sanitation Program
WSP-EAP	Water & Sanitation Program – East Asia & Pacific
WSUG	Water and Sanitation User Groups
WUG	Water User Group

Summary

The need for action

The development of rural water supply and sanitation in Cambodia is in crisis. At present up to 7 million people living in rural areas do not have adequate safe water supply. 11 million people defecate indiscriminately because they do not have a safe way to dispose of their excreta. Many of these 11 million people do not realise the risks of this practice to their health and the health of their families and neighbours – up to 20% of rural children under five may be suffering from diarrhoea, with a mortality rate from all causes of 126/1000 (National Institute of Statistics et al. 2001). The Government has given a commitment to meet the Cambodian Millennium Development Goals (CMDGs) but apart from that commitment there is little political will to make it happen, and the RWSS Sector does not have the institutional capacity or the finance to achieve these targets.

Economic benefits

Using data from a global study by WHO, it appears that there are potentially substantial benefits from investment in rural water supply and sanitation. The regional estimate of the cost benefit ratio (for urban and rural combined) for water supply alone is estimated at 8.17. For water supply and sanitation combined it is 11.04. This means that for every dollar invested, the economic benefit would be \$8 and \$11 respectively. Even the most pessimistic estimate of high costs and low benefits showed a positive cost-benefit ratio of 1.21 and 2.21 respectively. The results show that the benefits from every \$1 invested in sanitation would be \$23.48 (using mid-level values), with a range from \$11.09 in a pessimistic scenario to \$58.75 in an optimistic scenario.

While further study is needed to analyse the cost benefit ratios for rural water supply and rural sanitation in Cambodia, these initial figures demonstrate the substantial benefits that are possible, and should be used to advocate for more funding from both Government and donors.

Constraints

In common with many other developing countries, Cambodia faces a number of constraints. The UN MDG Task Force identifies these constraints in three broad categories: political, institutional and financial. According to the MDG Task Force, **political constraints** include:

- “political will – political leadership and government commitment to allocating sufficient national resources to the sector and to undertaking the reforms necessary to improve performance and attract investment”. In Cambodia an example of this is the Rectangular Strategy, in which neither domestic water supply nor sanitation are high priorities.
- Investments in water supply and sanitation are perceived as having lower returns than funds spent in other sectors”. In Cambodia the amount allocated to RWSS by the Ministry of Finance is very small and there is reliance on donors for all new investment
- Failure of technical specialists, civil society actors and others to make a compelling case to decision-makers, concerning the social and economic benefits of access to water supply and sanitation services”. In Cambodia this is shown by the lack of advocacy for RWSS when the National Poverty Reduction Strategy was produced, and at other times.

The MDG Task Force describes two types of **institutional constraints**:

- “The lack of appropriate institutions at all levels”. Cambodia does have appropriate institutions at national, provincial, district and commune level – MRD, PDRD, DORD, and commune councils respectively.

- “Chronic dysfunction of existing institutional arrangements: inadequate capacity, inappropriate incentives, lack of accountability, and absence of a sound regulatory system” The existing institutional arrangements in Cambodia are seriously dysfunctional, and are rooted in its recent history. The most critical aspect is probably Sector management and leadership. If this was active, many of the other problems facing the Sector would have been solved or would be in the process of being addressed. Capacity is another major factor at all levels. Together these constraints raise serious concerns about the absorptive capacity of MRD to manage substantial new funding for projects as well as discharging its responsibility for sector management.

The UN MDG Task Force describes several forms of **financial investment constraints**, including:

- “Poverty is a principal impediment to increasing access to services, from the household to the national level.” This certainly applies to Cambodia at all levels. It has made it particularly reliant on donor assistance and on the private sector for investment. While this may be reasonable for investment in new services, the inability to afford to sustain the operation and maintenance of services due to poverty has very serious implications.
- “Trends in official development assistance indicate that support for water supply and sanitation infrastructure is very modest, both in relation to support provided to the infrastructure sectors and in terms of what is necessary to meet the Millennium Development Goals for water and sanitation.” Cambodia has certainly been suffering from a shortage of donor funding to the RWSS Sector compared with the amount needed. Less than half the annual amount needed to reach the CMDGs in 2015 is currently being provided by donors.

In Cambodia, these constraints – political, institutional and financial – appear to form a vicious circle. Because of lack of interest and prioritisation at senior political level, donors are not encouraged to invest in the sector. Without funding, the Sector organisations cannot function effectively and efficiently, so they cannot engage the interest of political leaders. Poor management and performance also inhibits donors from supporting the Sector.

Achievements

A number of things have been achieved in the RWSS Sector in the past few years:

- From very low figures a decade ago, water supply coverage is now in the order of 30 – 40%, depending on the source of information. Sanitation coverage is much lower, but a start has been made.
- A National Policy for Water Supply and Sanitation, incorporating a Rural Water Supply and Sanitation Policy has been approved by the Council of Ministers
- A decentralised approach involving Commune Councils in rural water supply is being put into effect
- An Inter-Ministerial Coordinating Committee for Water Supply and Sanitation has been established, although it is not functioning effectively.
- The RWSS Sector Coordination Meeting chaired by MRD continues to meet regularly every month
- Funding from the ADB and JICA has been obtained
- A groundwater study has been conducted with support from JICA
- In sanitation, an “informed choice” approach has recently been developed, and several organisations have started the Community Led Total Sanitation approach
- Some implementation guidelines have been prepared for use by sector organisations.

Critical issues

The Review found that there are a number of critical issues facing the Sector. The following issues are considered to be the most critical for attaining the desired health and economic benefits for rural people through improved domestic water supplies and sanitation. Each is discussed in more depth in the main part of this report.

A. Sanitation and hygiene behaviour change

Sanitation coverage is lagging far behind water supply, both in absolute numbers and in the rate of implementation to increase coverage. It is closely related to hygiene behaviour, the use of latrines being one of the key indicators of safe hygiene practices. Both are very different to water supply in terms of implementation process, ownership, coverage and environmental and public health impact, so together they should be developed independently of water supplies (as well as being combined with water supplies in new integrated projects). **A strategy for sanitation and hygiene behaviour change is needed.**

B. Purpose of improved water supply

The purpose of improving domestic water supplies needs to be resolved in order to determine the most appropriate type of water supply service – **is it for health or for convenience?** Most people do not drink water from improved and protected groundwater sources because they do not like the taste. This raises a question about whether providing further, relatively expensive, safe water supplies is appropriate. There are two broad options – continue developing improved and protected sources but combine this with a major long-term campaign on the importance of safe water¹; or promote household water treatment and rainwater harvesting for safe drinking water and improve access to water for other domestic purposes but not to drinking water quality standards.

C. Operation and maintenance

The evidence in various reports and from the field work for this Review indicates that the assumption that communities can manage their own water supplies is not valid. This finding fits with international experience. **Communities need a support system** to ensure that management of operation and maintenance of water supply facilities is sustainable. With water supply services for 7 million people by 2015 and 16 million by 2025, the establishment and recurrent funding of a support system is becoming urgent.

D. Development of private sector capacity

The private sector in its various forms is seen as crucial to the development of sustainable water supply and sanitation services for rural people. Although development of private sector capacity is included in the National Policy for Water Supply and Sanitation, the few efforts to achieve this have not been sustained over the past few years. Concerted action is needed to **develop the skills, capacity and regulation of the private sector.**

E. Institutional capacity and performance

At present, Sector organisations do not have the capacity or the skills necessary to achieve the CMDGs. In particular, the **management of the sector by MRD needs to be strengthened** so that it can provide the positive leadership that is required. **The Sector needs the capacity to:**

- provide approximately 2.8 million people with water by 2015, and a further 9.6 million by 2025.
- provide community management and support systems to ensure that the water supplies keep functioning for 6.9 million people by 2015 and 16 million people by 2025.
- ensure that 600,000 households have and use latrines by 2015, and 2.5 million households by 2025, plus hygiene promotion.

¹ In cases where the non-acceptance is due to iron, other measures may be necessary.

F. Finance

To meet the CMDGs in 2015 estimates have been prepared based on MRD's 2005 Sector Investment Plan. These estimates require further work to validate the assumptions and costs used, but indicate that:

- Total investment cost of US\$116 million, or \$11.6 million annually, is needed, of which less than 50% is currently available
- Plus recurrent costs of US\$4.8 million annually

Thus, **there is a serious shortfall in the current funding** of capital development in the sector. In addition, the Government only provides a tiny fraction of the recurrent cost required for sustainability.

Recommendations and Potential Projects for Donor Support

The Review has identified a number of weaknesses and problems in the Sector that need further study or action to resolve. The following paragraphs summarise the recommendations and potential projects for donor support to address each of the six critical issues identified above. All the potential projects are at or contribute to the strategic level, and are in addition to the critical need for further programme support for implementation of service delivery. The potential projects are numbered according to the Section in which they appear, rather than in any order of priority. Figure 1 shows the context and level for each project by summarising the problems each is trying to address, and the way the problems link together.

A. Sanitation and hygiene behaviour change

Recommendation 3.2b

To address the scale of the task of overcoming the many constraints in tackling sanitation and to achieve significant progress towards achieving the CMDGs, MRD, the Ministry of Health and other relevant agencies should develop a stand alone strategy for sanitation and hygiene behaviour change.

Recommendation 3.3

MRD and MoH and other sanitation agencies should develop a generic list of appropriate tools and methods for sanitation promotion. With the variability of the factors likely to influence the uptake of sanitation, each sanitation project or intervention should study the context in which it is operating and adapt the most appropriate tools and methods for the specific location from this generic list.

Recommendation 3.4a

The Ministry of Education, Youth and Sport, in consultation with stakeholders, should develop a national standard for the number of school students per latrine. This should be defined separately for girls and boys.

Recommendation 4

All organisations should carry out baseline surveys of hygiene behaviour, including knowledge, attitudes and practice, at the start of a project or programme. Such surveys should not be limited to questionnaires, but should use a range of methods.

Potential Project 3.2: Sanitation and hygiene behaviour change strategy

A project for the development and implementation of a strategy for sanitation and hygiene behaviour change should include an analysis of the sub-sector. Although sanitation should be combined with water supply in new RWSS projects, a sanitation strategy should also be

independent because of the differences with water supply, and the very low coverage compared to water supply. The Project should include development of a strategy and implementation at a strategic level. It should not become involved in detailed implementation.

Potential Project 4: Promotion of hygiene behaviour change

This project would be a study of the effectiveness and impact of different approaches to promotion of hygiene behaviour change and sanitation promotion with reference to regional and international experience. The results of this should be used to develop a more strategic approach to hygiene behaviour change.

B. Purpose of improved water supply

Recommendation 5.1

Because of the confusion of different estimates of coverage, much of which arises out of the lack of definitions of access, the Government and sector organisations should formulate an official definition of access to rural water supply and sanitation services. The issue of multiple sources for different components of domestic demand would need to be addressed in a definition.

Recommendation 5.2

MRD and sector organisations should determine the data monitoring needs of the RWSS Sector, and establish appropriate systems to address these needs. All agencies working in the sector, PDRD, DORD, Commune Councils, NGOs, and private sector, should be obliged to report progress in coverage to MRD according to the systems developed.

Recommendation 7.6a

MIME and MRD, with the assistance of WHO, should review the *Drinking Water Quality Standards* and prioritise the most essential parameters for water safety in the context of rural areas.

Recommendation 7.6b

MRD should adopt the water safety framework approach for rural water supplies advocated by WHO and develop the systems, procedures and staff necessary.

Potential Project 5.2: Establishment and maintenance of coverage data monitoring

This project would address the considerable uncertainty concerning the data on the proportion of the population that has access to safe water supplies and sanitation. Establishing and maintaining accurate data would need careful design and planning, as it would involve substantial capacity development at provincial level to build a long term monitoring system, as well as integration with the database proposed as part of the ADB's Tonle Sap Rural Water Supply and Sanitation Project. It would also need commitment from the Government to finance the long term recurrent costs for running the system.

Potential Project 7.2: Development of alternative technologies

The ADB Tonle Sap RWSS Project has allocated US\$71,000 for the development of alternative technologies for difficult areas, but this amount is relatively modest and could usefully be supplemented by another donor to create a research project. The project should also explore alternatives to the groundwater solutions traditionally adopted in most areas of Cambodia. Suitable technologies may already be available in other parts of the world, so an extensive literature search, building on the survey of practical experience of Pickford (1995) should form part of the project.

Potential Project 7.6: Water safety framework and surveillance system

This project would establish a water safety framework for rural water supplies. While the establishment of the system (setting up procedures, training personnel, etc.) is fairly straightforward, the issue of long-term functioning and its recurrent running costs needs to be seriously considered. Unless the RGC is committed to prioritising the sector and providing the recurrent costs of an operational water quality monitoring system in perpetuity, establishment of the system will be a waste of investment.

C. Operation and maintenance

Recommendation 6.1a

MRD should develop a step-by-step process for implementation, operation and maintenance of rural water supply and sanitation services for sector-wide use. This should be based on the experience and existing practices of organisations in the Sector, and should draw on other examples, such as the Swiss NGO, Helvetas which produced *25 Steps to Safe Water and Sanitation* (published by SKAT in 2000), and Zambia's *Guidelines for Implementing Community Water Supply and Sanitation Projects in Rural Areas* (developed with support from WSP).

Recommendation 6.1b

MRD should establish an operation and maintenance support system to ensure that community management of operation and maintenance of rural water supply systems is sustainable in the long term. This should include support and training to Water and Sanitation User Groups and maintenance workers, supply chains for replacement parts for handpumps, and monitoring of the functioning of WSUGs and their water supplies.

Recommendation 6.2

MRD should monitor the siting of water points on public or private land in the long term to assess the impact in terms of access to the water supply for all members of the community and the functioning of the supply.

Recommendation 3.4b

The Ministry of Education, Youth and Sport, in consultation with stakeholders, should review the arrangements for managing school water supply and sanitation facilities. Based on this review, it should develop procedures for making agreements between the Ministry staff at local level, the school head teacher and teachers, and communities for management arrangements for the maintenance of facilities. This should include arrangements for monitoring the operation and maintenance.

Potential Project 6.1a: Implementation procedures to develop community management

The principle of community management of rural water supply systems is now well established in Cambodia, but there is no established process for achieving this end. This project would carry out a comparative evaluation of existing approaches to developing community management of RWSS services in Cambodia and a review of approaches internationally, leading to the development of national minimum standards for implementation procedures. This should be developed in coordination with the ADB's advisory team for the new Tonle Sap Rural Water Supply and Sanitation Project. These procedures should incorporate other community issues discussed in Section 6.

Potential Project 6.1b: Operation and maintenance support system

This project should encompass study of existing operation and maintenance in Cambodia, including community funding of O&M and supply chains, and international experience and thinking on maintenance support systems, leading to the design and establishment of a

support system for operation and maintenance either within existing structures or in new structures.

D. Development of private sector capacity

Potential Project 8.9: Enabling environment for private sector participation in RWSS

This project would address measures to provide support for increased private sector participation in RWSS, such as the reform of the enabling environment in which the private sector operates, and development of the capacity of the private sector through support to the Water Suppliers Association, including training and development of its capacity to become a self-regulating professional body, and support to other such associations.

E. Institutional capacity and performance

Recommendation 3.2a

Individuals with the ability to think, plan and manage at a strategic level need to be identified and appointed to positions of authority, and crucially, to be resourced and supported in these positions, to guide the sector strategically.

Recommendation 8.2

ADB and MRD should review and reduce the time allowed in the Tonle Sap Rural Drinking Water Supply and Sanitation Project for development of the strategy and implementation guidelines, so that these are available for use by the Project and other organisations as soon as possible.

Recommendation 8.3

Before finalising and promulgating the Water and Sanitation Law of the Kingdom of Cambodia (2004) (draft) MOWRAM, MIME and MRD should together review the Law so that it clearly specifies the urban and peri-urban responsibilities of MIME, the rural responsibilities of MRD and the overall water resource management responsibilities (in relation to water supply and sanitation) of MOWRAM. In particular, the responsibility for sanitation in small towns needs to be clearly allocated, and the range of technical solutions extended to include on-site options.

Recommendation 8.4

MRD should establish a working group to analyse the roles and responsibilities of the RWSS Sector, as listed in Table 8.1. The working group should recommend the allocation of each role or responsibility to the appropriate organisation in the Sector, including specifying the level/s at which the responsibility should be performed, taking into account decentralisation and de-concentration. A particular issue to resolve is the role of central MRD in relation to PDRDs and DORDs. If necessary, other relevant ministries should be involved in the recommendations. Based on the recommendations the Minister of Rural Development should publish a PRAKAS clearly defining the allocation and duties of all the roles and responsibilities.

Recommendation 8.6

MRD, with the Sector organisations, should be proactive in defining its own view of the most operationally effective decentralised structure for rural water supply and for sanitation, and promoting this, rather than waiting to see what is imposed on it.

Recommendation 8.7

MRD and donors supporting the RWSS Sector should establish a forum for ensuring consistent and coordinated support addressing the strategic needs of the Sector as well as investment in increasing sustainable service delivery coverage.

Recommendation 8.8

As part of its strategic role in sector management, MRD should determine the present capacity of all organisations working in the Sector, including the various types of private organisations. Based on this assessment it should prepare and implement a strategy for developing sufficient capacity in the Sector in order to meet the CMDGs and beyond, including links with and development of training organisations.

Recommendation 8.8b

MRD should explore the possibility of establishing a specialist training unit with a suitable training and research organisation to address the Sector's educational needs – technical, social and institutional. The unit should be supported by sector organisations in lecturing and giving students practical experience.

Potential Project 8.2: Capacity building RWSS strategy and guidelines

The ADB Tonle Sap RWSS Project includes a provision for the development of a strategy and guidelines for implementation processes, but this will only be a limited part-time task for the Project consultant team. ADB has indicated that additional support in the form of a technical advisor to the RWSS Strategic Unit in MRD would be valuable in order to build capacity for review and implementation of a comprehensive strategy and development of guidelines for project implementation processes.

Potential Project 8.8: Assessment of capacity of RWSS Sector and strategy for capacity development

An in-depth study is required to assist MRD to identify all the organisations in the Sector including private organisations or those that could contribute to the Sector and other related organisations, their personnel capacity and skills. This should be used to develop a strategy for development of Sector capacity needed to achieve the CMDGs.

Potential Project 8.10: Monitoring and information systems

There is a clear need for the development of effective monitoring and information systems, but there is a risk that, as soon as donor support ends, the systems stop working. Donor support for such systems should be dependent on a commitment from the RGC to provide the long term recurrent budget to maintain them.

F. Finance

Recommendation 5.5

MRD and Sector organisations should study the effectiveness of different community funding arrangements for operation and maintenance of water supply facilities, with specific reference to poverty and people's ability to raise and hold funds. This could be done as part of a wider study of O&M systems and support needs.

Recommendation 9.1

MRD and supporting donors should analyse the current costs of provision of services and based on these estimate the investment needed to reach the CMDGs and the Vision of full coverage.

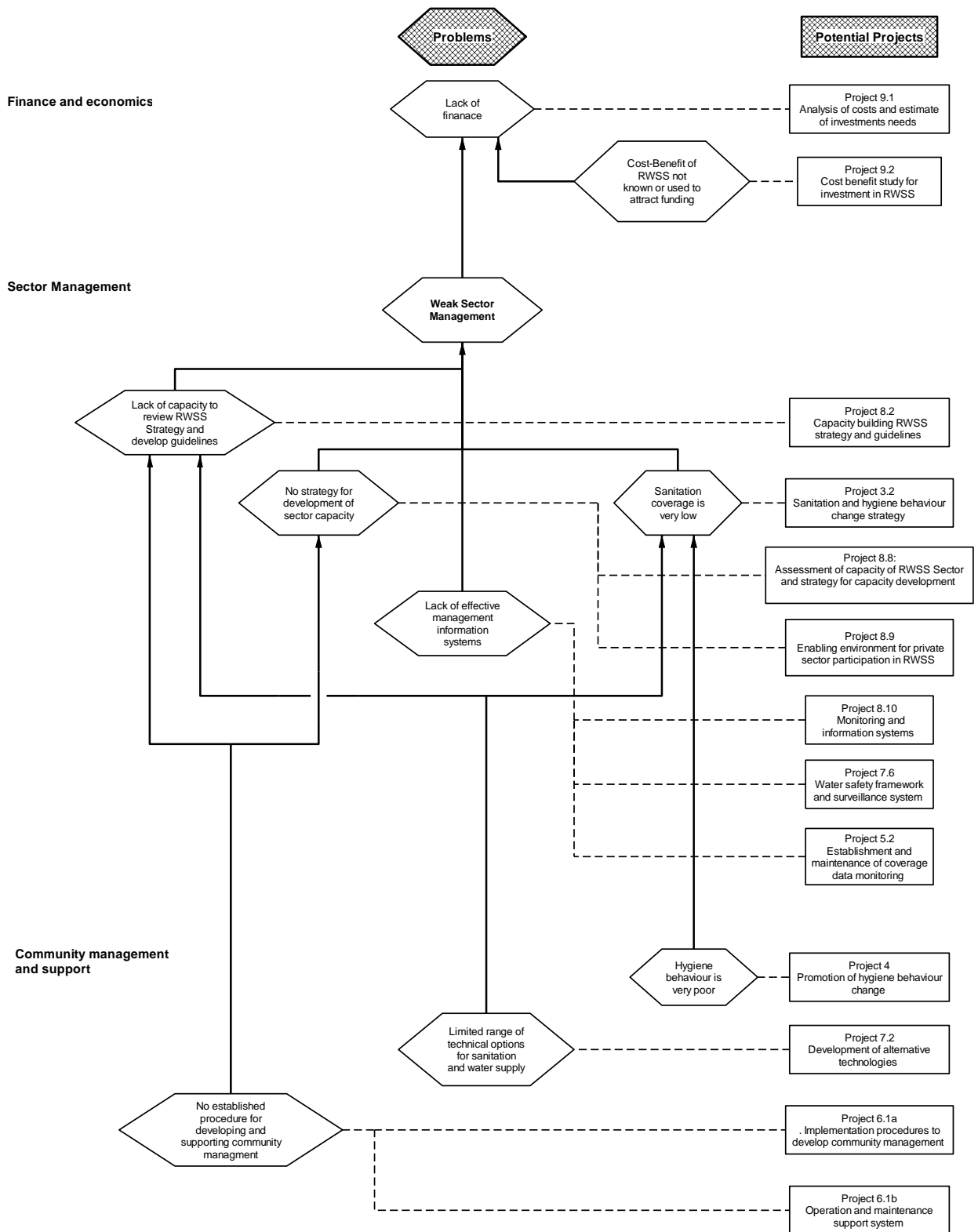
Potential Project 9.1: Analysis of costs and estimate of investments needs

This project would be a critical review of the Sector Investment Plan and its assumptions, a detailed study of the current capital costs of provision of service by the different types of organisation in the sector, and based on these, an estimate of the investment needs to reach the CMDGs and full coverage.

Potential Project 9.2: Cost benefit study for investment in RWSS

To strengthen the case to be used to advocate for increased investment in RWSS by both RGC and donors a cost-benefit study should be conducted specifically for rural water supply and rural sanitation.

Figure 1: Summary of Problems and Potential Projects



1 Introduction

1. This Review of the Rural Water Supply and Sanitation Sector was commissioned, as part of a wider project on infrastructure in Cambodia, by the British Department for International Development (DFID) under its South East Asia Community Access Programme (SEACAP) for research funding. It has been carried out, on behalf of the RWSS Water and Sanitation Sector Working Group², by Oxford Policy Management (OPM), a consulting company based in the UK.

2. The Review has been undertaken by a team consisting of:

David Stafford	Project Manager
Jeremy Ockelford	International Consultant and RWSS Specialist
Chhun Bunnarin	National RWSS Consultant
Ouch Phoumy	National Social Development Consultant

3. As some time had elapsed since the original Terms of Reference for the overall project had been prepared, DFID agreed that OPM should make a one-week inception visit in early July 2005 to determine exactly what was required in the RWSS sector. As a result of discussions with various people, including Secretaries of State in MRD, it was concluded that a full review of the RWSS Sector would be most valuable.

