

Country Name	<b>The Project for Water Supply in Bauchi and Katsina States</b>
Federal Republic of Nigeria	

**I. Project Outline**

Background	In Nigeria, in spite of various government efforts to improve the water supply rate, the ratio of people with access to safe water had declined from 49% in 1990 to 48% in 2004 due to population increase, etc., and the ratio was especially low in rural areas at 31% compared to 68% in urban areas at the time of ex-ante evaluation (2009). In provincial rural areas especially, there was an urgent need to secure safe water supply because many people drank untreated water from rivers, marshes and puddles and water-borne diseases such as cholera and infant diarrhea, etc. were prevalent.			
Objectives of the Project	To promote ground water development in 142 villages in Bauchi and Katsina States by procuring equipment and materials for borehole construction and providing trainings, thereby contributing to improvement of water supply and sanitation conditions in these states.			
Contents of the Project	<ol style="list-style-type: none"> <li>1. Project Site: Bauchi and Katsina States</li> <li>2. Japanese side: (1) Provision of grant necessary for procurement of drilling equipment (drilling rig, high pressure air compressor and cargo truck with crane), survey equipment (geophysical survey equipment, water analysis equipment and pumping test equipment) and borehole construction materials (hand pump, mechanic tools and PVC casing pipe and screen pipe), (2) Technical Assistance (soft component of Grant Aid)</li> <li>3. Nigerian side: Securing construction sites of boreholes, and promotion of community mobilization work to establish WASHCOM (Water, Sanitation and Hygiene Committee) etc.</li> </ol>			
Project Period	E/N Date	March 12, 2010	Completion Date	December 6, 2012 (handing over of procured equipment and materials)
	G/A Date	March 12, 2010		
Project Cost	E/N Grant Limit / G/A Grant Limit: 505 million yen, Actual Grant Amount: 392 million yen			
Executing Agency	Bauchi State Rural Water Supply and Sanitation Agency (RUWASSA) and Katsina State RUWASSA			
Contracted Agencies	Main Contractor: Nishizawa Limited inc. Main Consultant: Yachiyo Engineering Co., Ltd.			

**II. Result of the Evaluation**

## &lt;Constraints on Evaluation&gt;

- The impact of this project is “to contribute to improvement of water supply and sanitation conditions in Bauchi and Katsina States”, and “the number of population who are infected with water-borne diseases in Bauchi and Katsina States” is an indicator to be used for evaluation of “improvement of sanitation condition” above. However, as it is difficult to obtain such quantitative data, alternatively, information related to this indicator was collected by interviewing 67 villagers<sup>1</sup> about “whether the number of people who are infected with water-borne diseases (such as cholera, typhoid, dysentery, infant diarrhea etc.) in their family and/or neighborhood has been reduced after project completion (2012)”.

## &lt;Special Perspectives Considered in the Ex-Post Evaluation&gt;

- Construction of 168 boreholes by Nigerian side in 142 villages: In ex-ante evaluation sheet, construction of 168 boreholes by Nigerian side in 142 villages was treated not as ‘output’ of this project but as ‘outcome’ of this project. Thus, in ex-post evaluation, construction of 168 boreholes by Nigerian side in 142 villages is treated as ‘outcome’ (effectiveness) of this project in accordance with ex-ante evaluation sheet.
- Target Year for Evaluation: In ex-ante evaluation sheet, it was stated that the target year for evaluation is 2013, which is two years after project completion (the project was planned to be completed in July 2011). However, handing over of equipment and materials procured under the project was completed in December 2012. Thus, in ex-post evaluation, the target year was changed to 2014 (two years after handing over).

**1 Relevance**

## &lt;Consistency with the Development Policy of Nigeria at the Time of Ex-Ante and Ex-Post Evaluation&gt;

This project has been consistent with Nigeria’s development policy, as increasing water supply in rural areas is set in policy documents such as “the National Water Supply and Sanitation Policy (2000)”, “the National Rural Water Supply and Sanitation Programme (2004)” and “the Partnership for Expanded Water Supply, Sanitation and Hygiene Programme (PEWASH) (2016-2030)” at the time of both ex-ante and ex-post evaluations.

## &lt;Consistency with the Development Needs of Nigeria at the Time of Ex-Ante and Ex-Post Evaluation &gt;

At the time of ex-ante evaluation, Bauchi State aimed to raise the rural water supply rate from 30% in 2008 to 62% by 2016, and Katsina State aimed to raise the rate from 50% in 2008 to 87% by 2016. On the other hand, at the time of ex-post evaluation, Bauchi State achieved the rate of 52% against the target of 62% in 2016, and Katsina State achieved the rate of 61% against the target of 87% in 2016, and there is still a need for increasing the rural water supply rate.

