

FIRST WORKSHOP ON COSTING OF IMPROVED DRINKING-WATER SUPPLY SYSTEMS FOR LOW-INCOME COMMUNITIES

Khon Kaen, 3-6 March 2008



Report of an inter-regional workshop
with participants from Cambodia, Indonesia, Lao PDR,
Philippines, Thailand and Viet Nam



World Health Organization, 2008

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Organized by the World Health Organization,
in collaboration with
the Community Development for Sustainable Development
Association, Thailand, and
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1. INTRODUCTION

In the context of the collaboration between the World Health Organization and the University of Geneva on issues relating to the economic evaluation of water, sanitation and hygiene interventions, two guidance documents have been developed on the cost analysis of drinking-water supply and of sanitation options, respectively. The counterparts of the collaboration under this “RUIG” programme are the Water, Sanitation and Health programme, Department of Public Health and Environment, World Health Organization, Geneva, and the Department of Econometrics, Faculty of Economics of the University of Geneva.

The first guidance document, a Practical Manual for Costing Improved Drinking-water Supply Systems for Low-income Communities (Carlevaro and Gonzalez, 2008), prepared by the Department of Econometrics, provides appropriate material for capacity building at the national level. Country capacity in the various components of the economic appraisal of proposed drinking-water supply and sanitation projects is needed in the final run-up to achieving the MDG targets on water and sanitation, and to sustain the momentum of investment in this area after 2015.

WHO carried out a number of global economic analyses of investments in drinking-water and sanitation and their returns. These indicate the returns to range from US\$3 to US\$34 for each US\$ invested. However, such global analyses are based on assumptions that introduce a broad range of uncertainty in the outcome, and it is therefore pertinent to provide WHO Member States with the tools and know-how to carry out such analyses in the national context where levels of certainty can be enhanced.

From this perspective, it was decided to embark on a project that would combine pilot testing of the Practical Manual with capacity building in the area of costing, for a number of selected countries in the South East Asia and the Western Pacific Regions of WHO.

Support for this activity was provided by the Department of State of the Government of the United States of America, through a special grant to WHO, covering five of the six countries. For one country, Indonesia, support was provided from the budget of the WHO country office.

Objectives

- Knowledge on detailed costing criteria, procedures and methods conveyed to drinking-water supply decision-makers in five countries in Asia
- Practical Manual applied to drinking-water projects in the six countries and results documented
- Experience and conclusions of the application of the Manual synthesized for further use in the region and beyond

At the outset of the project the following components were foreseen: a first workshop of three-and-a-half days will introduce general economic evaluation methods, focus in on the guidance document and develop the protocols for its testing in the five countries. The country participants will then coordinate the testing of the document in their individual countries in

line with the agreed protocols. A second, three-day workshop will allow reporting and feed back, with a final synthesis of conclusions and recommendations. The workshops will be accompanied by resource persons of WHO (HQ and WPRO) and RUIG (the University of Geneva network).

Time and place

The schedule foreseen at the time this project was conceived and linked to the agreed disbursement of DOS funds included the following milestones: first workshop in Thailand 3-6 March 2008; implementation of agreed protocols by country teams April-August 2008; second workshop in Lao PDR 1-3 September 2008.

The original proposal based the selection of workshop venues on a cost analysis of the different options. The first workshop was to be held in Khon Kaen, Thailand and the second one in Lao PDR. The first workshop was organized in collaboration with the Community Development for Sustainable Environment Association (CDSEA), a Thai NGO which is active, among other things, in water supply and sanitation; the second workshop was proposed to be organized in collaboration with the WHO Country Office and the National Water and Sanitation Centre of the MOH in Lao PDR.

2. WORKSHOP PROCEEDINGS

Introduction

The first workshop on Costing of Improved Drinking-water Supply Systems in Low-income Communities was held at the Charoen Thani Hotel in Khon Kaen, Thailand from 3 to 6 March 2008. It was organized by the Thai NGO CDSEA together with Mahasarakham University and in collaboration with the World Health Organization and the University of Geneva.

The objectives and expected outputs of the first workshop are presented in the next section.

To achieve the workshop objectives and expected outputs, the programme of work was structured around presentations that provided the basic information on the subject matter, group work to develop the country protocols and plenary discussions to sort out any issues that needed further clarification and to harmonize the individual protocols. This structure is presented below and the detailed programme of work is attached as Annex 1.

Monday:

- morning: stage setting presentations – introduction of the practical manual on costing
- afternoon: Country reports on the status of water and sanitation – group work on criteria development

Tuesday:

- morning: presentation group work on criteria, followed by group work on protocol development
- afternoon: group work on protocol development (continued)

Wednesday:

- morning: presentation country protocols
- afternoon: completion protocols based on comments and discussions

Thursday:

- morning: presentation final protocols, road map, financial arrangements, arrangements for the second workshop.

The workshop was attended by 16 participants from six countries: Cambodia, Indonesia, Lao PDR, Philippines, Thailand and Viet Nam. A list of participants is presented in Annex 2. Country participants represented government agencies responsible for health, water supply and sanitation, planning, finance and investment, and there were also a number of NGO participants involved in drinking-water and sanitation projects. WHO country officers from Cambodia/Lao PDR, Thailand and Viet Nam also participated and WHO staff members from WPRO and HQ were in attendance as well. The two authors of the Practical Manual participated as resource persons. All participants received a copy of the Practical Manual for the Costing of Improved Drinking-water Supply Systems for Low-income Communities, and at the end of the workshop they received a CD ROM with all material received and produced as well as further background documents.

Objectives and expected outputs

There is a growing interest in the economic evaluation of drinking water and sanitation interventions, stimulated by the MDG7 target and recent new insights and analyses showing greater benefits than previously assumed. In most countries, the capacity to deal with economic evaluations of water and sanitation projects is limited.

The University of Geneva, in collaboration with WHO, produced two practical manuals for costing improved water supply systems and costing improved sanitation for low-income

communities. The US Department of State wants to support this area and provided a small grant to WHO to start capacity building in five selected countries.

The practical manuals on costing are part of a larger WHO/WSH effort that focuses on economic evaluation of water and sanitation intervention. In 2009, WHO and the International Water Association (IWA) will also publish a guidance document on social cost-benefit analysis entitled: "Valuing water, valuing well-being. Guidance to understanding the costs and benefits of water interventions."

Objectives of the overall activity include:

- Knowledge on detailed criteria, procedures and methods for costing conveyed to drinking-water supply decision-makers in six countries in Asia
- Guidance document applied to drinking-water projects in the six countries and results documented
- Experience and conclusions of the application of the guidance document synthesized for further use in the region and beyond

And the objectives of the first workshop include:

- Relevant professionals from six Asian countries informed about the principles, concept and detailed approaches of costing methods of water supply options
- Agreement reached on criteria and procedures for the pilot implementation of the practical manual.
- Protocols developed and harmonized for the pilot implementation

Expected outputs of the first workshop

- A report of the workshop reflecting the issues discussed, deliberations held, observations made and agreements reached
- Protocols for six countries to carry out pilots of the practical guidelines
- A roadmap on how to proceed until the second workshop (Vientiane 1-3 September 2008)

WHO's perspective on global costs and benefits of water supply interventions

The stage-setting presentation by WHO focused on three areas: the comprehensive picture of water and health issues, current perspectives and trends, and the rationale for water and sanitation investments.

For a number of decades, water and sanitation issues were considered synonymous with disease and poverty. Inadequate water supplies, unsafe water resources, poor water management and inequitable access all translated into time loss and financial costs, a burden of disease and high health care costs. Over the past 15 years, this concept has been turned around, and water and sanitation issues are now considered an engine for development: universal access to improved water supply, safe water resources and IWRM all have the potential to contribute to time and financial savings, averted disease costs and health, economically productive populations.

The 2004 World Health Report states that diarrhoeal diseases feature third in the list of leading causes of death from infectious diseases, with some 1.8M deaths annually, 90% of which can be attributed to lack of access to safe drinking-water and poor sanitation. The large majority of these are children under 5. It has been estimated that 95% of the diarrhoeal diseases can be attributed to lack of access to safe drinking-water and adequate sanitation.

Other water-associated diseases also present high burdens according to the 2004 report: malaria with 1.3 million deaths annually, trachoma with a global estimate of 6 million people visually impaired and schistosomiasis with 200 million people around the world infected.

The WHO/UNICEF Joint Monitoring Programme maps out the distribution of lack of access to drinking-water and sanitation on a biennial basis, showing the disadvantaged concentrated in relative terms mainly in Africa South of the Sahara, while in absolute terms and with special reference to access to sanitation, the largest number of people without access are located in South Asia. There are, however, also striking disparities between rural and urban population within countries.

Global assessments indicate that the annual costs of not dealing with water and sanitation amounts to 1.8 million deaths (WHO 2004), health care costs of US\$7 billion to health institutions and of US\$340 million to individual households, and an opportunity cost of time lost in illness and care of US\$63 billion. In the global cost-benefit analysis capital and recurrent costs were offset against the value of direct health benefits and other indirect benefits. Five interventions were modeled in different regional contexts:

- Halving population without improved WS by 2015 (through low-tech services).
- Halving population without improved WS&S by 2015 (through low-tech services) (MDG 7).
- Increasing access to improved WS&S services (low-tech) for all by 2015.
- Increasing access to improved WS&S services (low-tech) plus disinfection at point of use, for all by 2015.
- Increasing access to in-house piped water and sewer connection for all by 2015.

Options 3 and 4 proved particularly efficient, and option 5 resulted in dramatic health improvements, but at a cost that was not affordable in most developing country settings.