4. The Review was carried out as far as possible as a participatory process in four stages (each stage coinciding with a visit by the international RWSS expert). A Steering Committee was formed by the RWSS to guide the project team and has met during each visit. The four stages are:

- i. The main information gathering visit was conducted over four weeks in August and September 2005. The Review Team carried out a study of formal and grey literature and other forms of knowledge and experience; held a Special Meeting of the RWSS Sector Working Group; interviewed organisations and individuals at national level; made field visits to two provinces (Oddar Meanchey and Kompong Speu); interviewed organisations at provincial and district level; and visited a number of villages and talked with members of the commune councils, water user groups and individuals; and sent out a questionnaire to members of the RWSS Sector Working Group.
- ii. The findings of the literature study and field work were analysed and a Discussion Paper on Key Issues (October 2005) was produced in English and Khmer for consultation and use in the second stage. During a two week visit in November 2005 a major workshop was held with about 80 participants from national, provincial, and district levels of government and from donors, NGOs and others interested in the Sector, to reflect on the constraints and challenges and to develop solutions.
- iii. The results of the first two stages have been written up in the form of this draft Review Report for comments. In the third stage, the draft Review Report will be presented at a second workshop for discussion and comments.
- iv. The Review Report will be finalised in the light of the second workshop, and in the fourth stage there will be a final meeting to disseminate the findings to senior government staff and donors.

² This group is chaired by MRD and has representatives from its Departments of Rural Water Supply and Rural Health Care, and from UNICEF, WHO, WSP, international and national NGOs. It meets monthly.

1.1 *The nature of a review*

5. A review is a reflection of what is being done and what is being produced. This Review is based mainly on secondary evidence seen in a relatively short period: the policies, reports, studies and evaluations, and other documents provided to the reviewers. These have been supplemented by interviews with a number of people representing different agencies, and a relatively short field trip to gather primary evidence.

6. If the evidence is not produced or is not available, the review cannot form a view about something, other than draw conclusions about the absence of evidence. If there are other reports and studies available to support or refute the analyses presented in this draft Report of the Review, then please let us know about them.

7. There are also limitations of coverage of issues due to the limited time available for the review. It has not been possible to explore issues in as much depth as would be desirable. Indications of where further study would be beneficial is indicated.

1.2 *Definition of Sector*

8. For the purposes of this Review, the Sector includes all those organisations, groups and people with an interest in water supplies and sanitation in rural areas, including small towns where appropriate: government departments at central, provincial and district levels; multi-lateral and bilateral donors; UN organisations, international and national NGOs; private sector (from national companies to local artisans and entrepreneurs providing services, materials and equipment from drilling to water system operators); commune councils; and the users of the water supply and sanitation services, the communities and households themselves.

9. The Review is limited to rural areas under the mandate of MRD. It does not cover piped water supplies in small towns under the mandate of MIME. Development of sanitation in those small towns, however, is not covered by MRD so is assumed to be the responsibility of MRD. Another grey area is the peri-urban fringes of major cities – rural areas previously served by rural type supplies which are becoming urbanised.

10. There is a risk in using the term “sector”, as it implies a common purpose. With such a wide range of organisations and people, there are bound to be different interests and objectives.

2 Overview

11. The development of rural water supply and sanitation in Cambodia is in crisis. At present up to 7 million people living in rural areas do not have adequate safe water supply. 11 million people defecate indiscriminately because they do not have a safe way to dispose of their excreta. Many of these 11 million people do not realise the risks of this practice to their health and the health of their families and neighbours – up to 20% of rural children under five may be suffering from diarrhea, with a mortality rate from all causes of 126/1000 (National Institute of Statistics et al. 2001). The Government has given a commitment to meet the Cambodian Millennium Development Goals (CMDGs) but apart from that commitment there is little political will to make it happen, and the RWSS Sector does not have the institutional capacity or the finance to achieve these targets.

2.1 Constraints

12. Cambodia is not alone in this respect. In its recent report, *Health, Dignity, and Development: What Will It Take?*, the UN Millennium Project Task Force on Water and Sanitation explored the question of what will it take to expand water supply and sanitation coverage dramatically and sustainably. As the Task Force says: “To understand how to move forward to meet the Millennium Development Goals, it is first necessary to understand the obstacles that have constrained progress. Clearly, the explanations vary across communities, countries, and regions, but a common set of political, financial, institutional, and technical challenges confronts most developing countries in their quest to expand water supply and sanitation services”. (UN MDG Task Force 2005) Many of these challenges apply to Cambodia. The fact that Cambodia has these constraints in common with other countries should not be a reason for complacency.

13. The UN MDG Task Force identifies the constraints in three broad categories: political, institutional and financial.

Political constraints

14. There are three aspects to political constraints:

- “One of the chief constraints to expanding water supply and sanitation coverage is the lack of political will, by which we mean an absence of political leadership and government commitment to allocating sufficient national resources to the sector and to undertaking the reforms necessary to improve performance and attract investment”. (UN MDG Task Force 2005)

15. In Cambodia, the Rectangular Strategy sets the priorities. In the hierarchy of the “growth rectangles”, clean and safe water supply and “freeing the nation from water-related diseases” feature as items under Side 2: Water Resources and Irrigation System Management, of Rectangle II: Further Rehabilitation and Construction of Physical Infrastructure. “Sanitation education and information” come under Rectangle IV: Capacity Building and Human Resources Development, Side 2: Ensuring Enhanced Health Services. (RGC 2004) Thus, neither water supply nor sanitation are given top priority, with domestic water supply coming after water for agriculture.

- “For decision-makers in finance ministries, for example, investments in water supply and sanitation are perceived as having lower returns than funds spent in other sectors (for example, on roads or energy).” (UN MDG Task Force 2005)

16. The amount allocated to the Sector in Cambodia by the Ministry of Finance is very small. For example, each province was given R200 million (about US\$10,000) in 2005 for maintenance of broken wells. The government relies on donors for all new investment.

17. An international evaluation of the costs and benefits of investment in water supply and sanitation shows that, in the South East Asia Region for the urban and rural sectors combined, the cost-benefit ratio for water supply alone is estimated at 8.17. For water supply and sanitation combined it is 11.04 (Hutton and Haller 2004). This means that for every dollar invested, the economic benefit would be \$8 and \$11 respectively. A further study on sanitation in Cambodia shows that the benefits from every \$1 invested in sanitation would be \$23 (using mid-level values), with a range from \$11 in a pessimistic scenario to \$58 in an optimistic scenario. An estimate of the societal economic cost of 'doing nothing' between 2000 and 2015 is US\$2,243 million. (Environmental Resources Management 2005)

- "Another reason is the failure of technical specialists, civil society actors and others to make a compelling case to decision-makers, concerning the social and economic benefits of access to water supply and sanitation services". (UN MDG Task Force 2005)

18. As noted by Environmental Resources Management, the NGO Forum has few NGO members with an interest in water and sanitation, so no comments were made by it when the National Poverty Reduction Strategy was produced, or at other times (Environmental Resources Management 2005). None of the Forum's advocacy projects is directly related to water supply or sanitation.

Institutional constraints

19. The Task Force describes two types of institutional constraints:

- "The lack of appropriate institutions at all levels: at the community level, potential users of services are often constrained by the absence or underutilization of institutions to facilitate collective or individual action." (UN MDG Task Force 2005)

20. Cambodia does have appropriate institutions at national, provincial, district and commune level – MRD, PDRD, DORD, and commune councils respectively.

- "Chronic dysfunction of existing institutional arrangements: among existing institutions involved in the extension, operation, and maintenance of water supply and sanitation services – including formal organizations such as utilities and local governments, less formal associations such as village committees, and principles or practices such as laws, regulations, and customs – persistent problems at the heart of constraints to expanding access to service include inadequate capacity, inappropriate incentives, lack of accountability, and absence of a sound regulatory system." (UN MDG Task Force 2005)

21. The existing institutional arrangements in Cambodia are seriously dysfunctional, and are rooted in its recent history. They are described in detail in Section 8: Institutional. The most critical aspect is probably Sector management and leadership. If this was active, many of the other problems facing the Sector would have been solved or would be in the process of being addressed. Capacity is another major factor at all levels. Together these constraints raise serious concerns about the absorptive capacity of MRD to manage substantial new funding for projects as well as discharging its responsibility for sector management.

Financial constraints

22. “While institutional reform is often necessary for the expansion of access to water supply and sanitation, it is often not sufficient. Financial investment is also required, whether from national or sub-national government tax revenues; user charges; cross-subsidies from users who can afford to pay; private-sector investment; or official development assistance” (UN MDG Task Force 2005). The UN MDG Task Force describes constraints to each of these forms of financial investment:

- “Poverty is a principal impediment to increasing access to services, from the household to the national level. Within communities, some households simply cannot afford the costs of improved services without assistance from other families or from the state. Many poor countries simply do not have the financial resources either to provide water services to all or to sustain their operation.” (UN MDG Task Force 2005)

23. Poverty at all levels certainly applies to Cambodia. This has made Cambodia particularly reliant on donor assistance and on the private sector for investment. While this may be reasonable for investment in new services, the inability to afford to sustain the operation and maintenance of services due to poverty has very serious implications.

- “In some countries, governments have been reducing investment in water supply and sanitation with the hope that private-sector investments will fill the gap. Recent evidence suggests that this expectation is often overly optimistic; annual private-sector investment in water supply and sanitation for developing countries has continued to decline each year since its peak in 1997. (UN MDG Task Force 2005)

24. The expectation that the private sector will provide finance is less applicable to the rural sector than the urban sector. There are, however, some examples in small rural towns of private sector investment in piped water systems.

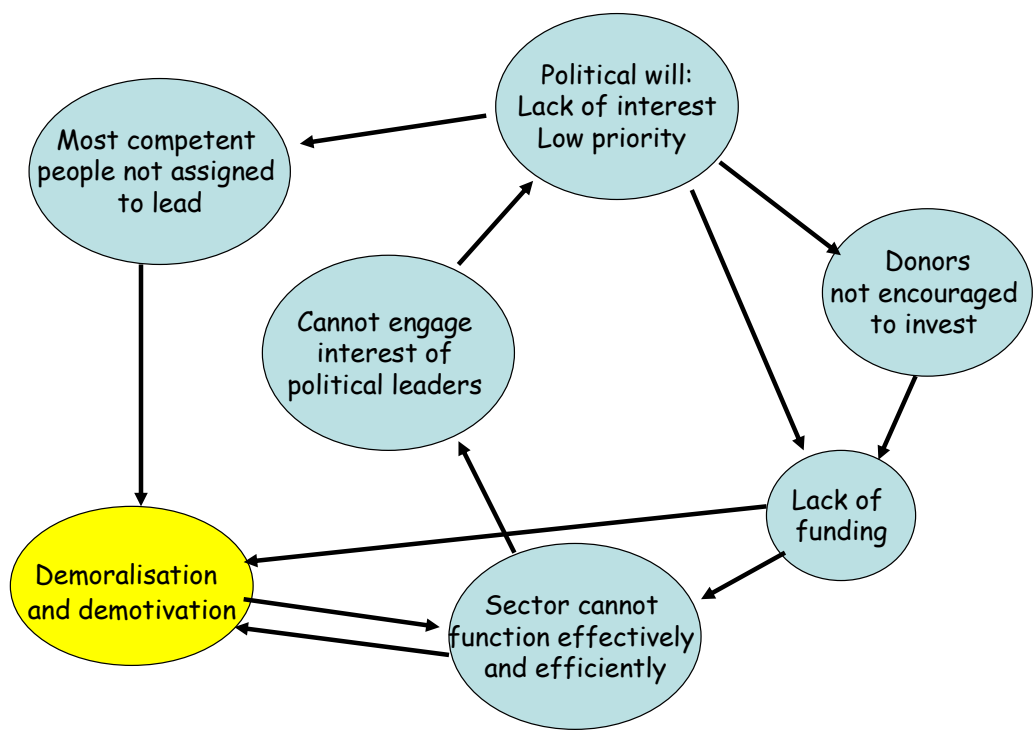
- “Trends in official development assistance indicate that support for water supply and sanitation infrastructure is very modest, both in relation to support provided to the infrastructure sectors and in terms of what is necessary to meet the Millennium Development Goals for water and sanitation.” (UN MDG Task Force 2005)

25. Cambodia has certainly been suffering from a shortage of donor funding to the RWSS Sector compared with the amount needed. As discussed in Section 9: Finance, less than half the annual amount needed to reach the CMDGs in 2015 is currently being provided by donors.

Interaction of constraints

26. In Cambodia, these constraints – political, institutional and financial – appear to form a vicious circle. Because of lack of interest and prioritisation at senior political level, donors are not encouraged to invest in the sector. Without funding, the Sector organisations cannot function effectively and efficiently, so they cannot engage the interest of political leaders. Poor management and performance also inhibits donors from supporting the Sector.

Interaction of constraints



27. Within this circle, there are other links. Because rural water supply and sanitation are not priorities or of interest, the political appointments system for senior ministry officials means that the most competent people are not assigned to lead the Sector. The lack of an inspirational leadership, combined with lack of finance, results in demoralisation and demotivation of people throughout the Sector. If people at the top do not care, why should a junior official receiving a token salary?

28. The challenge for Sector stakeholders is how to break this vicious circle. Funding is probably the most critical need – without finance the Sector cannot perform. Somehow all the organisations in the Sector have to convince donors and the political leadership of the country that if they are given the money, they can overcome the many problems discussed in this Review and produce the performance to justify the investment.

29. The Review identifies, for support by donors, a number of potential projects that would contribute to changing performance. These are highlighted in the Report in the relevant sections, and listed in after the Summary.

3 Sanitation

3.1 Definition

30. Sanitation is not defined in the *National Policy on Water and Sanitation*. Part 2: Urban Sanitation Policy concentrates on sanitation infrastructure, while Part 3: Rural Water Supply and Sanitation Policy refers in the Sector Vision to “sanitation services” and “hygienic environment” (RGC 2003). There is no explanation of what these terms cover. The earlier Policy Framework³ defined sanitation as “Management and disposal of human urine, excreta and domestic waste water” (MRD 2001). More recently, but unofficially, rural sanitation has been defined to include “not only building the sanitary facilities but more importantly hygiene promotion, behavioural changes, community mobilization for self-motivation and active participation in building a safe environment.” (MRD 2005)

3.2 Strategic level sanitation

31. For its report, *Meeting the Water and Sanitation Millennium Development Goal*⁴, ERM prepared a special annex addressing sanitation. This identified one of the biggest constraints to improvement in sanitation:

“At a global level, with a few exceptions, there is an overwhelming lack of political commitment to sanitation. This sentiment was reflected in the recently launched UN Millennium Project Task Force on Water and Sanitation Report. The Task Force identified 10 critical actions for achieving the water and sanitation target. Of particular relevance to this paper was the first action:

Action 1. Governments and other stakeholders must move the sanitation crisis to the top of the agenda.”

(Environmental Resources Management 2005)

32. This lack of political commitment is recognised as a problem, and has been successfully addressed in a number of countries through ministerial sanitation meetings such as Africasan 2002 and Sacosan 2003 (in South Asia). A similar meeting for East Asia is being planned for March 2007 in Beijing, with participation by Cambodia.

33. Thus, Cambodia is not unique in the lack of attention to sanitation at a senior political level. The lack of attention is reflected in the struggling performance of the sub-sector, with coverage figures for access to sanitation facilities varying geographically from almost zero to 16%. ADB noted that “The very low level of sanitation awareness in rural Cambodia is a hindrance for the development of good sanitation practices and the improvement of public and household sanitation infrastructure” (ADB 2005). This point is about rural people’s lack of awareness, but, as ERM points out, it can also be applied to the national Government level, considering the very low priority accorded to sanitation. The present practice of running a two day sanitation campaign each year, albeit supported by other ad hoc events on a limited budget, is not sufficient for sanitation promotion at a national level. This event may be more effective if it is used to address the lack of political will.

³ produced as part of the Policy and Capacity Building Project, implemented by MRD, WSP-EAP and BURGEAP with financial support from SIDA and AFD.

⁴ This study covering six countries in Asia and Africa was commissioned by DFID to investigate and the common characteristics of countries likely to meet the MDGs and countries likely to fail, and to draw lessons to help improve progress by the latter.

34. The low priority is also shown by the fact that there is no separate national policy on sanitation. Combining it with water supply in the National RWSS Policy may be a contributory factor to the low priority. It is now being recognised that “sanitation policy is more likely to have an impact if it stands alone rather than forming part of a combined water and sanitation policy” (WEDC 2005). “A combined policy can take account of the strong links between water, sanitation and health. Unfortunately, the institutional requirements of water supply and sanitation may be very different, particularly where most sanitation facilities are ‘on-plot’. Most combined policies focus on water supply and deal with sanitation in a rather perfunctory way” (WEDC 2005). This is certainly true of Cambodia’s National RWSS Policy. In the rural section of the Policy, every reference is to water supply and sanitation, never to sanitation alone, even though the requirements are different. This point is also true of many other reports and studies in the Sector.

35. The major problem with combining water supply with sanitation is that they are so different:

- The starting points are very different: there is already substantial water supply coverage together with priority demand for it, whereas sanitation has very low coverage and very little natural demand.
- The product is different: water supplies are generally developed as a community managed and owned facility, whereas sanitation is owned and managed at household level.
- The process is different: people demand water supply services and implementation is based on developing community management skills with up to 100% subsidy of the capital cost; whereas with little demand for sanitation, there have to be major efforts in promotion, social marketing and financial arrangements with limited subsidy.
- The environmental and public health impacts are different. Drinking water from an unimproved source only affects the individual, whereas indiscriminate defecation can affect the health of everyone living or working in the neighbourhood.

36. At a Sanitation Meeting in May 2005, the major challenge of sanitation was posed as follows:

“It’s obvious that the level of effort and investment required to achieve the MDGs or the Sector Vision for rural sanitation will be enormous. ... How will sector professionals, government, donors, and the private sector meet these challenges? At our current rate of progress, it seems highly unlikely that we will achieve either sector goal. It is clear that the pace of rural sanitation programs must increase dramatically; that rural sanitation programs must become more cost effective and sustainable; and that more human and financial resources must be brought to bear on the effort – both from public and international agencies, as well as from private sources.” (MRD 2005)

37. The plenary discussion at this meeting on issues, problems and potential solutions did not really live up to this challenge. The problems and solutions are concerned with detail rather than addressing the fundamental issues. The inability to address the broader strategic level appears to be common to other meetings on sanitation. A National Workshop on School Health organised by the Ministry of Education, Youth and Sport in 2004 (School Health Department 2004) posed a number of strategic questions but again, the results were mainly on detail. It did not result in a clear strategy to move things forward.

38. This highlights a challenge within the challenge of sanitation. Although sector professionals recognise the size of the task, it seems that generally they do not have the vision, skills or experience to deal with it strategically. They are much more comfortable working at the detailed level.

Recommendation 3.2a

Individuals with the ability to think, plan and manage at a strategic level need to be identified and appointed to positions of authority, and crucially, to be resourced and supported in these positions, to guide the sector strategically.

Recommendation 3.2b

To address the scale of the task of overcoming the many constraints in tackling sanitation and to achieve significant progress towards achieving the CMDGs, MRD, the Ministry of Health and other relevant agencies should develop a stand alone strategy for sanitation and hygiene behaviour change.

39. The development of a strategy will need to address a number of critical issues:

- As already mentioned, the level of awareness in rural areas is very low, with few people aware of the relation between good sanitation practices and improved health. Very few people use latrines, regularly clean water jars, treat water for drinking or use soap when washing hands (ADB 2005).
- From discussions and project experiences, communities always consider sanitation a very low priority in needs assessment processes (MRD 2005), although one exception to this is Concern's community led total sanitation project in two villages (which shows the potential). Within communities, it is important to distinguish priority by gender – women are likely to put it as a higher priority than men.
- As WSP-EAP has found, demand for sanitation grows when people can see and experience its benefits before investing in it. Initial negative experiences with sanitation can kill demand. Projects need to invest in ensuring that people's first experiences are positive. To do this, local motivating factors, which are diverse and not always predictable, need to be considered and catered to. (WSP-EAP 2002)
- The problem of lack of understanding at national level of the importance of sanitation needs to be overcome. At present, as MRD points out, "many policy decision makers and political leaderships rarely recognize the role of rural sanitation and its importance to the National development. Many people including some political leadership and policy makers still consider that rural sanitation is merely construction of toilets, which is placed as individual household responsibility." (MRD 2005) The challenge is how to change this attitude and understanding so that sanitation development is properly supported and adequately funded. Part of the argument will come from demonstrating the economic benefits of investing in sanitation, as discussed in Section 9.2 and proposed in Potential Project 9.2.
- The capacity of the sub-sector is very limited. Most of the rural sanitation programs are focused on a few districts in one province or a small number of provinces, and have relatively modest targets in terms of coverage/access (Rosenboom 2005). Only a few organisations are interested at national level, and they are constrained by funding, staffing or other priorities.
- A uniform approach on subsidies needs to be developed. At present subsidies range from zero to \$100 per family for household latrines (Rosenboom 2005).
- The recently developed *Informed Choice Manual on Rural Household Latrine Selection* will be a critical component of the strategy.

Potential Project 3.2: Sanitation and hygiene behaviour change strategy

A project for the development and implementation of a strategy for sanitation and hygiene behaviour change should include an analysis of the sub-sector. Although

sanitation should be combined with water supply in new RWSS projects, a sanitation strategy should also be independent because of the differences with water supply, and the very low coverage compared to water supply. The Project should include development of a strategy and implementation at a strategic level. It should not become involved in detailed implementation.

3.3 Sanitation promotion

40. The study by the Water and Sanitation Program – East Asia and Pacific, *Learning What Works for Sanitation: Revisiting Sanitation Successes in Cambodia*, will be an important resource for developing practical approaches for sanitation promotion. In particular, some of the motivating factors for people to obtain latrines are worth noting. These include:

- prior exposure to and positive experience of using a latrine (such as visits to urban areas; use of latrines in the Thai-Cambodian border refugee camps; seeing neighbours' practice)
- ease of getting sanitation construction materials and skills
- lack of forest cover and rice fields inhibiting open defecation practices
- awareness of hygiene
- privacy, security and ease, particularly for women.

(WSP-EAP 2002) (Bhandari et al. 2004)

41. As WSP-EAP notes, however, "At any given time a number of influencing factors are likely to be operating, singly or in combination. The results seem to suggest that there was no single, strongly motivating factor for sanitation improvements in all the communities, and that certain situation-specific facilitating conditions tend to interact with existing motivating factors to produce a resultant level of demand. The implication is that generating demand for sanitation and scaling it up will call for careful exploratory research and strategic promotion." (WSP-EAP 2002)

Recommendation 3.3

MRD and MoH and other sanitation agencies should develop a generic list of appropriate tools and methods for sanitation promotion. With the variability of the factors likely to influence the uptake of sanitation, each sanitation project or intervention should study the context in which it is operating and adapt the most appropriate tools and methods for the specific location from this generic list.

3.4 School sanitation

42. The following three quotations introduce the importance of school sanitation and hygiene education.

"School Sanitation and Hygiene Education (SSHE) is a very attractive issue not only from the political but also from a social perspective. It is based on the premise that children have a right to basic facilities such as school toilets, safe drinking water clean surroundings and information on hygiene. If these conditions are created, children come to school, enjoy learning, learn better and take back to their families concepts and practices on sanitation and hygiene. In this way, investment in education is more productive. Such conditions have an even greater positive

outcome for girls who often stay away from or drop out of schools which do not have toilet facilities.” (Snel 2003)

“SSHE refers to the combination of hardware and software components that are necessary to produce a healthy school environment and to develop or support safe hygiene behaviours. The hardware components include drinking water, handwashing and sanitary facilities in and around the school compound. The software components are the activities that promote conditions at school and practices of school staff and children that help to prevent water and sanitation-related diseases.” (Torres et al. 2002)

“School performance and school attendance has been co-related to worm infections as reflected in some studies. It was found that children with worm infestation tended to be more frequently absent from school. Another study reflected that after deworming, many pupils showed considerable improvement in growth and educational development.” (Torres et al. 2002)

43. There have been several initiatives to promote and establish school sanitation in Cambodia in recent years including a national workshop for FRESH (Focusing Resources on Effective School Health) organised by the School Health Department of the Ministry of Education, Youth and Sport in 2004. Meetings were also held in October and November 2005. Although the FRESH Workshop proposed a number of actions including a call for a national policy, and a list of points that could form the basis of a strategy, it does not appear that the initiative has progressed much.

44. Apart from the need for water supply and sanitation facilities in schools, one of the arguments used to support school sanitation programmes is that by influencing children, they will take the hygiene behaviour messages home and in turn influence their families to adopt safe practices. This may well be true, but it should also be remembered that such messages do not reach children who do not attend school (and their families). In their study in Siem Reap, Bhandari *et al.* found that primary school non-attendance by school-age-going children ranged from 10 to 25%. This means that up to a quarter of the children in an area will not receive the hygiene promotion messages, as well as jeopardising their chances of becoming literate. These children are often the poorest. Two of the reasons for non-attendance are that they have to help with manual labour to augment family incomes, and the cost of stationery and school clothes is unaffordable (Bhandari et al. 2004).