## &lt;Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation&gt;

In the Overseas Economic Cooperation Policy Consultation held in October 2007, the Japanese government and Nigerian government confirmed that Japan’s assistance will continue to prioritize increasing water supply<sup>2</sup>, and thus this project was consistent with Japan’s ODA policy.

## &lt;Evaluation Result&gt;

In light of the above, the relevance of the project is high.

**2 Effectiveness/Impact**

<sup>1</sup> Villagers interviewed included both male and female, old and young adults. Some have formal education up to secondary school level and others have only primary or below.

<sup>2</sup> Source: ODA Country Data Book (2009)

<Effectiveness>

The project has achieved its objectives, “to promote ground water development in 142 villages in Bauchi and Katsina States”. Actual figures of the number of boreholes constructed using drilling rigs procured under the project (Indicator 1) have largely exceeded target figures since project completion<sup>3</sup>. Data on the actual number of people who can have access to safe water from boreholes constructed using drilling rigs procured under the project including those in originally targeted 142 villages was unavailable (Indicator 2). However, if it is calculated based on an assumption that the average number of beneficiaries per borehole is 300 persons as set (designed) under the project, actual (estimated) figures have largely exceeded target figures since project completion. According to RUWASSA in the two states, equipment procured under the project are similar to those owned by RUWASSA in the past and easy to operate and maintain, which improved the speed and efficiency of borehole construction. Moreover, the SHAWN Project (2010-2018)<sup>4</sup>, funded by Department for International Development (DFID) and United Nations Children’s Fund (UNICEF), and its counterpart funds from the state governments have also contributed to securing necessary expenses for construction works and purchasing additional materials for constructing boreholes in villages other than the initially targeted 142 villages since project completion.

As to qualitative effects, all the 67 beneficiaries who were interviewed (33 in Bauchi State and 34 in Katsina State) answered that the quality of water taken from boreholes constructed using drilling rigs procured under the project has been improved compared to the previous sources of drinking water such as water vendors, rivers, community wells and ponds. Effects of the soft component of the project have been mostly produced and continued, as trainings for new staff on the use of equipment procured under the project have been conducted as OJT trainings in RUWASSA in both states, borehole inventories have been updated monthly, the borehole construction plan has been updated based on the one formulated under the project and mobilization activities for proper operation and maintenance (O&M) of water supply facilities by communities have been conducted at selected villages in both states.

<Impact>

Regarding the total number of boreholes constructed in both states, actual results largely exceeded the targets, as shown in the table below. In ex-ante evaluation, as targets indicating contribution of this project (to expected impact), 40 boreholes in Bauchi State and 50 boreholes in Katsina State were to be constructed (using drilling rigs procured under the project) annually over four years after construction of 168 boreholes in 142 villages. On annual average, approximately 70 boreholes were constructed from 2015 to 2016 in Bauchi State, and approximately 60 boreholes were constructed from 2015 to 2016 in Katsina State using drilling rigs procured under the project, and thus the project has achieved the targets and contributed to increasing the total number of boreholes in both states. On the other hand, despite of the largely increased number of boreholes, the targets of the water supply rate for 2016 has not been achieved (84% of the target in Bauchi State and 70% of the target in Katsina State). According to the Federal Ministry of Water Resources (FMWR), high water supply rates were set as target figures without enough budget allocation in the first place, there has been population growth and moreover, migration of internally displaced people from conflict areas in northeastern Nigeria to Bauchi State have also increased the entire population in the state, which in turn reduced the water supply rate. Regarding sanitation conditions in these states, among 33 beneficiaries interviewed in Bauchi State, 22 (67%) replied that the number of people who get infected with water-borne diseases (such as cholera, typhoid, dysentery, infant diarrhea etc.) in their family and/or neighborhood has been reduced after the installation of new boreholes, and among 34 beneficiaries interviewed in Katsina State, 25 (74%) replied that the above number has been reduced.

Regarding other impacts, no negative impact on natural environment has been observed and no land acquisition and resettlement has been occurred under the project. Some beneficiaries also commented that time to fetch water has been reduced due to the availability of the boreholes close to their home, and they now have more time to engage in other economic activities such as farming on their farmlands, trading (buying and selling goods), and rearing livestock (grazing), etc. Water from the boreholes is also used for these kinds of activities.

