

Country Name	Project for Human Resource Development for Water Supply in Sudan (Phase 1) (Phase 2)		
Sudan			

### I. Project Outline

Background	<p>In Sudan, the access rate to improved water sources was 67.5% in 1990. However, because of the civil wars, the situation was stagnant at around 65% (2010). The Government of Sudan made efforts for improving water supply facilities for the universal coverage of safe water supply by 2031. The Public Water Corporation (PWC) (renamed as the Drinking Water and Sanitation Unit (DWSU) in 2012) had overseen water supply throughout the country. After approval of the Law of Decentralization in 1994, the responsibility for operation and maintenance of water supply facilities was transferred from PWC to the State Water Corporations (SWCs). The role of PWC became limited to policy formulation, construction of large-scale water supply facilities, coordination of the international cooperation projects, monitoring of SWCs and human resources development. However, the water sector in Sudan faced serious problems associated with lack of budget, human resources, and equipment in most SWCs. In response, JICA implemented the "Project for Human Resources Development for Water Supply in Sudan" (Phase 1) was implemented (2008-2011). As a result, PWC Training Center (renamed as the Drinking Water and Sanitation Unit Training Center) developed its capacity for training implementation, while issues of human resources development at the state level remained to be improved further. Therefore, the Government of Sudan requested the Government of Japan for the succeeding project (Phase 2).</p>																						
Objectives of the Project	<p>Through establishment of training and monitoring units at the Drinking Water and Sanitation Unit Training Center (DWST) and SWCs, the projects aimed at training human resources in the water sector in Sudan, thereby contributing to enhancement of institutional capacity and appropriate management for water supply facilities.</p> <p>&lt;Phase 1&gt; Overall Goal: Institutional capacity for stabilizing water supply in the northern Sudan is enhanced. Project Purpose: PWC Training Center establishes the system the implementation of Training.</p> <p>&lt;Phase 2&gt; Overall Goal: Water supply system is properly managed in Sudan. Project Purpose: Human resources in water supply sector are properly trained in Sudan.</p>																						
Activities of the project	<p>1. Project site: All states in Sudan</p> <p>2. Main activities: &lt;Phase 1&gt; Development of training curriculum and materials, development of training management manuals, construction of the training center, training of trainers and coordinators, etc. &lt;Phase 2&gt; Development of the long-term and mid-term training plan, establishment of the training units at SWCs and monitoring units at DWST and pilot SWCs, etc.</p> <p>3. Inputs (to carry out above activities)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Sudan Side</td> </tr> <tr> <td>&lt;Phase 1&gt;</td> <td>&lt;Phase 1&gt;</td> </tr> <tr> <td>1) Experts from Japan: 9 persons</td> <td>1) Staff allocated: 18 persons</td> </tr> <tr> <td>2) Training in Japan: 11 persons</td> <td>2) Land and facilities: Office space, training facility and equipment, etc.</td> </tr> <tr> <td>3) Equipment: Office equip, training facility and equipment, etc.</td> <td>&lt;Phase 2&gt;</td> </tr> <tr> <td>&lt;Phase 2&gt;</td> <td>1) Staff allocated: 68 persons</td> </tr> <tr> <td>1) Experts from Japan: 10 persons</td> <td>2) Land and facilities: Office space, training facility and equipment, etc.</td> </tr> <tr> <td>2) Experts from the third country (Morocco): 11 persons</td> <td></td> </tr> <tr> <td>3) Training in the third country (Morocco): 48 persons</td> <td></td> </tr> <tr> <td>4) Equipment: Vehicle, office equipment, etc.</td> <td></td> </tr> </table>			Japanese Side	Sudan Side	<Phase 1>	<Phase 1>	1) Experts from Japan: 9 persons	1) Staff allocated: 18 persons	2) Training in Japan: 11 persons	2) Land and facilities: Office space, training facility and equipment, etc.	3) Equipment: Office equip, training facility and equipment, etc.	<Phase 2>	<Phase 2>	1) Staff allocated: 68 persons	1) Experts from Japan: 10 persons	2) Land and facilities: Office space, training facility and equipment, etc.	2) Experts from the third country (Morocco): 11 persons		3) Training in the third country (Morocco): 48 persons		4) Equipment: Vehicle, office equipment, etc.	
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Project Period	<p>&lt;Phase 1&gt; June 2008 to March 2011</p> <p>&lt;Phase 2&gt; November 2011 to September 2015</p>	Project Cost	<p>&lt;Phase 1&gt; (ex-ante) 260 million yen, (actual) 374 million yen</p> <p>&lt;Phase 2&gt; (ex-ante) 550 million yen, (actual) 675 million yen</p>																				
Implementing Agency	<p>&lt;Phase 1&gt; Public Water Corporation (PWC) Training Center &lt;Phase 2&gt; Drinking Water and Sanitation Unit (DWSU), State Water Corporations</p>																						
Cooperation Agency in Japan	<p>&lt;Phase 1&gt; Earth System Science Co., Ltd., Nihon Techno Co., Ltd. &lt;Phase 2&gt; Earth System Science Co., Ltd.</p>																						