The current focus of WHO action was on

- National capacity building in costing of improved water supply systems for low-income communities
- Production of a guidance document on social cost-benefit analysis of water supply options with special reference to small systems
- Promotion of water supply and sanitation options that appear to be optimally cost-beneficial (such as household water treatment and safe storage)
- Develop a practical manual for cost-benefit analysis of adequate sanitation options for low-income communities
- Study the cost-effectiveness of options for the safe use of wastewater, excreta and greywater in agriculture and aquaculture

Presentation of the Practical Manual

Professor Carlevaro and Dr Gonzalez gave a presentation on the Practical Manual they authored. They focused on five key issues: project motivation and objectives, the conceptual framework, appropriate improved WS technologies, the costing methods and the applications

In 2000, the UN Millennium Declaration (2000) confirmed the central role of water in sustainable development and in efforts to eradicate poverty. One of the key targets of MDG7 is to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. Better access to improved water supply, adequate sanitation and hygiene has significant impacts on health and on the quality of life of poor people.

In this context, a 2004 WHO conducted a survey by questionnaire among all WHO Member States to assess the total costs of achieving a selected number of WS&S improvement targets. This survey was unable to provide reliable cost estimates and a joint research project on the methodology of costing WS&S technologies was set up by WHO and the Department of Econometrics of the University of Geneva. A method was developed as part of a more comprehensive framework of socio-economic evaluation.

The conceptual framework that was developed consisted of the following elements:

- Definition of project rationale and objectives.
- Analysis and forecasting of the needs for project output.
- Definition of the gap between future needs and supply from existing facilities after ensuring their optimum use.
- Identification of project alternatives to meet the needs to fill this gap in terms of technology, process, scale, location.
- Performing least-cost analysis using economic prices for all inputs in order to identify the best economic alternative.
- Assessing whether non-quantifiable benefits and output quality considerations justify carrying out a cost-effectiveness analysis.
- Assessing whether the project's effectiveness will be sustainable throughout the life of the project through cost-recovery, tariff and subsidy (if any) based on financial (liquidity) analysis.
- Testing for risks associated with the project through sensitivity and risk analyses.
- Identification and assessment of distributional effects of the project and poverty reduction impact.
- Identification of a set of "improved" WS technologies, allowing to achieve the MDG WS targets.
- Selection, within this set, of the "appropriate" technologies suited for use in the specific setting of the planned improved WS project.
- Economic costing, assessment of the opportunity cost for the nation of these appropriate technologies and computation of cost indicators to use in least-cost, cost-effectiveness or cost-benefit selection.

The definition of improved water and sanitation technologies was taken from the WHO/UNICEF Joint Monitoring Programme. The main objectives of these technologies are to provide access to safe water, free from microbial contaminants and toxic pollutants in line with the third edition of the WHO Drinking-water Quality Guidelines (2006); to provide access to adequate quantities of water, allowing to meet the requirements for effective sanitation and hygiene, and to make water easily available, in order to encourage the use of water for drinking, sanitation and hygiene.

Improved WS technologies include:

- Piped water into dwelling, plot or yard: water is treated and piped through house connections or yard taps.
- Public tap/standpipe: water comes from a groundwater source and is shared by more than one household through a public standpipe.
- Tube-well/borehole: water is pumped in a suction mode from a free or a confined aquifer at a shallow, medium or great depth.

On the basis of local conditions the use of some technologies can be ruled out as they will be incompatible with prevailing constraints or entail unacceptable risks (for example: arsenic levels in groundwater). Before tackling the costing of available technologies it is important to discard all the incompatible technologies posing unacceptable risks to health. Local constraints on compatibility can be financial, economic, technical, environmental, institutional, cultural and social in nature.

Principles of economic costing

All relevant costs to the economy, regardless of who incurs them, must be included. Each cost item must be evaluated using economic prices representing the national opportunity costs of the resources invested in the project. Assumptions used for costing different technologies must be mutually consistent and comparable.

Costing methodology starts with the consideration, for each activity, of four types of costs.

- Investment or capital costs resulting from the construction and purchase of durable equipment.
- Operational costs that are required to keep a system going once it has become functional.
- Maintenance costs that are required to keep a system in good condition throughout its functional life.
- Other relevant costs: administration; professional, administrative and technical training; health and hygiene promotion and education.

A number of concepts need to be applied: Full Cost Present Value (FCPV), the consolidation of the present values of each economic cost component of the project, using a common discount rate reflecting the opportunity cost of capital; Average Equivalent Cost (AEC): for WS projects that become functional to their full potential at the time construction is completed, AEC is the constant annuity to be paid during the project life-cycle to refund the full cost of the project at a given opportunity cost of capital; Unit Average Equivalent Cost (UAEC) is the ratio of AEC on the annual production of the system at full capacity; Average Incremental Cost (AIC) applies to WS systems whose use increases gradually over time to meet their maximum services potential after some years and is the ratio of FCPV divided by the present value of the life-cycle production of the system, assuming the value of production remains constant in time.

Cost indicators can be used to rank improved WS technologies in order to select the most appropriate for the planned project, but only if the assessed technologies provide services of the same quality. When there are differences between options in the quality of services, a least-cost choice will not necessarily be economically optimal, as other technologies can have benefits compensating their exceeding costs. Still, a cost comparison of appropriate WS technologies can reveal the opportunity costs of the quality of services provided by the competing technologies.

There can be numerous objectives linked to the application of a costing method:

- To collect and to assess the costs of existing improved WS projects
- To test the user friendly applicability of the questionnaires and excel spreadsheet
- To define the importance of a suitable identification and evaluation of investments in the water sector
- To identify and gather data on costs components of each activity of the project (collection, pumping, transmission, treatment, storage and distribution)
- To better define the type of the project under consideration
- To define criteria and indicators for the selection of an option
- To define criteria and indicators for decision makers for investment in the selected option

There are also different components in any such method:

- The costing itself, estimates of investments, O&M costs, other relevant costs (administration, training, promotion and hygiene education)
- The physical-technical context: location, hydrology, quality of soil, ways of communication, transport, community characteristics, present WS&S conditions, power conditions
- The socio-economic context: labour conditions, community structure and organization, needs of WS&S, community contributions (financial, materials, labour, etc.)

The actors involved in the application of the costing method operate at different levels:

- Local authorities (committee, directorate, etc.)
- Municipal Office Council or City Office (public works department)
- Public Works Secretary (Ministry of Public Works or Housing)
- NGOs (engineering work-studies)
- Health Secretary (Ministry of Health) with regard to the expenses in hygiene education
- Private sources (construction firms, consulting firms, etc.)

Two case study examples of the application of the costing method were presented from Perú. Case study 1 had been carried out on a rural drinking-water system in Bellavista, Cajamarca, and case study 2 on a rural drinking-water system at Guantánamo, San Martín.

Country presentations

Representatives of the six teams had prepared presentations on the status of drinking-water and sanitation in their respective countries and excerpts are presented below.

Cambodia

Dr Mao Saray, Director of the Department of Rural Water Supply of the Ministry of Rural Development presented the elements of the National Strategy Focus (part of the Government of Cambodia Rectangular Strategy):

1. provide all citizens with clean and safe water
2. protect all citizens from water-related diseases
3. provide adequate water supply to ensure food security, economic activities and appropriate living standards
4. ensure water resources and an environment free from toxic elements

Improving access to safe drinking water and sanitation supports the overall goal of poverty reduction through a number of activities: facilitating the universal access to safe water and adequate sanitation; promoting sustainable and safe environments; reducing the social and health risks faced by population; enabling strategies such as promoting inclusive policy dialogues and pro-poor policy frameworks; addressing inequities by using region-wide approaches; directing activities at areas where poor people live particularly affected by lack of safe and adequate water supply and sanitation; and, strengthening cooperation and promote better relationships between local authorities and local populations.

The Government's information on rural access to safe drinking water and adequate sanitation showed 2005 coverage figures of 42% and 16%, respectively; in the urban settings these figures are 72% and 55%. With the 2025 national vision of achieving 100% in all these coverage figures, the intermediate targets in line with the Cambodian MDGs are, for 2015: 50% (rural water), 30% (rural sanitation), 80% (urban water) and 74% (urban sanitation).

Water resources in Cambodia include surface water (Tonle Sap (Great Lake) fluctuating between 2,500 to 13,000 km², the Mekong river system and the Tonle Sap river system), groundwater (which is available almost everywhere, but with concern over water quality - arsenic-) and rainwater.

An overview of the sectoral development status shows the following milestones:

- 1994: WATSAN Sectoral Working Group established
- 2001: The Government adopts the National Policy on Water Supply and Sanitation (amended in 2003)

- 2001: RWSS strategy framework (2001-2010) prepared (now being updated)
- 2003: National water quality standard adopted
- 2005: RWSS Investment Plan formulated
- 2005: National Water Supply and Sanitation Coordination Committee established (Inter-ministerial Committee)
- 2007: Technical Working Group for Rural Water Supply, Sanitation and Hygiene established (for donor coordination and partnership development of the sector)

Government agencies with a direct responsibility in the area of drinking-water and sanitation services include the Phnom Penh Water Supply Authorities, the Ministry of Industry, Mines & Energy (urban water supply), the Ministry of Rural Development (rural water supply and rural sanitation), the Ministry of Public Works & Transport (urban sanitation). Other ministries with relevant responsibilities include the Ministry of Water Resources & Meteorology (water resource management), the Ministry of Health (environmental health care) and the Ministry of Environment (environmental monitoring).

The roles and responsibilities of Central Government agencies have evolved over time from those of a service provider to those of a facilitator, and include the establishment of a legal and regulatory framework, securing financing for the sector investment, formulating policies, strategies and long-term investment plans, coordination of internal and external assistance and sector interventions, promotion of appropriate technology, human resource development, research and community education, and monitoring and evaluation system development and application.

The provincial authorities are responsible for planning at provincial level, facilitation and monitoring of programme implementation, inter-departmental cooperation and coordination, coordination with NGOs and ESAs at provincial level, support to the private sector development, to commune councils and to village level agencies, and the development of human resources within the provincial departments.

