

**Republic of Sudan
Drinking Water and Sanitation Unit
Ministry of Water Resources, Irrigation and Electricity**

**Republic of Sudan
Human Resources Development
Project
for Water Supply Phase 2**

Project Final Report

October 2015

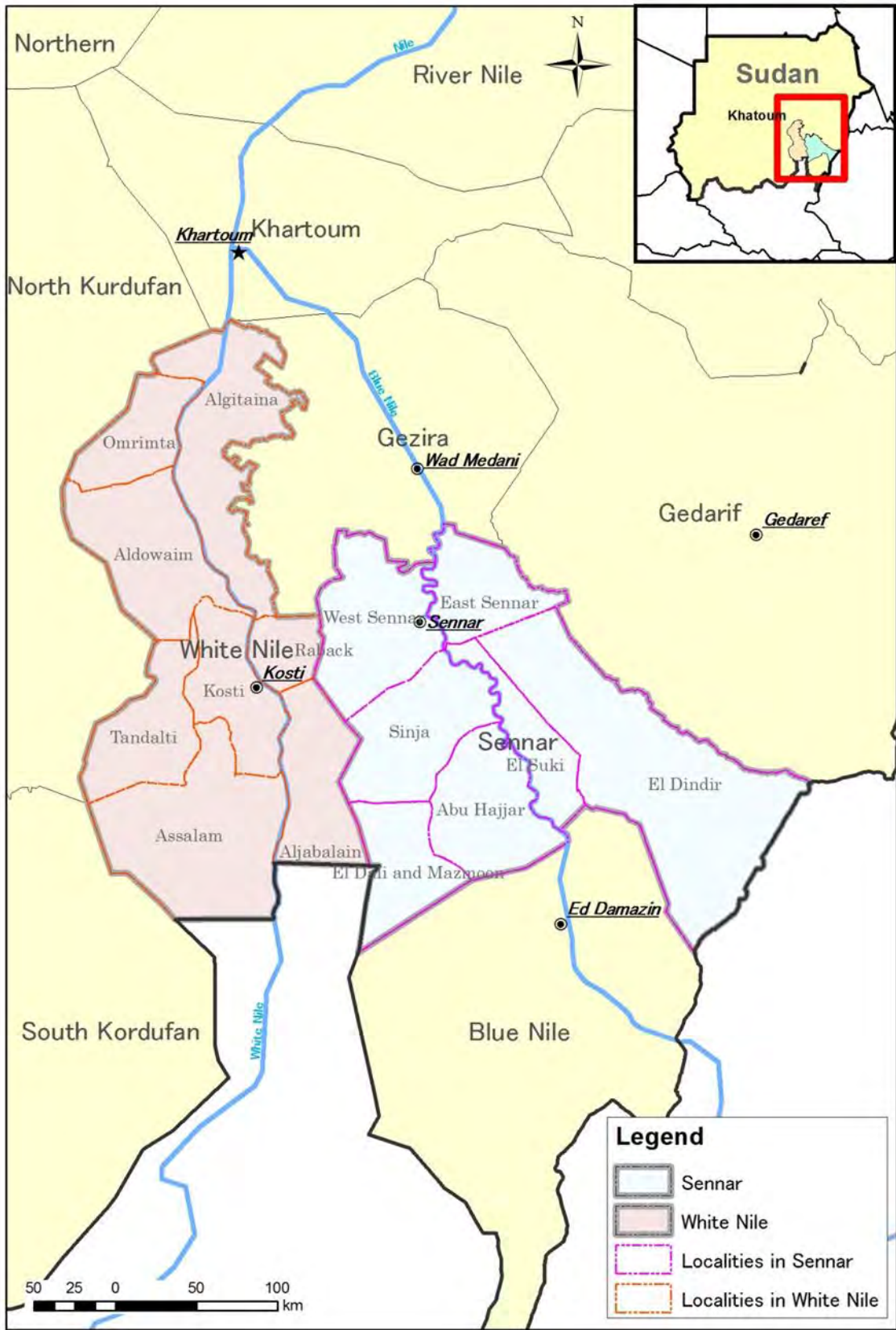
Japan International Cooperation Agency (JICA)

Earth System Science Co., Ltd

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Location Map of the Project



Location Map of the Pilot States

History of the Organization in Sudan Water Sector

Phase	Organization			Remarks
	Competent Ministry	Central government Organization	Local government Agency	
Before 1957 British colonial period	British colonial administration	British Sudan Light and Power Company		Ruled by British colonial administration. Developing infrastructure of electricity and water in the main city.
1957 - 1965 Just after independence of Sudan	Sudanese government	Sudanese Light and Power Company		After independence, transfer to Sudanese government.
1966 - 1978	Ministry of Works (1966 - 1978)	Central Electricity and Water Authority		Divide to rural and urban water supply organization.
	Ministry of Agriculture (1974 - 1979)	Rural Water and Development Corporation		
1979	Ministry of Energy and Mining	Central Electricity and Water Authority		Reintegrate to Ministry of Energy and Mining.
		Rural Water and Development Corporation		
1980 - 1986 The Numeri administration	Federal Ministry of Energy	Federal Corporation for Rural and Urban Water Supply	Regional Water Corporations	Divide electric sector from CEWA. Establish nine regions and both rural and urban water supply through regional water corporations. Responsibilities of Federal Corporation for Rural and Urban Water Supply reduced to management tasks.
1986 - 1989 Transform into corporation (The Mahdi administration)	Federal Ministry of Energy	National Urban Water Corporation		Divide to rural and urban water supply corporation.
		National Rural Water Corporation		
1992 - 2003 (Sector reform with putting federal rule in force)	Federal Ministry of Energy	National Water Corporation (NWC)	Regional Water Corporations State Water Corporations	Reintegrate rural and urban water corporation as federal corporation. Establish SWCs under State governments (26 states at first). Regional Water Corporations were dissolved in 2003.
2007	Federal Ministry of Energy ↓ Ministry of Irrigation and Water Resources			Transfer to Ministry of Irrigation and Water Resources newly established. Rename to PWC.
November 2011	Ministry of Irrigation and Water Resources ↓ Ministry of Water Resources	Public Water Corporation (PWC)	Public Water Corporation Training Center (PWCT) State Water Corporations (SWCs)	Rename by dividing irrigation sector.
July 2012	Ministry of Water Resources ↓ Ministry of Water Resources and Electricity			Rename by integrating with electricity sector.