<Evaluation Result>

In light of the above, the effect of the project has been observed as planned. Therefore the effectiveness/impact of the project is high.

Table 1 Quantitative Effects

Indicators	Baseline 2009 Baseline Year	Target 2013 2 Years after Completion	Actual 2014 2 Years after Completion	Actual 2015 3 Years after Completion	Actual 2016 4 Years after Completion
Indicator 1: The number of boreholes constructed using drilling rigs procured under the project	0	168	339	494	597
Of which Bauchi State	0	76	154	250	295
Of which Katsina State	0	92	185	244	302
Indicator 2: The number of population who can access to safe water from boreholes constructed using drilling rigs procured under the project	0	50,400	101,700	148,200	179,100

<sup>3</sup> The location of 33 boreholes out of the originally targeted 76 boreholes in Bauchi State and nine boreholes out of the originally targeted 92 boreholes in Katsina State was changed to other sites/villages due to reasons that boreholes were already constructed by other donors and/or results of geophysical surveys were unsuccessful. In case that the results of geophysical surveys did not satisfy the criteria, both RUWASSAs tried to select the nearest site within or around the original target villages. The number of villages where boreholes have been constructed using the procured drilling rigs is unknown due to lack of data.

<sup>4</sup> Sanitation, Hygiene and Water in Nigeria (SHAWN) Project aims to improve access to adequate levels of water, sanitation and hygiene education for vulnerable people in rural Nigeria.

Of which the number of population in originally targeted 142 villages	0	50,400	N/A	N/A	N/A
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Source: Ex-Ante Evaluation Sheet, Bauchi state RUWASSA and Katsina state RUWASSA

Note: (1) Actual results are cumulative numbers. (2) 'Actual' (estimated) figures of Indicator 2 are calculated by 'the number of boreholes constructed using drilling rigs procured under the project' x 300 persons (the number of beneficiaries per borehole set under the project).

Table 2 Expected Impact

[The total number of boreholes constructed in Bauchi and Katsina States]

	Target in 8 years from 2009 to 2016	Actual result in 8 years from 2009 to 2016
The number of motorized boreholes constructed in Bauchi State	520	555
The number of hand pump boreholes constructed in Bauchi State	1,676	2,707
The number of motorized boreholes constructed in Katsina State	474	797
The number of hand pump boreholes constructed in Katsina State	868	2,464

Source: Basic Design Study Report, Borehole Database of RUWASSA

Note: The reason for the actual number of hand pump boreholes constructed in Katsina State is fourfold of the target is not clear, however, it is possible, as Katsina state RUWASSA has seven drilling rigs.

[Water Supply Rate in Bauchi and Katsina States]

	Before the project (2008)	Target figure at target year (2016)	Actual result (2016)
Water Supply Rate in Bauchi State (%)	30	62	52
Water Supply Rate in Katsina State (%)	50	87	61

Source: Basic Design Study Report, Federal Ministry of Water Resources

Note: Water supply rate is calculated by the number of population with access to safe water / the total number of population in the state.

### 3 Efficiency

The outputs of the project were produced as planned. While the project cost was within the plan, the project period exceeded the plan (ratio against plan: 78%, 194%, respectively). The increase in the project period is due to a delay of the tax exemption approval for all the equipment procured under the project. Therefore, the efficiency of the project is fair.

### 4 Sustainability

#### <Institutional Aspect>

[Executing Agency Level] RUWASSA in Bauchi and Katsina States is responsible for construction of boreholes and O&M of equipment procured under the project. There are 45 staff members in Bauchi State RUWASSA and 55 staff members in Katsina State RUWASSA (both including non-permanent staff) assigned for construction of boreholes, and 12 staff members (including non-permanent staff) assigned in the workshop of each RUWASSA<sup>5</sup>. According to both RUWASSAs, the number of staff exceeds minimum requirements in general, however, the number of borehole construction teams is smaller than the number of drilling rigs they have (each RUWASSA has two teams, while RUWASSAs in Bauchi and Katsina States have four and seven drilling rigs including those procured under the project, respectively). In addition, the number of mechanics at the time of ex-post evaluation is much smaller than that at the time of ex-ante evaluation, and Katsina State RUWASSA is requesting the state government to increase the number. Currently staff members in other sections support mechanics as needed and thus there are no major problems in terms of lack of manpower. However, the number of staffs including mechanics should be increased in order to ensure availability of staff at all work sections and more efficient utilization of the drilling rigs they have.