Communities themselves participate actively in the planning process, the financial management, supervision of project implementation, and monitoring and evaluation. Cambodia's people-centred development approach entails that people must be empowered to manage planning and implementation of water and sanitation, projects, such projects must respond to genuine demands of the people, and people must have an opportunity to express such demands, and the capacity of people must be strengthened through education and learning so they can work towards the improvement of their livelihoods.

In order to meet these criteria, the water and sanitation programme has the following attributes: inclusiveness (poor, women, other vulnerable groups), demand-driven, informed choices from available options, a participatory and consultative approach, linkage to a decentralized process, sustainability on operations and maintenance, gender equality and focus on ethnic and indigenous minorities, assessment of environmental issues and land acquisition issues.

The future agenda for rural water supply programmes is comprehensive and include the following elements:

- Rural water supply improvements plans (for existing facilities): rehabilitation/upgrading of existing facilities, WSUG formation (community-base mechanism for sustainable functioning of facilities) and safe water use and hygiene promotion.
- Integrated RWSS Master Plans (for Strategic development targets): new projects (integrated sector-wide plans)

- RWSS Activities for Integrated Rural Livelihood Improvement Projects: community assets improvements (poverty reduction and livelihood programs), water use and hygiene promotion in conjunction with the public health improvements

In addition, the programme has routine tasks related to the preparation and application of standards and norms, creating an enabling environment for a demand-responsive approach, capacity building and institutional development, and the development of private/public sector partnerships. The challenges in all the above are lack of investment, problems of maintenance (in particular the role of the community therein), the low economic value attributed to water, limited private sector participation, a lack of appropriate technical solutions and a lack of a sufficient evidence base.

Indonesia

The Community Water Services and Health Project has been initiated by the Directorate of Environmental Health of the Ministry of Health of the Republic of Indonesia. This project receives support from the Asian Development Bank (loan 2163/2164 SF INO).

The goal of the project is to contribute to the improvement of the health status and quality of life of low-income communities in rural and peri-urban areas of Indonesia, with the following detailed objectives:

- to provide sustained access to safe drinking water and improved sanitation, and to improve the hygiene behavior related to waterborne diseases of low-income communities in rural and peri-urban areas.
- to improve district government capacity to facilitate and regulate basic water and sanitation services; empower communities to take responsibility for developing and implementing such services based on a demand-driven, community-based approach; and
- to increase communities' awareness and education with regard to appropriate health and hygienic behavior.

The criteria for selecting project sites included the level of poverty of local communities, the health status in relation to water-associated diseases (diarrhoea) and the existing situation with respect to access to safe drinking water.

Part of the funds provided are in the form of grants destined for the tsunami struck areas of northern Sumatra: five districts around Aceh and two on the island of Nias. The projects under the loan part of the funds made available are located in Jambi Province (Sumatra, five districts), West Kalimantan Province (six districts) and Central Kalimantan Province (six districts).

In all sites there are five project components:

1. District and sub-district capacity building

Capacity of district agencies will be strengthened to facilitate community-based planning and implementation of water supply and sanitation that also address hygiene behavior. The focus will be on improving the quality of services, whether indirectly facilitated or directly provided, to the communities.

2. Community empowerment

Participation of communities will be increased in the decision making process, planning, implementation and ownership of water supply and sanitation facilities. A community mobilization and training programme will support communities to improve their knowledge, skills, tools, financial resources and incentive systems to successfully carry out these

responsibilities. Community proposals will be in the form of a Community Action Plans (CAPs).

3. Community- based water supply and sanitation facilities

Improved water systems designed to enhance water quantity, accessibility and quality will be constructed or rehabilitated by the Project participating communities. Communities will receive a menu of technical options that describes the advantages and disadvantages of each technical option and the associated cost for construction, operation, maintenance and repair.

4. Sanitation and hygiene behavioural change

To maximize the health impact of project intervention and to reduce the incidence of diarrhoea and other waterborne diseases, health and hygiene promotion with the specific objective of behavioural change will be carried out. This will include:

- (i) a school health and sanitation program focusing on teachers and school children;
- (ii) hygiene promotion at religious facilities;
- (iii) a community hygiene programme focusing on households, youth, children out of school, men and women; and
- (iv) a home water treatment and storage programme focusing on households.
- (v) Community-Led Total Sanitation (CLTS).

5. Project implementation and coordination support.

The gender issues related to these water and sanitation projects were identified as follows: Access to clean water and sanitation is a basic need of all community members of communities (old/young, rich/poor, men/women). Women play a key role as providers and managers of water for their households. Women often promote of activities related to household and community sanitation. However, they are often not sufficiently represented and do not sufficiently participate in decision making institutions of their communities. The CWSHP is expected to contribute substantially to improved facilities and services, increased community participation in financing and maintaining water supply, and increased hygiene awareness. With its gender sensitive approach, the CWSHP will support women in their efforts to make activities more efficient.

Over the period 2006-2011, the project foresees to add 200,415 households with access to safe drinking water, and 146,000 households with access to adequate sanitation. The main budget component (40%) is for the infrastructure development.

The estimated values of the benefits are US\$21,394,500 and US\$2,917,500 for drinking-water and sanitation infrastructure, respectively. Some 600,000 hours of water collection time are estimated to be saved on an annual basis, and the savings of opportunity costs are estimated at US\$32,515,330 per year.

The Indonesian team decided to develop their protocol in the context of project components that had already been finished, so the cost analysis would be a retrospective one.

Lao PDR

With a total population of 5.6 million (2005) and a surface area of 236,800 km², the Lao People's Democratic Republic is, in the regional context, a not very densely populated, landlocked country in South East Asia. Its population growth rate amounts to 2.2% per year, and a large part of its population (41%) is under 14 years of age.

The 2004 Human Development Index ranks Lao PDR at 135, with a life expectancy at birth of 54 (males) and 56 (females) at birth and an under-five mortality of 136/1000. The per capita GDP is US\$606 (2006). Subsistence agriculture provides employment to over 70% of

the population. The national economy is worth US\$ 3,317M and the 2006 growth rate was 8.3%.

Poverty incidence in Lao PDR, 1992/93-2002/03

Years	Nation-Wide	Rural	
		Areas	Urban Areas
1992/93	46	51.8	26.5
1997/98	39.1	42.5	22.1
2002/03	30.7	33	23

In 2006, the estimated national poverty incidence was 27%, with 1.5 million people living under the poverty line. Poverty is concentrated in the North and East of the country.

As part of the Government’s poverty reduction strategy the institutional and legal framework for water supply and sanitation sets the targets and defines the actions in connection the the MDGs. Setting Government targets in this area is mainly driven by the public health concerns related to lack of access. These targets are presented in the following table

Water supply and sanitation plan of Lao government

Items	2005	2010	2015	2020
%-age access to safe water	66	74	82	90
%-age access to basic sanitation/toilets	47	58	69	80

The following Government agencies have responsibilities for drinking-water supply and sanitation:

The Department of Urban planning under the Ministry of Public Work and Transportation - the Department has established a coordination network from central government to local authority, i.e. at provincial and district level. It is responsible for planning and management of water supply in the urban areas such Vientiane Municipality, provincial and district centers. About 21.4 percent of total population of the country live in these areas.

The Department of Environmental Health and Water Supply under the Ministry of Public Health - the Department has established a coordination network from central government to local authority, i.e. at provincial, district and village level. It is responsible for water supply in the rural areas, i.e. the areas for which the Ministry of Public Work and Transportation is not responsible. The majority of population, i.e. almost 80 percent, lives in these rural areas.

A number of laws and regulations govern the area of drinking-water supply and sanitation.

- Water and Water Resource Protection Laws, 1996 (prohibiting any activities which significantly affects watershed and water quality, such clearing watershed areas for any purpose, leaving waste, chemical materials into natural water, etc.)
- Forestry Law, 1996 (prohibiting changing watershed areas for any purposes, etc.)
- Environmental Protection Law, 1999
- Hygiene, Prevention and Health Promotion Law, 2001
- Decree 37/PM on Management and Development of Water Supply System, 1999

The public expenditures for health, drinking-water supply and sanitation are presented in the table below. Over 65 percent of these expenditure comes from ODA (ADB, World Bank, GTZ, etc.).

Years	Expenditure for health, water supply and sanitation/million of US\$	Percentage of total public expenditure
2001	7.5	2.9
2002	17.9	6.2
2003	22.6	6.3
2004	23.8	8.2
2005	26.3	10.4
2006	20	5.5
2007	11.7	3.5
Over 7 years	129.8	On average 6.0

Water supply in urban areas.

There are 53 water treatment plants in 51 districts, and 712,757 people have access to urban water supply, corresponding to about 59 percent of target group or to about 12.7 percent of population within Lao PDR. However, there are other improved water sources, which have been identified by the Ministry of Public Health as safe water sources, as such as protected wells, public taps, etc. Of the people living in urban areas 75.5 percent have access to safe water (MICIII,2006).

Districts with and without urban water supply system

Provinces	Total number of districts	Number of districts with urban water supply system	Number of districts without urban water supply system	Percentage
Vientiane Municipality	9	8	1	88.89
Phonsaly	7	3	4	42.86
Luangnamtha	7	2	5	28.57
Oudomxay	7	1	6	14.29
Luangprabang	11	3	8	27.27
Huaphane	8	2	6	25.00
Xienkhouang	8	2	6	25.00
Xayyaburi	10	3	7	30.00
Vientiane	14	8	6	30.00
Borlikhamxay	6	2	4	3.33
Khammouane	9	3	6	33.33
Savannakhet	15	5	10	33.33
Saravane	8	3	5	37.50
Xekhong	4	1	3	25.00
Champasak	10	4	6	40.00
Attapou	6	1	5	16.67
Total	139	51	88	36.69

Source: the Ministry of Public Work and Transportation

Water supply in rural areas.