*Refer to P-85 Political Water, Anne-Sophie Berckedorf, 2011

Activities of the Phase 2 Project

Year	Month	Main Activity	Relative Project	Relative Persons	
2011	11	Commencement of the 1st year activity of the Phase2 Project Opening ceremony of White Nile Training Center	5th JCC of Darfur Project	Uemura, Onodera, Matsuo, Oshika, Yamamoto, Sato, Kimura, Sasaki	
	12	1st JCC of the Phase2 Project	Implementation of the Survey for the Darfur Project	Uemura, Ido, Ikeda, Imai, Murakawa	
1st	1	Visit of Minister of the Water Resources Ministry	Darfur area is divided from 3 states by 5 states		
	2	Dr. Hosono, Kumamoto University visited to the DWST Implementation of the Technical Guidance by Reax Co. Ltd		Katsushima, omura	
	3	Preliminary Study of the Morocco Study Tour	3rd JCC of Kassala project	Uemura	
	4	Opening ceremony of Sennar Training Center 1st Joint Seminar at Sennar SWC Press Interview by Kumamoto Daily News Paper		Uemura, Inoue	
	5	1st Training in Morocco		Uemura, Schiyo	
	6	2nd JCC of the Phase2 Project		Uemura, Onodera, Sato, Sasaki	
	7	handover Ceremony of the Phases 2 Equipment Ambassador Horie visited the DWST Completion of the 1st year activity in Sudan		Ambassador Horie, Iwata	
2012	10	Commencement of the 2nd year activity of the Phase2 Project		Uemura, Onodera, Matsuo, Oshika, Yamamoto, Sato, Kimura, Sasaki	
	11	3rd JCC of the Phase 2 Project 2nd Joint Seminar at White Nile SWC Mr. Wakui, Director of JICA HQs visited the Project Ambassador Horie visited the White Nile Training Center			
	12	5 Moroccan Experts were invited to Sudan Opening Ceremony of El Gezira Training Center Ms. Miyazaki, JICA HQs visited the DWST	Mid term review of the Kassala project 6th JCC of Darfur Project		
	2nd	1	PWCT changed name to DWST JESS President Mr. Itagoshi visited the Project Ambassador Horie visited the Pilot SWCs	Terminal Evaluation of the Darfur Project	
		2	3rd Joint Seminar at El Gezira SWC Mr. Sato, Director of JICA HQs, visited White Nile SWC	7th JCC of the Darfur Project Kosti Project was discussed by Mr. Saito and White Nile SWC	Saito, Uemura
3		Presentation at World Water Day by Mr. Uemura Opening Ceremony of Northern SWC Training Center 2nd Training in Morocco	Terminal Evaluation of the Kassala Project	Ambassador Horie, Sorimachi, Mori, Kato, Uemura, Oshika Uemura, Sato, Kato	
4	Mr. Tanaka, President of JICA visited the DWST 4th JCC of the Phase2 Project		Orkasa, Mori, Kato, Uemura, Sato, Sasaki, Yamamoto		
5	Completion of the 2nd year activity in Sudan				
2013	10	Commencement of the 3rd year activity in Sudan Mrs. Fatima and Mr. Uemura participated in IWA seminar at Nairobi	7th JCC of the Kassala Project	Uemura, Onodera, Matsuo, Oshika, Yamamoto, Sato, Kimura, Sasaki, Kadokami	
	11	5th JCC of the Phase2 Project "About Sudan Water" was published by the Expert Team 4th Joint Seminar at White Nile SWC The cooperation with the Mother Nile Project was carried out Baseline survey of the Sanitation Management was carried out			
	12	4 Moroccan experts were invited to Sudan Inter National Desalination Seminar in Red Sea			
	3rd	1	Opening Ceremony of the River Nile Training Center Commencement of the UNOPS Training Implementation of the Mid term Evaluation 6th JCC of the Phase 2 Project Workshop of the Monitoring was held at DWST	Terminal Evaluation of the Kassala Project	Miyazaki, Takagi Uemura, Sato
2		Meeting with the Ministry of Water Resources an Iranian company	Darfur Seminar by Africa Development Bank		
3		Presentation of World Water Day by Mr. Uemura New Minister visited the DWST New representative of JICA Sudan Office visited the DWSU		Mori, Koike, Kitaguchi, Uemura	
2014	4	3rd Training in Morocco Opening ceremony of North Kordofan Training Center 5th Joint Seminar at North Kordofan SWC	9th JCC of Kassala Project	Uemura Uemura Uemura	
	5	7th JCC of the Phase2 Project Completion of the 3rd year activity in Sudan			
2015	10	Commencement of the 4th year activity in Sudan Implementation of ODA tour in El Gezira state		Onodera, Yamada, Matsuo, Oshika, Yamamoto, Sato, Kimura, Sasaki, Kadokami Ambassador Ito, Nakata, Koike, Onodera	
	11	8th JCC of the Phase 2 Project 6th Joint Seminar at Northern SWC	Implementation of the Kassala Project Seminar at DWST	Kitaguchi, Shiomi, Onodera, Schiyo, Kuroda Onodera	
	12	2 Moroccan Experts were invited to Sudan Completion of the Mid and Long Term Human Resources Development Plan		Ambassador Ito, Nakata, Koike, Kitaguchi, Sano, Onodera	
4th	1	Completion of the Monitoring Manual			
	2	9th JCC of the Phase 2 Project Implementation of the Monitoring course for each SWC		Ejiri, Shimizu, Sano, Onosato Onodera	
	3	4th Training in Morocco		Onodera	
	4	Morocco briefing session of the 4th training was held in DWST		Onodera	
	8	7th Joint Seminar at Gedaref SWC 3 JICA Experts were dispatched in Sudan for the final activity	Implementation of the Basic Design Study for New Project	Uemura, Onodera, Kadokami	
	9	10th JCC and 8th Joint Seminar of the Phase 2 Project		Ambassador Ito, Nakata, Miyazaki, Shimizu, Sano, Uemura, Onodera, Kadokami, Schiyo	
	10	Project Presentation Submission of the Project Completion Report		Toyama, Iwasaki, Miyazaki, Shimizu and other JICA staff Uemura, Onodera, Oshika, Sato, Sasaki, Yamamoto, Kato	

