

"Project Formulation Survey" under the
Governmental Commission on the Projects for
ODA Overseas Economic Cooperation
in FY2012

Summary Report

Bangladesh

Feasibility Study of
Small-Scale Water Supply Project in Bangladeshi
Rural Areas

March 2013

Carried out by Consortium Members:

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POLY-GLU SOCIAL BUSINESS CO.,LTD.;

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The content of this report is a summary of a project formulation survey conducted through the Overseas Economic Cooperation Fund for Official Development Assistance in Fiscal Year 2012, commissioned by the Ministry of Foreign Affairs of Japan, and carried out by the consortium (KYORYO GIKEN CO., LTD., RESIN-TEC CO., LTD., POLY-GLU SOCIAL BUSINESS CO., LTD., and Nomura Research Institute, Ltd.). It does not represent the official views of the Ministry of Foreign Affairs.

Overview of Bangladesh

Identified as one of the Next 11 countries, Bangladesh is a country where economic growth is expected in the future. Also for Japan, Bangladesh is becoming a very important country from both political and economic perspectives.

On the other hand, Bangladesh has been rated as one of the least developed countries by the Development Assistance Committee, and there is a need for stability of people's lives in Bangladesh. In fact, the Government of Bangladesh has been promoting initiatives in agriculture, education, and healthcare, with an aim to become a middle-income country.

Under such circumstances, a project to install wells to provide drinking water in rural areas has been carried with an aim to supply drinking water to all people in Bangladesh by 2015, but the project has not advanced as much as expected, due to a bottleneck caused by problems with arsenic, iron, and manganese, etc. In addition, a sufficient budget has not been secured.

Drinking Water Challenges in Bangladesh

Area	Issues
Urban & Rural Areas	<ul style="list-style-type: none"> ■ Lack of investment funds
Urban Area	<ul style="list-style-type: none"> ■ Delay in response to population growth ■ Lack of groundwater, high cost of surface water system ■ Insufficient provision of water supply system in slum areas ■ Unstable water supply system, unsanitary water ■ Deterioration of facilities due to malfunction of operation and maintenance ■ Difficulty of monetization
Rural Area	<ul style="list-style-type: none"> ■ Arsenic contamination of groundwater ■ High concentration of iron and manganese in groundwater ■ Salt damage ■ Drawdown of groundwater ■ Inter-regional disparities ■ Infections caused by unsanitary water ■ Lack of budget

Current Situation of Villages

In fact, the village of Porir Khar, Barguna District, Barisal Division, which the survey team visited, was having similar groundwater problems found in other rural areas.

Currently, in the village of Porir Khar, residents are securing drinking water from water sources such as clarified water, groundwater, and ponds (In Porir Khar, a water treatment system was installed through the Association for Overseas Technical Scholarship (AOTS) project in FY 2010). Among these water sources, groundwater is said to be the most used water source. It is said that groundwater does not contain any arsenic but contains large quantities of iron and manganese.

As a result of drinking this kind of water, many people are suffering from gastric symptoms (similar to

a heavy feeling in the stomach) or diarrhea. There are a considerable number of children who need to stay home from school because of diarrhea, or a few women who need to take a 1-2-hour walk to visit hospitals. Local pharmacies and hospitals advocate drinking treated water.

Government's Response and Need for Project

Given this situation, we held interviews with the Local Government Division (LGD) in charge of drinking water in rural areas and with its subordinate organization, the Department of Public Health Engineering (DPHE). During the interviews, we received a comment that: Both LGD and DPHE believed it would be difficult to supply drinking water by using traditional wells, and they would need to utilize surface water from a pond or river. In fact, DPHE has carried out an experimental project to construct small-scale water supply systems that would preferentially utilize water from ponds or rivers. It is said that about 30% of the systems have already stopped operation, due to difficulties in local management and the collection of charges.

Despite the results, they still wish to continue constructing small-scale water supply systems, but are struggling to find a way to solve the above problem. Also, they need to secure a sufficient budget to overcome chronic budget deficits.

Therefore, with this report we propose a project that would accomplish the provision of safe drinking water to rural areas in Bangladesh, in a manner that would conform with the Bangladesh government's policy (for small-scale water supply systems using ponds or rivers as water sources). This project should also contribute to solve the DPHE's problems (in local management and the collection of charges).