The Ministry of Public Health is the main government agency taking responsibility for drinking-water supply in rural areas. Its activities are supported by massive technical and

financial assistance from international organizations, NGOs, governments of foreign countries such as SIDA, UNDP, WHO, GTZ, etc. Access to safe water from improved sources increased from 37.6 percent in 2002 (MRC) to 46.2 percent in 2006 (MICIII, 2006)

Consolidated overview of access to water supply and sanitation from 2002 to 2006

Items	2002		2006	
	Percentage with access to safe drinking-water	Percentage with access to adequate sanitation	Percentage with access to safe drinking-water	Percentage with access to adequate sanitation
Urban areas	75.5	67.1	75.5	83.4
Rural areas	37.6	19	46.2	31.1
Whole country	45.7	37.6	52.5	42.4

Source: MRC and MIC III

This reflects a considerable shortfall from the targets (according to plans, the targets to be achieved were 74 and 58 percent by 2010)

Philippines

The Philippines is an archipelago of more than 7,000 islands with an area totaling about 300,000 square kilometers. Three prominent bodies of water surround the archipelago: the Pacific Ocean on the East, the South China Sea on the West and the North, and the Celebes Sea on the South. This position accounts for much of the variations in geographic, climatic and vegetation conditions in the country.

The country is divided into three geographical areas: Luzon, Visayas and Mindanao. There are 17 administrative regions with 117 cities. The country's capital, Metro Manila, also known as the National Capital Region (NCR), is the country's smallest administrative region but the biggest metropolis composed of 14 cities and municipalities. The estimated 2005 total population is 85.3 million (NSO, 2006). The country's population density is 284 persons per square kilometer with an annual population growth at 2.1% in 2004.

The Philippines counts 421 principal river basins in 119 watersheds. The annual average rainfall is 2,400 mm and there are an estimated 50,000 square kilometers of groundwater reservoirs. The recharge or extraction potential of groundwater is estimated at 20,200 MCM per year, and the surface water dependable water supply at 833 MCM per day.

An evaluation of December 2004 shows that of the water permit grants by volume 56.43% goes to power, 36.77% to irrigation while domestic and municipal supplies, and industry take 3.18% and 3.82%, respectively.

Major cities expected to be faced with critical water needs by 2025 include Metro Manila, Cebu, Davao, Baguio, Angeles, Bacolod, Iloilo, Cagayan de Oro and Zamboanga. In 2005 there were a total of 6,280 drinking-water providers, the majority of which are BWSAs (3100), LGU utilities (1000) and Private companies (900).

The national demographic and health survey of 2003 showed the drinking-water and sanitation coverage data presented in the tables below:

Drinking-water coverage

Source of Drinking Water	Urban	Rural	Total
Piped into dwelling	50.90	16.0	34.3
Piped into yard/plot	4.80	5.90	5.30
Public tap	11.10	15.20	13.10
Open dug well	0.70	8.70	4.50
Protected well	18.60	35.30	26.60
Developed spring	0.90	8.10	4.30
Undeveloped spring	0.60	6.10	3.20
River/stream/pond/lake/stream	0.20	1.60	0.90
Rainwater	0.10	0.80	0.40
Tanker truck/peddler	2.20	0.80	1.50
Bottled/refilling station	9.80	1.30	5.70
Total	100.00	100.00	100.00

Sanitation coverage

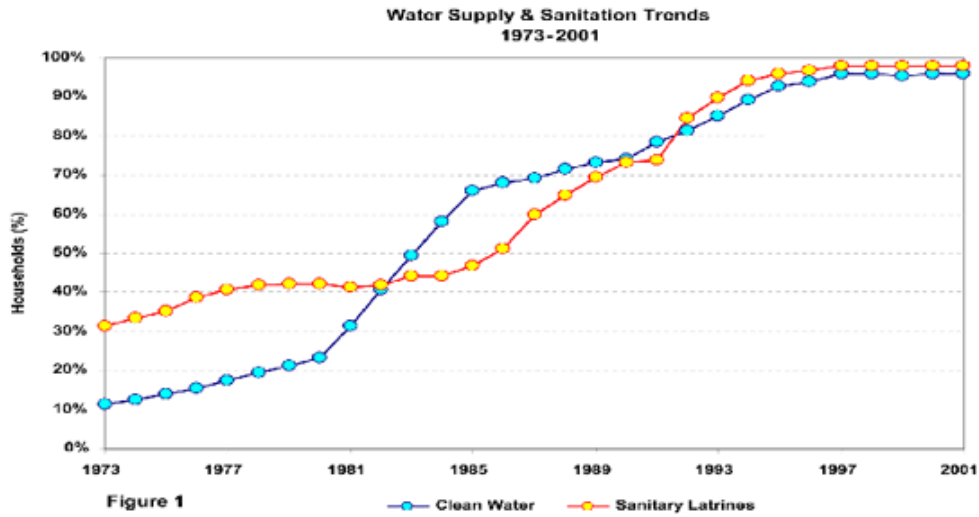
Type of Sanitation Facility	Urban	Rural	Total
Flush Toilet, own	76.7	53.6	65.7
Flush Toilet, shared	15.9	10.7	13.4
Closed Pit	1.5	10.7	5.9
Open Pit	0.8	6.8	3.7
Drop/Overhang	1.1	2.8	1.9
No toilet	3.9	15.4	9.3
Other	0.1	0.1	0.1
Total	100	100	100

World Bank data show a huge discrepancy between investments in drinking-water versus sanitation facilities – in 2003 an estimated 97% of investments in this are went to improving access to safe drinking-water. The government agencies involved in water and sanitation include the following:

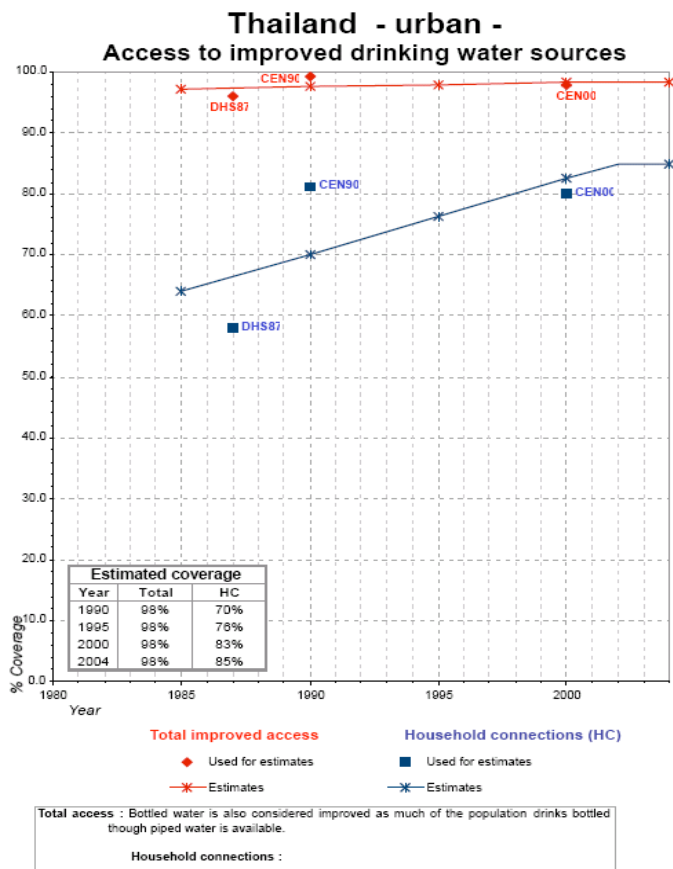
- National Economic Development Authority
- National Water Resources Board
- Department of Public Works and Highways
- Local Water Utilities Administration
- Metropolitan Waterworks and Sewerage System
- Department of Health
- Department of Interior and Local Government
- Department of Environment and Natural Resources
- Local Government Units

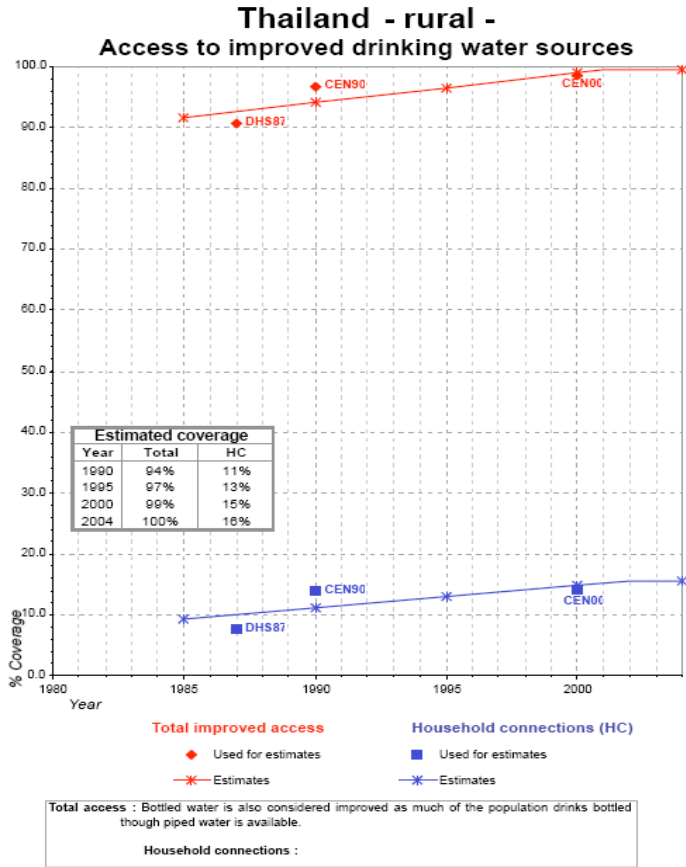
Thailand

The water and sanitation trends in Thailand over the period 1973-2001 are reflected in the table below. This information is based on the Population and Health Census by the National Statistics Office.