45. The facilities themselves, or lack of them, are also an inhibiting factor for school attendance, especially for secondary school age girls. Bhandari *et al.* found that 11 out of 36 primary schools (30%) in 2 districts had no toilets. In a survey of 78 schools in four provinces CfD found nearly 18% of schools had no sanitation facilities, and that even in schools with facilities, many were not functioning. Overall it found that less than 20% had properly functioning facilities. (Feldman 2005)

46. Some of the reasons for school latrines not functioning include (Feldman 2005):

- Flush toilet design when there is no water supply or the water point is too far away for easy access or the well goes dry seasonally
- Emptying of pits has not been done at many (or perhaps any) school latrines to date.⁵
- There is usually very little or no participation by school management, students, or communities in the design, construction or management of school latrines.

⁵ Some of these latrines are even now being replaced with new ones, although other schools have no facilities at all.

- There has been insufficient attention paid to building capacity at the schools to maintain and manage sanitation facilities.
- There is usually little follow-up from projects or local authorities after the facilities are built.

47. A potential project for development for technology options is given in Section 7.2

48. Another problem is the number of facilities provided for a school. The number of individual toilets at schools has tended to be below that called for by international guidelines or recommendations (which range between 20 to 50 students per toilet, depending on various factors). Many school buildings have two toilets regardless of the number of students. (Feldman 2005) Bhandari *et al.* found the number of students per toilet ranges from 61 to 385.

Recommendation 3.4a

The Ministry of Education, Youth and Sport, in consultation with stakeholders, should develop a national standard for the number of school students per latrine. This should be defined separately for girls and boys.

49. As with community water supply and sanitation, the literature on SSHE emphasises the importance of integrating hardware and software and involving all stakeholders – children, teachers and head-teachers, community and government. Coordination is happening to some extent at national level but it is not clear how much coordination and integration there is at local level and in schools. For example, the Project Information Documents for the Education Sector Support Project funded by World Bank lists components including school construction, removal of barriers to access to education through scholarships for disadvantaged children, and improving quality of education service delivery, but does not indicate how these work together. It does, however, attempt to form partnerships for teaching and learning at lower levels and bring communities into school planning (World Bank 2004). Until recently, the construction component of the project appears to have been working independently of the RWSS Sector.

Recommendation 3.4b

The Ministry of Education, Youth and Sport, in consultation with stakeholders, should review the arrangements for managing school water supply and sanitation facilities. Based on this review, it should develop procedures for making agreements between the Ministry staff at local level, the school head teacher and teachers, and communities for management arrangements for the maintenance of facilities. This should include arrangements for monitoring the operation and maintenance.

3.5 Waste water and solid waste

50. Although considered part of sanitation, there is little mention of waste water or solid waste disposal in the various studies and reports. This means that either they are not environmental problems or they are problems but are not addressed. From observation by the Review Team during the field work, both are problems but only in a few places. Some water points have poor drainage with waste water ponding. At some wells waste material such as soap packets, plastic bags and other rubbish were lying around. From a survey of wells in Poipet, Tracey (2003) found a correlation between bacteriologically contaminated water and waste water lying around the water point. A KAP survey by ZOA reported that 83% of people dispose of solid waste by burning or burying, compared with 35% by dumping

or not collecting⁶ (though this finding was based on a questionnaire but not confirmed by observation) (ZOA 2003).

⁶ The total for all methods is more than 100% because multiple answers were allowed.

4 Hygiene behaviour change

51. Water use education and hygiene education were first introduced in Cambodia in 1993, and are now part of most rural water supply and sanitation projects.

52. It is difficult to assess the effectiveness and impact of the project activities that are trying to promote hygiene behaviour change. There are few baseline surveys against which to measure change, and only one knowledge, attitudes and practice (KAP) survey was seen as part of this Review. The surveys are limited in scope, in that most are based on questionnaires without observation. The results, therefore, are an indication of people's knowledge and to some extent their attitudes, but not necessarily their practices. The surveys, however, do indicate that some change is being achieved:

- On water use, Johnston found in a survey for the Seth Koma Program that in project villages more people were likely to use safe sources for drinking than in control villages (Johnston 2003). In contrast, Tracey, in a study for ZOA in Oddar Meanchay, found most people continued to use traditional sources for drinking rather than improved sources, mainly on grounds of taste (Tracey 2003).
- On latrine ownership, Johnston (2003) found no significant differences between the Seth Koma Program and the control areas, and also no difference in use of latrines, and concluded "despite the reported high rate of trainings in latrine construction and hygiene, access to and use of latrines is still uncommon in all areas". Another survey (for MRD) found that latrine usage tends to be much higher during the rainy season compared to the dry season (WSSCS 2004)
- With hygiene knowledge, the results are more difficult to interpret, as indicators such as latrine ownership are very influenced by poverty. Thus, one study (for PLAN International in Siem Reap) found that despite their awareness about hygiene, a group of women were unable to afford digging of pit latrines (Bhandari et al. 2004). The same study also found that sanitation and hygiene issues are very low priority for rural people. Another survey (in Oddar Meanchey) found confusion over drinking water related disease, with a quarter to a third of people attributing malaria and dengue to drinking water, as well as, correctly, half knowing that it can cause diarrhoea (ZOA 2003).

Recommendation 4

All organisations should carry out baseline surveys of hygiene behaviour, including knowledge, attitudes and practice, at the start of a project or programme. Such surveys should not be limited to questionnaires, but should use a range of methods.

53. Different organisations have used different methods for promoting hygiene behaviour change. Although most are based on participatory approaches, it is not clear whether these methods are always followed at village level. The terms commonly used in Cambodia are "water use education" and "hygiene education". Education implies a rather formal and didactic process that people experienced at school. It may influence the teacher at community level to adopt similar methods, whereas training adults should be a very different process. The translation of these terms into Khmer needs care in order to orientate community level staff into adult training rather than school based teaching methods.

54. MRD promotes the use of the PHAST Approach – Participatory Hygiene and Sanitation Transformation. The PHAST method (Wood et al. 1998) has seven steps, each entailing at least one visit to the village during which only a limited number of villagers can be involved. This means that each step has to be repeated several times in a village to reach a wider audience than just the Water User Group (WUG). It can take up to six months of work with one village, depending on the time people have available, so it is not clear if MRD is promoting this full process or just a few tools from the approach. "The PHAST

approach helps people to feel more confident about themselves and their ability to take action and make improvements in their communities. Feelings of empowerment and personal growth are as important as the physical changes, such as cleaning up the environment or building latrines.” (Wood et al. 1998) GAA is using the PHAST approach for its project in Ratanakiri.

55. Following the experience of Concern in developing community led total sanitation (CLTS) in two villages, now expanded to five, MRD supported by UNICEF started work in 2006 on CLTS in 60 villages. PLAN International is also started CLTS in 4 villages in 2006. Kar and Pasteur describe the potential for scaling up CLTS but with an important note of caution, that “the approach can be replicated with relative ease and at low cost as long as the quality of facilitation is maintained” (Kar and Pasteur 2005).

56. As different agencies have used different approaches or similar approaches with different emphasis, it is not known what is most effective in Cambodia. The results quoted above are mixed.

Potential Project 4: Promotion of hygiene behaviour change

This project for support by a donor would be a study of the effectiveness and impact of different approaches to promotion of hygiene behaviour change and sanitation promotion with reference to regional and international experience. The results of this should be used to develop a more strategic approach to hygiene behaviour change.

57. MRD runs a one or two day hygiene and sanitation event annually. It has to be called an event rather than a campaign, because a campaign means a much more concerted set of actions over a period of time to produce an objectified change. The effectiveness of a one-off event once a year for changing hygiene behaviour at an individual level is seriously questionable. People are subject to so much information in their lives that by the next day, most of it is forgotten. How many of us would have learned to read if we had just been told once a year that it is an important and useful skill? It actually takes several years of teaching by skilled teachers. It may be more useful to use such an annual event to address change in political perceptions and priorities for hygiene behaviour.

5 Access to water supply and sanitation facilities

5.1 Definitions

58. The RWSS Sector Vision in the *National Policy on Water Supply and Sanitation* states that: "Every person in rural communities has sustained access to rural water supply and sanitation services" Apart from being "safe", there is no other explanation or definition of the Vision – for example, what access and services mean in practical terms.

59. Internationally, the Global Water Supply and Sanitation Assessment 2000 Report established definitions that have become generally accepted for the purposes of monitoring coverage. Access to water supply and sanitation were defined in terms of the types of technology and levels of service afforded:

- For water, this included house connections, public standpipes, boreholes with handpumps, protected dug wells, protected springs and rainwater collection; allowance was also made for other locally-defined technologies.
- "Reasonable access" was broadly defined as the availability of at least 20 litres per person per day from a source within one kilometre of the user's dwelling.
- Types of source that did not give reasonable and ready access to water for domestic hygiene purposes, such as tanker trucks and bottled water, were not included.
- Sanitation was defined to include connection to a sewer or septic tank system, pour-flush latrine, simple pit or ventilated improved pit latrine, again with allowance for acceptable local technologies. The excreta disposal system was considered adequate if it was private or shared (but not public) and if it hygienically separated human excreta from human contact.

(WHO 2000)

60. The Global Water Supply and Sanitation Assessment 2000 Report does not include in its range of acceptable technologies household level treatment systems, some of which have been proven to produce safe water (Roberts 2003) and are becoming widely adopted in Cambodia. The issue of how to assess systems that provide the partial supply of the drinking water component of the total domestic need also needs to be considered.

61. For monitoring the MDGs, UNDG notes that "access and volume of drinking water are difficult to measure and so sources of drinking water that are thought to provide safe water are used as a proxy". (UNDG 2003)

62. For water supply, basically there are three criteria for a definition: quantity of water, quality of water, and distance to source. In Cambodia, access is only defined in terms of quality; quantity and how far people have to go to collect the water are missing. In the absence of any official definitions in Cambodia, organisations have tended to make their own or adopt those of others. For example, the EU's PRASAC Project set the maximum walking distance to a water point as 150m, based on the observation that people continue to use their traditional sources if distances to improved sources are too far (PCB Project 2000).

63. The minimum quantity of water was proposed as 20 litres per person per day in the Rural Water Supply and Sanitation Sector Policy Framework prepared by MRD with assistance from WSP under the PCB Project in 2001. Although this has not been made official this figure is generally accepted.

64. Quality will be more difficult to define. Although the *National Drinking Water Quality Standards* have now been established, safe and acceptable are not the same. As discussed in Section 7.6, although a water source may be safe chemically and bacteriologically, it may not be acceptable to people because they do not like the taste so it would not meet the Standards. A further question is whether the whole required quantity has to meet the quality requirement, or only the proportion for drinking and cooking. Classifying water by type of technology is also problematic. Opinions vary over what type of technology is safe or unsafe; the condition of the technology is critical to the safety of the water; and there is evidence that “improved” technologies can be contaminated due to the way they are used.

65. For distance to source, the Global Water Supply and Sanitation Assessment 2000 Report definition of 1km is not appropriate for Cambodia. As the PRASAC Project observed, people will not walk far to collect water.

66. Sanitation can cover a wide range of issues related to the household and wider environment. In the Policy Framework it was defined as “management and disposal of human urine, excreta and domestic waste water”. In terms of access to sanitation services the definition is generally restricted to the technology for excreta disposal. Until recently the pour flush latrine was considered to be the only safe method in Cambodia. With the introduction of the *Informed Choice Approach for Sanitation* technologies have now been widened to include simpler and lower cost options, so it will be necessary to officially define access to sanitation in these terms. The critical point in any definition of ‘safe’, made in the Global Water Supply and Sanitation Assessment 2000 Report, is that human excreta should be hygienically separated from human contact.

Recommendation 5.1

Because of the confusion of different estimates of coverage, much of which arises out of the lack of definitions of access, the Government and sector organisations should formulate an official definition of access to rural water supply and sanitation services. The issue of multiple sources for different components of domestic demand would need to be addressed in a definition.

5.2 Coverage figures

67. There is considerable confusion over the coverage figures for water supply and sanitation. National rural water supply figures range from the Cambodia Inter-Census Population Survey (CIPS) figure of 40% to Cambodia Socio-Economic Survey of 60%. Other sources of information give different figures again. The variation in figures is due to a number of reasons:

- The lack of definitions makes it difficult to say who has a safe or unsafe water supply. For example, the two recent surveys by the Ministry of Planning⁷ are based on different definitions of safe and unsafe technologies. (Hang Lina 2005)
- There is no single central database for holding records of systems and facilities constructed by the many organisations and projects in the Sector.
- The databases that do exist are not maintained, with some agencies failing to report construction of new facilities.
- The Ministry of Planning surveys and the Seth Koma Follow-Up Survey (Johnston 2003) are based on questionnaires, thus relying on people reporting their source of drinking

⁷ Cambodia Inter-censal Population Survey 2004 (CIPS); Cambodia Socio-economic Survey 2003-2004 (CSES)

water. This has two effects – people report what they actually use, so even if they do have access to an improved source it may not be recorded; alternatively, people may report what they think the surveyor wants to hear.

- The reclassification of urban and rural areas (National Institute of Statistics 2004) means that the statistics will need adjustment.

68. An example of people reporting what they actually use compared to what they have available comes from the field work for this Review. In Oddar Meanchey, the ICPS reports only 22.7% “coverage”⁸ whereas a locally maintained database of facilities constructed⁹ shows that nearly every village had an improved source of water, so approaching 100% coverage. This makes an important point – ‘access to’ and ‘use of’ are very different, which indicates a limitation in the Sector Vision.

69. Sanitation coverage figures are equally confused, with reported figures varying widely, from around 8 percent up to more than 16 percent. Small scale surveys indicate considerable variation within geographic areas:

- PLAN baseline study Siem Reap (2005): < 2% coverage
- WSP surveys in 3 provinces (2004): 1%-8%
- ADB Surveys in 5 “Tonle Sap provinces (2004?): 5%-15%
- MRD National coverage figure (Sector Investment Plan, 2005): 12.5%

(Rosenboom 2005)

70. The problem of coverage figures has been recognised. WSP has been carrying out a study of the discrepancies between data sets, and is due to publish its report soon.

71. This confusion over both water supply and sanitation coverage data makes planning for the Sector difficult, and means that potential donors may not have confidence in the investment needs. It also makes prediction of whether Cambodia is on track or off track to meet its CMDGs impossible. More accurate coverage figures are needed for several reasons, including monitoring of progress and determining and targeting of investment for rural water supply and sanitation (Rosenboom 2005).

72. There have been a number of initiatives in the past on water supply data collection with varying degrees of success. The fact that systems have not been successful or sustainable raises a question of whether there are other ways to get the data needed than setting up a national data collection system, and if so, whether they offer a better chance of success. To answer this question the first thing to determine is the reason for collecting the data. If it is only for things such as coverage analysis, planning and investment targeting, data collection could be done through the national surveys (CSES, DHS, Census and CIPS) after ensuring that robust definitions and associated training materials (for surveyors) were in place. If more detail (e.g. on functioning, use, spares supply, maintenance etc.) is needed, national data collection systems may have to be set up. (Rosenboom 2006)

Recommendation 5.2

MRD and sector organisations should determine the data monitoring needs of the RWSS Sector, and establish appropriate systems to address these needs. All agencies working in the sector, PDRD, DORD, Commune Councils, NGOs, and private sector, should be obliged to report progress in coverage to MRD according to the systems developed.

⁸ Combined figure for Oddar Meanchey and Banteay Meanchey

⁹ by ZOA

Potential Project 5.2: Establishment and maintenance of coverage data monitoring

This project would address the considerable uncertainty concerning the data on the proportion of the population that has access to safe water supplies and sanitation. Establishing and maintaining accurate data would need careful design and planning, as it would involve substantial capacity development at provincial level to build a long term monitoring system, as well as integration with the database proposed as part of the ADB's Tonle Sap Rural Water Supply and Sanitation Project. It would also need commitment from the Government to finance the long term recurrent costs for running the system.

73. A project like this may include a national database for storing and accessing the information. The history of water databases in Cambodia is not good – there are at least six in existence, held by several different organisations. Only one or two of these are kept up to date, the others falling into disuse after the end of the project within which they were developed. ADB is now proposing another database as part of the Tonle Sap Rural Water Supply and Sanitation Project, with a similar risk of not being maintained after the end of the project. The most appropriate way of obtaining, keeping and using data needs to be discussed before opting to develop any system – central or decentralised.

74. There has to be a serious commitment by all organisations working in the Sector, the various government ministries and departments, local government and commune councils, UN organisations, international, national and local NGOs, and the private sector, firstly to make the system work to resolve this problem, and secondly to make the system work in the long term by providing information to and using information from a central database.


5.3 Poverty and access

75. When discussing poverty it is important to remember that it is not just a financial issue. "Poverty has two dimensions – low income, which is insufficient to maintain a dignified life; and low level of human capabilities, which restricts a citizen's options to lead a life of his or her choosing" (UNDP 2000). "Poverty is a form of deprivation with strong interactive linkages to other forms such as physical weakness, isolation, vulnerability, and powerlessness" (Chambers 1983).

76. "Inadequate water and sanitation services to the poor increase their living costs, lower their income earning potential, damage their well-being, and make life riskier" (Bosch et al. 2002). The linkages between poverty and water and sanitation are summarised in Table 5.1. This Table was presented to the Sector by Thomas Meadley at a National Consultation with Key Stakeholders entitled "Reducing Rural poverty through Water Supply and Sanitation Development" in 2003. (MRD et al. 2003)

77. With the very low incomes of many people in rural Cambodia, their ability to pay for the capital and/or running costs of the technology proposed is critical. One of the reasons for lack of maintenance of water supply systems is because people cannot afford these running costs, including the purchase of replacement parts. Ensuring that people understand and choose the most appropriate technology for themselves is a crucial part of the project process. One of the main reasons people give for not having a latrine is that the model offered up to now, the pour flush, is too expensive. The introduction of the informed choice approach for sanitation should help to overcome this problem.

Table 5.1: Linkages between poverty and water and sanitation

Lack of water sanitation and hygiene		Poverty dimensions	Key effects
		Health	<ul style="list-style-type: none"> ▪ Water- and sanitation- related illnesses ▪ Stunting from diarrhoea-caused malnutrition ▪ Reduced life expectancy
		Education	<ul style="list-style-type: none"> ▪ Reduced school attendance by children (especially girls) resulting from ill health, lack of available sanitation, or water collection duties
		Gender and social inclusion	<ul style="list-style-type: none"> ▪ Burdens borne disproportionately by women, limiting their entry into the cash economy
		Income/consumption	<ul style="list-style-type: none"> ▪ High proportion of budget used on water ▪ Reduced income-earning potential because of poor health, time spent collecting water, or lack of opportunity for businesses requiring water inputs ▪ High consumption risk because of seasonal or other factors

(Bosch et al. 2002)

78. Bhandari et al. (2004) found in Siem Reap that secretly selling land has become a trend amongst the poorest. This trend can also be observed in provinces such as Kompong Speu, where poor people are selling good quality land and moving to remoter areas. The road through Oral District is now fenced for plantation style agriculture. This trend means that the poorest people are moving to new areas without service coverage, so coverage for the poorest may be declining in real terms.

79. Poverty and disability are also closely linked, with disabled people being some of the poorest and most marginalised in communities. The Seila survey of wells found some very high rates of disability in one district in Banteay Meanchey (24%) and rates of 3 to 5 % in other provinces. This means that in a village of, say, 20 households, up to 5 people may have difficulty in using a standard water point or a latrine. Often these people are not seen during short visits by outsiders, so the problem is not noticed. Cambodia was the subject of a case study for a DFID funded Knowledge and Research Project carried out by WEDC, Loughborough University in the UK, on disability and water supply and sanitation. As a result the main published output of the project, *Water and Sanitation for Disabled People and Other Vulnerable Groups: Designing services to improve accessibility* (Jones and Reed 2005), is being translated into Khmer, and one organisation, Development Technology Workshop (DTW) is directly involved with developing and adapting water supply and sanitation technologies to address the needs of the disabled. DTW has partnered with a local NGO, Disability Development Services (DDSP) in Pursat, and has links with the Disability Action Council (DAC) in Phnom Penh. Organisations working elsewhere in the country can learn from DTW's experience, and the Sector as a whole should build a relationship with the DAC.

5.4 Increasing coverage

80. The MRD has committed to the overall target of rural water supply and sanitation in the CMDGs, which state:

- (i) Target 7.10: Increasing the proportion of rural population with access to safe water from 24% in 1998 to 50% in 2015
 - (ii) Target 7.12: Increasing the proportion of rural population with access to improved sanitation from 8.6% in 1996 to 30% in 2015
- (Ministry of Rural Development 2005)

81. The RWSS Sector Vision in the National Policy for Water Supply and Sanitation is that every person in rural communities has access to safe water supply and sanitation services by 2025. (RGC 2003)

82. The rural population of Cambodia is increasing, so taking account of the current population growth rate of 1.81%¹⁰ the actual numbers of rural people to be served can be estimated as shown in Table 5.1.

Table 5.1: Population coverage targets

	2004 ¹¹	2015		2025	
		Estimated	Target %	Estimated	Target %
Population	11,530,000	13,795,000		16,506,000	
Water supply			6,898,000		16,506,000
Sanitation			4,139,000		16,506,000

83. Despite the uncertainty about the actual coverage figures at present, it is necessary to make an assumption about the current figures in order to assess the increase in coverage needed to meet the targets. So, assuming present coverage of water supply as 40% and sanitation as 10%, the increase needed is:

Water supply: to serve an additional 2.8 million people by 2015
and a further 9.6 million people by 2025

Sanitation: to construct 597,000 household latrines by 2015
and a further 2.5 million household latrines by 2025.

84. These assumed coverage figures do not take account of the number of facilities that have broken down and fallen into disuse, and thus the rehabilitation needs. Another uncertainty is the current total rate of implementation by all organisations working in the sector. Again, making assumptions based on recent figures, the current rates compared to the required rates (excluding rehabilitation) are:

Table 5.2: Implementation rates

	Current annual rate	Required annual rate now to 2015	Required annual rate 2015 to 2025
Water supply – number of water points ¹²	2,600	1,150	4,800
Sanitation – number of household latrines	3,500	60,000	247,000

85. The figures suggest that while the rate of implementation of water supply should be adequate to meet the 2015 target (with some spare capacity for rehabilitation), with an

¹⁰

National Institute of Statistics. (2004). "Cambodia Inter-Censal Population Survey 2004, General Report." Ministry of Planning, Phnom Penh.

¹¹

National Institute of Statistics. (2005). "Cambodia Inter-Censal Population Survey 2004, Demographic Estimates and Revised Projections." Ministry of Planning.

¹² Assuming 200 people per water point

acceleration to meet the 2025 target, the rate of implementation for sanitation is grossly inadequate. The water supply implementation rates, however, may be misleading as they do not take account of recent and still needed improvements to the community management approaches to water supply, which will increase the time and resources needed to develop each system in a village.

86. One detail that needs to be added to the broad picture is the internal migration that is occurring. The migration of poor people selling land and moving to remote areas has already been mentioned. In Oddar Meanchey, the Review Team was told several times that people are moving from existing registered villages to establish new villages, sometimes up to 10km away. These new villages are not yet officially recognised, so are still registered as part of the original commune. A third type of migration is that apparently people are moving from the more densely populated provinces to the sparsely populated eastern and north-eastern provinces. Taken together, these trends will increase the number of villages to be served with new water supplies. They will have less influence on the number of latrines because that estimate is based on the number of households.

87. The projection of water supply needs and coverage can also be challenged as discussed in Section 5.2 on Coverage Figures. If people report that they do not use a safe source of water for drinking, the generally accepted reason being that they do not like the taste, should more such improved sources be provided? When enough improved groundwater sources for every household in every village in Cambodia have been provided, survey results will still show that people do not have a safe source for drinking. They may well be using the improved source for a range of other domestic purposes but is this the most cost effective way of reaching the CMDGs? Chasing target numbers is misleading the Sector from what it should really be trying to achieve: reliable, affordable water supply services and affordable household and school latrines that people actually use.

88. The CMDG targets for water supply and sanitation are actually only indicators for Goal 7: Ensure environmental sustainability. They also contribute to other goals: Goal 1: Eradicate extreme poverty and hunger; Goal 2: Achieve universal nine-year basic education (by providing a child friendly school environment, particularly for girls); Goal 3: Promote gender equality and empower women (in view of the role of women in managing water supplies); and Goal 4: Reduce child mortality. The quality of the water supply and sanitation services is more critical for achieving these goals than a simple numbers game.