### II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

- The Phase 2 was implemented with the aim of training human resources for proper management of the water supply system, based on the results of the Phase 1 (established the training system at DWST). Therefore, in the ex-post evaluation, the two projects were interpreted as one intervention, and for the evaluation of effectiveness/impact, and the Project Purpose and Overall Goal of the Phase 2 were referred to.

- Indicator 2 of the Project Purpose of the Phase 2 was set as the number of maintained water yards. Since it was a result of the trained human resources, it was utilized as an indicator for verifying the Overall Goal in the ex-post evaluation.

<Constraint on the Ex-post Evaluation >

- Because of the outbreak of COVID-19, information was collected through a questionnaire survey from DWSU and three SWCs and phone interviews

to make evaluation judgement in the ex-post evaluation. Site visits were not conducted.

**1 Relevance**

<Consistency with the Development Policy of Sudan at the time of Ex-ante Evaluation>  
 The “Quarter Century National Plan for Domestic Water Supply” (2003-2027) aimed at improvement of the equitable access safe water supply, and the “25-year Water Supply Plan” (2003-2027) aimed at increasing the water coverage ratio to 100% by 2027. Thus, both the Phase 1 and Phase 2 projects were consistent with the development policy of Sudan at the time of ex-ante evaluation of each project.

<Consistency with the Development Needs of Sudan at the time of Ex-ante Evaluation>  
 Due to the more than 20-year internal conflicts which ended in 2005, infrastructures including water supply facilities were fragile and there were not sufficient personnel for operation and management of water supply facilities. The Training Center was established at PWC by the Phase 1, but it still had needs for developing mid-term and long-term plans for human resources development for water supply. Thus, both the Phase 1 and Phase 2 projects were consistent with the development needs of Sudan at the time of ex-ante evaluation of each project.

<Consistency with Japan’s ODA Policy at the time of Ex-ante Evaluation>  
 One of the priority issues mentioned in the ODA Charter (2003) was peace-building, and one of the priority areas was the support for basic human needs which included support in the water and hygiene sector<sup>1</sup>. In Sudan, after the Comprehensive Peace Agreement in 2005, the Government of Japan expanded its bilateral assistance to Sudan. Then one of the priority areas was the support for improvement of the basic livelihood which included strengthening water and hygiene facilities and maintenance capacity<sup>2</sup>. Thus, the two projects which aimed to develop human resources for proper management of the water supply system were consistent with Japan’s ODA policy at the time of ex-ante evaluation of each project.

<Evaluation Result>  
 In light of the above, the relevance of the project is high.

**2 Effectiveness/Impact**

<Status of Achievement for the Project Purpose of the Phase 2 at the time of Project Completion>  
 The Project Purpose was achieved by the time of project completion. The system for training implementation was established and strengthened at DWST in the Phase 1 and the Phase 2. Training courses were implemented based on the mid-term/long-term human resources development plan. Also, support was provided for development of the training implementation structure in each SWC. In the Phase 2, a total of 5,851 personnel of DWST and SWCs were trained by DWST in the Phase 2 (Indicator 1).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>  
 The project effects have partially continued. DWST has continuously provided training courses. The number of the implemented courses and trainees decreased in 2018 and 2019 due to political, economic and social unrest which actually preceded the political turmoil that started on December 2018. Training topics were data management/GIS (Geographic Information System), M&E (Monitoring and Evaluation), pipe network management, rural water development and water analysis. Both of the two pilot SWCs investigated in the ex-post evaluation (Sennar and White Nile) have continued their training implementation. The number of the implemented courses decreased in 2018 and 2019 in Sennar, because the new training center was being constructed. State level training topics have included the government finance, electrical management and well management, data management, community development management, water quality management, etc. Regarding the non-pilot SWCs, the information was available only from SWC of River Nile. It has annually conducted training for water supply staff. The number of implemented training courses.