Broken down in urban and rural access datasets, there is a clear discrepancy in terms of household connections.





Viet Nam

In an area of 331,000 km² over 80 million inhabitants live in a country that stretches from 23° to 9° northern latitude. Rural water supply in Viet Nam has the following characteristics:

- Tube wells are generally uncontaminated (0 Faecal coliforms in 74% to 91% of the samples).
- Dug wells are generally contaminated (minimally 5% with 0 coliforms)
- Rainwater systems are usually contaminated (between 0% and 58% with 0 coliforms).
- Surface water is contaminated (0%-6% with 0 coliforms only)
- High iron content (Groundwater) - maximally 25 -30 mg/l
- High chloride content in coastal areas
- High arsenic in some small areas

The drinking-water coverage data for the rural areas in Viet Nam are presented in the table below. Problems and challenges relate to water quality, rural water supply coverage, sustainability, water supply and sanitation technology for difficulty and remote areas, awareness of people, water and sanitation market, private sector and budget.

Number	Region	Year 2005	To 2010
1	North of Northern region	56	78
2	Red river delta	65	87
3	North of Central region	61	84
4	Central coastal area	59	81
5	Central Highlands	52	85
6	East of Southern region	68	88
7	Mekong river delta	67	90
	Whole country	62	85

Key solutions to implement the National Target Programme for Rural Water Supply and Sanitation over the period 2006 – 2010 include IEC and community participation, financial investments, technology (WS technology, WQ, O&M), better planning and human Resources development

Group work, plenary discussions and outcome

For the development of protocols by country teams, a framework was provided which defined the following parameters: boundaries, focus, actions and outputs

Proposed boundaries for the protocol

In space: pilot work at the national level on **three distinct proposed projects** for improved water supply; these can be **rural, urban** or a **mix of both**.

In time: the work has to be carried out so that results can be presented at the workshop **early September**.

Financial: the work should be carried out **within a budget of US\$5,500 per country**.

Focus

Improved drinking-water supply for **low-income communities**.

Sites where there are **real alternatives** for the improvement of access to safe drinking-water.

Preferably new projects in the **early planning stage**, so that the manual is applied in the most realistic context.

Only the **cost component** of economic evaluation is covered; the effectiveness or benefit aspects are **not** covered.

Within the cost component both **financial** and **economic costs** are covered.

Actions

Agreeing on site **criteria** and on **protocols** (during the workshop)

Formalizing links, obtaining clearances, settling administrative **arrangements** for the implementation of the pilot studies

Detailed design of the individual pilot studies, **roles and responsibilities** of the partners

Implement the Practical Manual and the excel sheets in a step-by-step basis

Document the findings as the team goes through the step by step approach: (a) the actual outcome of the cost estimation and analysis, and (b) constraints encountered in implementing the Practical Manual

Prepare a final report with conclusions and recommendations coming out of the pilot studies for presentation in Lao in September

Outputs

Detailed cost estimates for the individual projects.

Reports summarizing the outcomes of the pilot studies and the findings of implementing the Practical Manual.

Recommendations for further improvement of the Manual.

3. CONCLUSIONS AND RECOMMENDATIONS

Sixteen participants from six countries in the WHO regions of South East Asia and the Western Pacific (Cambodia, Indonesia, Lao PDR, Philippines, Thailand and Viet Nam) met in Khon Kaen Thailand from 3 to 6 March 2008 to discuss a detailed costing method for improved drinking-water supply systems for low-income communities. The objectives were to discuss the proposed method and to develop protocols to apply the method and test it in diverse settings in their countries.

The group arrived at the following conclusions and recommendations:

- (1) the group reviewed the method developed by the University of Geneva, department of econometrics, and acknowledged it to be a valuable tool for countries in the region to strengthen their planning and implementation of drinking-water supply projects as part of efforts to reach the MDG drinking-water and sanitation targets.
- (2) The group appreciated that costing was part of more comprehensive economic evaluation approaches (cost-effectiveness analysis, cost-benefit analysis), but that it was important to strengthen national capacities on a step-by-step basis, with costing being the first step.
- (3) The group developed criteria for the selection of projects at the planning stage that would provide the context for applying and testing the costing tools under discussion – these include location (rural – peri-urban), access, geophysical characteristics, size, water source, diversity of technical water supply options, socio-economic status of communities (focus on low-income), availability of data and current burden of water-borne diseases. These criteria were selection indicators and it was not intended that projects to be selected would fulfill all of them.
- (4) The group recognized that costing of improved drinking-water supply systems requires a multidisciplinary approach, and that the information obtained needs to be channeled to decision-makers in different sectors.

The following recommendations were adopted:

- (1) the country teams will carry out the protocols they developed at the workshop within the six month timeframe agreed with support from the WHO. They will report on the outcome of their work at a second workshop in Lao PDR 1-3 September 2008.
- (2) In the implementation of the protocols the teams should guarantee that the balance be maintained between applying the manual on a real case with a usable outcome, and testing the method proposed to provide feedback for possible improvements of the manual.
- (3) Strengthening of the institutional arrangements should be pursued between drinking-water supply and health authorities, and the authorities of planning, finance and investment, to provide a basis for future routine collaboration on economic evaluation of water supply and sanitation systems.
- (4) The role of NGOs in the planning and implementation of drinking-water supply systems should be enhanced where feasible and appropriate and their capacity to participate in costing exercises and other economic evaluations should be strengthened.
- (5) WHO and its partners should continue to develop and refine methods for the economic evaluation of water supply and sanitation projects, and should document country experiences for dissemination to its Member States.

ANNEXES



Annex 1
Programme of work for first workshop
Costing of improved water supply systems for low-income communities
Khon Kaen, Thailand 3-6 March 2008

Monday 3 March 2008

- 09:00 Opening of the workshop
Statements on behalf of WHO, the University of Geneva and CDSEA

Introduction of participants

Objectives and expected outputs

Robert Bos, WHO/PHE
- 09:30 Global cost-benefit analysis of water supply interventions

Robert Bos, WHO/PHE
- 10:00 Introduction to the cost analysis guidance document

Fabrizio Carlevaro
University of Geneva
- 10:30 refreshments
- 10:45 Details the cost analysis guidance document

Cristian Gonzalez
University of Geneva
- 11:15 Framework for testing the cost-analysis guidance document:
criteria and procedures

Robert Bos, WHO/PHE
- 11:45 Plenary discussion on relevant issues, Q&A
- 12:15 lunch
- 13:30 Country reports: status of water and sanitation in the region

13:30-13:50 Cambodia
13:50-14:10 Lao PDR
14:10-14:30 Philippines
14:30-14:50 Indonesia
14:50-15:10 Thailand
15:10-15:30 Viet Nam
15:30-15:45 Discussions
- 15:45 refreshments
- 16:00 Group work: development of criteria for the selection of trial projects, in two groups.

Tuesday 4 March 2008

09:00 Recapitulation of day 1, Q&A

Robert Bos, WHO/PHE

09:20 Presentation of group work for site selection criteria, and consolidation of criteria

Plenary discussion with presentations by the two groups

09:45 Group work – each country team works on protocol development, defining objectives, projects, expected outputs, partners, institutional arrangements.

12:15 lunch

13:30 Presentation outcome group work and discussion

14:45 Group work (continued) – each country team works on method and procedures, formulates a detailed action plan with activities, milestones and an overall timeline.

17:00 Closure of the day's session

Wednesday 5 March 2008

09:00 Presentation and discussion of the five draft country protocols

09:00-09:15 Cambodia

09:15-09:25 discussion

09:25-09:40 Lao PDR

09:40-09:50 discussion

09:50-10:05 Indonesia

10:05-10:15 discussion

10:15 refreshments

10:30-10:45 Philippines

10:45-10:55 discussion

10:55-11:10 Thailand

11:10-11:20 discussion

11:20-11:35 Viet Nam

11:35-11:45 discussion

11:45 Plenary discussion on the incorporation of cost-analysis procedures into the existing drinking-water policy and planning framework and the operational framework for water supply extension, operation and maintenance: opportunities and constraints

12:15 lunch

13:45 Group work to update the protocols based on the morning's discussions

Thursday 6 March 2008

09:00 Presentation final protocols

- 10:00 Agreement on the administrative arrangements for the implementation of the protocols
over a six month period
- 10:30 refreshments
- 10:45 Detailed presentation on the Excel sheets accompanying the Practical Manual
- 11:15 Discussion on other relevant items: communications during protocol implementation, publication of outputs, technical support from University of Geneva.
- 11:30 Arrangements for the second workshop
- 12:00 Closure of the workshop

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Annex 2.
List of participants, resource persons and organizers

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Annex 3 Country protocols

Study Protocol Water Supply Costing in Cambodia

1. Background

The Government of Cambodia has adopted the National Policy on Water Supply and Sanitation, in which the development goal of the Rural Water Supply and Sanitation Sector (RWSS) is stated that “Every person in rural communities has sustained access to safe water supply and sanitation services and lives in a hygienic environment by 2025”. The Cambodian Millennium Development Goals (CMDG) includes objectives to increase safe water supply services for 50 percent of rural population and adequate sanitation services for 30 percent of rural population by 2015.

At present, recent surveys in Cambodia confirm that, only about 31 percent of rural populations have access to safe water supply services and 16 percent of rural populations have access to basic sanitation facilities. It is estimated that, to attain the CMDG targets by 2015, the RWSS sector should increase safe water supply improvements for 3.15 million populations and basic sanitation improvements for 2.86 million populations within 10 years framework.