5.5 Maintenance and sustainability

89. One crucial word in the Sector Vision is “sustained”. Most of the discussion in the previous section on increasing coverage is premised on the existing and new facilities and services functioning and continuing to function. Many of the water supplies constructed in past years have already failed and fallen into disuse, but may still be counted in the coverage figures. A definition of sustainability is given in Section 7.1.

90. As discussed in Section 6 (Community management) the assumption that communities can or will maintain their own systems is open to doubt. The Seila Survey of Commune Wells found that although the principle that users should be responsible for well maintenance is widely accepted, formal operation and maintenance arrangements are very weak, with only about 30% of the wells under the responsibility of user committees, and these committees having very few effective activities. Even so, it appeared that users were undertaking sufficient maintenance to ensure a continued supply of water in most cases. (Seila Working Group 2004). These findings are corroborated by other studies (Johnston

2003) (Tracey 2003) (Bhandari et al. 2004) and by the field work of the Review Team. All these findings, however, are about water supplies that are relatively new.

91. An important aspect is **maintenance funds**. Several studies discuss problems with these – non-existence of a fund; disappearance of the money; non-collection of user fees; use of funds for community contribution to the new water point; etc. (Johnston 2003) (Tracey 2003) (Seila Working Group 2004) (ZOA 2003). Tracey (2003) identified one of the fundamental causes: “One of the primary reasons that well funds and user fee systems have not proved particularly successful in rural Cambodia is that village finances are rarely transparent and accountable. Water committee treasurers lack a model example of financial management. Although many attempt to keep records, few are clearly presented”. It can also be questioned whether tying up funds in cash-poor villages is an effective use of villagers’ money. The *National Policy* states that “Communities should have the right to choose the manner in which their funds are managed and accounted for, so long as it is effective and transparent” (RGC 2003).

Recommendation 5.5

MRD and Sector organisations should study the effectiveness of different community funding arrangements for operation and maintenance of water supply facilities, with specific reference to poverty and people’s ability to raise and hold funds. This could be done as part of a wider study of O&M systems and support needs.

92. In a study of DRA in Mozambique, Edward Breslin questions whether capital cost contributions (in cash or in-kind) are a good measure of sustainability. He writes that “according to DRA thinking, community capita cost contributions are indicators of the financial and organizational capacity of a community to sustain its water points”. WaterAid’s¹³ experience suggests that the link between community capital cost contributions and sustainability may be, at best, tenuous and at worst, spurious. WaterAid and its partners now tend to look for community contributions related to what is actually required to sustain a given system, for example, pump rods, a spares kit or a sack of cement. These are considered better indicators of sustainability than labour and local materials, as it helps build community capacity, both to select appropriate technologies and maintain them. Communities learn what is actually required to sustain a given technology, where they can get these parts and materials and how much they cost. (Breslin 2004)

¹³ The international NGO that Breslin was working for

6 Community

6.1 Community management

93. The principle of **community management** of rural water supply systems is now well established in Cambodia. The National Workshop on VLOM in 1994 set the direction for this (Village Level Operation and Maintenance Project 1994), and it is now part of the *National Policy on Rural Water Supply and Sanitation*. One of the Guiding Principles is Community Participation in the RWSS Programme:

“It is necessary to ensure that all members of the community have equal opportunity to participate in the planning and decision-making related to the type and level of RWSS services they receive and the way in which those services are financed, implemented, managed, and monitored.” (RGC 2003)

94. The community’s roles and responsibilities are defined to include management of water services through Water and Sanitation User Groups (WSUG). It is not known how many WSUG or WUGs exist.

95. The actual process to achieve management at community level is critical to achieving sustainability of the service. Unfortunately, there is no national guidance on this process. MRD produced the *Guideline for the establishment Of Water Sanitation User Group (WSUG)* in 2004, but this mainly defines the roles and responsibilities of a group and its members, with only a very brief flow chart of the steps for setting up a WSUG. There is no guidance on the detailed process of village selection; introduction of the water supply and sanitation service to a village; community and implementing agency obligations; social and technical assessment; development of technical choices and selection of technology; training for planning and management of construction; financial management and procurement; and commissioning of the water supply.

96. Before its withdrawal from the RWSS Sector in 1995, Oxfam published “Water is Life”, documenting the step-by-step process it had developed and implemented with communities for water supply. Other organisations may have similar processes (though none were seen during this Review). Government agencies, including PDRD technical staff, do not have the benefit of this type of guidance, and there is no national minimum standard for the process.

Recommendation 6.1a

MRD should develop a step-by-step process for implementation, operation and maintenance of rural water supply and sanitation services for sector-wide use. This should be based on the experience and existing practices of organisations in the Sector, and should draw on other examples, such as the Swiss NGO, Helvetas which produced *25 Steps to Safe Water and Sanitation* (published by SKAT in 2000), and Zambia’s *Guidelines for Implementing Community Water Supply and Sanitation Projects in Rural Areas* (developed with support from WSP).

Potential Project 6.1a: Implementation procedures to develop community management

The principle of community management of rural water supply systems is now well established in Cambodia, but there is no established process for achieving this end. This project would carry out a comparative evaluation of existing approaches to developing community management of RWSS services in Cambodia and a review of approaches internationally, leading to the development of national minimum standards for implementation procedures. This should be developed in coordination with the ADB’s advisory team for the new Tonle Sap Rural Water

Supply and Sanitation Project. These procedures should incorporate other community issues discussed in Section 6.

97. There is some discussion in the various studies of two alternative management arrangements at village level – village water committees (VWC) and water and sanitation user group committees (WSUG). A VWC may be responsible for a number of water points within a village, whereas the WSUG is responsible for only one water point. From discussion of the two management structures with key village informants in Oddar Meanchey, Tracey found that they considered the WSUG to be more appropriate because it is easier to mobilise community participation, collect funds and to disseminate information due to the small groups living in close proximity to one another. This finding was repeated in Poipet, although this was based on only three months of experience. (Tracey 2003) These findings support the structure proposed in the *Guideline for the Establishment of Water Sanitation User Group* (MRD 2004).

98. Despite the management structures and the Guidelines, evidence from the field shows that community management has not been achieved in a sustainable way in practice. The field work in two provinces as part of this Review and studies such as Tracey (2003), the Seila Working Group (2004), and Bhandari et al. (2004) show that, with a few exceptions, communities are not really confident or competent to manage their rural water supplies yet. When the Review Team asked people in villages what they would do when their pumps break down, the usual answers were “don’t know” and “we will go to the agency that constructed it and ask for help”. In its study covering 199 wells in five provinces, the Seila Working Group found that only about a quarter of wells were under the responsibility of a VWC or WSUG committee, and that in most cases users were unable to say when these committees had last met, or undertaken any activity (Seila Working Group 2004).

99. Tracey (2003) suggests that the lack of benefits associated with membership of a water committee is one of the main reasons for this failure in sustainability. Bhandari *et al.* suggest that the effectiveness of water point committees depends on the status of the families and individuals within the committee, and find that most of the reinforced wells belonging to an extended family are maintained properly when compared to the shared or public wells. They report villagers’ perceptions of the factors causing the ineffectiveness of water use committee as:

- Lack of technicians at the village level
- Spare parts market is far away from the village
- Absent or poor management committees
- Large number of water user groups (10-12 families per well)
- Ownership is not strong enough to influence of the system
- Awareness of the users on all the above issues is limited.

100. Another problem may be the lack of legal status of WSUGs. Neither the *National Policy on Water Supply and Sanitation* nor MRD’s *Guideline for the Establishment of Water Sanitation User Groups* provide a formal legal status. It could be deemed that WSUGs come under the authority of the Commune Council but this should be formally and legally established. With this legal status, actual ownership of the waterpoints can also be formalised.

101. **Ownership**, as mentioned in the list above, was raised as an issue in the draft Sector Strategy: “it is not clear who the legal owners of water supply systems are. In many places, communities think that the ministry or organisation that arranges the construction of the water supply is the actual owner of the installation.” The Strategy also noted as a risk “ownership of the land on which the water point is built. If the land is privately owned, then the landowner often assumes de facto ownership sooner or later. Afterwards the owner is not likely to grant free access to others.” (Ministry of Rural Development 2001).

102. The *National Policy on Rural Water Supply and Sanitation* does not define ownership, referring only to “a sense of ownership” as part of a WSUG’s responsibilities. The Sector Investment Plan states that: “Water and Sanitation User Groups with legal authority to manage services will be the owners of the water supply facilities” (RGC 2003) but an investment plan is not normally the legal instrument for granting such title. There is no other legislation that deals with the issue.

103. Another aspect of ownership is the practice of many development agencies of putting their organisation’s name and logo on a sign-board at the water point. As Tracey (2003) points out, “as users are greeted by this sign as they enter the water point, it is not altogether surprising they may not fully perceive themselves to be the owners of the water point”. This practice is not conducive to community ownership. Every time people use the waterpoint they are reminded of who provided it. This reminder may influence them in seeking help when the pump breaks down.

104. The importance of ownership is well made in the following passage:

“Ownership is at the root of successful community management. It is also one of the vaguest and most overused buzzwords in the sector, perhaps second only to ‘demand’ – for which ownership is often seen as a vital ingredient. Frequently, what it refers to is a ‘sense of ownership’ brought about by contributions to planning, construction or capital costs. It is frequently reduced to a box to be ticked once a community has contributed 5 per cent or 50 per cent to capital costs, or contributed their labour (‘sweat equity’) to system construction. They have paid for it, so now they are supposed to feel that they own it, even if nobody has given them any legal rights over the system. An important finding of the Participatory Action Research (undertaken by the authors) is that legal ownership is crucial. Some of the 22 communities in the PAR project suffered greatly from conflict when different communities competed for the same source and ownership was disputed. In most countries, the community has not been given sufficient legal status to own the source or the system, and cannot therefore protect it. The point of a sense of ownership is that community members behave as if they do own it, and people who own things (particularly poor people) do their best to protect them. If communities have no legal status or legal ownership, their ‘sense of ownership’ will be a sham and will soon evaporate.” (Schouten and Moriarty 2003)

105. Thus the assumption that water facilities will be kept in working order if we tell people they are the owners, give them a few days training on the role of user committees and pump maintenance, is being steadily discredited. Most agencies only provide short-term follow-up support to communities after completion of schemes. Although this monitoring may be for two or three years, it is short-term in the context of water supply systems that are intended to last for twenty or more years. When a scheme is new, both the system and the water user committee can be expected to function better than later when the systems becomes older and the committee and maintenance worker have forgotten their training. In effect, there are no maintenance support systems in Cambodia. A few days of training and follow-up visits for a year or two or until the project or funding ends are not the same as the long-term support system that is needed.

106. These points on community managed O&M and sustainability are well made in an email conference three years ago, “Beyond the Community”, run by IRC in The Netherlands. It is worth quoting some lengthy extracts because many of the issues are relevant to the situation in Cambodia, and it shows that Cambodia is not alone in facing these problems.

“International experience after two decades of implementing projects aiming at community management of operation and maintenance shows that communities can

do a great deal. They can successfully carry out operation and maintenance, they can organise cost recovery, they can co-operate with other communities to make large and complex piped systems function. But the experience also shows that the sustainability of community managed systems is fragile even if they are implemented with intensive participatory training and planning. There are numerous risks that threaten the sustainability of the water supply systems and communities often get into problems after the agency has left. Problems arise with the technical maintenance of their systems, but most of all problems arise with their management: with cost recovery, planning, transparency of decision making, communication between committees and community people. Problems also arise where the conditions are more difficult, where demand is not that obvious, where cohesiveness in communities inhibits decision making and where systems are more complicated. If things start to go wrong with the management of the system, distrust in the community will grow and will finally bring the system to its knees.

Without outside support most community-managed systems will at some point in time break down. This does not mean that community management has failed and that government provision is necessary. What it does mean is that in addition to the 80% of management effort provided by the community, there is a crucial 20% that must come from outside, troubleshooting, backstopping, facilitating, enabling. Only then systems can become sustainable beyond the lifetime of a project or a system and only then more people can be served more quickly while maintaining sustainability.”

(Moriarty and Schouten 2002)

107. As stated in the draft *10 Year Sector Strategy* in 2001, “support to community level management is necessary if water supply systems are to be sustainable. Support does not mean taking over management functions at the community level. It does mean providing technical and management advice and training to enable communities to manage their own activities. It is important to monitor whether communities are successfully managing their systems, and take action in cases where there are problems.” (Ministry of Rural Development 2001) Some of these functions are briefly defined in MRD’s *Guideline for the establishment Of Water Sanitation User Group*, but they need to be made clearer and more specific, preferably in a stand-alone document for a support system for community management of operation and maintenance. An essential component of support is supply chains to allow communities to obtain replacement parts for handpumps. As the number of water supplies increases, support to community level management will become even more important. It will be necessary to increase the capacity of the support services at the same rate as new systems are being constructed (Ministry of Rural Development 2001).

Recommendation 6.1b

MRD should establish an operation and maintenance support system to ensure that community management of operation and maintenance of rural water supply systems is sustainable in the long term. This should include support and training to Water and Sanitation User Groups and maintenance workers, supply chains for replacement parts for handpumps, and monitoring of the functioning of WSUGs and their water supplies.

Potential Project 6.1b: Operation and maintenance support system

This project should encompass study of existing operation and maintenance in Cambodia, including community funding of O&M and supply chains, and international experience and thinking on maintenance support systems, leading to the design and establishment of a support system for operation and maintenance either within existing structures or in new structures.

108. One of the most important factors in establishing a successful support system for community management of O&M is political will. As long as the emphasis is on achieving new coverage numbers, finance will be concentrated on that. The failure of so many water supply schemes in the past should be a major concern at the highest levels. Unfortunately, the emphasis is on rehabilitating these schemes, rather than addressing the needs to keep systems running successfully. These support systems will have to keep the water supplies functioning for 6.7 million people by 2015 and 16 million people by 2025. This will be a substantial business in its own right, which will need recurrent funding to run.

6.2 Well location

109. The location of wells is a contentious issue. Generally there are two options: siting on public land or siting on private land. The basic advantages of each are:

- on public land, access is open to all people of a community, the location may be more equitably determined for access for all, and there is less chance of ownership being taken over by individuals;
- on private land there is more chance that the well will be properly cared for and looked after.

110. The Seila Working Group found some evidence to support the latter argument: “Almost all wells (96%) were located on land belonging to a private household. It appears to be common practice for a wealthy or influential household to take the primary responsibility for paying the beneficiary contribution to construction costs, and for maintenance of a well located on the household land.” It also noted, however, that locating wells on the land of better-off households raises obvious equity concerns, finding that about 10% of wells were located at the houses of village or commune officials (which it considered disproportionately high), and it found “a modest tendency for poorer households to be located at a greater distance from the well.” (Seila Working Group 2004) There is also evidence that some wells are taken over by individuals by excluding community use, and during the field work the Review Team heard complaints about noise from people drawing water late at night. If an agency, in particular an NGO, includes empowerment as a project objective, then location of a waterpoint will be an important factor in achieving the objective.

111. Based on the findings of an earlier impact study of the PRASAC Programme, ADB proposes to site wells on private land for its new Tonle Sap Rural Water Supply and Sanitation Project (Asian Development Bank 2005). It will be important to monitor this and other projects to ensure that the assumptions behind the policy of siting on private land are valid, and that it does not disadvantage the poorest and most vulnerable people in a community.

Recommendation 6.2

MRD should monitor the siting of water points on public or private land in the long term to assess the impact in terms of access to the water supply for all members of the community and the functioning of the supply.

112. Within the scope and time available for the Review, it has only been possible to look at some of the more apparent issues and problems concerning community approaches and community management of rural water supplies. Further study and reflection is needed to address the complexity of the subject. As a guide to this, the following extract from the book, *Community Water, Community Management: From System to Service in Rural Areas* by Ton Schouten and Patrick Moriarty is given at length, including a causal diagram of the main factors affecting the achievement of widespread, equitable, sustainable community management. The book is based on an analysis of experience in six different countries.

The complexity of sustainable management
(Schouten and Moriarty 2003)

“At its simplest, we consider successful community management to be the provision of a fully sustainable service that provides an equitable water supply to a community. As we explained in the introduction, by 'sustainable' we mean that once a community has been provided with a given level of service it should never have to revert to a structurally lower level of water in terms of quantity or quality. We also mean that it can sustain a system that will be maintained not only during its natural lifetime, but will also eventually be replaced or upgraded. By 'equitable' we mean that no section of the community is left with their minimum needs unmet.

“This definition or benchmark should be true for any successful water supply service, whoever is responsible for implementing it. In response to those who may feel that we set an unrealistically high benchmark we pose the question of why a system that breaks down after 'only' five or even ten years should be considered sustainable. It is unacceptable to implement systems with no idea of what happens at the end of their design life.

“It is clear from Part 2 (of the book, which looks at the case studies in depth) that communities often come close to achieving this degree of success for short periods, but that there are also frequent failures, and that systems often do not survive in the longer term. Success requires a complex series of factors to be favourable, while failure can be precipitated by just one factor going wrong.

“This complexity can be captured to some extent in a causal diagram that maps interrelated issues. Figure 13.1 shows the relationship between the desired outcome - widespread, equitable, sustainable community management - and various key factors. The arrows between factors show the flow of cause and effect. Those factors within the shaded area relate directly to the community and its capacity. Those factors outside the shaded area are outside the community and outside its control.

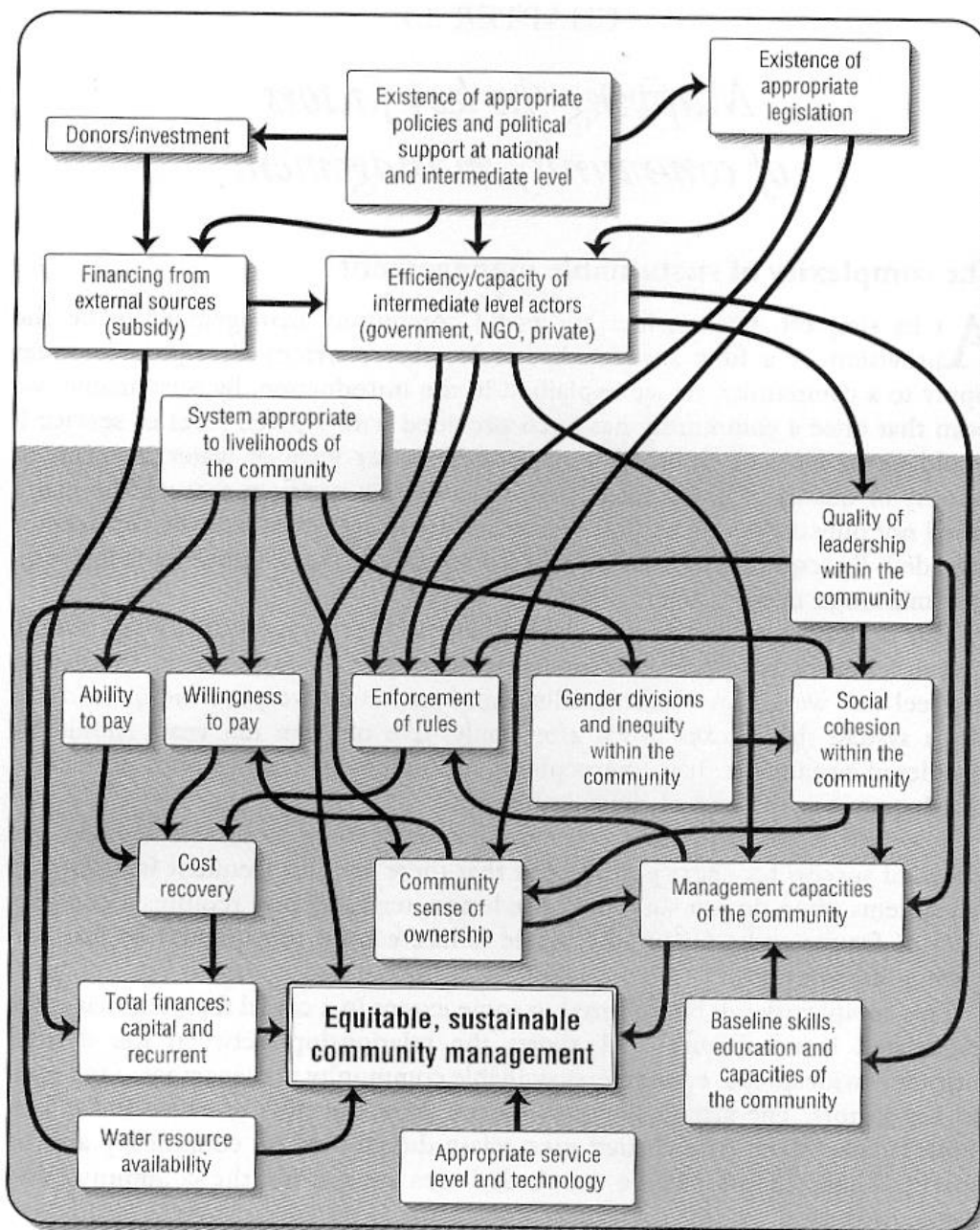


Figure 13.1 Causal diagram of the main factors affecting the achievement of widespread, equitable, sustainable community management

“Figure 13.1 suggests that widespread, equitable, sustainable community management is directly dependent on a mix of water resource availability, total finances, management capacities of the community and appropriate service levels and technology. Outside the community it is also directly dependent on the efficiency/capacity of intermediate level actors (government, NGO and private). All these factors must be addressed if the desired outcome is to be achieved. Furthermore, it is the combination of causal factors that is important the factors have meaning only in relation to each other. For example, community management capacity is meaningful only in relation to the complexity of the system. What is adequate capacity for a simple system may founder when a complex system is installed. The diagram does not speak of absolutes, but rather of balances.

“Each factor is influenced by, and influences, others. The diagram is therefore a conceptual representation of the main issues that we identified in Part 2. And although the diagram is complex, with multiple linkages between different factors, it is in fact a simplified representation of the reality within communities. Understanding and accepting the degree of complexity is key to understanding why a single intervention affecting a single factor can never lead to improved management. An analysis across the entire range of factors is needed to identify an appropriate balance.

“The factors outside the community have been greatly simplified in this diagram. The enabling environment is represented very generally, while efficiency and capacity of intermediate-level actors represents a whole bundle of organizations, and a range of skills and capacities. This single factor could be unpacked to display a whole range of new factors, including technical backup, facilitation, spare part availability, private sector capacity, etc. Most of the external factors are not shown as impacting directly on sustainability, but rather as affecting aspects such as service level, financing and management capacity. The impact of these external factors appears in this diagram, and perhaps to the casual observer also in real life, to be less direct than do the factors related to community capacity. This may be one reason why failures of water systems are more often put down to failures of community capacity than to failures in support.

“There is no correct state for any individual factor on its own. Sustainable community management is achieved only by the correct mix of factors. It is meaningless to talk about the 'management capacities of the community' in isolation from the technology or service level. It is equally pointless to judge the level of finances without looking at the service level. Good management capacities and appropriate technical solutions can compensate for poor water resource availability or low finances. However, where three or four factors are all poor, or unsuited to each other, overall failure will occur. Understanding this issue is at the heart of the search for flexible community management.”

7 Technology

7.1 Sustainability

113. One of the objectives of the RWSS Sector is that services should be sustainable. It is useful, therefore, to define sustainability, and to bring out the importance of the technology component of it in any discussion on choices and selection of technology. The O&M aspects of sustainability are discussed in Section 5.5. François Brikké defines a service as sustainable when:

- it functions and is being used
- it is able to deliver an appropriate level of benefits (quality, quantity, convenience, comfort, continuity, affordability, efficiency, equity, reliability, health)
- it continues over a prolonged period of time (which goes beyond the life-cycle of the equipment)
- its management is institutionalized (community management, gender perspective, partnership with local authorities, involvement of formal/ informal private sector)
- its operation, maintenance, administrative and replacement costs are covered at local level (through user fees, or alternative financial mechanisms)
- it can be operated and maintained at local level with limited but feasible external support (technical assistance, training, monitoring)
- it does not affect the environment negatively.

(Brikké 2000)

114. It is likely that many of the water supply and sanitation services and facilities that have been installed in the past few years would not meet all the points in this list, and thus could not be deemed sustainable.

115. One of the critical processes which influence sustainability is linking technology choice with operation and maintenance. Technical factors that contribute to sustainability of improved services are:

- Technology selection.
- Complexity of the technology.
- The technical capacity of the system to respond to demand and provide the desired service level.
- The technical skills needed to operate and maintain the system.
- The availability, accessibility and cost of spare parts.
- The overall costs of O&M.