[Community Level] After water supply facilities (boreholes) are constructed, they are handed over to communities to operate and maintain them by themselves. At the time of the ex-post evaluation, according to both RUWASSAs, WASHCOM has been established in every community in 142 villages targeted under the project, and checks and repairs are conducted on a needed basis by WASHCOM members. Although the number of members of WASHCOMs slightly varies depending on the size of communities, normally there are 10-11 members in a WASHCOM including a chairman/leader, a secretary, a treasurer, a public relation officer, a facility caretaker and members etc., and at least two to four female members are included.

#### <Technical Aspect>

[Executing Agency Level] It was observed that RUWASSA in both states has generally sufficient level of technical capacities. However, there is no established training system within RUWASSA to internally transfer the techniques acquired under the soft-component, mainly due to the inability to secure budget for the trainings. In both RUWASSAs, no internal training has been conducted in recent years<sup>6</sup>, and particularly, non-permanent staff members, who are mainly young workers, are not allowed to participate in official trainings organized by Nigerian government and/or donors and they can only have training opportunities at sites through OJT. The borehole construction manual prepared under the soft component of the project has been lost and the one provided under the UNICEF project is used by RUWASSA in both states. Training materials prepared under the soft component have also not been utilized, as no training has been organized by both RUWASSAs.

[Community Level] Trainings on community mobilization and facility management have been conducted for 36 communities in 2013, 37 communities in 2014 and 51 communities in 2015 (approximately 400 to 560 community members attended each time) in both states since project completion. It was observed that WASHCOMs are generally capable of conducting checks and minor repairs of water supply facilities.

<sup>5</sup> In the workshop, there are mechanics who check and repair rigs, trucks and compressors and assemble and process simple machines, electricians who conduct welding works and electricity-related repairs, operators of procured equipment, and those who manage procured materials.

<sup>6</sup> Both RUWASSAs have sent several staffs to the National Water Research Institute to attend trainings since project completion. However, there is no established calendar for such trainings and no record of participants and training contents.

#### <Financial Aspect>

[Executing Agency Level] RUWASSA in both states has certain amount of income (budget allocation from state governments and support from the counterpart fund (Nigerian side budget) for the SHAWN project) every year, though the amount is not a constant figure. Basically, construction and repair of boreholes and O&M of procured equipment are conducted based on available amount of income each year. The number of boreholes constructed has exceeded the targets as stated above, there has been no borehole, among those constructed using drilling rigs procured under the project, which was dried up even in dry seasons, and most equipment procured under the project are in good conditions in both states. Thus, it is judged that the allocated amount of funds in both states is generally sufficient for the scale of this project. However, as stated above, no internal training has been conducted in both RUWASSAs due to the inability to secure budget for the trainings. Moreover, it should be noted that the amount of income in the table includes the counterpart fund for the SHAWN project, and thus there is a possibility that the amount of income from the state government might decrease after 2018 (the completion of the SHAWN project).

#### Income and Expenditure of RUWASSA<sup>7</sup>

(Unit: 1,000 Naira)

	2014	2015	2016
<b>Bauchi State</b>			
Income	238,291	371,358	786,058
Expenditure	87,835	139,680	304,928
<b>Katsina State</b>			
Income	520,969	405,508	595,538
Expenditure	437,894	391,395	454,445

Source: RUWASSA

[Community Level] Water charges are collected on a weekly or monthly basis in a few communities, and they are most frequently collected when a borehole breaks down and needs to be repaired. The amount of water charges varies in each community ranging from approximately 20 Naira to 500 Naira, which is collected per person or per household. According to interviews with villagers, the collected amount is generally sufficient to conduct O&M of hand pump boreholes properly among WASHCOMs.

#### <Current Status of Operation and Maintenance>

[Executing Agency Level] All equipment procured under the project are in good conditions in Katsina State. However, in Bauchi State, high pressure air compressor has been under repair for one month, and geophysical survey equipment and water analysis equipment are utilized but some parts need to be replaced. RUWASSA in Bauchi State conducts regular maintenance of all the procured equipment on a monthly basis, while RUWASSA in Katsina State conducts regular maintenance of drilling rigs for every 13 to 15 boreholes construction<sup>8</sup>. The problem faced by RUWASSA in both states is that original spare parts for drilling rig, high pressure air compressor, geophysical survey equipment and water analysis equipment are not available locally, because these equipment were imported from Japan and local agents which sell such spare parts are not available. Thus, these have to be fabricated from spare parts of other equipment.