2. Objectives

To assist the Government to achieve such target with their limited budget, Economic Institute of Cambodia (EIC), under the support of the Ministry of Rural Development, would like to carry out a pilot study on Water Supply Costing in Cambodia, initiated by World Health Organization (WHO). This study aims to identify least-cost options of planned improved Water Supply Systems in Cambodia using a practical manual of Costing-Model developed by University of Geneva.

Specific objectives of the study required by WHO are:

- To test and improve the questionnaire and Costing-Model spreadsheet developed by economists of University of Geneva.
- To introduce and adapt this practical manual Costing-Model in the context of Cambodia.

Beyond these outputs, EIC expects that this Costing-Model will become the useful tool and input for identify least-costing option among the WATSAN Technical Working Group discussion.

3. Expected Outputs

There are two main outputs expected from this study:

- a. The Costing-Model spreadsheet which filled by the survey data of three proposed options in Cambodian context; and,
- b. An analytical report of the user-friendliness from the field which will consist of:
 - Least-costing analysis of the proposed options using Costing-Model developed by University of Geneva;

- Identify issues and challenges of this Costing-Model, if any, and propose some recommendations and its adaptability into Cambodian context.

4. Activities

To realize above objectives/outputs, EIC research team, under the guidance of Ministry of Rural Development of Cambodia, will conduct this study on the selected three proposed options out of Tonle Sap Rural Water Supply and Sanitation Project (TSRWSSP). The selection will be based on criteria developed during the First Workshop on Costing of Improved Water Supply Systems for Low-Income Communities in Khon Kaen, Thailand (3-6 March 2008).

After identifying the three proposed options for the pilot study, three further main activities will then be carried by EIC research team:

- a. Firstly, EIC research team will conceptualize the study by doing desk review on the draft practical manual of “Costing Improved Water Supply Systems for Low-income Community” and documents related to the three proposed options of water supply selected from TSRWSSP. Consultation with some key experts will also be done for deeper understanding the scope of the study and the three proposed options;
- b. Secondly, EIC research team will conduct two field surveys with relevant stakeholders using the questionnaire guided by University of Geneva.
 - The first field survey will be conducted with some key project experts and village authorities using Physical-Technical and Socio-Economic questionnaire. This survey is to understand general information about three selected villages/sites of the proposed water supply option such as their urbanization characteristics and hydrological/climate aspect, etc. Both face-to-face interview and focus group discussion will be used in this survey.
 - The second field survey is the market survey, which is to try to assess the cost of the three selected proposed water supply options. The survey will thus be done by face-to-face interview with component suppliers and focus group discussion with relevant local authorities and villagers.
- c. Finally, an analytical report will be realized based on data from the field with close consultations and comments with key experts from University of Geneva and other stakeholders.

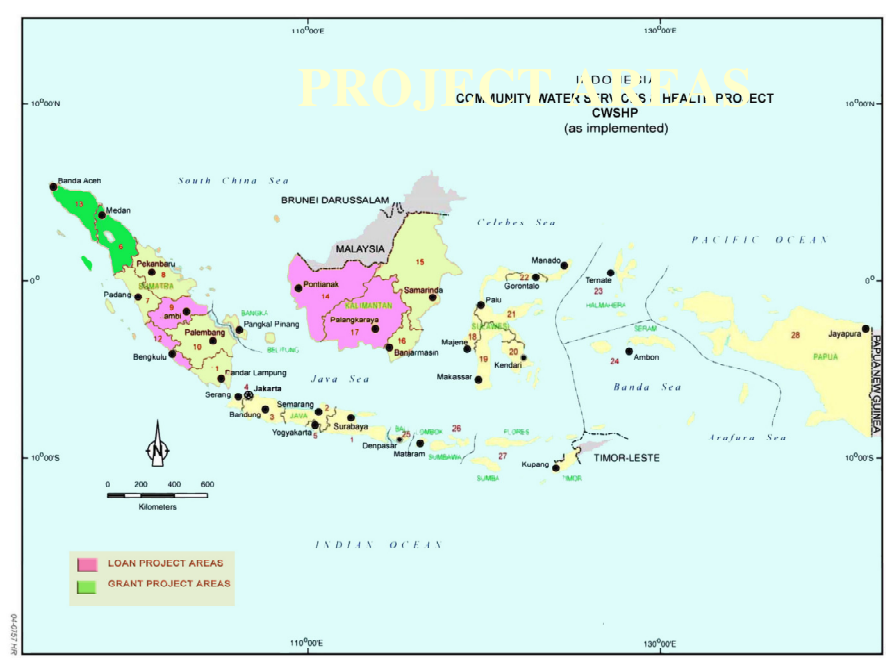
5. Tasks and timeframe

Tasks	March				April				May				June				July				August			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conceptualization																								
Detail Protocol				x																				
Questionnaire compilation						x																		
Data collection																								
Technical questionnaire									x															
Socio-eco questionnaire										x														
Costing questionnaire																x								
Report Writing																								
Costing-Model Spreadsheet																								
Report preparation																								
Consult with experts																								
Report finalization																								

6. Tasks and estimated budget

Tasks	US\$
Conceptualization	1,800
Field survey	3,319
Report Writing	2,000
Total	7,119

**PROTOCOL DEVELOPMENT
COST ANALYSIS OF WATER SUPPLY OPTION FOR LOW
INCOME COMMUNITIES INDONESIA**



**PROJECT :
WATER SUPPLY LOW INCOME COMMUNITY -2 (WSLIC-2)
DIRECTORATE ENVIRONMENTAL AND HEALTH-DG
MINISTRY OF HEALTH,
INDONESIA 2008**

BACKGROUND
<p>The Ministry of Health, Indonesia is faced with the challenge to contribute in a meaningful way to achieving one of the country's main targets of the Millennium Development Goals, namely to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. One of the ways is to estimate the financial and economic costs of improved access both to safe drinking water and adequate sanitation.</p> <p>In the context of the collaboration between the World Health Organization and the University of Geneva on issues relating to the economic evaluation of water, sanitation and hygiene interventions, two guidance documents have been prepared on the cost analysis of drinking water supply and sanitation options. The guidance provides a comprehensive approach and methodologies for estimating and evaluating the costs of improved drinking water supply options for low-income communities. The guidance would be useful for application in Indonesia. However, before it is used at the country level, it is importance that the guidance is used at the pilot scales for selected areas in Indonesia.</p> <p>Towards this end, WHO is providing both the technical and financial assistance to Indonesia for the pilot studies of the guidance. This documents proposes the objectives, methodologies, expected outputs and action plans for the pilot studies of the guidance. The financial breakdown of the proposal is also provided.</p>
DEFINING SITES
<ul style="list-style-type: none"> • Location : Post Project water supply low income community (WSLIC-2) in Bogor district : three villages and three improved technologies for water supply (each village with one technology). • These locations have already been planned for rural water supply.
OBJECTIVES
<p>To obtain detailed costing of rural water supply at the district level for a project that has been planned and implemented.</p>
OUTPUT
<p>To determine the least cost option of improving technology in rural water supply</p>
PARTNERS AND INSTITUTIONAL ARRANGEMENTS
<ul style="list-style-type: none"> • Ministry of Home Affairs • National Planning Bureau (Bappenas) • Ministry of health (Executing Agencies) • Ministry of Public Works • Ministry of Finance • Local Government
METHODS AND PROCEDURES
<ol style="list-style-type: none"> 1. Coordination Meeting to prepare study 2. Prepare and decide locations 3. Prepare user friendliness questionnaires 4. Data Collection, Validation and Verification : <ul style="list-style-type: none"> • Data sources : <ul style="list-style-type: none"> - Project Secretariat at National, Province, and District levels; - Community Action Planned (CAP) • Types of Data : <ul style="list-style-type: none"> - General aspects of study areas - Investments costs

<ul style="list-style-type: none"> - Maintenance costs - Operating cost - Other relevant costs: administration, training and other <ol style="list-style-type: none"> 5. Data Analysis and summary 6. Prepare Draft Report 7. Dissemination & Consultation Workshop 8. Completion report
STUDY ORGANIZATION
<ul style="list-style-type: none"> • Project Implementer: <ul style="list-style-type: none"> – Ministry of Health in cooperation with working group of water and sanitation national level. • Ministry of Health to work with a national expert (economics) from one of the universities. The expert will be engaged for 4 months.
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ACTION PLAN																						
No	Activity	April				May				June				July				August				Milestones
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1	Coordination meeting to prepare study																				Coordination group	
2	Selection of locations																				Location decided	
3	Preparation of user friendly questionnaires																				Questionnaires Prepared	
4	Data Collection, validation and Verification																				Data Collected, and Validated	
5	Data Analysis and summary																				Study Summary	
6	Preparation of Draft Report																				Draft Report	
7	Dissemination Workshop																				Workshop	
8	Finalization of Report																					Final Report

BUDGET

No	Activity	Detail	Cost
1	Coordination meeting to prepare study	2 package x USD 170	USD 340
2	Preparation of Study Locations (communication etc)	1 package x USD 52	USD 52
3	Preparation of questionnaires	1 package x USD 170	USD 170
4	Data Collection, Validation and Verification	1 pers x 4 d x 3 loc x 3 t x USD 40 - 1 pers x 1 tr x 3 loc x 3 t x USD 22	USD 1638
5	Data Analysis and summary	Consultant salary (4 month)	USD 2400
6	Preparation of Draft Report	Consultant salary	USD 100
7	Dissemination Workshop	20 person x 1 days x USD 35	USD 700
8	Final Report		USD 100
		TOTAL	USD 5500

Project Proposal (Lao PDR)

Project name: Costing Improved Water Supply for Low-income Communities in Lao PDR

Working Team:

- The National Center for Environmental Health and Rural Water Supply (Coordinator and Leader of the project)
- The National Economic Research Institute, the Ministry of Planning and Investment (technical support partner)
- Water Resource and Environment Administration (technical support partner)

Background and Rationale

The importance of water supply is widely recognized, as expressed in the MDG targets. Unsafe water is a source of many diseases such as diarrhoea and other water-borne diseases. Every year, globally millions of people die from these diseases. Consequently, the improvement of water supply systems, especially in the rural areas, is required urgently. To meet the requirement, efficient techniques and technologies are needed.