<Status of Achievement for Overall Goal of the Phase 2 at the time of Ex-post Evaluation>  
 The Overall Goal has been achieved at the time of project completion. It was confirmed that the trained staff have utilized their learnings to maintain and operate water supply facilities at all of the surveyed two pilot SWCs and one non-pilot SWC (Indicator 1). Learnings from the training have been utilized at SWCs as listed in the table below. And, they have utilized their learning for maintaining water yards (borehole, elevator tank, generator house and public fountains) at each SWC (Indicator 2). The number of the operated and maintained water yards has increased in the three answered states, particularly in River Nile where the population has increased and so have the industrial and commercial activities.

<Other Impacts at the time of Ex-post Evaluation>  
 First, synergy effects have been confirmed with other JICA projects such as the “Project for Improvement of Public Services in Three Darfur States” (2015-2021), “Project for Strengthening Institutional Capacity for Operation and Maintenance of Water Supply Systems” (2016-2020) and “Project for Improvement of Water Treatment Plant in Kosti City” (2016-). Those trained by the project have become key persons in the mentioned projects because of their experience, and it helped the smooth project implementation because they have understood the technical cooperation projects of JICA.

<Evaluation Result>  
 Therefore, the effectiveness/impact of the project is high.

Achievement of the Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) Human resources in water supply sector are properly trained in Sudan.	1. The number of trainees that are trained in Sudan exceeds 2000.	<u>Status of achievement: Achieved (Partially Continued).</u> (Project Completion) - A total of 5,851 trainees were trained in whole country in the Phase 2: 1,469 of DWST, 1,147 of pilot states and 3,235 of other states. Training topics provided by DWST included water treatment plant, water supply facility, data management/GIS, well management, and so on. (Ex-post Evaluation) - In two pilot states surveyed in the ex-post evaluation, although the number of

<sup>1</sup>Ministry of Foreign Affairs “ODA Databook 2008.”

<sup>2</sup>Ministry of Foreign Affairs “ODA Databook 2011.”

		<p>trainees could not be confirmed, training itself has been continued. At SWCs of Sennar and White Nile, a total of 44 training courses were implemented for four years from 2016 to 2019. Training topics in Sennar SWC in 2017 and 2018 were the government finance, electrical management and well management. Training topics in White Nile SWC in the same years were project management, data management, community development management, water quality management, GIS, sanitation management, and organizational management. - In River Nile SWC (non-pilot), a total of 220 trainees were trained for four years from 2016 to 2019</p> <table border="1" data-bbox="758 309 1508 436"> <thead> <tr> <th></th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Implemented courses in Sennar</td> <td>10</td> <td>3</td> <td>2</td> <td>2</td> <td>17</td> </tr> <tr> <td>Implemented courses in White Nile</td> <td>9</td> <td>8</td> <td>5</td> <td>5</td> <td>27</td> </tr> <tr> <td>Trainees in River Nile</td> <td>40</td> <td>60</td> <td>80</td> <td>40</td> <td>220</td> </tr> </tbody> </table> <p>- Also DWST has continuously provided training courses. A total of 858 trainees were trained for four years from 2016 to 2019. Training topics included data management/GIS, M&amp;E, Pipe network management, rural water development, water analysis, and so on.</p> <table border="1" data-bbox="758 577 1508 672"> <thead> <tr> <th></th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Implemented courses in DWST</td> <td>17</td> <td>21</td> <td>13</td> <td>6</td> <td>57</td> </tr> <tr> <td>Trainees in DWST</td> <td>214</td> <td>337</td> <td>210</td> <td>97</td> <td>858</td> </tr> </tbody> </table>		2016	2017	2018	2019	Total	Implemented courses in Sennar	10	3	2	2	17	Implemented courses in White Nile	9	8	5	5	27	Trainees in River Nile	40	60	80	40	220		2016	2017	2018	2019	Total	Implemented courses in DWST	17	21	13	6	57	Trainees in DWST	214	337	210	97	858
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(Overall goal) Water supply system is properly managed in Sudan.	<p>1. SWC staff utilized their knowledge and technical skills to maintain and operate water supply facilities.</p> <p>2. The number of annually maintained water yards* is increased to more than 20 in each SWC. *Water yard: borehole, elevator tank, generator house and public fountains.</p>	<p><u>Status of achievement: Achieved.</u> (Ex-post Evaluation)</p> <p>- Staff of Sennar SWC who were trained by the project have utilized their learnings to maintain and operate water supply facilities, regarding water quality and safety, water network management, well management, mechanics, electricity management, data &amp; information management, government accounts and computer basics.</p> <p>- Staff of White Nile SWC who were trained by the project have utilized their learnings to maintain and operate water supply facilities, regarding government financial systems, data management, security &amp; safety management, generators &amp; pumps water maintenance, organization management, community development management, water quality management, project management and GIS.</p> <p>- Staff of River Nile SWC (non-pilot SWC) who were trained by the project have utilized their learnings to maintain and operate water supply facilities, regarding sanitation management, electric management, electronic water meter, computer skills, methods of tender &amp; contracting, GIS, management of water supply facilities, well management, and how to use computer applications.</p> <p><u>Status of achievement: Achieved.</u> (Ex-post Evaluation)</p> <p>- The number of annually maintained water yards mostly reached more than 20 increased to more than 20 in each of the surveyed SWCs.</p> <table border="1" data-bbox="758 1317 1324 1442"> <thead> <tr> <th></th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Sennar</td> <td>60</td> <td>75</td> <td>90</td> </tr> <tr> <td>White Nile</td> <td>36</td> <td>19</td> <td>27</td> </tr> <tr> <td>River Nile (Non-Pilot)</td> <td>204</td> <td>257</td> <td>204</td> </tr> </tbody> </table>		2016	2017	2018	Sennar	60	75	90	White Nile	36	19	27	River Nile (Non-Pilot)	204	257	204																										
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Source: Project Completion Report and information provided by DWST and SWCs of Sennar, White Nile and River Nile.