Table of Contents

Page

Location Map of the Project

Location Map of the Pilot States

History of the Organization in Sudan Water Sector

Activities of the Phase 2 Project

1 Introduction	1
2 Project Purpose	2
3 Basic Concept	3
4 Outline of DWST and PSWCs	6
4-1. Training System at the National Level	6
4-1-1. Training Organization	6
4-1-2. Training Budget	7
4-2. Training system at the PSWC.....	7
4-2-1. Training Organization	7
4-2-2. Training Budget of the PSWC.....	9
5 PDM Activities and Outputs	10
5-1. Summary of the Activities and Outputs	10
5-2. Output 1	11
5-2-1. Establishment of the Mid and Long Term HRD Plan	11
5-2-2. Training Plan and Contribution of the Training.....	12
5-2-3. Training Courses in the DWST	14
5-3. Output 2	15
5-3-1. Result of Training.....	16
5-3-2. Training Pictures	19
5-3-3. Kosti Special Training.....	21
5-3-4. Water Yard Rehabilitation	23
5-4. Output 3	23
5-4-1. Monitoring Activities.....	24
5-4-2. Establishment of Monitoring Units in the DWSU	26
5-4-3. Monitoring Activities	28
5-4-4. Monitoring Data Sharing	29
5-4-5. Expansion of monitoring activities	30
5-4-6. Utilization of Monitoring Data	31
5-4-7. Monitoring Manuals	32
5-4-8. Pictures on the Monitoring Activity	33

5-5.	Output 4	34
5-5-1.	Trainee at the DWST and the SWCs	34
5-5-2.	Training Implementation in the DWST and the SWCs	36
5-5-3.	Training Centers Construction in the SWCs	36
5-5-4.	Development of Manuals	38
5-5-5.	Joint Seminar	39
6	Other Outputs	41
6-1.	Procurement	41
6-2.	JCC	43
6-3.	Collaboration with other Development Partners	44
6-4.	Collaboration with Morocco	46
6-5.	Mid Term Review and Terminal Evaluation	50
6-5-1.	Midterm Review	50
6-5-2.	Results of each Evaluation by JICA	50
6-6.	Website of the DWST	51
6-7.	Public Relations (PR)	52
7	Encouragement of Ownership	53
7-1.	Establishment of Mutual Trust	53
7-2.	Instruction of the Budgeting System	54
7-3.	Procurement of Necessary Equipment and the Guidance of Utilization	55
7-4.	Appropriate Capacity Development for Sudanese	56
7-5.	Activities Based on the Various Fields	57
7-6.	Data Accumulation and Discussion	58
7-7.	Information Sharing among the DWST and the SWCs	59
7-8.	The Award System	60
7-9.	Goal of Water Sector in Sudan	61
8	Challenges and Recommendations	62
8-1.	Delaying of New Training Center's Construction of the DWST	62
8-2.	Outflow of Human Resources to Saudi-Arabia	62
8-3.	New Customers and Autonomous Budget System	63
8-4.	Women's Empowerment	63
8-5.	Expectation to JICA Sudan Office	64
8-6.	Formulation of Appropriate PDM	65

Attachment

Attachment-1 PDM

Attachment-2 JCC Minutes of Meeting

Attachment-3 Equipment Handover Certificates

Attachment-4 Appreciation letter on Mid and Long Term Human Resources Development Plan

Attachment-5 DWST Mid and Long Term Human resources Development Plan

Attachment-6 DWST Human Resources Development manual

Attachment-7 DWSU Monitoring Manual(Water Supply Facility/Training)

Attachment-8 Comparison of the Contribution of the Training Works in Sennar
(Well Management Training)

1 Introduction

The Republic of Sudan (hereinafter Sudan) witnessed a long period of civil wars and domestic conflicts taking place between the northern Sudan and southern Sudan from 1955 to 2005. In 2005, “Comprehensive Peace Agreement “was concluded with international involvement. Subsequently, the Darfur Peace Agreement in May 2006, and the Eastern Sudan Peace Agreement in October, 2006 were signed respectively. After this series of peace accords, a referendum was held to put independence of Southern Sudan to a vote in 2011. Thus, it resulted in the birth of the independent Republic of South Sudan as the 54th country in Africa on July 9, 2011. However, even after the independence of South Sudan, the conflict around the border area has not ceased. The challenges of security in this region still remain.

The independence of the South Sudan also has a bad impact to Sudan as oil exports from Sudan were suspended since then. Total exports on oil-related production dropped sharply by around 75%. The Governmental revenue decreased 12 billion of Sudanese Pound. In response to this harsh economic situation, Sudanese Government addressed devalued currency, increasing tax, curtailment of subsidies on oil products, cutting Governmental expenditures while further investment in foreign countries, export promotion of gold and agricultural produce are encouraged*¹.

Meanwhile, the World Bank and International Monetary Fund have promoted a decentralization policy in most African countries since the 1990s to help in governance. This modality had a significant influence on Sudan as well. The Decentralization Law of Sudan in 1992 consequently transferred the power and authority from the Central Government to the State Government. This Decentralization policy was applied to the water sector as well. The Presidential degree in 1994 which aimed at organizational restructuring in the water sector entailed the dissolution of the National Water Corporation (NWC) which existed as a national body. The NWC used to be a national agency to manage rural water and urban water supply in all the State of Sudan before this reform. However, since 1994, the NWC became a federal body only to deal with large scale projects or international coordination and monitoring the water supply in the States, as a result of the power transition. Instead, the branch offices of the former NWC in all States were reorganized to be State Water Corporations (SWCs) to be responsible for water supply projects at State level. The NWC was, in turn, renamed to be “the Public Water Corporation (PWC)” in 2007, and reorganized again to be “the Drinking Water and Sanitation Unit (DWSU)” in 2013.