The World Health Organization (WHO), which is the main organization concerned with health of the world population, in cooperation with the University of Geneva, has developed a technical guideline for costing options for supply of safe water to low-income communities. However, many questions related to the technologies remain unanswered, especially the questions whether there are other technical options to supply water for low-income communities that cost less, an analysis of these costs and, which option is the most suitable one from a cost perspective.

To answer the questions mentioned above, the Organization and University give out a small research grant to relevant agencies in Lao PDR, Vietnam, Cambodia, Indonesia, Thailand and the Philippines to test the manual.

Objectives

- To identify possible water supply options for low-income communities in Lao PDR
- To estimate the costs of possible options
- To provide feedback to technical guideline developed by WHO and University of Geneva.

Methodologies and Procedures

- Collecting and reviewing existing data and information such as data and information on existing water supply options, technologies, costs, quality, capacity of each existing technological options by results and findings of previous studies and projects planned.
- Identify gaps of data and information needs, based on the above review and considering the inputs needed in the practical manual and excel sheets.

- Develop and use the manual to collect information addressing the above-mentioned gaps.
- Two case pilot studies to collect data and information missing by participatory approach will be conducted, one should be located in the mountainous and one in the low land area. In each case, a participatory assessment will be conducted; local price of construction materials, labor and other factors related to cost estimation for water supply will be collected. The criteria to select the sites are : number of population/density, low income (below poverty line), water quantity and quality, water sources (River, rain water harvesting, spring, deep well, shallow well), disease burden and financial availability.
- National consultation workshop (WHO, UNICEF, WSP-EAP, NGOs, Local authorities, Water related sectors, Sanitation sectors and Economic sectors, etc).
- Data analysis by Excel.

Action Plan

No	Activities	Mar	Apr	May	Jun	July	Aug	Sept
1	Collecting and reviewing existing data and information							
2	Pre-field visit							
3	Field work preparation (guideline, training)							
4	Field survey							
5	Building database and data analysis							
6	First draft report							
7	Consultation workshop							
8	Finalize report and submit the final report							
9	Present in the second regional workshop in Laos							1-3

Expected Outputs

- Building up capacity of concerning agencies such the National Center for Environmental Health and Rural Water Supply, the National Economic Research Institute, the Water Resources and Environment Administration, etc. in cost estimation for water supply in low-income communities within Lao PDR.
- Information and knowledge on possible options and cost of water supply in low-income communities in Lao PDR.
- Basic data and information for cost-benefit analysis of low-income communities in Lao PDR.
- Basic data and information for water supply planning in rural areas.
- Feedback to the technical guideline for rural water supply developed by WHO and University of Geneva.

Budget Plan

No	Budget line	Amount (USD)
1	Administration	500
2	Collecting and reviewing existing data and information	500
3	Pre-field visit	600
4	Field work preparation	400
5	Field survey	2,000
6	Building database	400
7	Analyzing and writing report	1,100
8	Consultation workshop	500
	TOTAL	5,500

Philippines

Project Title: Pilot Testing of Manual on Costing of Improved Water Supply Systems for Low-income Communities

Background:

Poor water quality and sanitation continue to pose a major threat to human health. Diarrhea, which is spread easily in an environment of poor hygiene and inadequate sanitation, kills about 1.8 million people each year, most of them children under five years of age.

Further, water quality is deteriorating in many places, and some cities in the developing world treat only about 10% of their sewage. As a result, developing countries are facing enormous crises.

The WHO and the University of Geneva, recognizing the positive impact which safe water supply and sanitation interventions will bring to human health, developed a draft manual to analysis the cost of WS & S projects which in turn will serve as an important tool for planners, policy/decision makers and project managers. The manual covers the methodology allowing identification and costing of the technical alternatives of water supply systems that will be best served the intended communities.

As a result of the 4 day workshop on the draft manual organized by WHO at Khon Kaen, Thailand on 3 – 6 March 2008, participating countries are required to pilot the use of the draft manual to determine its completeness, applicability and usefulness.

General Objective:

To assess the cost of differing levels of improved water supply systems for low income communities.

Specific Objectives:

To conduct cost analysis of improved water supply systems using the draft WHO manual (questionnaires).

To provide feedback to WHO on the use of the draft manual

Methodology:

1. Review of available of data needed.
2. Site visits
3. Consultation to other stakeholders
4. Data analysis

Project Sites:

The project sites will be selected based on the following criteria:

- Low-income communities
- Rural/Peri-urban areas
- Accessibility
- Cooperation/commitment of partners and communities
- Size of proposed water supply project (USD 2,500 to USD 75,000)

Accordingly, the proposed sites will come from the lists of priority projects under the following wherever is applicable:

- Waterless municipalities under the President's Priority Project on Water (P3W)
- PCWS Project sites

Expected Outputs:

- Technical Report
 - Accomplished tool
 - Description of activities done
 - Findings and recommendations

- Financial Report

Implementation Arrangements:

Executing Agency: Department of Health

Implementing agency: Philippine Center for Water and Sanitation

Other Partners:

- National Anti-Poverty Commission (NAPC)
- Department of Agrarian Reform (DAR)
- Peace and Equity Foundation

Project Duration:

6 months (April – August 2008)

Budget:

USD 5 532

Implementation Plan

Timetable																						
Activity	Week																				Milestone	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1. Desk Review of the tool.																						Familiarization with the tool
2. Gather and review of available records																						3 project sites identified
3. Conduct initial analysis of the available data using the questionnaire																						Data gaps identified; Gaps on questionnaire identified
4. Conduct of site visits																						data validated and data gaps resolved
5. Drafting of initial report																						Cost of the proposed water system; Gaps on questionnaire identified. Initial report drafted.
6. Presentation of study results to concerned stakeholders																						Study results presented; feedback and recommendations gathered
7. Finalizing of technical report																						Technical report finalized
8. Submission of Final Report																						Technical report submitted.

BUDGET (in US \$)				
Rates				
Staff rates per man-day:			50	
Lodging Costs, per man-day			25	
DSA, per man days			9	
transport, per site			25	
Activity				
	Qty	Unit	Unit Cost	Cost
1. Desk Review of the tool.				
manpower	9	man-days	50	450
2. Gather and review of available records				
manpower	7	man-days	50	350
DSA	4	man-days	9	36
3, Conduct initial analysis of the available data using the questionnaire				
manpower	7	man-days	50	350
4. Conduct of site visits				
manpower	20	man-days	50	1,000
DSA	20	man-days	9	180
Lodging	10	man-days	25	250
transport	5	times	25	125
5, Drafting of initial report				
manpower	12	man-days	50	600
6. Presentation of study results to concerned stakeholders				
manpower	8	man-days	50	400
food				40
7. Preparation of technical report				
manpower	6	man-days	50	300
Subtotal				4,081
				1,428
Communications				23
TOTAL				5,532

**RTG-WHO COLLABORATIVE PROGRAMME
PROJECT ACTIVITY PROPOSAL
FOR THAILAND**

PART I. ADMINISTRATIVE INFORMATION		
1.1 Full Name of Responsible Officer: to be confirmed after consultation		
Full Name of Organization:		
<p style="text-align: center;">Thailand water resource association</p> <p style="text-align: center;">Thailand Environment Institute</p>		
Address of Organization:		
<p style="text-align: center;">180/3 Praram 6 Road, Soi 34, Samsennai, Payathai Bangkok 10400 Thailand 16/151 Muang Thong thani, Bond Street, Bangpood, Pakkred, Nonthaburi 11120</p>		
Telephone Number:	Fax Number:	E-mail Address:
1.2 Title of Project:		
<p style="text-align: center;">Costing of improved water supply systems for selected low-income communities in Thailand</p>		
1.3 Proposed Starting Date:		
<p style="text-align: center;">March</p>		
1.4 Estimated Duration (in months): 6 Months		
1.5 Total Budget Requested (Baht): 5,500 \$ (178,145 Baht)		

II. PROJECT TIMELINE

Title of Project: Costing of improved water supply systems for selected low-income communities in Thailand

Numbers	Activities	Month					Budget Required (\$)
		March	April	May	June	July	
1	Desk Review of the tool						
2	Site Selection and review primary datas						
3	Site Survey						
	- Interview villagers, local government						
	- Water resource, Tophographic Surveys						
	- Fill out questionnaire						
4	Data Analysis (for technology on each site)						
5	Pre-design						
6	Cost Estimation and analysis						
7	Evaluation on tool						
8	Final Report with conclusion and recommendation						

III. PROJECT DESCRIPTION

3.1 Background:

In the context of the collaboration between the World Health Organization and the University of Geneva on issues relating to the economic evaluation of water, sanitation and hygiene interventions, two guidance documents have been prepared on the cost analysis of drinking-water supply and sanitation options, respectively.

The US Department of State has provided WHO/PHE with a small grant for capacity building in this area, to cover relevant professional staff in five countries.

The guidance document prepared by the Faculty of Economics (department of econometrics) of the University of Geneva provides appropriate material for a capacity building exercise at the country level. The details of the proposed actions are described in the remainder of this document.

3.2 Objectives:

Specific

- To select sites in Thailand in accordance with in the defined sites criteria.
- To estimate the cost for all (construction, operation and maintenance and other cost) in each selected site.
- To make recommendation for further improvement of the manual.