(Brikké 2000)

116. An additional factor is replicability – the ability to copy designs at a local level without expensive tools, equipment, materials or high levels of training. (McLennan 2006)

7.2 Technology Options

117. For rural water supplies, only a limited range of technology has been provided in Cambodia until recently. The main focus has been on abstracting groundwater, mainly through drilled tubewells fitted with handpumps, and to a lesser extent, protected hand-dug wells. This has led to the view held by the ADB that “the lack of choice offered to the beneficiaries on the different technological and cost options available has led to the construction of inadequate or unaffordable RWSS systems for the rural population. As a result, many water systems have failed.” (ADB 2005)

118. In fact there has been some innovation in technology options in the past few years, most notably household water treatment systems, rainwater harvesting, and small-scale piped systems providing treated surface water.

119. For sanitation the technology options have been even more limited, with only the pour-flush latrine being provided. In most cases this type of latrine is unaffordable for poor people without substantial subsidy from the implementing agency, which in turn will be unaffordable to government and donors to achieve full coverage at a national scale. As WSP-EAP points out, “more than 30% of the rural population lives on less than one dollar a day. If latrine costs cannot be brought down, it is unlikely that a large part of the population will ever be able to afford one” (WSP-EAP 2005).

120. There is a misconception held by many people in government and some implementing agencies that the pour-flush latrine is the only “safe” latrine design. There is, in fact, a range of possible latrines that are accepted by UNICEF and WHO as improved sanitation facilities for the purposes of the MDGs. Those appropriate for rural areas include the pour-flush latrine, the simple pit latrine and the ventilated improved pit latrine (open pit latrines are classified as unimproved) (WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation 2004). The cheapest of these may not be as safe as more expensive types, but the use of it is certainly safer than open defecation. Unfortunately, the misconception that it is only the pour-flush latrine that is safe has been passed on to rural people, so that is what they now expect to be provided. This has added to the challenge of persuading people to construct their own latrines.

121. The recent publication of the *Informed Choice Manual on Rural Household Latrine Selection* by MRD, with support from WSP, should go a long way to redress the problem of affordable improved household sanitation. The Manual provides a range of alternative designs from the cheapest and most basic to the sophisticated and expensive, thus allowing people to choose the most appropriate for their needs and circumstances. (MRD 2005)

122. There is still a need to find technical solutions for rural water supply and sanitation in difficult areas, such as those where there is no groundwater, where there is regular drought, and in areas prone to flooding. (Ministry of Rural Development 2001) (ADB 2005) In the forthcoming Tonle Sap Rural Water Supply and Sanitation Project, ADB has allocated part of the budget for development of alternatives, such as very deep tube wells, treatment of surface water, new designs for water storage, filters for individual households, and new types of latrines (ADB 2005). The MIREP project of GRET/Kosan is already developing small scale piped systems treating surface water in areas where groundwater is not available or it is contaminated with arsenic (Mahe et al. 2004). The systems are designed according to the local population’s ability to pay, so may not be feasible for very poor communities, or poor people living outside the economically feasible service area.

Potential Project 7.2: Development of alternative technologies

The ADB Tonle Sap RWSS Project has allocated US\$71,000 for the development of alternative technologies for difficult areas, but this amount is relatively modest and could usefully be supplemented by another donor to create a research project. The project should also explore alternatives to the groundwater solutions traditionally adopted in most areas of Cambodia. Suitable technologies may already be available in other parts of the world, so an extensive literature search, building on the survey of practical experience of Pickford (1995) should form part of the project.

7.3 Selection process

123. The fourth guiding principle of the *Rural Water Supply and Sanitation Sector Policy* is:

“that all members of the community have equal opportunity to participate in the planning and decision-making related to the type and level of RWSS services they receive and the way in which those services are financed, implemented, managed, and monitored.”

124. More explicitly, Community Roles and Responsibilities in Chapter 2 include: “Participate in the planning process to ensure that the community receives the type of services they want and that the users are willing to pay for them”. (RGC 2003)

125. From discussions with commune councillors and communities during the field work of this review, villages in the two provinces visited were generally not given the choice of technology for water supply. It seems from discussions with various people and organisations that this is common in most projects and programmes. For example, there is no process for offering choice in the Seila Programme’s Commune/Sangkat Fund Project Implementation Manual. It simply says that the direct beneficiaries should participate as much as possible in choosing the design for the projects and in monitoring implementation of the projects. (Seila Programme 2004). The reasoning and way that communities should use to reach their decision is not explained.

126. Although the principle of offering people choice in levels and types of service has been the basis of the demand responsive approach (originally introduced by the World Bank), guidance on how to do this with communities has been slow in coming. There are, however, two reference books that suggest ways of achieving this:

- Deverill, P., S. Bibby, et al. (2002). Designing water supply and sanitation projects to meet demand in rural and peri-urban communities – Book 1: Concept, Principles and Practice, WEDC, Loughborough University
- Bolt, E. and C. Fonseca (2001). Keep It Working: A field manual to support community management of rural water supplies. Delft, IRC International Water and Sanitation Centre (tool for Matrix Ranking of Preferences)

127. The agreement between MRD and MIME over responsibility for piped water systems in small rural towns (Ministry of Rural Development and Ministry of Industry Mine and Energy 2005) may limit people to make their own choice in another way. Each is promoting their own interest determined by technology (MIME for piped water schemes, MRD for handpumps and protected wells, etc.) rather than enabling communities to explore the best options for themselves. MIME’s selection of small towns and large villages predetermines the choice of technology. A further factor with piped systems is that they tend to serve the richer areas of a small town – the poorest 10% cannot afford the connection (Mahe et al. 2004). This means that the possibility of cross-subsidising the poorest people to help pay for a handpump is missed.

128. As discussed in the previous section, the technology options for sanitation have been restricted to one, so the selection process has not been relevant. With the introduction of the Informed Choice Approach, this will now change.

7.4 Technical design, specification and standardisation

129. The *National Policy on Water Supply and Sanitation* states that “Enforceable RWSS standards should be put into place as a means of sustainably ensuring high quality service and promoting community welfare.” (RGC 2003) These have been developed for handpumps and protected hand-dug wells, the technologies that are generally promoted for rural water supply, but standards still need to be developed for the technologies that are newer to Cambodia, such as rainwater harvesting. The timing of this is important, so that development and optimisation of the technology is not constrained by the imposition of inappropriate standards. Minimum standards which still allow scope for innovations above the minimum level of performance could be considered.

130. Standards have also been developed for pour flush latrines, but there are reported to be technical design problems with these. Fully lining the pits with impervious concrete rings prevents infiltration of liquid waste, so the latrine fills up too quickly, as well as making the cost expensive. Pickford recommends that “the lower part of a lining (below a metre or so) should allow liquid to infiltrate into the soil. Sometimes holes are made in concrete pipes during manufacture, or are punched through after casting. Bricks, masonry and blocks are made with open joints and are often laid as a honeycomb unless the soil is too loose. If soil is so loose that it runs through open vertical joints, the lining can be backed with 100mm of fine gravel” (Pickford 1995).

131. There are also problems with the standard design for school latrines, which is based on having a reliable and easily accessible water supply. For schools where this is the case, it is not a problem, but for schools where there is no water supply or the water supply is remote from the latrines, a water based latrine system will not work. This is shown by the evidence gathered by the *Baseline Environmental Sanitation Study*, in which less than half the schools had access to water, and approximately 40% of the toilets were broken or unused. (CfD 2004) The other design fault is that the outlet from the latrine pan faces the opposite direction to the pipe leading to the off-set pit. This reduces the effectiveness of the flushing water in moving solids through the pipe and makes it impossible to rod the pipe if it becomes blocked.

132. One aspect not generally considered for “standardising” is the timing of construction. There are several reports about problems of wells drying up in the dry season. This can be attributed to the fact that they were constructed during the rainy season when ground water levels are higher and water levels generally are not steady, and it is difficult to dig wells. Engineers, hydrogeologists, drillers and well diggers all know that wells should not be constructed at that time of year, but the timing is imposed due to the RGC financial year, which only gets around to releasing budgets during the rainy season. Either the financial year should be adjusted, or the financial rules changed so that budgets can be carried over to allow construction at the most appropriate time of year. Construction work should be done in the dry season, so contracts should be started in time to allow construction from November or December.

7.5 Quality control

133. Having set technical standards, it is then necessary that the standards are complied with by contractors and suppliers. Ensuring that construction is carried out to the required standards is notoriously difficult in rural water supply. Contractors are often working in remote areas without adequate supervision because the supervision is handicapped by lack

of time, transport and other resources. Corruption in the tendering and contract award process can be another constraint.

134. Seila has established a system of technical supervision for construction work. The Technical Support Official (TSO) is a staff member of the Technical Support Unit of ExCom/PRDC. Usually there will be one TSO for each District. Amongst many other duties the TSO acts as the Technical Supervisor for individual projects. The Technical Supervisor has a special responsibility to supervise implementation of the contract and to certify the quantity and quality of work done by the contractor. (Seila Programme 2005) The training of TSOs, however, does not have a specific module on quality control or on how to train community representatives for quality inspection.

135. The other part of the process is the Project Management Committee (PMC), usually selected by the Commune Chief. From a process audit of Seila Projects¹⁴, Commune Chiefs “thought that the PMC were trained and could intervene if they were not happy with the quality of the construction. They were also all very robust in approving their satisfaction with the quality of projects”¹⁵. Of the PMCs, 88% felt they could intervene if quality was not right, and more than 80% were satisfied with project construction. Users, though, were less happy, with only 70% saying they were satisfied. (Holloway and Sok 2005) It is interesting to note the downward progression in satisfaction. Another survey found that an average of 79% of users were satisfied, with a range from 67 to 93% (Seila Working Group 2004).

136. User satisfaction, however, does not necessarily mean that the technical specification has been met. For rural villagers without much knowledge or experience of construction for comparison, anything may be better than nothing.

137. Information on the quality of NGO commissioned projects was not available. With better resources, it is possible that quality control is better, but this would need further field study to verify.

138. The other important aspect of quality control is the materials. In particular, handpumps have to conform to a rigid specification of materials quality and manufacturing dimensions in order to be considered a “standard” handpump. A frequent complaint in the Sector is that the quality of some of the Vietnam No.6 pumps is very poor, and that the so called “Afridev” pump manufactured in Cambodia is not to standard. To ensure that the locally produced pump is to specification and therefore is an Afridev, an independent quality assurance check should be carried out by an organisation such as Crown Agents, which specialises in this type of quality control.

7.6 Water quality

139. Cambodia published its *Drinking Water Quality Standards* in 2004. These cover all the normal chemical, bacteriological and physical parameters suggested by the WHO in its Guidelines for Drinking Water Quality, including parameters for pesticides, etc. (Ministry of Industry Mines & Energy 2004)

140. There is, however, a fundamental problem with Cambodia’s Standards, concerning the acceptability of water in terms of taste, colour and odour. The Standard states that taste and odour have to be “acceptable” to consumers. These two parameters are subjective,

¹⁴ This covered all construction – roads, culverts, small irrigation structures, as well as water supply facilities.

¹⁵ A note of caution added that “the Survey Teams came to the conclusions that most of the Commune Chiefs were very “questionnaire-aware” and knew the right answers to give”

while all the other physical and chemical quality parameters are objectively measurable. No test methods or other ways of assessing taste and odour are prescribed. This means that water that is actually bacteriologically and chemically safe for drinking can fail to meet the *Standards* and thus has to be rejected. This has serious implications. It means that meeting the CMDGs will be impossible unless people are satisfied with the taste of the water, something that has generally not been achieved for protected groundwater sources up to now. It raises two alternative approaches: campaigning to persuade people of the benefits of protected groundwater sources; or household level water treatment which does seem to produce safe water with an acceptable taste.

141. For rural water supplies the *Drinking Water Quality Standards* are too comprehensive. Many of the parameters are desirable rather than essential, and are too difficult and expensive to test for given the paramount need to minimise the most common risks – bacteriological contamination, arsenic, fluoride and nitrates.

Recommendation 7.6a

MIME and MRD, with the assistance of WHO, should review the *Drinking Water Quality Standards* and prioritise the most essential parameters for water safety in the context of rural areas.

142. Another problem in terms of acceptability is the widespread but mistaken perception that calcium in water (in the form calcium carbonate) is harmful to health, specifically causing kidney stones. The World Health Organisation sets no guideline value for calcium in water and does not recognise it as hazardous to health.

143. Setting standards is only part of the problem. It is also necessary to monitor and enforce the standards. At present for rural water supply, there is very little capacity for this **water quality monitoring**. Testing for arsenic is now routinely carried out for new water supplies by PDRD using field test kits, but apart from that there are no laboratories or personnel for regular testing of all the other parameters. Such a system of testing needs equipment, people, a supply of test materials and money to run.

144. The alternative approach to water quality testing now advocated by WHO is water safety frameworks. In the same year that Cambodia published its *Drinking Water Quality Standards*, WHO published the third edition of its *Guidelines for Drinking Water Quality (GDWQ)*. The new GDWQ sets out a water-safety framework with three key components:

1. Health-based targets, taking into account public health burdens and priorities and normally set by health authorities.
 2. System- or technology-specific water-safety plans of which the most relevant for rural systems are: (a) system assessment to determine whether the drinking water supply (from source through treatment to the point of consumption) as a whole can deliver water of a quality that meets the health-based targets; (b) operational monitoring of the control measures in the drinking-water supply that are of particular importance in securing drinking-water safety;
 3. Independent surveillance: a system that verifies that the above are operating properly.
- (Howard and Bartram 2005)

145. This approach of water safety frameworks would be more appropriate for Cambodia now. The approach has less need of water testing equipment with trained personnel and high running costs for transport and supplies, and it is more proactive in ensuring safe water, rather than reacting to water quality problems some time after the event or conditions that caused the failure.

Recommendation 7.6b

MRD should adopt the water safety framework approach for rural water supplies advocated by WHO and develop the systems, procedures and staff necessary.

Potential Project 7.6: Water safety framework and surveillance system

This project would establish a water safety framework for rural water supplies. While the establishment of the system (setting up procedures, training personnel, etc.) is fairly straightforward, the issue of long-term functioning and its recurrent running costs needs to be seriously considered. Unless the RGC is committed to prioritising the sector and providing the recurrent costs of an operational water quality monitoring system in perpetuity, establishment of the system will be a waste of investment.

146. A water quality monitoring system has little purpose if it is not possible to act on the results. If a water source does not meet the Standards, the responsible agency (or the community itself) needs to be able to rectify the cause of the problem, whether it be pollution of the source, degradation of the abstraction system or contamination of the delivery system. Condemning a source as failing to meet the *Standards* also raises the risk of alternative sources – if the main source is contaminated, either bacteriologically or chemically, and so condemned as unfit for drinking, is the alternative source of higher risk? For example, a protected well may just fail to meet the bacteriological or arsenic parameter, but the alternative source may be a highly bacteriologically contaminated pond, and thus more dangerous.

147. In this respect, the results of the rigorous water quality testing carried out by IDE for the development of its water filters is worth highlighting. Tests on the raw water showed that river and lake water tend to be better quality than ponds and can be better than some wells. (Roberts 2003)

148. A comprehensive report produced in 2004, *Situation Analysis: Arsenic Contamination of Groundwater in Cambodia* (David Fredericks 2004), analyses the problem of arsenic, maps the occurrence and geographical risk areas, and proposes actions for mitigation of the effects of arsenic. UNICEF is now supporting MRD with a new project to address this and other aspects of water quality.

149. The one concern about arsenic that arose during the field work of this review was with the field testing of water in Oddar Meanchay. The test results from routine field testing of newly developed water supplies show consistent positive results in the order of 10µg/l. These results are reported to MRD in Phnom Penh. The concern is not the actual results, which are within the acceptable limit of 50µg/l, but the fact that there is no reaction to question whether these are true results, or whether there is something wrong with the testing method or equipment¹⁶. The consistency of the results (nearly all reported as 10µg/l) for an area identified by Fredericks as low risk should have prompted a reaction about the accuracy of testing or the possibility of widespread low level contamination in the province. This concern also raises a bigger question about how and whether the routine water quality monitoring data for all parameters in a national water quality monitoring systems would actually be used.

¹⁶ The field test equipment is only sensitive enough to give three possible results: no arsenic detected; 10µg/l; and >50µg/l.

8 Institutional issues

8.1 Policy

150. A Policy Framework for the RWSS Sector was produced in February 2001 by the Rural Water Supply and Sanitation Working Group, made up of various ministries and other organisations and led by MRD, after various stakeholder workshops and consultations. This was one of the two outputs of the Policy and Capacity Building Project supported by WSP with funding from SIDA (MRD 2001). The second output, a 10 Year RWSS Sector Strategy was produced in draft form in July 2001 after two further stakeholder workshops (Ministry of Rural Development 2001). The Policy Framework was revised and combined with an earlier *Water Supply Policy* prepared by the Ministry of Industry, Mines and Energy (MIME undated) to become the *National Policy on Water and Sanitation*, which was ratified by the Council of Ministers on 7 February 2003 (RGC 2003).

151. The National *Policy on Water and Sanitation* is in three parts:

Part 1: Urban Water Supply Policy

Part 2: Urban Sanitation Policy

Part 3: Rural Water Supply and Sanitation Policy

The RWSS section of the National Policy is based fairly closely on the earlier Policy Framework, but with some differences. The following discussion of the Policy is restricted to Part 3, except where noted.

152. The development of the national Policy and its ratification by the Council of Ministers was a very important step in the development of the Rural Water Supply and Sanitation Sector. It gives the organisations in the Sector the authority and the responsibilities to establish water supply and sanitation services for rural people and it provides an appropriate basis for delivery of these services. Some of the important principles in the Policy are:

- It clearly sets the role of government as a facilitator of the Sector, enabling other organisations to deliver the actual services.
- It prioritises services for poor people.
- It clearly defines the role of the private sector in service delivery and the role of government to enable the private sector to achieve this, including promoting “transparency and competition in sector service provision”.
- It establishes the role of communities in management of their water supply and sanitation facilities and services.
- Communities are to choose the type and level of service, based on information about the technical and financial aspects of the service options.

153. There are, however, several shortcomings in the Policy:

- There are no definitions of terms such as “access”, “sustained”, “sanitation” and “hygienic environment”. The earlier Policy Framework defined these, as well as giving a glossary of detailed terms. In particular, for water supply service it stated: “The basic quantity of water is 20 litres per person per day”, although the distance to the water point and the basic level of service for sanitation were left to be determined in the subsequent sector strategy.
- The lack of definition of a minimum level of service for both water supply and sanitation is a serious omission. This makes it difficult to assess coverage, as discussed in Section 5.2.

- The distinction between urban and rural, essential for delineation of responsibilities between MIME and MRD is not stated. The only reference is in a footnote in Part 1: Urban Water Supply Policy, which says “Urban in this policy is referred to city or town”. This led to conflicting views as to which ministry is responsible for water supply in small towns in rural areas. This was resolved after two years by the Memorandum of Understanding between MIME and MRD, which gives responsibility for piped water systems managed privately to MIME (MRD and MIME 2005), but the effect of this is to predetermine the type of service for people, in contradiction to the Urban Policy of giving people a choice of service.
- Under Chapter 2, Clause (a) Central Government Roles and Responsibilities, which states that “Government will function as a facilitator at all levels ...”, the first bullet point appears confused or even misleading. It states a specific role of central government as:

“Establish an independent regulatory body to facilitate active participation by communities and service providers in sector-related interventions”.

This is not the role of an independent regulator, whose functions are typically concession or licence award and revocation, economic regulation, and quality of service regulation. The original Policy Framework had a significantly different wording of this point, which makes more sense in the context:

“Ensure a legal and regulatory framework that creates an ‘enabling environment’ to facilitate active participation by communities and other stakeholders in sector-related interventions”. (MRD 2001)

In other words, government is to set the rules within which other organisations and communities can work. This difference is either a problem of translation from English to Khmer to English or it shows a serious misunderstanding of the point.

- There is no distinction between monitoring and evaluation – their purpose, practice and use. The following definitions make the distinction:

“Evaluation is the checking, collection and analysis of information about *past* project development for purposes of making decisions about continuation of the project and/or to improve the performance of similar projects and the sector as a whole.

“Monitoring is the checking, collection and analysis of information about *current* project development to improve implementation, performance and results. In essence it means comparing the actual situation with the expected (or planned) situation — and then taking action to bring reality and expectations together.”

(emphasis added) (Shordt 2000)

- There is no separation or recognition of the very different issues of sanitation. Every reference is to water supply and sanitation, never to sanitation alone, even though the requirements and approach in each sub-sector are different. As a result, sanitation is not given sufficient consideration.

154. Despite its faults, the general opinion amongst Sector professionals is that it is not worth revising the National Policy at present. Development of the Policy took considerable time and effort by many within the Sector, so it would be better to devote both these limited resources to making it work in practice.

155. One change has been made to the Policy. In a Cabinet Meeting on 17 September 2004, the RGC Cabinet adopted the following amendments submitted jointly by MIME and MRD:

- The role and responsibility of Government at national level be amended as ... “the Governmental Institutions are tasked to come up with initiatives and ensure the supply of clean water and sanitation nationwide and gradually encourage the participation and capacity building of the private sector...”
- The main role of the Government at national level be amended as ... “the service to supply clean water to the poor community in emergency case and in the areas where the private sector can not supply....”
- The main role of the Government at provincial and municipal level be amended as “the service to supply clean water to the poor community in emergency case and in the areas where the private sector can not supply....”
(RGC 2004)

156. It is difficult to understand this decision. It creates a direct contradiction with the role of Government defined in the *National Policy*. In Chapter 5: Private Sector Participation, the stated policy is to “Create a competitive environment that motivates the private sector to supply cost-effective RWSS services that respond to community demand, especially in underserved areas” (RGC 2003). Even though MRD is not directly competing by bidding against the private sector, the fact that MRD and PDRDs deploy their own drilling rigs and teams means that there is little incentive for the private sector to develop its capacity. Continuing to implement projects, albeit in remote and difficult areas, will not stimulate the private sector to develop its expertise. For emergency cases, it is not feasible to have a stand-by drilling capacity unless it is active, which means that it has to be working on development project to the exclusion of private sector.

157. One of the motivations for private sector is profit. To balance the risk and achieve its profit, the private sector may initially charge more for working in difficult and remote areas, but as they build up their experience and expertise and competition develops, costs should reduce. The initial higher cost is one of the costs of developing the private sector. The experience of UNICEF provides a good example. For its first well contract in Stoeung Treng it had to use a contractor from a neighbouring province because there were none locally. Two years later another project attracted nine bidders from the province itself.

158. This change in the Policy also distracts MRD from the role it should be playing of leading and motivating the sector as a whole. The decision raises questions about MRD’s motives in continuing to directly implement projects, and JICA’s reasons for supporting it with its rural water supply project in Kompong Cham.

159. In 2004 MRD issued a PRAKAS¹⁷ to organise an official working group, the Policy and Strategy Coordination Unit (PSCU) for the facilitation of policy and strategy for the sector. Its role is to support all the tasks of MRD and other parties involved for policy and strategy implementation of rural water supply and sanitation. It is understood that this Unit is coordinated by an Under-Secretary of State, but it appears that it has not been active since the PRAKAS.

160. Although MRD has primary responsibility for leading and implementing the Policy, there is a role for other organisations, in particular NGOs, to advocate greater support to the Sector by government, as noted by Environmental Resources Management. The NGO Forum has few NGO members with an interest in water and sanitation, so no comments were made by NGOs to government at the time of the National Poverty Reduction Strategy,

¹⁷ An official Ministerial order

or at other times. (Environmental Resources Management 2005). None of the Forum's projects is directly related to water supply or sanitation.

8.2 Strategy

161. The second output of the PCB Project was the *Rural Water Supply and Sanitation Sector: 10 Year Sector Strategy: 2001-2011*, issued in final draft form in July 2001. For reasons which are not clear this strategy was never finalised or adopted for implementation. Possible reasons could be that MRD did not secure funding to implement the Strategy, that MRD expected further technical support to undertake the organisational and developmental changes proposed by the Strategy, and that MRD was reluctant to address some of the implications of the Strategy. Most of the strategic objectives, other objectives and planned outputs remain relevant today.

162. The ADB was aware of the strategy development process in 2001 (the Strategy is referred to in the PPTA Report) and it is not clear why ADB and its consultants preparing the SSTA for the new RWSS Sector Project were not reminded about the draft Strategy by MRD. In the *Report and Recommendation of the President to the Board of Directors on a Proposed Grant ...for the Tonle Sap Rural Water Supply and Sanitation Sector Project* (one of the final stages in ADB's project approval process) it states that "MRD has not yet developed an overall RWSS strategy to implement the policy, and only a few guidelines have been developed" (Asian Development Bank 2005). As a result of this mistaken knowledge, the new project includes assistance in preparing a RWSS strategy. Outputs have been set including "RWSS strategic unit with two full-time professional staff in charge of developing RWSS strategy within 3 months of grant effectiveness", and a RWSS strategy within 24 months, to be supported by implementation guidelines within 36 months (Asian Development Bank 2005). The new ADB Project implementation team is aware of the existing draft Strategy and is planning to build on it.