Challenges in Implementing this Project

In our survey, we conducted interviews not only with the village of Porir Khar, LGD, and DPHE but also with parties involved in ODA project formulation. Conditions for the project formulation we learned from the interviews are listed in the following table. A condition that most of the parties mentioned was that local communities should maintain and operate the systems and provide the operating capital, as well. Conditions set by the ministries of Bangladesh were: utilization of surface water; an easy-to-maintain system design; and cost minimization.

Results from Interviews with Related Parties

Organization	Conditions for Project Formulation
Local Government Division (LGD)	<ul style="list-style-type: none"> ● Local community can operate on its own and collect charges. ● Avoid allowing a private firm to operate the water business alone. ● Project will enhance the capabilities of DPHE, since construction of small-scale water supply systems is expected to increase in the future.
Department of Public Health Engineering (DPHE) (Central)	<ul style="list-style-type: none"> ● Utilize surface water, to avoid problems with arsenic, iron, and manganese. ● Local community should manage the system. ● Establish a local O & M structure or a system so that the O & M costs will be borne by the local community. <ul style="list-style-type: none"> ➤ In this connection, raise local users' awareness. ● Conduct the project through DPHE. ● Make it a non-profit organization.
DPHE (Local)	<ul style="list-style-type: none"> ● Change the awareness of people who are not maintaining filtration devices. ● Consult with the Head of Union that Porir Khar belongs to. ● Carry out educational activities so that the project will be locally accepted.
Planning Commission	<ul style="list-style-type: none"> ● Provide grant aid, if possible.
JICA (Local Office)	<ul style="list-style-type: none"> ● Solve issues regarding operation after system installation. ● Raise spirit of unity among local people. ● Establish a system for water quality control. ● Carry out plans to develop systems in other areas as well.
Embassy of Japan in Bangladesh	<ul style="list-style-type: none"> ● Establish a structure so that local people can operate and maintain the systems on their own. <ul style="list-style-type: none"> ➤ To do this, create a structure to be procured locally.
DWASA	<ul style="list-style-type: none"> ● Entrust the system management to a Community Based Organization. ● Conduct awareness and educational activities directed at local people. ● Minimize initial costs and operating cost.

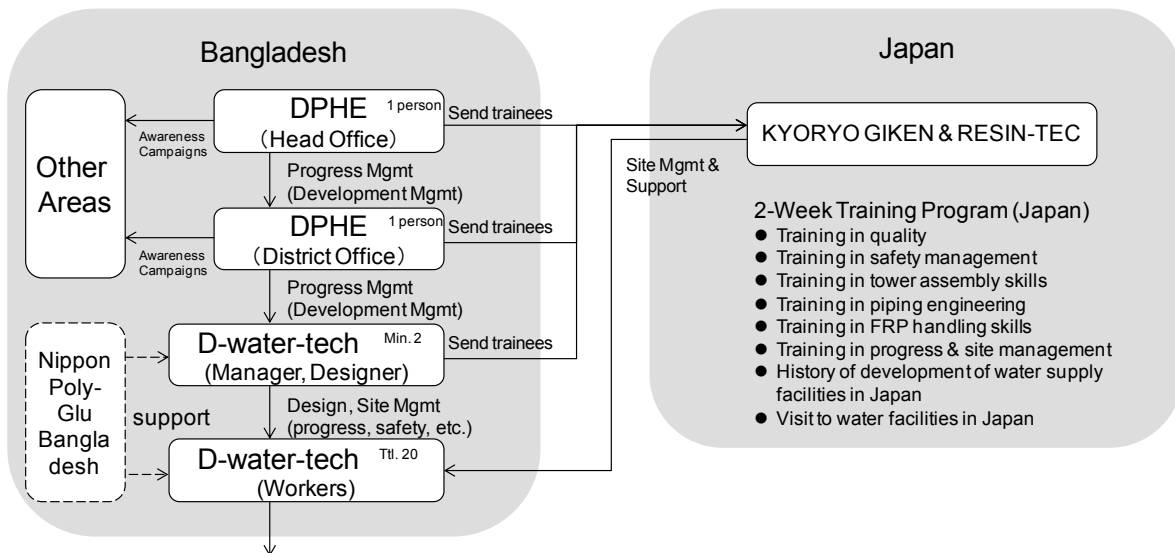
Source: Created through Interviews

Specific Contents of Project

Through the local survey and interviews, we have examined issues from the construction to operation of the system and determined the specific contents of this project. The outcome of our determination is summarized in the following table. While details are described in Chapter 5 of the report, we believe the ultimate goal of this project is “to establish a structure so that local communities can operate and maintain the small-scale water supply systems on their own.” To achieve this goal, we would need measures to reduce operating costs, develop appropriate local communities, and design easy-to-maintain programs and awareness-raising programs, and so forth.