### 3 Efficiency

Although the total project period of the Phase 1 and Phase 2 was within the plan, the total project cost of the two projects exceeded the plan (ratio against the plan: 96% and 130%, respectively). The Outputs were produced as planned. Therefore, the project efficiency is fair.

### 4 Sustainability

#### <Policy Aspect>

Promotion of the operation and maintenance of water facilities has been prioritized in the “Quarter Century National Plan for Domestic Water Supply” (2003-2027). Also, the “25-year Water Supply Plan” (2003-2027) has aimed at increasing the water coverage ratio to 100% by 2027.

#### <Institutional/Organizational Aspect>

DWST has sustained the basic organizational structure to plan, implement and evaluate training courses. It has revised the mid-term training plan for human resource development developed by the project, and has implemented courses throughout the year according to the annual plan, which has included the budget allocation, number of target trainees and training courses. DWSU has assessed the training needs through the field visits and coordination with SWC training centers and also from interviews with the trainees at DWSU. The training database developed by the project has been updated and utilized. At the time of ex-post evaluation, DWST had five coordinators and 90 trainers. The trainers were mostly contracted by DWSU and have been assigned according to courses. However, the number of the coordinators and trainers has not been sufficient, because many of them have immigrated to work in other countries. DWST has planned to appoint additional staff and make internal transfers to avail more staff for trainings. Three staff has been assigned at the DWST Monitoring Unit, but the number has not been sufficient. DWSU has planned to appoint new staff based on the newly created organizational chart.

Regarding the state level, there have been three, eight and five staff in the monitoring unit of SWC of Sennar, White Nile and River Nile, respectively. The number has been sufficient at SWC of Sennar and White Nile, where they have periodically monitored various

activities with the standardized forms. In River Nile, the number of staff has not been sufficient, but they have planned to hire a new engineer and assign transportation and communication means for monitoring. For operation of water yard systems, SWC of Sennar has assigned three to five technicians for each well in the big cities and one technician for each well in the rural areas. According to them, the number has not been sufficient. SWC of River Nile has assigned five to 10 operators depending the well size, and the number of operators has been as planned. The number of operators of SWC of White Nile was not available, but they answered that the number has not been sufficient.

<Technical Aspect>

Training coordinators of DWST has sustained sufficient skills for management of training courses, based on evaluations of themselves, trainers and DWST. As well, trainers have sustained sufficient skills, as training of the trainers (TOT) has been performed as part of the annual training plan. The training materials and management manuals developed by the project have been utilized.

Regarding the state level, SWC of Sennar and White Nile answered that their trainers has sustained the skills acquired from the project, judging through practical trainings which they have conducted since the time of project completion. They also answered that their operators have sustained sufficient skills, too, although some of White Nile still needed more training. In the case of Sennar, they also have sufficient skills as a result of continuous training and acquired experience. In case of River Nile, SWC has considered that their operators needed additional trainings as most of them did not have a sufficient educational background.