163. Given that there is already a draft Strategy that simply needs reviewing, for the time allowed in the Tonle Sap RWSS Project for developing the Strategy and each of the related outputs seems to be too long. In particular, 3 years into a 5 year project seems to be an excessive amount of time to produce implementation guidelines covering mainstreaming gender, community participation, contributions and subsidies, private sector participation, sector planning, water quality monitoring and testing, participatory monitoring and evaluation and operation and maintenance. These guidelines will be needed by the project for its own implementation so should be developed quickly, then monitored and refined before finalising after about three years experience of their use.

Recommendation 8.2

ADB and MRD should review and reduce the time allowed in the Tonle Sap Rural Drinking Water Supply and Sanitation Project for development of the strategy and implementation guidelines, so that these are available for use by the Project and other organisations as soon as possible.

164. There is, however, a need to support review and implementation of the strategy but this is only one task amongst many for ADB's consultants. From discussion with ADB, it would welcome additional technical support from another donor to build the capacity of MRD in this important role.

Potential Project 8.2: Capacity building RWSS strategy and guidelines

The ADB Tonle Sap RWSS Project includes a provision for the development of a strategy and guidelines for implementation processes, but this will only be a limited

part-time task for the Project consultant team. ADB has indicated that additional support in the form of a technical advisor to the RWSS Strategic Unit in MRD would be valuable in order to build capacity for review and implementation of a comprehensive strategy and development of guidelines for project implementation processes.

8.3 Legislation

Water and Sanitation Law of the Kingdom of Cambodia(2004) (draft)

165. According to Article 2, this Law is to “cover all the management activities related to water supply and sanitation within the whole territory of the Kingdom of Cambodia”. Article 3, however, defines water supply service as “exploitation of treatment and distribution of water through pipeline network to the users”, and sanitation service as “the exploitation of collection and transmission of sewerage discharged from domestic houses, public and private establishments to the treatment plant”. The definitions in Article 3 contradict Article 2 by excluding most of the population of Cambodia due to the nature of the appropriate technology used – sanitation in particular. It also predetermines the technical solution for sanitation in urban and peri-urban areas, including small towns, ignoring international evidence about the inappropriateness of sewered sanitation compared with on-site sanitation in such environments.

166. Article 5 gives MIME the responsibility “for setting and administrating the government policies, strategies and planning in water supply and sanitation sector”. The MRD’s role is not specified. Apparently this draft Law has been promoted by MOWRAM and MIME without the involvement or input of MRD. As a result, it does not incorporate the responsibilities of MRD for water supply and sanitation in rural areas.

167. The rest of the Law deals with regulation and licensing of commercial service providers, so is not applicable to rural water supply or sanitation.

Recommendation 8.3

Before finalising and promulgating the Water and Sanitation Law of the Kingdom of Cambodia (2004) (draft) MOWRAM, MIME and MRD should together review the Law so that it clearly specifies the urban and peri-urban responsibilities of MIME, the rural responsibilities of MRD and the overall water resource management responsibilities (in relation to water supply and sanitation) of MOWRAM. In particular, the responsibility for sanitation in small towns needs to be clearly allocated, and the range of technical solutions extended to include on-site options.

The Law on the Administration and Management of Commune/Sangkat (2001)

168. The Commune/Sangkat Law is the legal framework for Commune Councils and the way they function, including planning and reporting. This is relevant to the Sector in terms of the planning process for local development of water supplies and sanitation. There is, however, nothing to establish the legal status of Water and Sanitation User Groups.

Other laws

169. Other relevant laws include the Law on Investment and the organic laws, currently being drafted, establishing the full decentralisation and de-concentration framework.

8.4 Roles and Responsibilities

170. It is a frequent complaint, raised specifically at a Special Sector Group Meeting held early in the Review process but also heard on other occasions, that roles at national and provincial levels are not clearly defined. A series of sessions were planned for the Sector Review Workshop held in November 2005 for participants to identify roles and responsibilities based on a list of all the functions necessary for an efficient and effective sector. Participants were expected to identify which organisation is designated responsible at present, which organisation if any actually takes responsibility at present, and which organisation should be responsible in the future, taking into account the Deconcentration and Decentralisation (D&D) Strategy. Participants became stuck on the first of this three part exercise, an indicator in itself of the confusion over roles and responsibilities. The planned process was therefore changed so that a smaller group met to discuss some of the factors that lay behind the issue. Points raised in that discussion included:

- This is a difficult discussion because it is circular.
- In theory, roles and responsibilities are well defined
- In practice they are confused.
- Donors do not follow – donors are wrong sometimes
- Cannot just be solved at departmental level – has to be interministerial
- Need to define which parts are not clear.
- Need to work out in the interim before it is changed through D&D from 2006-2010.
- Complexity of RWSS Sector
- Donors are not helping
- Government does not claim responsibilities
- Overall strategic plan is lacking
- Difficult to talk about fine tuning without money
- Previous documents on this remain relevant

Solutions suggested include

- Examples of SWAPs in the Health Sector
- Dissemination is needed
- This Review leading to shopping list of potential projects for donor support could help.
- MRD needs to visit long term planning
- Output from workshop needs to be channelled to senior levels.

171. As noted by the Workshop, roles and responsibilities are complex. It is outside the scope of and the time available for this Review to go into the issue in detail or to offer solutions; it can only make some observations and suggestions on particular points. It is up to the Sector organisations themselves, and specifically the “lead” organisation, MRD, to resolve these problems.

Recommendation 8.4

MRD should establish a working group to analyse the roles and responsibilities of the RWSS Sector, as listed in Table 8.1. The working group should recommend the allocation of each role or responsibility to the appropriate organisation in the Sector, including specifying the level/s at which the responsibility should be performed, taking into account decentralisation and de-concentration. A particular issue to resolve is the role of central MRD in relation to PDRDs and DORDs. If necessary, other relevant ministries should be involved in the recommendations. Based on the recommendations the Minister of Rural Development should publish a PRAKAS clearly defining the allocation and duties of all the roles and responsibilities.

172. There are three parts to roles and responsibilities:

- Officially designated roles, either by legislation or government policies;
- Performance (or non-performance) of the roles, whether authorised or not;
- Acceptance or respect by other organisations of the right of the officially designated organisation to undertake the role.

173. The first of these can be examined fairly objectively – either there is written authority or there is not, although in some cases the written meaning can be ambiguous.

174. The second is more subjective. An organisation may claim to be performing the role, whereas in the opinion of others it may not be or may not be doing it effectively. In some cases an organisation may take on a role they consider important because they believe it is not being performed by the officially designated organisation.

175. The third part is also a matter of opinion. Acceptance means recognising the official organisation's right to undertake the role and supporting it in this by abiding by any rules or obligations. Respect is not a right – it has to be earned, in this context usually by carrying out the role effectively.

176. Reasons for not fulfilling a responsibility may be lack of funding, lack of capable and competent staff, other higher priorities, or not understanding it, or not accepting it.

177. There are a number of levels and divisions to the roles and responsibilities in the water and sanitation sector. At its broadest, the division of the whole of water and sanitation into responsibilities of various ministries is fairly straightforward:

- Ministry of Water Resources and Meteorology (MOWRAM) has overall responsibility for water resource planning and management.
- MRD is specifically responsible for rural water supply and sanitation.
- MIME is responsible for water supplies to provincial and small towns, regulation of the private sector involved in piped water systems, setting drinking water quality standards, water quality in piped supplies, and urban sanitation outside Phnom Penh.
- Ministry of Health (MOH) is responsible for the water quality of public water supply sources
- Ministry of Planning is responsible for monitoring the CMDGs
(Asian Development Bank 2005) (Hang Lina 2005)

178. Some of the ambiguities in this broad division will be discussed when looking at the detailed roles and responsibilities within the RWSS Sector. The dispute over responsibility for small towns has been resolved by the Memorandum of Understanding between MIME and MRD. MIME has proposed a further refinement to make a distinction based on area classification as well as system typology. In this proposal, piped water is classified as an "urban type of supply" and thus always the responsibility of MIME, regardless of location (makes setting and enforcing standards etc, easier). In addition, all water supplies in an area classified as "urban" would fall to MIME regardless of type of supply (including hand pump wells in Phnom Penh for example). However, the MOU has not been formally adjusted. (Rosenboom 2006)

179. Sanitation in small towns seems to fall into a gap. CfD is undertaking it in some small towns on behalf of MIME.

180. Focussing on the RWSS Sector, Table 8.1 gives a list of roles and responsibilities that need to be undertaken in an effectively functioning sector. These may be performed in different ways at different levels – central/national, provincial, district, commune or village – or may be a responsibility at one level only. Some of them are issues within their own right, and are discussed elsewhere in this report. The following notes on each group of roles and responsibilities in Table 8.1 are confined to: who is responsible, is the responsibility being carried out, and by whom. Many of the responsibilities are also undertaken within an organisation's own operations but that aspect is not covered here. The National Policy specifies a number of roles for Central Government, without specifically naming MRD. It is assumed that these roles are assigned to MRD.

181. Policy and strategy

Policy formulation, strategy preparation and their dissemination and implementation are set as a central government role by the *National Policy*. The RWSS Policy was prepared by MRD and issued by the Government. MRD prepared a strategy in 2001 but it was never finalised. The *National Policy on Water Supply and Sanitation* has been disseminated, although it does not appear to be fully understood at all relevant levels in MRD. Implementation is constrained without a strategy.

182. Planning

Sector planning is a central government role in the National Policy: "Prepare plans for putting the Policy into practice". It is not apparent that this role is currently carried out by MRD. The national level inventory of water resources is not properly maintained, due to poor management of it and implementing organisations not contributing to it.

183. At provincial level, the Provincial Rural Development Committee is responsible for rural development planning (National Policy). Commune Councils are responsible for commune level planning (RGC 2005), and this is well established. Plans were not seen so no comment on the quality of planning is possible.

184. Finance

The various financial responsibilities are set by Government rules. Securing finance for the Sector is a specific role of central government, specified in the National Policy. MRD produced a Sector Investment Plan in 2002 and updated it in 2005. It has had limited success in attracting funds to the Sector (the current JICA Project in Kompong Cham; the new ADB grant for the Tonle Sap RWSS Project), and it has not managed to obtain sufficient recurrent funds from central government.

185. Coordination

The National Policy states that MRD is to: "Coordinate internal and external assistance, and sector interventions". ADB (2005) states that "No entity currently exists to coordinate the implementation of policy and the preparation of the strategy and guidelines". MRD holds regular monthly meetings of organisations in the Sector, but these are mainly for information exchange rather than coordination of activities.

186. There is a Coordinating Committee for Water Supply and Sanitation comprised of senior representatives from the ministries involved in the water sector (Ministry of Industry Mines & Energy 2004), but it rarely meets. Coordination between ministries is generally considered to be weak.

187. The National Policy states that PRDC is to support inter-departmental cooperation and coordination at the provincial level. Some PRDCs meet on a regular basis (it is not known if this happens in all provinces).

Table 8.1: Roles and Responsibilities within the RWSS Sector

<p>Sector policy and strategy</p> <ul style="list-style-type: none"> ▪ Policy formulation ▪ Strategy preparation ▪ Dissemination ▪ Implementation
<p>Planning</p> <ul style="list-style-type: none"> ▪ Data collection ▪ Inventory of water resources (type, quantity, quality) ▪ Rural water supply planning and investment ▪ Sanitation planning and investment ▪ Selection of communities for water supply ▪ Selection of communities for sanitation
<p>Finance</p> <ul style="list-style-type: none"> ▪ Budgeting/estimating ▪ Obtain funding ▪ Financial planning ▪ Budget allocation ▪ Disbursement ▪ Monitoring expenditure
<p>Co-ordination</p> <ul style="list-style-type: none"> ▪ Within RWSS sector ▪ Outside RWSS sector
<p>Regulation</p> <ul style="list-style-type: none"> ▪ Policy ▪ Finance ▪ Community management principles ▪ Design standards and types ▪ Quality of work ▪ Water allocation ▪ Conflict resolution ▪ Water quality
<p>Service delivery</p> <ul style="list-style-type: none"> ▪ Funding ▪ Community mobilisation/facilitation ▪ Sanitation promotion ▪ Technical design and assistance ▪ Management of construction ▪ Procurement ▪ Quality control
<p>Operation and maintenance</p> <ul style="list-style-type: none"> ▪ Operation ▪ Maintenance ▪ Repair ▪ Development of community capability ▪ Support systems ▪ Supply chains
<p>Monitoring and evaluation</p> <ul style="list-style-type: none"> ▪ Sector monitoring ▪ Sector evaluation ▪ Programme/project monitoring ▪ Programme/project evaluation
<p>Research and development</p> <ul style="list-style-type: none"> ▪ Commissioning ▪ Undertaking

188. Regulation

Regulation in this context is monitoring and ensuring that other organisations, including government and the private sector, carry out their functions in accordance with established legislation, regulations, procedures, standards and quality of service. There is no formal allocation of this role. Some quality control of construction is undertaken at field level, but this is contract supervision by the employer of the contractor. Water quality monitoring is assigned to MRD, but there is no effective system for this in place. Ministry of Health also has a responsibility for water quality of public water sources.

189. Service delivery

The *National Policy* designates NGOs and the private sector to implement service delivery, facilitated by MRD centrally and PDRD provincially. Some PDRDs are still implementing construction work rather than facilitating. The Cabinet amendment of September 2005 to the *Policy* allows MRD to implement in emergencies and in areas where the private sector can not supply. Currently its drilling rigs are operating in the JICA project in Kompong Cham.

190. Operation and maintenance

The National Policy assigns this responsibility to the user community. Most are struggling to fulfil this role. Responsibility for support systems for this, including supply chains for replacement parts for handpumps, is not defined.

191. Monitoring and evaluation

Central responsibility for the system extending down to the field is assigned to MRD. There is no effective monitoring system in place. Evaluations are carried out as part of project implementation. There has been no overall evaluation of the sector – ADB's PPTA in 2003 and this Review are probably the closest equivalent.

192. Research and development

According to the National Policy, MRD is to “develop and promote technical assistance in the field ... research ...”. Some research is being carried out by NGOs and the Royal University of Phnom Penh, but on their own initiative rather than at the instigation of MRD. Organisations funding research include WHO, UNICEF and WSP.

8.5 Sector management and strategic leadership

193. As a result of its turbulent history up to the time of the signing of the Paris Peace Agreement in 1991, Cambodia has suffered from a severe shortage of skilled, experienced and qualified staff in all parts of its government and economy. In particular, most of the Government service was very weak at that time. While some Ministries have addressed these problems and made significant progress in developing their capacity to function effectively and fulfil their responsibilities, others have made much less progress. Since it came into being in 1993, the Ministry of Rural Development has remained in the latter group.

194. MRD has officially been given responsibility for rural water supply and sanitation. As such, it is responsible for managing the Sector and providing strategic leadership towards the Sector Vision in the *National Policy*. Aspects of the management and leadership role are contained in the objective results that the *National Policy* (RGC 2003) is seeking to achieve:

- RWSS Sector development priorities are identified and addressed with greater efficiency and with greater long-term sustainability;
- Greater consistency of approach employed by the various RWSS sector initiatives and programmes

Related specific roles include:

- Secure financing for the sector
- Formulate, disseminate, and implement RWSS policies, regulations, and strategies
- Prepare plans for putting the Policy into practice
- Coordinate internal and external assistance, and sector interventions

195. It may be helpful to give a practical definition of leadership, taken from an international report on management in the water and sanitation sector:

“Leadership is the ability to inspire others to understand the institution’s mission, to commit themselves to that mission, and to work toward its fulfilment. It goes well beyond proficiency in management skills. In order to perform its functions in a competent manner, an institution in any sector needs to have effective leadership at many different levels.” (Edwards 1988)

196. MRD has made little progress to strengthen its ability for the overall management of the Sector and leadership to achieve the Vision and the objectives set out in the National Policy. The main evidence for this is the many issues and problems described in this Review. The Review has not newly discovered these – it is just reflecting issues that have been well known for a number of years by the various stakeholders in the Sector.

197. A specific example is the frequently voiced need for a strategy to implement the National Policy. The draft Strategy, developed by MRD and other stakeholders with the assistance of the PCB Project in 2001, identified most of the problems and issues in the Sector and proposed ways forward (Ministry of Rural Development 2001). Since then, only limited progress has been made in securing either the funding or political support to implement that Strategy, and it is now all but forgotten. The ADB Project Consultant team is aware of the draft Strategy and will be reviewing and finalising it.

198. It is fairly easy for MRD to find excuses and reasons, mainly related to the political context of the country and the lack of resources and funding. But part of leadership is advocacy and ensuring that the profile and importance of the Sector is brought to the attention of the highest levels of government.

199. Since its inception in 1993, MRD has been heavily involved in implementation of projects and has found it difficult to adapt to this role of leading, managing and facilitating the Sector. Part of the problem is that there is little new incentive and considerable loss of present incentives to make this change. There are also questions over whether it has the right combination of skilled and experienced people for this changed role. Enabling MRD to change to this role is one of the biggest challenges facing the sector. Some of the support necessary for making this change is to be provided as part of the ADB Tonle Sap Rural Water and Sanitation Project starting soon, but this role change is not entirely compatible with the responsibility for implementation of that Project.

200. An important issue within sector management is collaboration and coordination between different government departments and levels of government. There appears to be significant weakness in this respect, to the extent of competition rather than collaboration to achieve the common purpose of the Sector Vision.

8.6 Decentralisation and De-concentration

201. The evolving decentralisation and de-concentration (D&D) process will have a major effect on the way that the Sector operates. As stated in the D&D Strategy Framework “up to now, the relations between ministries and institutions at national, provincial/municipal and district/khan levels have not been clear, whether it is in the forms of centralization, decentralization or deconcentration. The strongest system at the present is centralization. Some duplicate and unclear duties create many difficulties in the coordination and provision of public services and effective and sustainable development at provincial/municipal and district/khan levels” (RGC 2005). The intention is to “establish management systems of provincial/municipal, district/ khan and commune/sangkat administrations based on the following principles:

- “a unified administration will be put in place at provincial/municipal and district/ khan levels.
- “At commune/sangkat level, local authority has been established by the elections organized in February 2002. The Royal Government needs to strengthen and improve them so that they are more effective in responding to the needs for development and poverty.”

(RGC 2005)

202. The Sector and its lead Ministry need to consider how it will be affected by this process, how and whether it needs to redefine its roles and responsibilities to fit with D&D, and what it needs to do to develop its capability and capacity to operate in this new way. The National Water and Sanitation Policy has already set the way for much of this, but it needs to be reviewed in the light of D&D.

203. There appears to be a complacency about D&D in terms of “we just have to wait to see what happens and what is decided for us”. MRD and other Sector organisations have the best understanding of the organisational needs of a decentralised rural water supply and sanitation sector. Although “national level” is not defined, the D&D Strategic Framework appears to offer an opportunity for an input to this change: “to support this reform policy, the

national level must clearly define in law and various legal instruments the duties of provinces/municipalities, districts/khans and communes/sangkats based on the capacity of each level in delivering public services, managing development and financial resources (including revenues from their own sources and national transfers) so that effective management at each level of administration is ensured" (RGC 2005).

Recommendation 8.6

MRD, with the Sector organisations, should be proactive in defining its own view of the most operationally effective decentralised structure for rural water supply and for sanitation, and promoting this, rather than waiting to see what is imposed on it.

8.7 Coordination

204. A dictionary definition of coordinate is: "to combine or integrate harmoniously; to harmonise." There are frequent complaints about poor coordination or lack of coordination in reports and other documents and at meetings conducted as part of this Review. These complaints are about coordination amongst various groupings at different levels, including the following:

- National level amongst ministries
- National level amongst donors and government
- National level RWSS Sector
- Vertically between central, provincial, district and commune levels
- Within ministries, specifically MRD

205. At **national level amongst ministries**, a Coordinating Committee for Water Supply and Sanitation comprised of senior representatives from the ministries involved in the water sector has been established. They include:

- Ministry of Industry Mines and Energy (MIME), as chair
- Ministry of Rural Development (MRD) as vice-chair
- Ministry of Water Resources and Meteorology (MOWRAM)
- Ministry of Health (MOH)
- Ministry of Planning (MOP)
- Ministry of Public Works and Transport (MPWT)
- Ministry of the Environment (MOE)
- Phnom Penh Water Supply Authority (PPWSA)
- Ministry of Economy and Finance (MEF)
- Council for the Development of Cambodia (CDC)
- Council of Ministers
- Phnom Penh Municipality.

(Ministry of Industry Mines & Energy 2004)

206. From discussions with officials of MRD, it was not possible to determine the frequency of meetings of this Coordinating Committee, its outputs or its effectiveness. It appears that it rarely meets.

207. Outside of formal meetings, inter-ministerial relationships are weak, partly due to the requirement that staff follow well-established and controlled vertical lines of communication. Exchange of data or information that would assist staff in their duties is slow and often limited. (Asian Development Bank 2005) (Environmental Resources Management 2005) To an outside observer, the limited coordination between the ministries to date appears to be due to political struggles between the two parties of the coalition government. MIME and MRD are dominated by different parties. (Environmental Resources Management 2005)

208. At **national level, donors and government** have established a system of 17 Technical Working Groups to coordinate efforts in various topics and sectors. Theoretically water supply and sanitation fall under the Technical Working Group on Infrastructure and Regional Integration (IRITWG), but the IRITWG has not yet addressed any water supply and sanitation issues, since it has been focusing almost entirely on transport. The Council for Social Development is seeking to address this omission by expanding its membership, drawing on support from the TWGs but noting the need to coordinate with additional agencies to address water supply and sanitation. (Ministry of Planning 2005)

209. Coordination amongst donors and with MRD is weak. There is no established forum for this, and though there may be consultation, there is a tendency to adopt individualistic approaches. Donors make their own decisions on where and how they should intervene without any leadership from MRD and without any national context in which to make those decisions. Consequently, there is no consistent approach by donors. There has been little or no collective action to make MRD accountable for outputs. This situation is self-perpetuating, and it is difficult to see how to break the circle. Both MRD and donors need to address this critical problem.

Recommendation 8.7

MRD and donors supporting the RWSS Sector should establish a forum for ensuring consistent and coordinated support addressing the strategic needs of the Sector as well as investment in increasing sustainable service delivery coverage.

210. At **Sector** level, the Rural Water Supply and Sanitation Working Group has been meeting monthly for well over ten years, but it is mainly concerned with information exchange rather than coordination. As ADB notes, no entity currently exists to coordinate the implementation of policy and the preparation of a strategy and guidelines (Asian Development Bank 2005). As part of the new Tonle Sap RWSS Project, a Policy and Strategy Unit is being set up in MRD to address this gap (see also Section 8.2).

211. **Vertical coordination** is criticised from two directions: first, “at district/khan level: coordination and management is generally weak, the system of accountability is implemented by vertical lines at each sector” (RGC 2005); and second, “linkages between parent ministries and provinces are also very weak” (Environmental Resources Management 2005). The D&D Strategic Framework aims to overcome these problems through its establishment of formal structures, but it will still rely on people without sufficient skills and experience.

212. Some coordination does take place at **provincial level**, with meetings of the Provincial Rural Development Committee covering Sector issues. In this Review, it has not been possible to ascertain the effectiveness of such meetings, or hear from all the parties involved.

213. Addressing the challenges of coordination at all these levels will require a long term capacity building effort. Even with this, the starting point is a willingness of all organisations and individuals to cooperate, based on a new level of trust.

8.8 Sector capacity

214. Capacity can be considered at two levels: the communities’ capacity to manage, operate and maintain their services; and the Sector organisations’ capacity to develop new services and support the maintenance of existing services. There are weaknesses in community capacity, but as development of community capacity is part of the process of

development of services, these are discussed in other parts of this Review. This section focuses on the capacity of the Sector to deliver new services and sustain existing services.

215. At the Special Sector Meeting held as part of this Review, several aspects of the capacity of the sector were raised as issues of concern:

- Lack of implementation capacity
- No capacity to regulate the private sector
- Lack of water quality testing facilities
- No systematic water quality monitoring system
- Lack of training capacity to develop the implementation capacity.