However, the decentralization policy in the water supply sector brought about some negative impact since it was not accompanied by full financial transition from the Central government to States. Since then, some of the States have been faced with a lack of budget, human resources and materials. Furthermore, this policy increased disparities between quickly developing Khartoum State and neglected other States. In contrast, the capacity level of engineering and administration in each branch office in the NWC used to be standardized since there used to be a personnel reshuffling

¹ * data from MoF, Japan in 2015

system before.

Under these circumstances, the Human Resources Development Project for Water Supply in the Republic of Sudan (Phase 1) was planned as a first Project since the technical cooperation between Sudan (hereinafter Sudan) and the Government of Japan resumed in 2008 after a 17 year interval. Phase 1 project was conducted from June, 2008 to March, 2011, aiming at capacity building at federal level on HRD. Phase-1 successfully ended to enhance the capacity of training implementation of the Public Water Corporation Training Center (PWCT). On the other hand, the situation of the human resources development of water supply sector in 18 states still remained to be developed. Therefore, the Government of Sudan requested the Government of Japan to launch the Second Phase of the Project for Human Resources Development for Water Supply in Sudan (Phase 2) to enhance the capacity of training implementation at States level in addition to HRD at the federal government level.

The purpose of Phase 2 is to develop human resources in the water sector at states level. Phase 2 has focused on two Pilot States (White Nile state and Sennar state). Phase 2 started in November, 2011 and was expected to end at the middle of September 2015. It has also collaborated with other JICA Projects such as “Capacity Development Project for Provision of the Services for Basic Human Needs in Kassala (hereinafter referred to as K-TOP) and “Project on Human Resources Development for Darfur and the Three Protocol Areas” (hereinafter referred to as Darfur Project).

This Final Report (F/R) describes the all activities of Phase 2 from November, 2011 to September, 2015.

2 Project Purpose

The overall goal of Phase 2 is **“Water supply system is properly managed in Sudan”** which is described in the Project Design Matrix (hereinafter PDM). It means that water supply facilities such as wells, water treatment plants, elevated water tanks, power generators, pumps, and pipelines are maintained by skilled engineers in SWCs with a sustainable budget. In order to achieve this goal, a human resources development approach was adopted in this project. Accordingly, the Project purpose was designed to be **“Human resources in water supply sector are properly trained in Sudan”**.

Phase 2 addresses to solve remaining challenges in state level while Phase 1 (2008-2011) addressed strengthening the capacity at Federal Governmental level. It aims at capacity building of SWCs’ training system as well as the DWST. To achieve this, the PDM of Phase 2 outlines four major outputs.

First output (Output 1) is defined **“Training courses are implemented by DWST based on its Mid-Term/Long-Term Human Resources Development Plan”**, focusing on strengthening the capacity at federal level. Meanwhile, at state level, two states (the White Nile SWC and the Sennar SWC) were selected to be pilot SWCs (hereinafter PSWC) to achieve the Output 2 and the Output 3. The Output 2, **“Training course implementation structures in PSWCs are developed by PSWCs**

in collaboration with DWST” and the Output 3 “Monitoring system is established within DWSU and Pilot SWCs for training course implementation and O&M of water supply system of PSWCs” were designed in the PDM accordingly. The Output 4 is aimed at dissemination of the Output 1, 2 and 3, to be defined “Training course implementation structure is developed within each SWC in Sudan in collaboration with DWST.”

3 Basic Concept

The implementation system of this Project is conceptualized as shown in Figure.3.1. The JICA Experts are supposed to assist the DWST and the DWSU activity continuously same as in Phase 1. Especially, the JICA Experts are to support equipment procurement, training implementation, training center construction, and establishing a monitoring system.

Phase 2 is supposed to strengthen the training system in the two PSWCs as well. In this regard, it is expected in this system that the knowledge and the skill in the DWST must be transferred to the PSWC. The training target in the PSWCs is technician staff level, unlike the DWST focuses on engineer staff level in the SWCs. In addition, Moroccan Experts were invited for technical exchange every year while planned annual training programs in Morocco.

The assignment of the Experts from 2011 to 2015 is summarized in Table 3.1 and the comparison of the plan and actual assignment is shown in Table 3.2. The relationship between Phase 1 and Phase 2 shows the Figure 3.2.