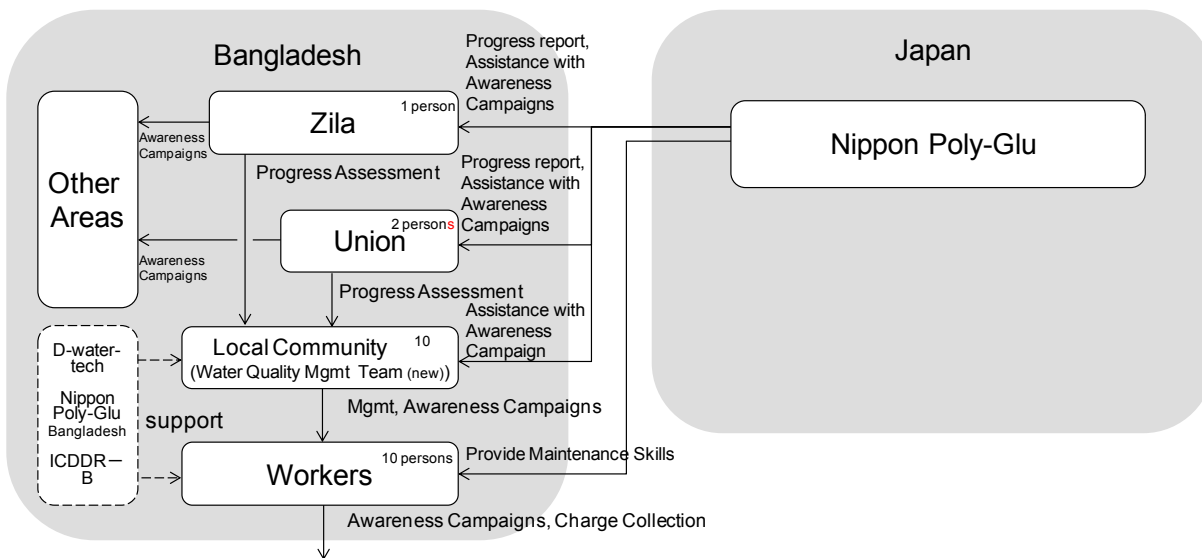
Issues found in Project Formulation and Measures foreseen by Project