<Financial Aspect>

DWST has received the budget from the Ministry of Finance and had project-based budgets from private sector entities or government institutions departments as per the agreements with them. Its budget request has been on a slight increasing trend, but the allocation ratio has not been high. According to DWSU, the budget, as shown in the table, has been sufficient for training implementation but not for covering monitoring costs, due to the high expenses caused by the high inflation rate.

Regarding the state level, SWC of White Nile and River Nile answered that the budget has been sufficient for training implementation and monitoring. On the other hand, SWC of Sennar has not secured a sufficient budget. Due to the low water tariff which is used for operation and maintenance of water facilities and training needs assessment, the training center in Sennar has not received sufficient funds. Because of various factors related to economic and political pressure such as necessary approval by the State Governor as well as instability of clean water supply, it was difficult for Sennar SWC to increase the water tariff in consistency with the cost of operation and maintenance.

<Evaluation Result>

In the light above, there have been issues in the institutional/organizational and financial aspects. Therefore, the sustainability of the effects is fair.

5 Summary of the Evaluation

The projects achieved the Project Purpose and the Overall Goal. The human resource development mechanism was established, and training has been continuously conducted at DWSU and SWC training centers. Water yard systems have been continuously operated and maintained. Regarding sustainability, there have been staff and budgets shortages at DWST and some SWCs, but they have sustained sufficient skills for training implementation. As for efficiency, the total project cost of the two projects exceeded the plan.

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

**III. Recommendations & Lessons Learned**

Recommendations for Implementing agency:

- Some SWCs' training was affected by construction or rehabilitation work such as the case of Sennar State. When SWCs include any similar planned work which may affect the training implementation in the annual training plan, it is recommended to them to prepare for continuation of training in other available facilities.
- Some SWCs such as River Nile and Sennar stated that their technicians did not have enough educational backgrounds. It is recommended to them to tailor some courses for such trainees by dividing the course contents by levels (primary and advanced). This can help them to graduate those with limited educational background from lower to higher-level courses, and thus ensure maximum benefits for all trainees.
- It is recommended to DWSU to provide the technicians trained by the project and training program even after the project completion with opportunities for disseminating their knowledge and experiences to other states. In states where staff or additional budgets cannot be deployed, DWSU could mobilize available resources through cooperation and linkages among SWCs. For example, some SWCs can exchange resources or apply lessons learned from other SWCs with strengths.

Lessons Learned:

- Despite the difficult circumstances that Sudan has gone through due to the unrest after the political turmoil and then the pandemic of Covid-19, training courses have continued, which has been attributed to the commitment and ownership of SWCs. The following efforts were made in the projects tried to enhance the counterpart personnel's ownership. First, they learned much from Morocco's experience in the water supply sector. Morocco is also an Arabic-speaking country in the North African region, and the natural environment is similar. Learning from developed Morocco was a great stimulus for them, most of whom did not have a learning experience overseas. For planning and implementing a project for capacity development, it is necessary to confirm if any neighboring country has the similar project experience. If there is any, it is effective to invite trainers from the country. Second, trainees who performed well in the training were given

Training budget of DWST (SDG)

	2016	2017	2018	2019
Budget requests	3,498,600	3,585,600	3,635,300	3,793,900
Budget allocated	596,907	497,824	1,546,565	1,055,025

Training budget of Sennar SWC (SDG)

	2016	2017	2018	2019	2020 (plan)
Budget requests	450,000	450,000	400,000	547,000	1,000,000
Budget allocated	243,343	222,981	243,257	157,909	N/A

Training budget of White Nile SWC (SDG)

	2016	2017	2018	2019	2020 (plan)
Budget requests	799,792	700,000	540,000	700,000	1,300,000
Budget allocated	501,599	133,592	306,155	574,160	N/A

Training budget of SWC of River Nile SWC (SDG)

	2016	2017	2018	2019	2020 (plan)
Budget requests	50,500	65,000	75,000	1,300,000	1,200,000
Budget allocated	32,400	40,000	45,000	531,240	N/A

awards. Third, opportunities for technical exchanges were provided to SWCs through the trainers' mutual visits. These efforts are effective for not only improving but also sustaining the counterpart personnel's skill and ownership. For a project where trainers are trained over the country, it is desirable to include such an award system and technical exchanges for producing and sustaining the effects.