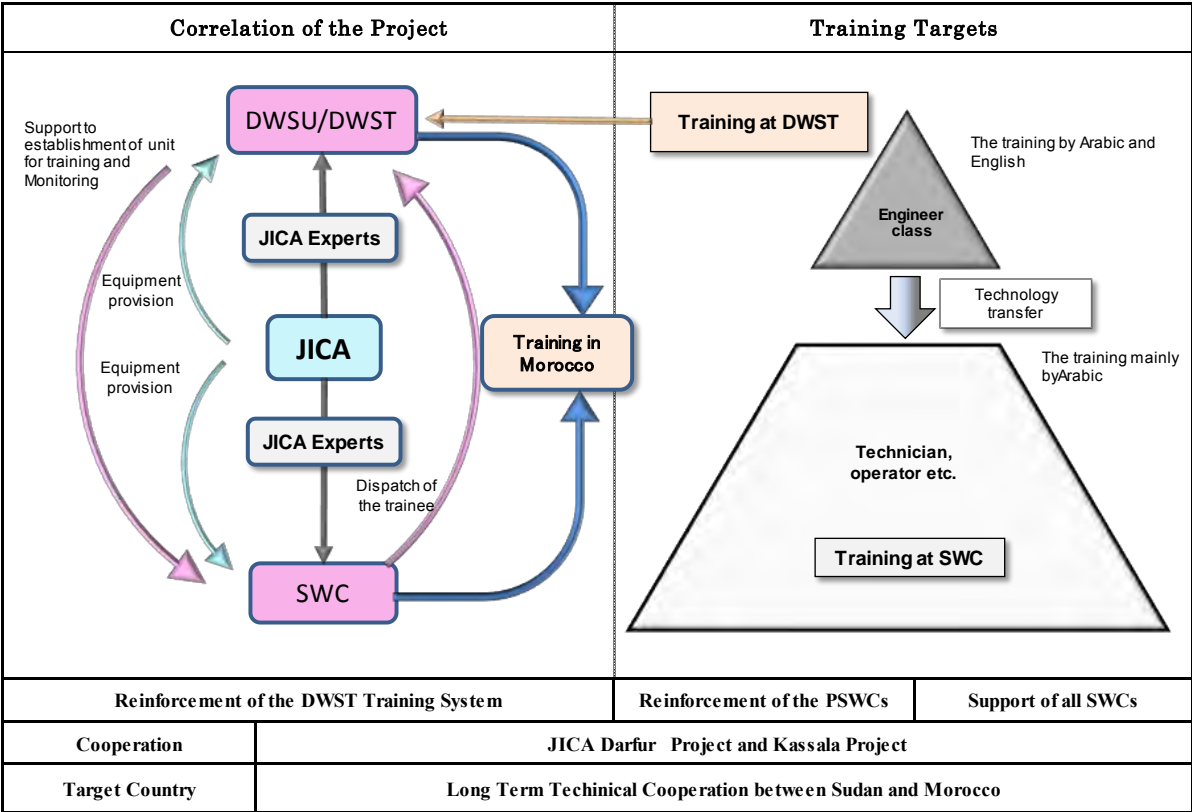


Figure 3.1 Concept Image of the Phase 2 Project

Table 3.1 Assignment of the Experts for Phase 2

No	Name	Field of Charge	Year	Assignment	Assignment									Days	M/M					
					10	11	12	1	2	3	4	5	6			7	8	9		
1	Mr. Mitsuro Uemura	Leader, Training Management ,Water Supply Plan	1	2011.Nov-2012.Jul													243	8		
			2	2012. Oct-2013. May														212	7	
			3	2013.Oct-2014. May															237	8
			4	2015. Aug-2015. Sept															30	1
2	Mr. Jun Onodera	Sub Leader, Organizational Management, Water Tariff Management	1	2012.Apr-2012. Jul													81	3		
			2	2012. Oct-2012. Dec														61	2	
			3	2013. Oct-2013. Dec															60	2
			4	2014. Oct-2015. Sept															174	6
3	Mr. Yusuke Oshika	Well Management	1	2012. Mar-2012. Jul													122	4		
			2	2013. Jan-2013. Apr														92	3	
			3	2013. Nov-2014. Feb															90	3
			4	2015. Jan-2015. Mar															61	2
4	Mr. Makoto Yamamoto	Management of Water Supply Facility (Water Treatment Plant/Pipe Network)	1	2012. May-2012. Jun													50	2		
			2	2013. Feb-2013. May														75	3	
			3	2013. Oct-2014. Mar															90	3
			4	2014. Nov-2015. Jan															51	2
5	Mr. Ryouichi Kimura	Electricity, Mechanics, Equipment Management, Kosti Training	1	2011. Nov-2012. May													182	6		
			2	2012. Oct-2013. Feb														120	4	
			3	2013. Nov-2014. Mar															110	4
			4	2014. Oct-2015. Apr															89	3
6	Mr. Tadashi Sato	Data Management, Monitoring	1	2011. Nov-2012. Jul													182	6		
			2	2012. Oct-2012. Dec														61	2	
			3	2013. Oct-2014. Feb															79	3
			4	2015. Mar-2015.Apr															76	3
7	Mr. Sunsaku Matsuo	Water Quality Management	1	2011. Nov-2012. Mar													121	4		
			2	2012. Oct-2012. Dec														61	2	
			3	2014. Apr-2014. May															43	1
			4	2014. Dec-2015. Jan															41	1
8	Mr. Arata Sasaki	Community Development	1	2012. Apr-2012. May													61	2		
			2	2013. Mar-2013. May														45	2	
			3	2014. Apr-2014. May															51	2
			4	2015. Jan-2015. Feb															30	1
9	Ms. Aya Kadokami	Sanitation Management	1	No assignment													0	0		
			2	No assignment														0	0	
			3	2014. Mar-2014. Apr															82	3
			4	2014. Oct-2015. Sept															60	2
10	Mr. Hiroyoshi Yamada	Management of Training Facility, Water Supply Plan (2)	1	No assignment													0	0		
			2	No assignment														0	0	
			3	No assignment															0	0
			4	2014. Dec-2015. Jan															32	1
Total											3,255	109								

Table 3.2 Comparison of the Assignment Plan and Actual of Japanese Experts

No.	Field of Charge	Name	Organization	Plan Actual	1st	2st	3st	4st	Total	Remarks
					Year	Year	Year	Year		
1	Leader, Training Management ,Water Supply Plan	Mr. Mitsuro Uemura	Earth System Science	Plan	8.10	7.07	6.73	8.10	30.00	IMM only for 4th year
				Actual	8.10	7.07	7.90	1.00	24.07	
2	Sub Leader, Organizational Management, Water Tariff Management	Mr. Jun Onodera	Earth System Science	Plan	2.70	2.03	1.37	2.40	8.50	
				Actual	2.70	2.03	2.00	5.87	12.60	
3	Well Management	Mr. Yusuke Oshika	Earth System Science	Plan	4.07	3.07	4.00	2.00	13.14	
				Actual	4.07	3.07	3.00	2.03	12.17	
4	Management of Water Supply Facility (Water Treatment Plant/Pipe Network)	Mr. Makoto Yamamoto	Japan Techno	Plan	1.67	1.03	2.03	1.70	6.43	
				Actual	1.67	2.50	3.00	1.70	8.87	
5	Electricity, Mechanics, Equipment Management, Kosti Training	Mr. Ryouichi Kimura	Earth System Science	Plan	6.07	4.00	2.03	2.03	14.13	
				Actual	6.07	4.00	3.67	2.97	16.71	
6	Data Management, Monitoring	Mr. Tadashi Sato	Earth System Science	Plan	6.07	2.03	1.70	2.03	11.83	
				Actual	6.07	2.03	2.63	2.53	13.26	
7	Water Quality Management	Mr. Sunsaku Matsuo	Earth System Science	Plan	4.03	1.00	1.70	1.70	8.43	
				Actual	4.03	2.03	1.43	1.37	8.86	
8	Community Development	Mr. Arata Sasaki	Earth System Science	Plan	2.03	1.03	1.33	1.00	5.39	
				Actual	2.03	1.50	1.70	1.00	6.23	
9	Sanitation Management	Ms. Aya Kadokami	Earth System Science	Plan	0.00	0.00	0.00	0.00	0.00	From 3rd Year
				Actual	0.00	0.00	2.73	1.97	4.70	
10	Management of Training Facility, Water Supply Plan (2)	Mr. Hiroyoshi Yamada	Earth System Science	Plan	0.00	0.00	0.00	2.03	2.03	From 4th Year
				Actual	0.00	0.00	0.00	1.07	1.07	
Total				Plan	34.74	21.26	20.89	22.99	99.88	
				Actual	34.74	24.23	28.1	21.51	108.5	