		Issues	Measures based on Project	
Construction	Water Source, Water Quality	<ul style="list-style-type: none"> ■ Need to utilize surface water, to avoid problems with arsenic, iron, and manganese. 	<ul style="list-style-type: none"> ■ Design a small-scale water supply system utilizing surface water from a river or pond. (Since Bangladesh is a country with a flat plateau made of alluvia, generally there are many rivers for water supply.) 	
		<ul style="list-style-type: none"> ■ Avoid using groundwater for drinking, to secure the water for irrigation. 		
		<ul style="list-style-type: none"> ■ Need to establish a management system for water quality. 	<ul style="list-style-type: none"> ■ Easy to conduct purification work by using flocculants made by Nippon Poly-Glu Company. ■ Local procurement of water quality control equipment with proven records, and implementation of periodic analyses of water quality at International Center for Diarrheal Disease Research in Bangladesh. 	
		<ul style="list-style-type: none"> ■ Need to solve the salinity problem. 	<ul style="list-style-type: none"> ■ As the salinity problem has seasonal characteristics, reservoirs matching the length of such season shall be secured. 	
Construction	Design & Cost	<ul style="list-style-type: none"> ■ A project for 250 households (about 1,000 people) requiring 40 million to 100 million Taka cannot be approved as an ODA project. 	<ul style="list-style-type: none"> ■ Reduce costs through measures such as selecting and designing a site downstream from river and utilizing flocculants made by Nippon Poly-Glu Company ■ Reduction of Japanese labor costs by subcontracting construction work to local firms. 	
		<ul style="list-style-type: none"> ■ Ultimately, the Government of Bangladesh will expand the program nationwide. Therefore, the water supply system needs to be equal or better in terms of its cost & added-value balance than the small-scale water supply system which DHPE has experimentally installed. 	<ul style="list-style-type: none"> ■ Project plan established to accomplish “development of operating structure” and “continuity” that were challenges for DHPE. 	
Construction	Development Structure	<ul style="list-style-type: none"> ■ DHPE is managing drinking water for rural areas, and needs to be invited as a Project partner. ■ Need to contribute to the improvement of DPHE’s technical capabilities. 	<ul style="list-style-type: none"> ■ Project to have DPHE as the main developer, conduct training in Japan, and contribute to the improvement of DPHE’s technical capabilities. 	
Operation	Operating Structure	<ul style="list-style-type: none"> ■ Since private firms cannot operate water businesses, need to establish an organization that can be run by the local community. 	<ul style="list-style-type: none"> ■ Design an operating structure where the local community acts as the main operator. 	
	Operation	Continuity	<ul style="list-style-type: none"> ■ Continuity cannot be secured, unless the user awareness of local people increases. 	<ul style="list-style-type: none"> ■ Plan awareness-raising campaigns using top-down & bottom-up approaches. <ul style="list-style-type: none"> ➢ Local community made of members with influential power. ➢ Various awareness programs during the awareness-raising campaign period, prior to the completion of small-scale water supply system
			<ul style="list-style-type: none"> ■ Need to set up an affordable rate for local people, and develop a charge collection system that can be carried out on a continual basis. 	<ul style="list-style-type: none"> ■ Set a price below 2 Taka per 10 liters of water, and introduce “fix price & 5-men charge collection team” systems.
			<ul style="list-style-type: none"> ■ There are many people who do not maintain filtration devices or do not know how to do so. 	<ul style="list-style-type: none"> ■ Adapt the maintenance method currently applied in Porir Khar.
		<ul style="list-style-type: none"> ■ Need to develop an expansion plan for other areas. 	<ul style="list-style-type: none"> ■ Conduct awareness campaigns in surrounding areas through zilas and unions, in parallel with the nationwide campaigns through DHPE. ■ By installing a small-scale water supply system, provide treated water to surrounding villages and lead to educational activities in other areas. 	