216. In addition, the National Policy states that “Government staff capacity should be increased at all levels in order to more effectively Implement RWSS sector activities” (RGC 2003). In the Rectangular Strategy, the Government also recognises that the strengthening of institutional capacity is crucial to sustainable development (RGC 2004). ADB, quoting from MRD’s Institutional Development Plan (2003-2007) notes that “While MRD has gained substantial knowledge of RWSS since its creation in 1993, much of this knowledge rests with a few qualified staff, often seconded to various externally funded projects. At provincial and district levels, this situation may cause a recurrent lack of capacity to implement projects” (Asian Development Bank 2005) (MRD 2002). NGOs have a key role to play in empowering communities, but experienced NGOs are generally expensive and in short supply in Cambodia (Asian Development Bank 2005).

217. The existing capacity of the Sector to deliver water supply services, and sanitation and hygiene promotion, and to develop the capacity of communities to manage the services in the long term, is not clear. There is no central record of the number of organisations – government, international agencies, international NGOs, local NGOs, private companies and individuals, and the skills they can provide to the Sector. An attempt has been made as part of this Review to collect and collate this information, but it is by no means complete. Information was taken from the Directory of NGOs in Cambodia, the Directory of the Water Suppliers Association, and by a survey questionnaire sent by email to members of the Sector Working Group. This information has been compiled to distinguish between type of work and geographic location. The results, given in Appendix A, need to be treated with caution:

- Only 18 of about 40 organisations in the Sector Group circulation list responded.
- Private organisations are listed according to their registered address, but also work in other provinces.
- An organisation may be working in only a few villages or one or two districts in a province, so the province cannot be considered as having sufficient implementation capacity.
- The lists do not take account of Seila and local government capacity, etc.

Nevertheless, the tables in the Appendix do reveal some useful insights:

- None of the international NGOs that responded to the questionnaires work in Kampong Chhnang, Koh Kong, Preah Vihear, Stung Treng (UNICEF is working there).
- There are no registered local NGOs with skills relevant to the RWSS Sector in Koh Kong, Mondul Kiri, Preah Vihear, Ratanak Kiri, although Cambodian NGOs at national level can potentially work in these provinces.
- Only a few local NGOs are directly interested in rural water supply and sanitation, and very few in hygiene education and promotion.
- Most local NGOs are involved in community development.

218. ADB's assessment of MRD is that it has a total of 2,286 staff, of which 620 are based in Phnom Penh with the remaining 1,666 based in PDRDs throughout the country. The absence of an efficient personnel management structure within the ministry made it impossible to determine accurate and up-to-date staff related information, such as desegregation by sex, academic qualifications, professional training, work experience, job responsibilities, distribution by sector, and distribution by department (BCEOM 2002). There are about 100 staff in the Department of Rural Water Supply, of which only about 30 have professional qualifications.

219. The shortage of qualified and experienced staff raises a question about MRD's capacity to manage and lead the sector, fulfil all its other designated roles and responsibilities, and take on substantial new funding for managing implementation projects. The operational management of MRD is likely to be seriously stretched to carry out all the roles expected of it, especially with the addition of the new ADB Project.

220. A number of efforts have been made over the years to develop the capacity of MRD. UNICEF has been a long term partner since MRD's inception in 1993. WSP supported it with the 3-year Policy and Capacity Building Project from 1998 to 2001, and AFD provided technical and financial support until about 2002. That MRD still has some way to go to become an effective manager of the Sector raise questions about the appropriateness of these efforts and the ability and willingness of MRD to change.

221. To make some sort of assessment of the capacity needed in the Sector to meet the CMDG targets it is necessary to make some assumptions. As with any analysis based on assumptions, if the assumptions change the analysis and conclusions would change.

222. Based on the estimate in Section 5.4 (Tables 5.1 and 5.2), the Sector needs the capacity to provide approximately 2.8 million people with water by 2015, and a further 9.6 million by 2025. There will also need to be support systems in place to ensure that the water supplies keep functioning for 6.9 million people by 2015 and 16 million people by 2025.

223. Achieving sanitation coverage is a much bigger task. The capacity will be required to ensure that by 2015 nearly 600,000 households have and use latrines, and by 2025, 2.5 million households. The hygiene behaviour of most people living in rural areas will also need to be improved.

224. The capacity issue is, however, more than just numbers – it is also necessary to predict the type of skills required. For example, developing community capacity to manage the services is a longer, more intense process than the construction of facilities, so the number of community development people needed will be substantially greater than the number of technicians.

225. The ADB assisted MRD to develop an Institutional Development Plan in 2002. This “stresses that a major retraining and recruitment will be needed for MRD and PDRDs. Retraining will be based on a needs assessment indicating required competencies for jobs in rural development, especially RWSS. The needs assessment will also suggest the optimal way to achieve the required competency. Capacity building within all levels of MRD will aim to strengthen MRD and PDRDs and enable them to make the transition from their traditional role of implementer to that of facilitator. Their emerging role will require them to be able to collaborate with other partners that enjoy comparative advantages, such as the private sector, whose advantage is in the technical area, and NGOs, whose advantage is in community mobilization” (MRD 2002).

226. The capacity of MRD itself to adapt to its role of facilitating and managing the Sector is to be addressed as part of Tonle Sap RWSS Project supported by ADB. This will include “a capacity-building program for MRD, PDRDs, DORDs, and commune councils on RWSS policies, planning, budgeting, financial management and accounting, project administration, economic analysis, gender awareness, community participation techniques, environmental management, land acquisition and resettlement, private sector participation, technical issues, and data management”. In addition “The Project has allocated sufficient resources to intensively train NGOs and supervise their performance”. (Asian Development Bank 2005)

227. Two warnings are needed on this concept of capacity development. First, “greater understanding is needed of the dynamics and processes of capacity building and greater rigour is needed in the planning, design and implementation of capacity building activities. Most “capacity building” is carried out on a project by project basis as a “tack-on” to the main contract of physical service delivery. There is seldom a planning process which involves a whole area and which addresses capacity building and training on a programmatic basis. Because there is so much uncertainty and confusion relating to the function of capacity building, it is largely ad hoc and unlikely to be successful in the long-run in most instances”. (Abrams 1996) Second, before any planning for capacity development, many of the strategic questions raised in other parts of this Review need to be addressed and answered.

228. MRD is the designated organisation to address the capacity needs of the Sector. One of its specific roles is to “Develop and promote technical assistance in the field of human resource development” (RGC 2003). Up to now, nobody has discussed the needs with the training institutions, such as the Institute Technologie du Cambodge and the Royal University of Phnom Penh, so that they can plan for the number of technicians, social development workers, hygiene promoters and engineers that should be trained now. ITC produces ‘rural engineers’ but none of the universities in Cambodia produce specialist water supply, sanitary or public health engineers.

229. The lack of knowledge about the present capacity of the Sector and other organisations that could assist is a major constraint to strategic planning of personnel needs and capacity development.

Recommendation 8.8

As part of its strategic role in sector management, MRD should determine the present capacity of all organisations working in the Sector, including the various types of private organisations. Based on this assessment it should prepare and implement a strategy for developing sufficient capacity in the Sector in order to meet the CMDGs and beyond, including links with and development of training organisations.

Recommendation 8.8b

MRD should explore the possibility of establishing a specialist training unit with a suitable training and research organisation to address the Sector’s educational needs – technical, social and institutional. The unit should be supported by sector organisations in lecturing and giving students practical experience.

Potential Project 8.8: Assessment of capacity of RWSS Sector and strategy for capacity development

An in-depth study is required to assist MRD to identify all the organisations in the Sector including private organisations or those that could contribute to the Sector and other related organisations, their personnel capacity and skills. This should be used to develop a strategy for development of Sector capacity needed to achieve the CMDGs.

8.9 Private Sector

230. The importance of the private sector to the development of rural water supply and sanitation services has been recognised for a long time, both internationally and in Cambodia. In Cambodia, however, the private sector is also recognised as being weak and in need of support to develop. The need to support its development was written into the National Policy on Water Supply and Sanitation, with responsibility assigned to MRD as facilitator for rural Cambodia. The Policy is “Create a competitive environment that motivates the private sector to supply cost-effective RWSS services that respond to community demand, especially in underserved areas”. (RGC 2003)

231. The term “private sector” covers a wide range of different types of organisation and individual. These include:

- Village/commune based artisan
- Village/commune based pump mechanic
- Local market or shop
- Local manufacturer
- Drilling company
- Consultants (individuals and companies)

232. Such a wide range of types can provide a wide range of different types of service including

- the physical infrastructure for the delivery of water
 - technology
 - construction;
 - the physical infrastructure for waste disposal, both human excreta and solid waste;
 - technology
 - construction;
 - the organisational arrangement to run the water supply system;
 - the maintenance and repair of the water supply system;
 - the training and other methods to enable communities to manage the infrastructure;
- (Ockelford 2002)

233. Development of the private sector faced and still faces a number of constraints. It is instructive to track these to see what has happened to the constraints over time. The original list in Table 8.2 comes from the draft Strategic Plan in 2001, organised around the specific clauses in the *National Policy* intended to address them. The current list comes from the participants at the Key Issues Sector Workshop as part of this Review.

234. From Table 8.2 it appears that little has changed over the past four years, despite the National Policy and the recognised need to develop the private sector.

Table 8.2: Constraints to Private Sector Development

Draft Strategic Plan (2001)	National Policy (2003)	Key Issues Workshop (2005)
<ul style="list-style-type: none"> ▪ absence of suitable regulatory laws, rules and regulations ▪ preference to work in peri-urban areas, where population density is higher, rather than in remote rural areas. ▪ low level of interest due to the small scale and low capital of many projects. 	<p>Create a competitive environment that motivates private sector service providers to supply water and sanitation services in order to respond to community demand.</p>	<ul style="list-style-type: none"> ▪ Geographic areas: <ul style="list-style-type: none"> - Too far, bad access road and low cost - Prefer work in high density population areas ▪ Condition of contract: <ul style="list-style-type: none"> - Contract condition too strict - No payment for dry well - Payment procedure is difficult (many stages) - Bill payment (high risk) - Weak regulation (high risk)
<ul style="list-style-type: none"> ▪ difficulty in obtaining the initial capital required to invest in expensive equipment for drilling and other activities. 	<p>Support the development and establishment of mechanisms that support small-scale RWSS contractors at the community level, by facilitating their access to small loans.</p>	<ul style="list-style-type: none"> ▪ No access to capital
<ul style="list-style-type: none"> ▪ uncertain profit margin due to hidden costs ▪ uneven bidding practices due to competition from subsidised government drilling units such as the MRD "Water Base" and the PDRDs ▪ competition from NGOs, which are subsidised 	<p>Promote transparency and competition in sector service provision.</p>	<ul style="list-style-type: none"> ▪ Un-normal bidding: <ul style="list-style-type: none"> - Complicated bidding document - Bidding document form is high cost - Competition from subsidized organisations (bidding) - Hidden costs - Absence of laws - Uncertain (hidden) cost ▪ Colluding: <ul style="list-style-type: none"> - Project managers - Party/group parties - Project commission (%)
<ul style="list-style-type: none"> ▪ 	<p>Encourage and facilitate contractual relations between water and sanitation user groups, service providers, and local authorities.</p>	<ul style="list-style-type: none"> ▪ Participation <ul style="list-style-type: none"> - Lack of participation from the local authorities - Low interest on supply and demand side - Low interest (high risk)
<ul style="list-style-type: none"> ▪ difficulty in obtaining spare and replacement parts for equipment ▪ weak technical and business management skills 	<p>Encourage the private sector to use new technologies and to conduct pilot projects in order to disseminate experience and information to sector stakeholders.</p>	<ul style="list-style-type: none"> ▪ Private sector himself <ul style="list-style-type: none"> - Not enough equipment - Delay contract - No access to capital - Difficult access to spares etc. - No capital (high risk) - Low capacity (technical/financial and management) (high risk) ▪ Technical skill <ul style="list-style-type: none"> - Lack of technical skill - Look for the cost only - The contractors' lack of skill - Low skills (finance and management)

235. Some efforts, however, have been made, with some success. With more demand for water and people prepared to pay, small private piped systems have started to appear, mainly in the commercial areas of big villages. The quality of water and service varies greatly. The MIREP (“Mini Réseau d’Eau Potable” or small piped drinking water systems) programme was launched in 2001 to help rural communes and the local private sector to set up piped water projects based on private partnerships. The major objective of MIREP was to take advantage of the local private sector interest in water supply and to set up a water system that could serve more people more efficiently. (Mahe et al. 2004) It has established 12 piped water systems run by private operators in small rural towns.

236. A further NGO initiative is the development and commercial marketing by two NGOs (International Development Enterprise and Resource Development International) of household water filters through the private sector. This is proving to be successful and is showing much promise for the future.

237. In some ways the private sector has developed itself despite the constraints. There are many private suppliers in the water sector, supplying equipment (jars, plastic PVC, VN6 pumps, toilet slabs), contractors (drillers) or water suppliers (water carts, piped water supply, bulk water suppliers). In reality these people are providing a very important service, but very few projects have tried to promote their participation, by providing training, or facilitating access to credit. (Mahe 2005)

238. The Water Suppliers Association was formed in 2002 with support from MRD and Burgeap under the APSER Project, and subsequently recognised by the Ministry of Interior. The association has 85 companies, including well drillers, water supply equipment producers, water supply network investors and operators, jumbo jar producers, pump manufacturers, etc. Its main business aim is “to mobilize all water suppliers nationwide so as to establish solidarity, unity and cooperation in their business activities, thereby ensuring the business’s stability and progress”. One of its more important activities was pre-qualification testing for membership of the Association (Water Supply Association, 2003). Unfortunately, after a promising start, the Association has become inactive due to lack of further support. Such a professional body has the potential to be an important vehicle for development and self-regulation of the private sector, but it needs further support, including political support, to achieve this potential. Another promising move is that the MIREP operators have, on their own initiative, set up two suppliers’ associations – one in Kandal and one in Takeo.

239. A retrogressive step in terms of developing the private sector has been MRD seeking and receiving a change in the National Policy to allow it to continue drilling operations in remote areas. This is directly contrary to its role of motivating the private sector to work in underserved areas. JICA’s rural water supply and sanitation project in Kompong Cham encourages MRD in this abnegation of its role, and it appears to go against JICA’s own policy. Its country study states that: “in order to alleviate poverty, resolve the income disparities between the cities and rural villages, and stop the population movement from farm villages to cities, it is important for Cambodia to develop local industries in the provinces. However, putting this idea into practice is very difficult due to many constraints.” (JICA 2002)

240. More widely it is clear that the private sector needs further support to reach the stage where it can take off by itself. It is equally clear that MRD is severely limited in its ability to fulfil its role in developing the private sector.

241. The new Tonle Sap RWSS Project has a section headed “support to the private sector”, but the support is mostly in the form of using the private sector in contracts for the construction of facilities. The only point addressing development of capacity is training on technical standards. The Project also proposes to “establish a database of private sector contractors”, thus duplicating the existing list of the Water Suppliers Association. (Asian Development Bank 2005)

Potential Project 8.9: Enabling environment for private sector participation in RWSS
This project would address measures to provide support for increased private sector participation in RWSS, such as the reform of the enabling environment in which the private sector operates, and development of the capacity of the private sector through support to the Water Suppliers Association, including training and development of its capacity to become a self-regulating professional body, and support to other such associations.

242. In a study on opportunities for the private sector in rural water supply and sanitation, SMS arrived at some conclusions on factors for developing the private sector. The ones most relevant for further support by a donor project include (SMS 2003):

- Further development of policy aimed at raising the commitment of the donor community to supporting the development of a sustainable private sector solution.
- On-going development and support for trade bodies, in particular the Water Suppliers Association, and the role of such bodies in promoting the opportunities for all private sector suppliers.
- Capacity-building and on-going assistance, both in commercial and technical terms, to improve the willingness and ability of individuals to start businesses and subsequently manage them effectively.
- Consultation with financial services institutions aimed at improving the access to appropriate lending products to rural water supply and sanitation businesses, and the willingness and commitment of such institutions to serving this market.

243. An additional point would be a review and simplification of the system of contracts for small-scale construction work, taking into account the existing procedures of Seila and the Commune Sangkat procedures.

244. MRD is responsible for regulation of the sector to ensure that organisations abide by the National Policy and other rules and procedures. It is, however, not equipped to undertake this role, lacking both the resources, financial and human, and the credibility. The only form of regulation that is practised is contract management to ensure that private sector contractors produce water supply and sanitation facilities that meet the specifications and quality (which are essential components of sustainability), but the implementation of contract management has also been weak. The capacity and capability to do this at lower levels to ensure that rural people get the quality of water supply or sanitation facility to which they are entitled is a significant problem. Some of the systems established under the Seila Programme can provide suitable processes to follow. One very recent initiative by the Government is the establishment of Accountability Working Groups at provincial level as a complaints procedure for the Commune/Sangkat Funds (NCSC 2005). Ways to expand the mandate of these Groups to cover the whole of water supply and sanitation sector implementation should be considered.

8.10 Monitoring and Information Management

245. “The RWSS project planning should continually be improved through data collection, analysis, stakeholder feedback, research, monitoring and evaluation.” This quote from Chapter 3: Planning in the *National Policy* captures the reason for monitoring and information management. It does not need further elaboration. Yet the monitoring and information systems in the Sector are seriously inadequate for the purpose quoted. There is no overall system for monitoring, several databases exist but are maintained to varying degrees and are not shared. Inside government few data management systems exist and no systematic reporting by projects is enforced, and many NGOs do not have data on past activities available (MRD 2004).

246. As raised at the Special Sector Meeting for this Review, centralised record keeping is not supported by implementing agencies. Although MRD has primary responsibility for establishing and running a centralised information system, such a system relies on all organisations in the Sector to make it work effectively.

247. The possible recommendations on monitoring and information systems are already in the National Policy:

- The focus of data collection should be on the quality, effectiveness, and sustainability of RWSS services.
- Communities should be involved in the monitoring, evaluation, and reporting process.
- Sector stakeholders should receive training on how to collect and use data.
- Simple and cost-effective means of storing and disseminating sector information should be developed to encourage data exchange between the communities, private sector, and all levels of government institutions.
- Government, other decision-makers, and support agencies should use sector information to produce the project action plans and to help design future programmes, and to improve RWSS sector policies.

(RGC 2003)

Potential Project 8.10: Monitoring and information systems

There is a clear need for the development of effective monitoring and information systems, but there is a risk that, as soon as donor support ends, the systems stop working. Donor support for such systems should be dependent on a commitment from the RGC to provide the long term recurrent budget to maintain them.

248. A very useful guide for development of monitoring systems is provided by Kathleen Shordt, *Action monitoring for effectiveness: improving water, hygiene and environmental sanitation programmes*, published by IRC International Water and Sanitation Centre, Delft, NL. (Shordt 2000).

249. Part of the new Tonle Sap RWSS Project supported by ADB is to set up an information management system. With the project management structure with its separate Project Management Office at central level and Project Management Units in the six provinces covered, there is a risk that the system will be focused on the needs of the project, rather than addressing the national needs.

8.11 Corruption

250. One issue of serious concern that was raised a number of times at all levels during the consultation stage of the Review is corruption. This problem is not unique to Cambodia or the RWSS Sector but is common in other countries in the South East Asia Region, and in other parts of the world. Corruption affects the RWSS Sector in two ways. It is either a fundamental cause of many of the problems in the Sector, or it inhibits a solution to the problems. Because of the nature of corruption, it is difficult to obtain specific evidence. People are unwilling to provide information because of the risks of retribution to their businesses, their careers and themselves.

251. The practice and effects of corruption are part of a wider problem in the Cambodian systems, as evidenced by recent speeches by His Excellency Hun Sen, the publication of *Fighting Corruption in Cambodia: The Demand for an International Standard Anti Corruption Law in Cambodia* (Pact and PADCO 2005), and the draft Law on Anti-Corruption (June 2005). The Government has given a commitment in the Rectangular Strategy to tackle corruption, stating that, amongst other things, "good governance requires that corruption be reduced to a minimum". It goes on to state that: "the Royal Government of Cambodia will promote the implementation of the Anti-corruption Law and, as soon as possible, create an independent body to fight corruption. The Royal Government will also promote effectiveness, transparency and accountability in the management of public finances, especially through the strengthening of audit processes and public procurement." (RGC 2004)

252. Corruption in the RWSS Sector will have to be addressed in the wider context of these government moves to eradicate it. This does not mean, however, that Sector organisations should be complacent about the problem.

9 Finance and economics

9.1 Sector finance

253. The following three quotations summarise the issues for financing the development of water supply and sanitation in general, and rural water supply and rural sanitation in particular.

“The major constraint to the sustainable development of RWSS in Cambodia is the lack of investment funds” (ADB 2005).

“At current, expenditure levels for the sector are roughly in the order of magnitude of 1 percent of GDP, by various estimates far below what would be needed to meet the goals the government has set itself for the sector. Much of this expenditure is currently financed by development partners and the budgetary contribution to the development of the sector is minor.” (RGC and World Bank undated)

“Current public expenditures are strongly skewed towards the water sector (as opposed to sanitation) and towards Phnom Penh (as opposed to the remainder of the country). Given the lenient terms of public financing, this means that most subsidies to the sector are currently captured by consumers in the capital.” (RGC and World Bank undated)

254. An estimate of the finance needed for rural water supply and sanitation to meet the 2015 CMDGs is made in the Sector Investment Plan (Ministry of Rural Development 2005). This comes up with a total investment cost of US\$115.97 million, and a recurrent cost of US\$4.83 million. These figures need to be treated with some caution. Software costs are estimated as a percentage of hardware, and as discussed in other parts of this report, software is inadequate at present, so historical costs are not reliable for estimating future needs. Operation and maintenance costs are included in the investment cost, again as a percentage, whereas they should be treated separately as a recurrent expenditure. It may be possible to reduce some hardware costs; for example, the costs of latrines under the CLTS approach are much lower than under conventional sanitation projects; the costs of household water treatment systems are lower than community water supplies based on handpumps.

255. Using these estimates in the absence of anything better, an annual investment cost of US\$11.6 million is needed. ADB is investing \$18 million as a grant over the next five years, which is \$3.6 million per year, or 31% of the rate per year required. JICA is providing about \$1.5 million per year and UNICEF contributes about \$1 million annually. Collectively the NGO programmes are extremely unlikely to make up the shortfall of more than 50%.

Recommendation 9.1

MRD and supporting donors should analyse the current costs of provision of services and based on these estimate the investment needed to reach the CMDGs and the Vision of full coverage.

Potential Project 9.1: Analysis of costs and estimate of investments needs

This project would be a critical review of the Sector Investment Plan and its assumptions, a detailed study of the current capital costs of provision of service by the different types of organisation in the sector, and based on these, an estimate of the investment needs to reach the CMDGs and full coverage.

256. There appear to be two factors causing this lack of investment in the sector. Firstly, the Government's own priorities in allocating resources do not lead by example. "Government priorities, according to the main national planning document, the Rectangular Strategy, which resonates strongly with the NPRS, are: education; health, agriculture and rural development. Rural water supply for domestic use features under the rural development umbrella, but not as strongly as water supply for irrigation. (Environmental Resources Management 2005) Rural domestic water supply and sanitation promotion are simply not considered as priorities by the Government. ERM go on to suggest that "the lack of adequate information relating to the impact of water access on poverty has played a role in government priorities being placed elsewhere".

257. As a result, there is strong reliance on donors, which raises the second inhibiting factor – the institutional environment. The evidence presented in the other parts of this report demonstrate so many problems that donors are simply reluctant to become involved. At least one major bilateral donor has withdrawn support from the Sector because of poor sector management.

258. The challenge is how to reverse both these factors. Again this falls into two parts. The first challenge is to demonstrate the importance of the Sector socially, and the benefits economically. Social benefits speak for themselves, although they are usually posed in negative rather than positive terms, but the case for economic benefits needs to be made more strongly, as presented in Section 9.3. The second challenge is that MRD needs to overhaul its management of the Sector. It needs to demonstrate that the problems described in this Review can be overcome, including, critically, its own attitude. It needs to change from waiting for others to solve the problems to being much more proactive.

9.2 Economic Benefits

259. As Hutton and Haller state in their important study, *Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level*, conducted on behalf of the World Health Organisation, "the potential productivity and income effects of improved access is a significant argument to support further resource allocations to water and sanitation" (Hutton and Haller 2004). The following estimate of the benefits of investing in water supply and sanitation is based on that study.

260. The aim of the study was to estimate the economic costs and benefits of a range of selected interventions to improve water and sanitation services for 17 WHO sub-regions and globally. It evaluated a range of interventions from provision of basic services to meet the MDGs to universal coverage with treated water and partial sewerage. The interventions relevant to Cambodia for the Millennium Targets in 2015 are:

- Intervention 1: Halving the proportion of people without access to improved water sources
- Intervention 2: Intervention 1 plus halving the proportion of people who do not have access to improved sanitation facilities.