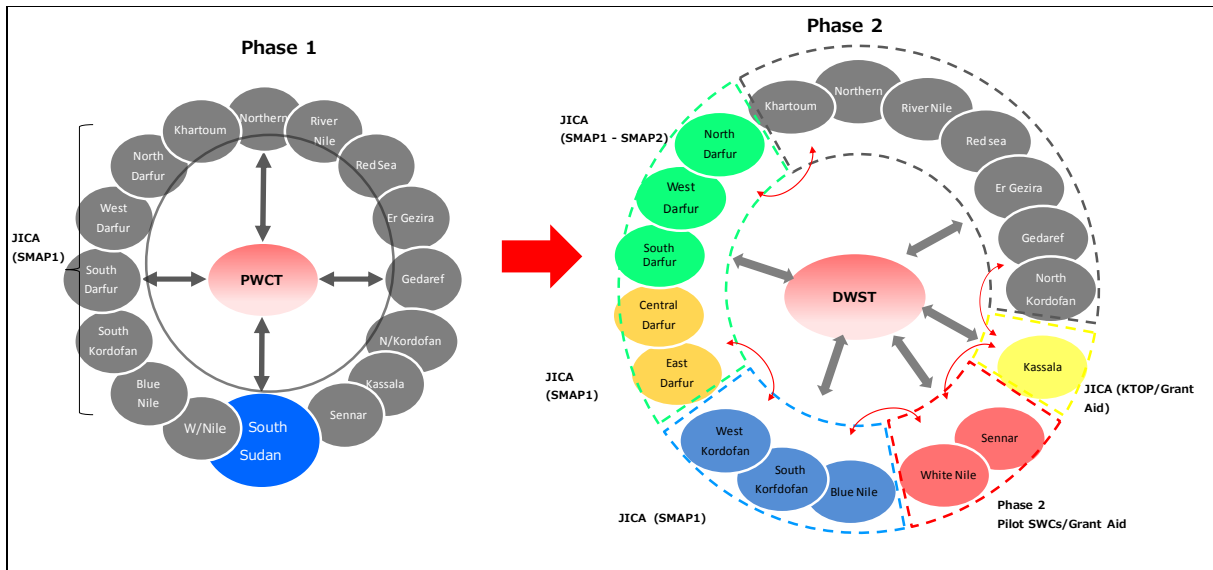


Figure 3.2 Relationships between Phase 1 and Phase 2 Project

4 Outline of DWST and PSWCs

4-1. Training System at the National Level

4-1-1. Training Organization

The DWST is a national training center for the water supply sector in Sudan. The organizational structure is the same as the time of Phase 1 although the name was changed from PWCT to DWST. The staff members in the DWST are composed of the Director and eight staff members. Regarding management, all members are working together for every training program. It was changed because it was found at the time of Phase 1 that it was not efficient that one training coordinator concentrates on one training program. In Phase 2, the staff members of the DWST become able to manage the training by themselves without any JICA Expert assistance.

Meanwhile, a new training center, which was supposed to be completed within Phase 2 period, is still under construction. Accordingly, the new training management system that the Director planned remains to be established.