3.3 Methodology:

Conceptual framework

- Desk review of the tools
- sites selection base on selection criteria
- record retrieved/ primary data collection,
- site survey, interview villagers / fill out questionnaire/ implement practical manual /water source and topographic survey
- preliminary design for each site
- cost estimation and analysis
- document constraints encountered in implementing the manual
- prepare final report with conclusions and recommendations

Activities

- **Desk review of the tool**

In order to make sure that everyone in the team understand the tool, there will be the first team meeting to review the tool. e.g. questionnaire etc.

- **sites selection base on selection criteria**

Base on the site selection criteria, two sites will be selected. The site shall be in Central region as it is accessible for field survey and it also represent the villages in central Thailand.

The primary data such as number of population, number of household, social condition, water source etc. of the site will be reviewed

- **Site surveys**

- Interview villagers, Local Administration Organization with prepared questionnaire (from a practiced Manual)
- Water source and topographic surveys

The team will investigate water source available in term of quality and quantity for both groundwater and surface water. Location of house and place where water supply is needed, e.g. school, temples etc.

- Fill out questionnaires

Information on interview and survey will be fill out in the questionnaire with some remark on what to be consider for water supply project. E.g. source of water to be selected.

- **Data analysis**

- **preliminary design for each site**

Site survey data from the two sites will be gather and analyze for preliminary design with all component, detailed shall be available for defined cost.

- **cost estimation and analysis**

Each component of water supply systems will be transferred to the bill of quantities with unit cost base on the Department of Water Resources, Bureau of Water Management standard. Then all the cost will be analysed as a basis to minimize the total cost.

The construction (initial) cost, operation and maintenance and other cost. e.g. training etc. will also include in the data to be analyze in the spreadsheet provided by WHO , Department of Economic, University of Geneva.

- **Evaluation on tool**

The outcome of cost estimation and the finding of implementing the practical manual will be discussed in the second workshop.

- **prepare final report with conclusions and recommendations**

All information collected from site survey, preliminary design, cost estimation will be compiled together with some conclusions and recommendations on a practical manual

- 3.4 Utilization of Results:** *(Describe how the results of this project will contribute to delivering the **product** as stated in the Work Plans of WHO Thailand for the current biennium.)*

PART IV. BUDGET (in Thai Baht)

- 4.1 Budget Details** *(attach additional sheets if necessary):*

<u>Category</u>	<u>Budget Requested (Baht)</u>		
1. Personnel*			
Name	Position	% of Time on Project	Budget Required, Baht
Total Personnel			

2. Equipment*			
Category	Quantity	Unit Cost	Total, Baht
Total Equipment			

3. Supplies			
Category	Quantity	Unit Cost	Total, Baht
Stationary			5,000
Total Supplies			5,000

4. Data Entry and Data Processing			
Category	Quantity	Unit Cost	Total, Baht
pre-design	2	8,000	16,000
cost estimate	2	8,000	16,000
Total Data			32,000

- 5. Per Diem Costs*** (number of persons x rate x number of days = total)

first meeting					
Types of attendees/staff	Local or non-local	No. of persons	Rate	No. of days	Total, Baht
Resource persons	Local	1	1,000	1	1000
	Non-local				0
Participants	Local	2	500	1	1000
	Non-local	1	3,000	2	6000
Secretarial staff	Local				
	Non-local				
Total Per Diem					8000

field surveys at site1					
Types of attendees/staff	Local or non-local	No. of persons	Rate	No. of days	Total, Baht
Resource persons	Local				
	Non-local				
Participants	Local				
	Non-local	5	2,000	4	40000
Secretarial staff	Local				
	Non-local				
Total Per Diem					40000

field surveys at site2					
Types of attendees/staff	Local or non-local	No. of persons	Rate	No. of days	Total, Baht
Resource persons	Local				
	Non-local				
Participants	Local				
	Non-local	5	2,000	4	40000
Secretarial staff	Local				
	Non-local				
Total Per Diem					40000

the last meeting					
Types of attendees/staff	Local or non-local	No. of persons	Rate	No. of days	Total, Baht

Resource persons	Local	1	1,000	1	1000
	Non-local				0
Participants	Local	2	500	1	1000
	Non-local	1	3,000	2	6000
Secretarial staff	Local				
	Non-local				
Total Per Diem					8000

6. Transportation Costs* (number of travellers x cost per person x trips = total)

at first meeting				
Types of travelers	No. of travelers	Cost per person	No. of trips	Total, Baht
Resource persons				
Participants	1	2,000	1	2000
Secretarial staff				
Field trips				
Other transport (specify)				
Total Transportation				2000

first and second surveys				
Types of travelers	No. of travelers	Cost per person	No. of trips	Total, Baht
Resource persons				
Participants				
from Roi-et to Bangkok	1	2,000	2	4000
from Bangkok to site	5	750	8	30000
Secretarial staff				
Field trips				
Other transport (specify)				
Total Transportation				34000

at the last meeting				
Types of travelers	No. of travelers	Cost per person	No. of trips	Total, Baht
Resource persons				
Participants	1	2,000	1	2000
Secretarial staff				
Field trips				
Other transport (specify)				
				2000
Total Transportation				2000

7. Documents/Printing

Category	Quantity	Unit Cost	Total, Baht
Draft and Final Reports			4,500
Total Documents			4,500

8. Miscellaneous* (Specify)

Category	Quantity	Unit Cost	Total, Baht
Total Miscellaneous			2,645

Grand Total	178,145
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4.2 Budget Justification:

Budget Category (See sub-part 4.1)	Justification
1. Personnel	-
2. Equipment	-
3. Supplies	For stationary (5,000 Baht)
4. Data entry/processing	For outsourcing e.g. Pre-design, filing data in sheet model (32,000 Baht)
5. Per diem costs	For sites surveys (24,000 Baht)
6. Transportation costs	For sites surveys (38,000 Baht)
7. Documents & printing	For reports (4,500 Baht)
8. Miscellaneous	For communication (2,645 Baht)

Protocol for Study on Costing Improved Water Supply System for Low-income Communities in Vietnam

I. Site selection

The costing study will focus on a technological option supposed to take place in a rural area (a village or a community), preferably in mid-land or Red river delta.

The study team will determine the site based on criteria that were developed during the workshop in Khon Kaen as follows:

1. Availability of a proposed project including project documents (feasibility study/basic design).
2. Accessibility of the area (not too far from Hanoi city), low coverage of water supply, water resources available.
3. Low – income community, available investment for proposed project.
4. Acceptance of the project from community, commitment of the local government.

II. Objectives

1. To collect and to access the cost of the proposed project of improved water supply system in a low-income community.
2. To draw any practical issue in use of manual and spreadsheet.
3. To provide recommendations to improve the manual.

III. Expected outputs

Technical Report from study team includes:

1. A spreadsheet with all costs for the proposed project computed.
2. Recommendations and suggestions for improving manual.

IV. Partners and institutional arrangement

1. Implementer:

A study team will be set up including participants from Vietnam in the workshop in Thailand and additional members from CERWASS.

2. Main Partners:

- Central level: SO&CERWASS (MARD), WHO VTN, UNICEF...
- Provincial level: DARD, PCERWASS, local government.

3. Roles and Institutional Arrangement:

- SO&CERWASS: providing data & information on national plan, potential proposed project and comments.
- Provincial level: giving permission to study team to conduct study, providing access to detailed data related to the project.
- Project owner: providing project documents and related data and co-operation during the study.
- Study team will conduct activities of the study.

V. Method and procedure

Several methods will be applied during the study, including:

1. Data collection: review project materials, questionnaires, interview.
2. Applying costing – model from the Manual.
3. Exchange ideas with experts and consultation.
4. Reporting.

VI. Action Plan

To achieve the above objectives and outputs, the following activities will be conducted by a study team:

1. Setting up study team including 4-5 members with management, water engineering and economics backgrounds to cover all aspects of the study.
2. Selecting study site and proposed project:
 - Collecting proposals from projects that are in planning phase, including project designs and cost estimates to serve for selection purposes.
 - Reviewing and selecting an appropriate option based on criteria for site selection.

3. Making plan of implementation:
 - Allocation of tasks and responsibilities among team members.
 - Setting up detailed schedule of each activity.
4. Studying technological components and related costs:
 - Reviewing project components in technical design and related cost estimates conducted by project consultants from project materials.
 - Identifying typology of costs for the proposed project, including capital cost, O&M cost and other relevant costs.
 - Checking physical-technical questionnaires, socio-economic questionnaires, data requirements from costing-model in the manual to find any gap in data availability.
5. Field survey to collect additional data and information
 - Interview local community and concerned organizations.
 - Discussion with project consultants on cost estimates.
 - Working with project owner.
6. Cost calculation and analysis
 - Compilation of obtained data and information to make sure that all necessary data are available for costing calculation.
 - Conducting cost computation.
 - Economic analysis and evaluation.
 - Preparing a draft report based on the proposed format.
7. Small workshop to collect comments from donor side, concerned organizations.
8. Revising and finalizing the final report (Vietnamese and English version).

VII. Budget plan

No	Activity	Budget (USD)
1	Selecting study site and proposed project	500
2	Making plan of implementation	200
3	Studying technological components and related costs	1,000
4	Field survey to collect additional data and information	1,500
5	Cost calculation and analysis	1,000
6	Small workshop to collect comments	500
7	Revising and finalizing the draft report	800
	Total:	5,500

Action plan and schedule of activities are summarized in the following table:

ACTION PLAN FOR STUDY ON COSTING OF IMPROVED WATER SUPPLY SYSTEM IN LOW-INCOME COMMUNITY

No	Activity	Schedule																							
		March				April				May				June				July				August			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Setting up a study team		x	x																					
2	Selecting study site and proposed project				x	x																			
3	Making plan of implementation						x	x																	
4	Studying technological components and related costs							x	x	x	x	x													
5	Field survey to collect additional data and information											x	x	x	x										
6	Cost calculation and analysis															x	x	x	x						
7	Small workshop to collect comments																		x	x					
8	Revising and finalizing the draft report																				x	x	x		