Construction of Small-Scale Water Supply System

Chart: Development Structure

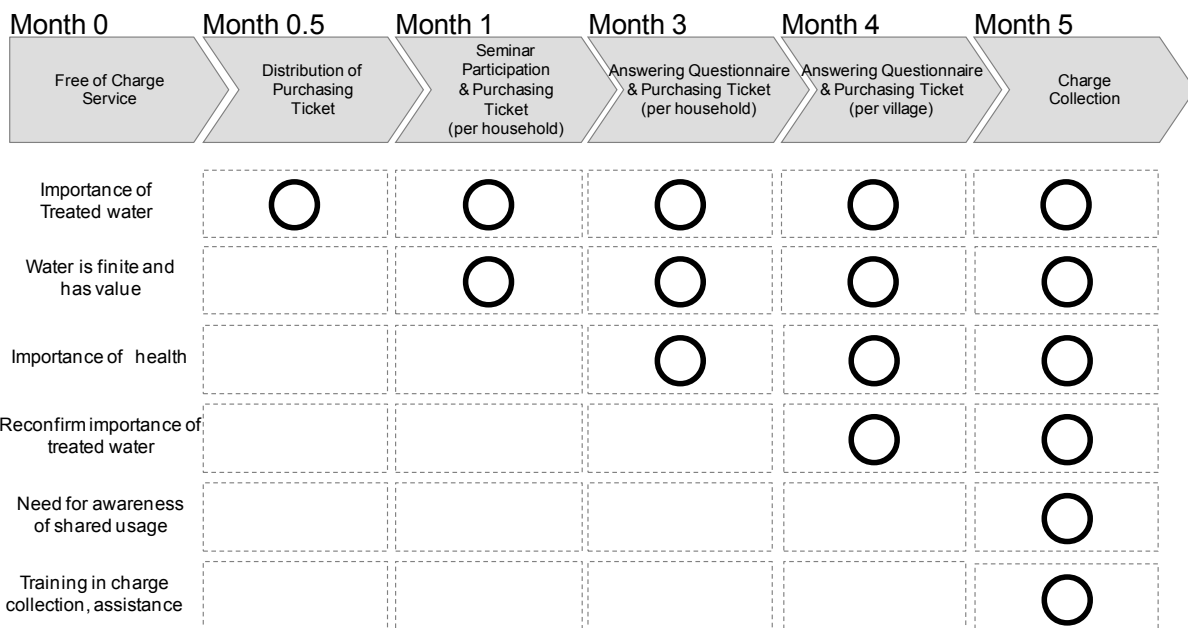


Operation of Small-Scale Water Supply System

Chart: Operating Structure

Project Members of Local Community, foreseen

Head of Village	<ul style="list-style-type: none"> ■ Have influence on local people. ■ Have management capability.
School Master, retired School Master	<ul style="list-style-type: none"> ■ Have influence on local people. ■ Have management capability
Teacher, retired Teacher	<ul style="list-style-type: none"> ■ Have influence on local people. ■ Widely known.
Medical Doctor, Pharmacist	<ul style="list-style-type: none"> ■ Aware of importance of safe water from the medical perspective. ■ Can have influence on the minds of local people.
Women's Leader, Parents' Leader	<ul style="list-style-type: none"> ■ Have influence on local people. ■ Widely known.



Awareness-Raising Campaigns

to be Conducted prior to Completion of Small-Scale Water Supply System

Applicable ODA Project Type and Confirmation of Laws & Regulations

Having examined the consistency of this project with each type of ODA project and conducted the field survey, we reached the conclusion that our proposed project is feasible as a “General Project (free of charge)”, a “Grassroots Human Security Project”, a “Technical Cooperation Project”, or a “Community Development Support Project”. In addition, we conducted some research on laws and regulations and found out that no critical problem existed in terms of implementing the project.

Applicable ODA Project Types for the Project

General Project (Grant Aid)	Very high affinity, as the project concerns drinking water, Bangladesh being a least developed country, and the government's budget being limited.
Grant Assistance for Grass-Roots Human Security Project	Applicable, if the local community can be positioned as an NGO. However, since there is a budget limit of 10 million yen, need to consider combining with other budget.
Technical Cooperation Project	Applicable, if DPHE has a budget available for constructing small-scale water supply systems in the future. However, if the budget is not available or too little, need to secure the budget separately.
Project for Community Development	Like a General Project, very high affinity, as the project is involved in introducing specs and design matching local needs, actively utilizing local suppliers, machines and materials, as well as organizing a new community to locally manage drinking water.

Future Development of proposed Small-Scale Water Supply System

The small-scale water supply system proposed by this report will not only contribute to the improvement of living standards in Bangladesh. It could also collaborate with other projects currently conducted in Bangladesh by Japan, such as “Maternal, Newborn and Child Health / Maternal and Child Health Promotion” and the “Basic Education Improvement Program”. It could also contribute to the overseas business development of Japanese SMEs (Nippon Poly-Glu, Poly-Glu Social Business, Kyoryo Giken, and Resin-Tec).

Furthermore, the provision of safe water in rural areas of Bangladesh is a problem that needs to be solved at the earliest possible time. Essentially, it is a task that DHPE should take in hand, but DHPE's project has not been carried out with a sense of speed, as there are pending issues such as the budget and management after construction, etc. On the other hand, formulating it as an ODA project would require time to coordinate with the local government and other parties.

In order to advance the project, we believe it is necessary to decide on a site as early as possible, establish a record as a test plant, and motivate DPHE to carry out the project. In this connection, we recommend the village of Porir Khar as the first test site. We have already established a trusting relationship with the people of Porir Khar. As a common awareness regarding water has been already established in Porir Khar, it would be easy to build a local community. Also, as the chief of Barguna District has agreed to cooperate, it would be easy to achieve the participation of representatives from other zilas and unions.

In terms of cost, there is also room for improvement for Porir Khar, as they already have a water treatment system installed through the AOTS project. By utilizing the system, we can reduce the initial construction costs.

Overview of Feasibility Study of Small-Scale Water Supply Project in Bangladeshi Rural Areas