(Hutton and Haller 2004)

261. Hutton and Haller estimated the full investment costs and annual running costs of the interventions for urban and rural sectors combined. Investment costs were based on investment costs per capita given in the as the Global Water Supply and Sanitation Assessment 2000 Report, including planning and supervision, hardware, construction,

protection of water sources and education. Estimation of recurrent costs¹⁸ was more problematic due to lack of data, so they combined values from the World Bank and other international projects with assumptions of running costs as a percentage of the annual investment costs.

262. The benefits of the interventions included time savings associated with better access to water and sanitation facilities, the gain in productive time due to less time spent ill, health sector and patients costs saved due to less treatment of diarrhoeal diseases, and the value of prevented deaths. The benefits were valued in monetary terms using conventional economic methods for valuation, based on the year 2000.¹⁹

263. Because of measurement limitations, their analysis does not include all the benefits, but captures the most tangible and measurable ones, and identifies who the beneficiaries are. For ease of comprehension and interpretation of findings, the benefits of the water and sanitation improvements not captured in the DALY (disability-adjusted life year²⁰) estimates were classified into three main types:

1. direct economic benefits of avoiding diarrhoeal disease;
2. indirect economic benefits related to health improvements; and
3. non-health benefits related to water and sanitation improvements.

These benefits are presented in Table 9.1, grouped by main beneficiary.

264. From the information given in the Appendices to Hutton and Haller's Report, it would be difficult to make a cost benefit estimate specifically for Cambodia but the figures for the Regional grouping including Cambodia can be presented. According to the Report, Cambodia is classified as Western Pacific Region, Mortality Stratum B. In the Tables in the Appendices it is grouped with Lao PDR, Myanmar and Viet Nam, collectively coded as WPR-B2²¹. Hutton and Haller's analysis is based on achievement of the Millennium Development goals of halving the proportion of people without access to improved water supply and sanitation. This is a higher target than the CMDGs. Also, the analysis does not distinguish between urban and rural interventions.

265. The cost-benefit ratio for water supply alone is estimated at 8.17. For water supply and sanitation combined it is 11.04. This means that for every dollar invested, the economic benefit would be \$8 and \$11 respectively. Even the most pessimistic estimate of high costs and low benefits showed a positive cost-benefit ratio of 1.21 and 2.21 respectively.

266. The higher ratio for water supply and sanitation than for water supply alone indicates that investment in sanitation yields proportionately larger benefits than water supply. This conclusion is borne out in an ERM study for DFID on the Millennium Development Goals. ERM specifically looked at the economic costs and benefits of sanitation for 13 countries including Cambodia, drawing on the study by Hutton and Haller. Again, the study is on urban and rural sanitation combined. The results show that the benefits from every \$1 invested in sanitation would be \$23.48 (using mid-level values), with a range from \$11.09 in a pessimistic scenario to \$58.75 in an optimistic scenario. ERM also estimated the societal

¹⁸ Recurrent costs include maintenance of hardware and replacement of parts, emptying of latrines, regulation and control of water supply, ongoing protection and monitoring of water sources, water treatment and distribution, and continuous education activities.

¹⁹ The costs of treatment of diarrhoea were based on health service unit costs from WHO regional unit cost databases. Transport costs for seeking treatment are assumed. Indirect benefits such as gains related to lower morbidity and gains related to fewer deaths were valued using minimum wage rates.

²⁰ Disability Adjusted Life Year is a measure of the burden of disease. It reflects the total amount of healthy life lost, to all causes, whether from premature mortality or from some degree of disability during a period of time. http://www.worldbank.org/html/extdr/hnp/hddflash/workp/wp_00068.html

²¹ The sub-classification was checked in a personal communication with Guy Hutton

economic cost of 'doing nothing' between 2000 and 2015 as US\$2,243 million. (Environmental Resources Management 2005)

Table 9.1: Benefits of RWSS Interventions

BENEFICIARY	Direct economic benefits of avoiding diarrhoeal disease	Indirect economic benefits related to health improvement	Non-health benefits to water and sanitation improvement
Health sector	<ul style="list-style-type: none"> ▪ Less expenditure on treatment of diarrhoeal disease 	<ul style="list-style-type: none"> ▪ Value of less health workers falling sick with diarrhoea 	<ul style="list-style-type: none"> ▪ More efficiently managed water resources and effects on vector bionomics
Patients	<ul style="list-style-type: none"> ▪ Less expenditure on treatment of disease and less related costs ▪ Less expenditure on transport in seeking treatment ▪ Less time lost due to treatment seeking 	<ul style="list-style-type: none"> ▪ Value of avoided days lost at work or at school ▪ Value of avoided time lost of parent/ caretaker of sick children ▪ Value of loss of death avoided 	<ul style="list-style-type: none"> ▪ More efficiently managed resources and effects on vector bionomics
Consumers			<ul style="list-style-type: none"> ▪ Time savings related to water collection or accessing sanitary) facilities ▪ Labour-saving devices in household ▪ Switch away from more expensive water sources ▪ Property value rise ▪ Leisure activities and non-use value
Agricultural and industrial sectors	<ul style="list-style-type: none"> ▪ Less expenditure on treatment of employees with disease 	<ul style="list-style-type: none"> ▪ Less impact on productivity of ill-health of workers 	<ul style="list-style-type: none"> ▪ Benefits to agriculture and industry of improved water supply, more water resources – timesaving or income generating technologies and land use changes

(Hutton and Haller 2004)

267. ERM also notes the wider benefits of investment in sanitation beyond the household level. These include:

- Improved sanitation will result in fewer children missing school through illness.
- Safe, clean, separate and private sanitation in schools will contribute to increased attendance and a reduced drop out rate by girls
- evidence that illness impacts on the learning ability of a child
- the combined impact of good school sanitation is the clear economic advantages of having a more educated workforce.

- Poor sanitary conditions will act as a disincentive for investors – sanitation will be seen by many firms as a pre-requisite for considering whether to invest in the country. (Environmental Resources Management 2005)

268. These results make a compelling case for investing in water supply and sanitation in Cambodia, and reinforce the need to give much greater priority to sanitation than in recent years.

Potential Project 9.2: Cost benefit study for investment in RWSS

To strengthen the case to be used to advocate for increased investment in RWSS by both RGC and donors a cost-benefit study should be conducted specifically for rural water supply and rural sanitation.

269. To realise the benefits discussed in the foregoing, it is not sufficient just to provide access to water supply and sanitation facilities. As a study in India notes: “providing an additional water supply alone does, however, not translate automatically into economic returns. Women need a reliable and predictable service delivering sufficient amounts of water to meet basic household needs, an enabling environment for productive uses of time and water, gender relations that allow such productive uses, and economic opportunities to turn these uses into income.” The authors go on to say that “domestic water supplies should include the productive uses of water and time gained at the domestic level in their planning and design.” (Verhagen et al. 2004) These additional aspects need to be included in the design of rural water supply and sanitation projects.

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Appendix A: Organisational analysis

Organisations in the sector

Organisation	Acronym	Type of organisation					Level			Sector responsibility					Type of implementation										
		Government	Donor	Multilateral support organisation	Operational IO/NGO	Local NGO	Private sector	National	Provincial	District	Co-ordination	Policy-making	Planning	Monitoring and reporting	Regulation and control	Funding	Water supply development	Operation/maintenance support	Sanitation	Hygiene promotion	Water resource management	Community development	Capacity Building & Training	Private sector development	Other
Cambodia Global Action	CGA																								
European Commission Humanitarian Office	ECHO																								
GRET/Kosan	GRET																								
International Development Enterprises	IDE																								
PPS International	PPS																								
RainWater Cambodia	RWC																								
RCEDO	RCEDO																								
Water and Sanitation Program	WSP																								
Resource Development International????	RDI																								
Social Fund of the Kingdom of Cambodia	SFKC																								
Samaritan's Purse	SP																								
Department of Environment, Royal University of Phnom Penh	RUPP																								
Hagar	HG																								
DWHH/GAA	GAA																								
Action Contre la Faim	ACF																								
Development Technology Workshop	DTW																								
Plan International	PI																								
UNICEF	UNICEF																								
ZOA	ZOA																								

Notes:

1. "Sector responsibility" means responsibility for the particular aspect for the sector as a whole. It is assumed that organisations carry out their own project level planning, monitoring, reporting, etc. as part of implementation.
2. "Operation and maintenance" means the long term support to O&M, not the short-term project based training of user committees and caretakers.

Organisations in the sector by geographic area

Provinces (rural)	Sector responsibility						Type of implementation								
	Co-ordination	Policy-making	Planning	Monitoring and reporting	Regulation and control	Funding	Water supply development	Operation/maintenance support	Sanitation	Hygiene promotion	Water resource management	Community development	Capacity Building & Training	Private sector development	Research and piloting
National						WSP ECHO SFKC	WSP IDE SFKC		WSP IDE SFKC				WSP RUPP	WSP IDE	IDE RUPP
Banteay Meanchey							RCEDO			RCEDO					
Battambang							HG		HG	HG		HG	HG		
Kampong Cham							RWC PI		PI	PI		PI	RWC PI		RWC
Kampong Chhnang															
Kampong Speu		UNICEF	UNICEF	UNICEF		UNICEF	UNICEF RWC SP		UNICEF SP	UNICEF SP		UNICEF SP	UNICEF RWC SP	UNICEF	UNICEF RWC
Kampong Thom		UNICEF	UNICEF	UNICEF		UNICEF	UNICEF RWC HG		UNICEF HG	UNICEF HG		UNICEF HG	UNICEF HG	UNICEF	UNICEF RWC
Kampot							GRET			CGA				GRET	GRET
Kandal							RDI GRET HG		RDI HG	CGA HG		RDI HG	RDI HG		RDI
Koh Kong															
Kratie							RWC HG		HG	HG		HG	HG		RWC
Mondul Kiri							ACF			ACF					
Preah Vihear															
Prey Veng		UNICEF	UNICEF	UNICEF		UNICEF	UNICEF HG		UNICEF HG	UNICEF HG		UNICEF HG	UNICEF HG	UNICEF	UNICEF
Pursat							HG DTW		HG DTW	HG		HG	HG DTW		DTW
Ratanak Kiri							HU GAA		GAA	GAA			HU		
Siemreap							HG PI		HG PI	HG PI		HG PI	HG PI		
Stung Treng		UNICEF	UNICEF	UNICEF		UNICEF	UNICEF		UNICEF	UNICEF		UNICEF	UNICEF	UNICEF	UNICEF
Svay Rieng		UNICEF	UNICEF	UNICEF		UNICEF	UNICEF HG		UNICEF HG	UNICEF HG		UNICEF HG	UNICEF HG	UNICEF	UNICEF
Takeo							GRET							GRET	GRET
Oddar Meanchey		UNICEF	UNICEF	UNICEF		UNICEF	UNICEF RCEDO ZOA CARE		UNICEF CARE	UNICEF RCEDO CARE		UNICEF	UNICEF	UNICEF	UNICEF

Private sector

No.	Name of Drilling Company	Type of Activity													Locations	
		HD	MD	WC	LC	T	CO	HP	JC	RPWS	C	ED	E	WF	Province	District
1	Pure Water Development Association		√	√		√	√				√		√		Bantay Mean Chey	Serei Saophoan
2	Rural Community & Environment Development Organization		√	√	√	√	√	√	√	√	√				Bantay Mean Chey	Serei Saophoan
3	Development Group Water Team		√	√	√	√	√	√			√	√			Bantay Mean Chey	Ou Chrov
4	Drilling Well Group		√	√	√	√	√	√			√				Bantay Mean Chey	Serei Saophoan
5	Drilling Well Development		√	√	√	√	√	√	√						Bantay Mean Chey	Serei Saophoan
6	Ly Houv		√	√		√	√	√		√	√				Bantay Mean Chey	Ou Chrov
7	General Construction and Water Supply		√	√	√				√		√				Bantay Mean Chey	Serei Saophoan
8	Development & Education Pour L'eau Potable (DEEP)	√	√	√	√		√	√							Battambang	Battambang
9	Development Groundwater System		√	√	√	√	√								Battambang	Aek Phnom
10	Rural Hand Pump Well Development		√	√		√	√	√			√		√		Battambang	Battambang
11	Rural Hand Pump Construction		√	√		√	√	√			√	√	√		Battambang	Battambang
12	Ros Sopheak		√	√	√			√	√						Kampong Cham	Kampong Cham
13	Ek Sithon		√	√							√				Kampong Cham	Prey Chhor
14	Hor Ly Hay		√	√	√	√		√	√	√	√	√			Kampong Cham	Kampong Cham
15	Sem Savin	√	√												Kampong Cham	Ponhea Kraek
16	Than Kimsreann		√	√	√			√	√						Kampong Cham	Kampong Siem
17	Heang Ngim		√	√	√	√	√		√						Kampong Cham	Tboung Khmum
18	Hang Vorn		√								√				Kampong Cham	Prey Chhor
19	Kang Rei		√	√	√	√		√	√						Kampog Chhnang	Rolea B'iei
20	Construction Pump Well and Jumbo		√	√		√		√	√			√	√		Kampong Speu	Chbar Morn
21	Pechnil Well Drilling and General Construction		√	√	√	√	√	√	√			√	√		Kampong Speu	Chbar Morn
22	Water Suply Network Pich Chang Va									√	√				Kampong Speu	Basedth
23	Drilling Well Chea Songly		√	√				√							Kampong Speu	Basedth
24	Khemarak Both		√	√	√			√	√		√				Kampong Thom	Stueng Saen
25	Oung Chroeung		√	√		√	√	√			√				Kampot	Angkor Chey

26	SORYA		√	√	√	√	√	√			√			Kampot	Chhuk
27	Un Samphan Hand Pump Well Company		√	√		√		√			√	√		Kampot	Chhuk
28	Drilling Well Mam Sambo		√	√	√			√	√		√	√		Kampot	Banteay Meas
29	HATHA PALAKAR		√	√		√	√	√		√	√		√	Kampot	Chhuk
30	Saveun Enterprise		√	√	√									Kandal	Angk Snuol
31	Chiv Meang Hout Group Pure Water Well Construction		√	√	√	√	√	√			√	√	√	Phnom Penh	Russei Keo
32	Association Cambodgienne D'Aprovisionnement En Eau (ACAPE)	√	√	√	√	√	√	√		√	√		√	Phnom Penh	Russei Keo
33	PPS International							√				√		Phnom Penh	Chamkamorn
34	KOSAN												√	Phnom Penh	Doun Penh
35	Construction Clean Well Group		√	√										Phnom Penh	Toul Kork
36	IDE Cambodia					√	√	√					√	Phnom Penh	Toul Kork
37	Sar Sopharn		√	√	√	√		√						Pursat	Sampov Meas
38	MITTY		√	√	√	√								Pursat	Sampov Meas
39	Soy Rithy		√	√	√			√						Pursat	Sampov Meas
40	TEP KOSAL	√	√	√		√								Preah Vihear	Tbaeng Meanchei
41	Hand Pump Well	√	√	√										Prey Veng	Peam Ro
42	General Construction		√	√	√			√						Prey Veng	Prey Veng
43	Chik Phan	√	√	√	√									Prey Veng	Peam Ro
44	Heng Samy		√	√										Prey Veng	Peam Ro
45	Drilling Well	√	√	√										Prey Veng	Kampong Trabek
46	Drilling Well Khin Sophy		√	√										Prey Veng	Kampog Leav
47	Well Construction and Latrine		√	√	√			√						Prey Veng	Kampog Leav
48	Association Khmer Pour Le Development De L'eau Potable (AKDEP)		√	√				√						Prey Veng	Kampog Leav
49	Heng Mong Enterprise Construction	√	√	√	√			√	√					Prey Veng	Kampog Leav
50	Seng La		√	√	√	√		√						Prey Veng	Kampog Leav
51	Drilling Well	√	√	√										Prey Veng	Kampong Trabek
52	So Savan	√		√		√								Prey Veng	Kampong Trabek
53	You Pon		√	√										Prey Veng	Peam Chor
54	Hand Pump Well		√	√		√								Prey Veng	Peam Ro

55	Heng Chea Costruction		√	√												Prey Veng	Kanhchriech
56	Sou Seung		√	√												Prey Veng	Peam Ro
57	Heng Phouy		√	√												Prey Veng	Peam Ro
58	Seng La Clean Water		√	√	√	√		√								Prey Veng	Kamchay Mear
59	Phath Sophal Enterprise Construction		√	√	√			√	√							Prey Veng	Kampog Leav
60	KARATAS	√														Siem Reap	Angkor Chum
61	So Phea	√	√			√		√								Siem Reap	Siem Reap
62	Khla Skom	√				√										Siem Reap	Siem Reap
63	Ta Seung	√				√										Siem Reap	Angkor Thom
64	Chea Preah Dak	√				√										Siem Reap	Banteay Srei
65	Neari Khmer	√				√										Siem Reap	Banteay Srei
66	Tonle Sap	√				√										Siem Reap	Siem Reap
67	Khlar Thom	√				√										Siem Reap	Siem Reap
68	SAMOT (sea)	√				√										Siem Reap	Siem Reap
69	ANDONG PECH	√	√	√		√				√	√					Siem Reap	Siem Reap
70	TEUK SAAT		√	√	√	√	√				√					Siem Reap	Siem Reap
71	PENH CHET	√	√	√		√										Siem Reap	Siem Reap
72	Meakh Saphan		√	√	√											Svay Rieng	Svay Teab
73	Construction Clean Well		√	√		√		√		√	√	√	√			Takeo	Doun Kao
74	Water Supply Network Phnom Den									√						Takeo	Kiri Vong
75	Water Supply Lum Chang									√						Takeo	Samrong
76	Water Supply Network Romenh									√						Takeo	Kaoh Andath
77	Water Supply Network Tram Khna									√						Takeo	Bati
78	Hightech Drilling & Construction	√	√	√	√	√	√	√	√		√	√	√			Takeo	Doun Keo
79	General Construction Tak Leng		√	√	√		√	√	√		√	√				Takeo	Doun Keo
80	Clean Water SMAO KHNHEY Village									√						Takeo	Bati
81	Well Construction Vary Phal		√	√	√	√	√	√			√	√	√			Takeo	Doun Keo
82	Chea Chheng Drilling		√	√			√	√		√	√					Takeo	Prey Kabas

Note:

HD - Hand Drilling
MD - Mechanic Drilling
WC - Well Construction
LC - Latrine Construction
T - Training
CO - Community Organizing
HP - Hand Pump

JC - Jar Construction
RPWS - Raw Piped Water Supplies
C - Contractor
ED - Equipment Dealer
E - Engineering
WF - Water Filter

Local NGOs and Implementing Activities According to Province and City

	Acronym	Organization	Health Edc	VDC training	CD	Gender	WS
Banteay Meanchey	CSDA	Cambodia SocioE Dev't and Democracy Ass			x		
	DEEP	Dev't& Education pour l 'Eau potable			x		x
	CWCC	Cambodia Women crisis center				x	
	ACAPE	Association Cambodgienn d'Approvisionnement en Eau					x
Battambang	AS	Aphiwat Strey			x		
	ADOVIR	Association f Development/our village'rRight	x		x		
	BS	Banteay Srei			x		
	KFA	Khmer Farmer Association			x		x
	NLYACC	New Life of Youth Asia Cambodia Christian			x		
	PTD	Pteas Teuk Dong			x	x	
	SEA	Samanak Service Endelessness Association			x		
	SME	Small and Medium Enterprise Cambodia			x		
	SDR	Social dev't in Rural			x		
	SP	Sovanna Phoum			x		
	VCAO	Vulnerable Children Assistance Organization			x		x
	CBO	Cambodia Building Org					x
	Amara	Amara				x	
	CHRDA	Cambodia Human Rights &Dev't Association				x	
	ILDO	Islamic Local Dev't Org				x	
	SDR	Social dev't in Rural				x	
Kompong Cham	AFESIP	Agri pour les femmes En Situation Precaire			x	x	
	BAED	Buddhist Association f Environment Dev't	x		x		
	HPDO	Head the Poor f Dev't Organization			x		
	NLYACC	New Life of Youth Asia Cambodia Christian			x		
Kompong Speu	APCA	Assistance to PoorChildren Agency			x		
	BK	Bandos Koma	x		x		
	WOSO	Women's ServiceOrganization			x		
	ACAPE	Association Cambodgienn d'Approvisionnement en Eau					x
	CPFDO	Cambodia Poor Familyes Dev't Org					x
	RWC	Rain Water cambodia					x
	RADE	Rural association f dev't f the Economic					x
	MB	Mlub Baitong				x	

	Acronym	Organization	Health Edc	VDC training	CD	Gender	WS
Kompong Tom	BfD	Buddhism for Development Kg.Tom	x		x		
	CODEC	Cooperation Dev't f Cambodia			x		
	MCO	Monks Relief and Khmer Culture Org			x		x
	WFD	Weak Family Dev't			x		
	ESSD	Environmental Support&Social Dev't					x
	SAWAC	Sanitation, Agriculture,Water&Agronomy in Cambodia					x
Kompong Chnnang	PNKA	Phnom Neang Kangrei Association			x		
	KAPE	Kampuchea Action for Primary Education				x	
Kampot	ACAPE	Association Cambodgienn d'Approvisionnement en Eau					x
	SAWAC	Sanitation, Agriculture,Water&Agronomy in Cambodia					x
Kandal	BK	Bandos Koma	x		x		
	KFA	Khmer Farmer Association			x		x
	MCO	Monks Relief and Khmer Culture Org			x		x
	PAD	People's Association for Dev't				x	
	SP	Sovanna Phoum	x				
	ACAPE	Association Cambodgienn d'Approvisionnement en Eau					x
	RADE	Rural association f dev't f the Economic					x
	CWARO	Org for Assistance of Children and Rural Women				x	
Kratie	AFESIP	Agri pour les femmes En Situation Precaire			x	x	
	CED	Community Economic Development			x	x	
	VPS	Vulnerable People Support			x		
	KWWA	Kratie Women's Welfare Association				x	
	CCD	Cambodia Community development		x			
Pailin	DEEP	Dev't& Education pour l 'Eau potable			x		x
	WACD	Women Association f Community Dev't			x	x	
Phnom Penh	AFESIP	Agri pour les femmes En Situation Precaire			x	x	
	TASK	Trotrung ning Akphiwat Sokapeap neak Kre Kro			x	x	
	UPDF	Urband Poor Dev't Fund			x		
	WOMEN	Women Organization f Modern Economic/Nursing			x		
	ABC	Association of the Blind in Cambodia				x	
	DSO	Democratic Service Org				x	
	KYCC	Khmer Youth Camp for culture				x	

	Acronym	Organization	Health Edc	VDC training	CD	Gender	WS
Prey Veng	ODOV	Org to Develop Our Villages			x		
	PNKS	Ponleu Ney Kdey Sangkum			x		
	SME	Small and Medium Enterprise Cambodia			x		
	RADE	Rural association f dev't f the Economic					x
Pursat	AARR	Alliance Association of Rural Restoration			x		
	BK	Bandos Koma	x		x		
	EPDO	Env protection and Dev't organization			x		
	NLYACC	New Life of Youth Asia Cambodia Christian			x		
	SARE	Support Association for Rural farmers			x		
	WP	Wathnapheap			x		
	RADE	Rural association f dev't f the Economic					x
	RFCD	Rural Friend for Community dev't					x
	SAWAC	Sanitation, Agriculture, Water & Agronomy in Cambodia					x
Siem Reap	AFESIP	Agri pour les femmes En Situation Precaire			x	x	
	APDO	Angkor Participatory Development Organization			x		
	NLYACC	New Life of Youth Asia Cambodia Christian			x		
O-Dor meanchey	DEEP	Dev't & Education pour l'Eau potable			x		x
	RCEDO	Rural Community Dev't & Env Dev't Org Information			x		x
Stung Treng	CEPA	Culture and Env Preservation Association			x		
	SWDC	Stung Treng Women's Dev't Center				x	
Svay Rieng	PTEA	Por Tom Elderly Association			x		
Takeo	BK	Bandos Koma	x		x		
	CCK	Chamreun Chiet Khmer		x			

Source: NGO Directory

Remarks:

1. Health education of the organizations mentioned on the list above do not specify clearly on which activities they has been done.
2. For other organizations they have implemented education and training to community and the leaders on specific topics like: health nutrition HIV/AIDS prevention, home base care, vocational training, agriculture crop/tree planting and animal care, environmental awareness, technical training, saving, sewing, credit and culture.
3. CCK has provided training to Village development Committee (VDC)
4. CCD has provided training on capacity building to VDC and CC