[Community Level] O&M of water supply facilities (boreholes) are conducted by WASHCOMs (communities). In Bauchi State, when a borehole breaks down and in case when it is beyond their capabilities to repair the facility, Local Area Mechanics (LAMs) hired by Local Government Area (LGA) repairs it. In Katsina State, in case when WASHCOMs cannot repair a facility, RUWASSA repairs it. However, records of O&M in WASHCOMs were not available. It was found out during the survey for the ex-post evaluation that, while Katsina State RUWASSA has handed over all mechanic tools procured under the project to WASHCOMs, Bauchi State RUWASSA has not distributed some mechanic tools to some WASHCOMs (LAMs) yet. According to Bauchi State RUWASSA, this was because necessary trainings for LAMs on borehole repairs were not completed, however, these trainings have recently been completed and thus all mechanic tools would be distributed soon.

#### <Evaluation Result>

In light of the above, some problems have been observed in terms of the institutional, technical and financial aspects of the executing agency. Therefore, the sustainability of the project effect is fair.

#### 5 Summary of the Evaluation

The project achieved its objective of promoting ground water development in 142 villages in Bauchi and Katsina States, as the number of boreholes constructed using drilling rigs procured under the project have largely exceeded target figures. The expected impact of improving water supply and sanitation conditions in both states have also been obtained, as the total number of boreholes constructed in both states have largely exceeded the targets and the majority of interviewed beneficiaries replied that the number of people who are infected with water-borne diseases in their family and/or neighborhood has been reduced after the installation of new boreholes. Regarding the sustainability, the number of staffs at RUWASSAs should be increased, training system for staff members needs to be established in RUWASSAs, budget for internal trainings in RUWASSAs needs to be secured, and original spare parts for some equipment are not available locally, while there is no serious problem in the institutional, technical and financial aspects. As for the efficiency, the project period largely exceeded the plan.

Considering all of the above points, this project is evaluated to be satisfactory.

### III. Recommendations & Lessons Learned

#### Recommendations to Executing Agency:

- (For FMWR and state governments) Technical trainings for young staff (including non-permanent members) of RUWASSAs must be conducted before the senior officers, who attended several trainings organized by the Nigerian government and several donors, are retired, and the know-how must be transferred to the young technicians in order to ensure the sustainability of the project and the technical level of RUWASSAs.
- (For RUWASSA) RUWASSA in Bauchi State needs to distribute all mechanic tools to WASHCOMs (LAMs) promptly.

<sup>7</sup> In Bauchi State RUWASSA, among the income in the above table, the amount of budget allocation from the state government was 182,091 thousand Naira in 2014, 274,798 thousand Naira in 2015, and 508,167 thousand Naira in 2016 (the rest was the support from the SHAWN project). Among the expenditure in the above table, construction cost of boreholes and O&M cost of procured equipment was 31,635 thousand Naira in 2014, 43,121 thousand Naira in 2015, and 27,038 thousand Naira in 2016 (the rest was hardware and soft components of the SHAWN project). On the other hand, the breakdown of income and expenditure at Katsina State RUWASSA was not available.

<sup>8</sup> Information on frequency of regular maintenance of other equipment was unavailable in Katsina.

Lessons Learned for JICA:

- As stated above, the borehole construction manual developed under the soft component of the project has been lost and thus not being used at RUWASSA. In case that manuals and/or materials are developed under a project, it must be ensured to distribute soft copies of the manuals to executing agencies, to upload them on website of executing agencies or any other governmental website, and/ or to keep the close communication channels between executing agencies and JICA so that they can request support from JICA anytime they need (re-distribute the manuals or send the soft copies etc.). In addition, in case that other donors have developed similar types of manuals in the country and there are no problem in the quality of such manuals, it should be considered to utilize them or harmonize the manuals.
- As stated above, original spare parts for some equipment are not available locally. JICA should thoroughly examine the specifications of equipment to be procured under a project after checking availability of spare parts in the local market in the preparatory survey, and inform an executing agency of the procurement procedure or information of local agents which sell such spare parts after the handing-over.
- As stated above, data on the actual number of people who can have access to safe water from boreholes constructed using drilling rigs procured under the project including those in originally targeted 142 villages was unavailable. JICA should set target indicators that can be obtained at the time of ex-post evaluation.



People fetching water at a borehole drilled using the rig procured under the project in Katsina



Children fetching water at a borehole drilled using the rig procured under the project in Bauchi