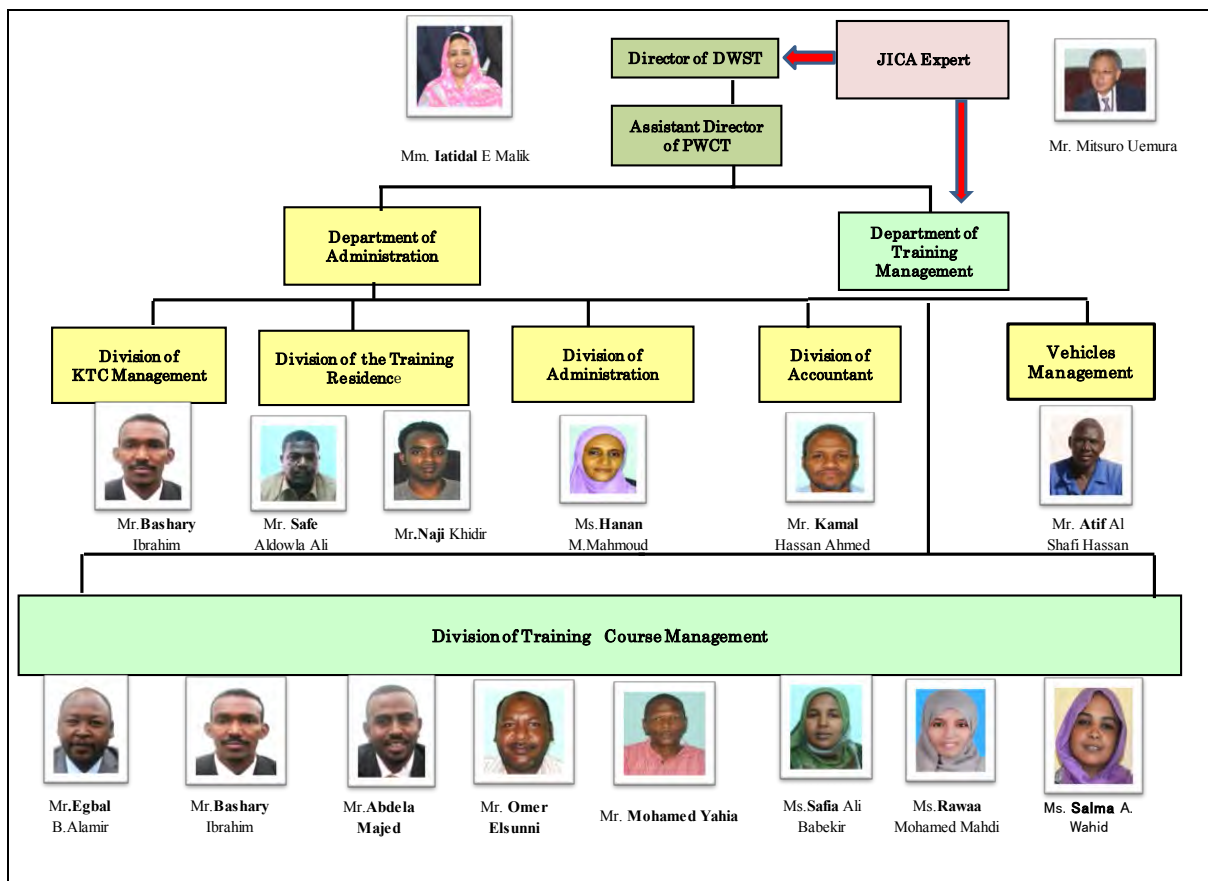


Figure 4.1.1 Training Organization of the DWST

4-1-2. Training Budget

As shown in Figure 4.1.2, the budget for the DWST is increasing every year since 2008. The training budget is increasing year by year. In particular, the budget in 2013 became double as in 2008. Again, the amount of budget in 2015 is 13 times as much as in 2008. To ensure the budget for human resources development by the counterpart’s efforts in federal and state level is the most important characteristics of this Project.

This effort by Sudanese has been praised at International Water Association (IWA) Seminar, which was held in Nairobi, October 2013. However, despite this effort, the actual expenses have not been disclosed. One of the reasons is that the budget is managed not by the DWST but by the DWSU. The other reason seems that a financial disclosure system does not prevail in Sudan as few managers are allowed to access financial information.

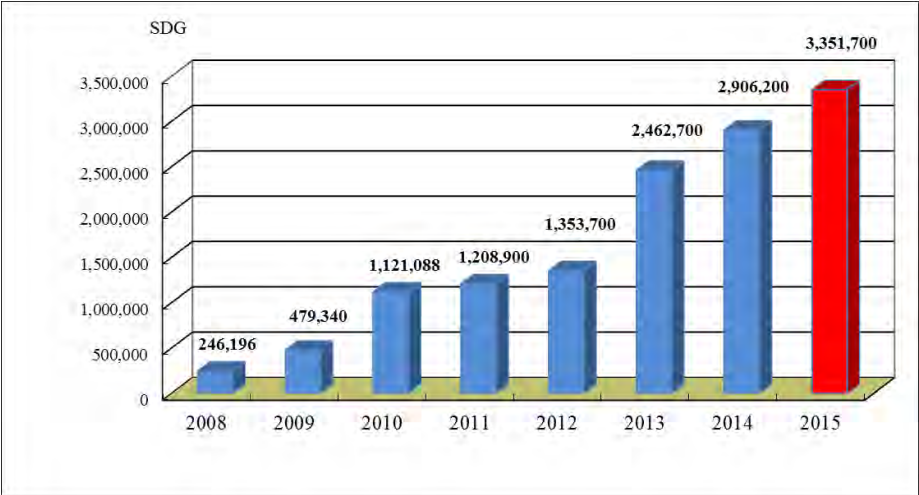


Figure 4.1.2 Fluctuation of the Training Budget of DWST

4-2. Training system at the PSWC

4-2-1. Training Organization

The JICA Experts have been working at two PSWCs, White Nile and Sennar except for the Team leader. 13 training courses have been implemented based on the specialty field of each JICA Expert. The organization structure is modeled by the DWST, in which staff members are composed of the training center Director, vice Director, training management unit and administration unit. The one thing that varies from the DWST is that the PSWC allocate staff for cleaning the facility. Unlike the DWST, it is also a unique point that the staff members of the training center double as their original position in SWCs.

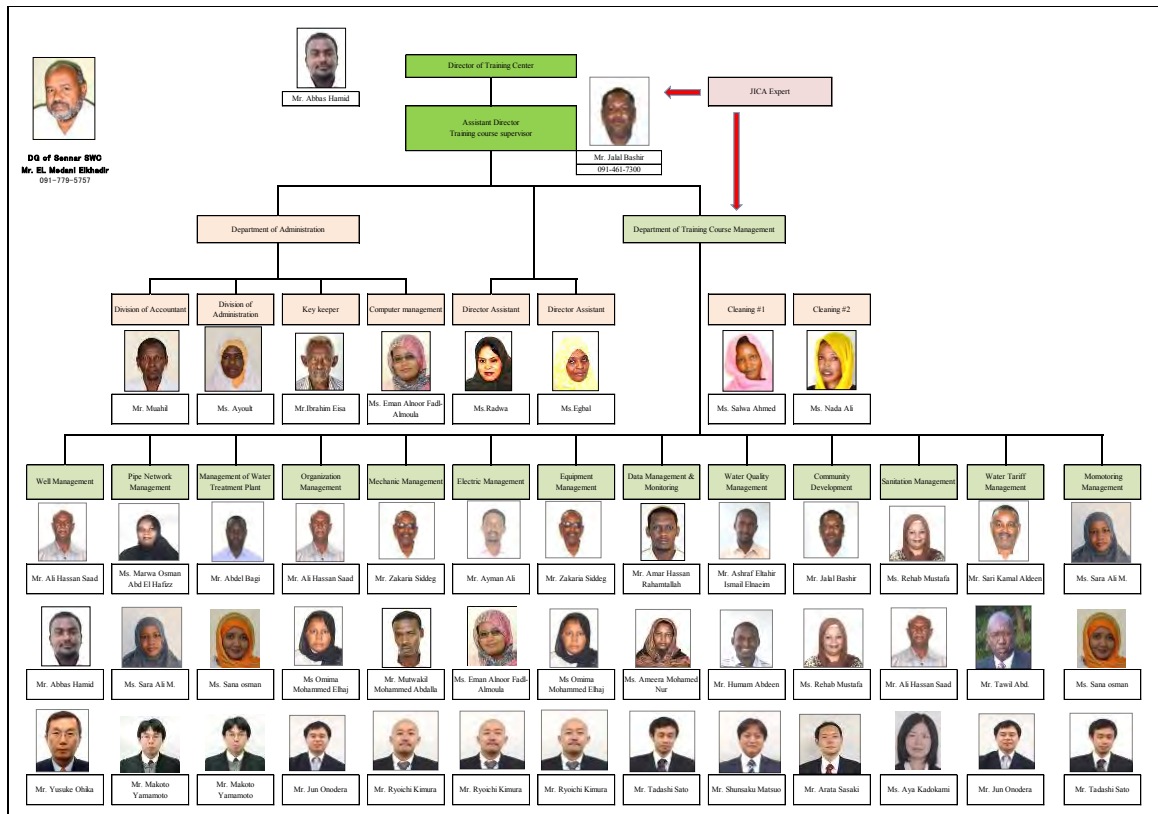


Figure 4.2.1.1 Training Organization of the Sennar SWC

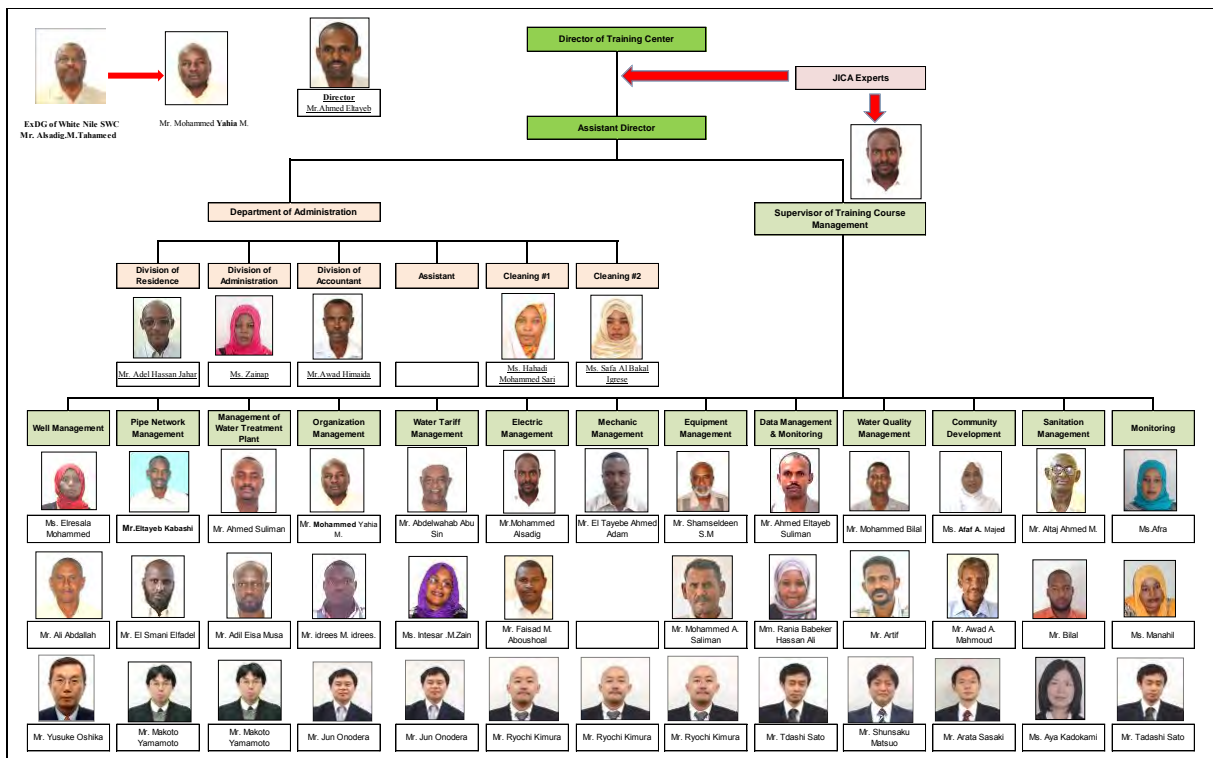


Figure 4.2.1.2 Training Organization of the White Nile SWC

4-2-2. Training Budget of the PSWC

In this Project, the budget on training activities has been secured by the counterpart in Sudan. It is necessary that SWCs keep the budget for training stably, considering sustainability after the project. The idea that the counterpart organization is responsible to bear all expenses for training is one of the key concepts in this Project since Phase 1 (2008-2011). Therefore, the JICA Experts repeatedly instructed the counterpart staff on the budgeting process from the beginning of the first fiscal year. Thus, the PSWC became able to proceed budget application smoothly by the second year (2013). Consequently, both PSWCs are able to conduct training smoothly on schedule as training budgets in the PSWCs are likely to increase year by year.

In addition, the progress of this project and its significance became widely recognized by the state Government. It led the SWCs to be able to keep a stable budget as well.

Training budgets of both PSWCs from 2012 to 2015 are as follows.

Table 4.2.2 Training Budget of Sennar and White Nile SWC

Year	2012		2013		2014		2015	
	White Nile	Sennar	White Nile	Sennar	White Nile	Sennar	White Nile	Sennar
Personnel Expense	69,500	40,400	81,700	108,480	155,900	88,800	198,150	112,050
Transportation Expense	5,310	10,290	5,600	2,360	96,200	26,100	96,200	96,750
Welfare Expense	56,000	19,350	16,625	25,680	60,700	128,600	104,220	73,700
Stationary & Office consumables	4,935	24,000	8,980	9,870	12,716	8,190	13,499	13,499
Maintenance	20,400	104,010	48,600	36,000	32,000	24,000	32,000	32,000
Communication Costs	6,700	14,000	21,576	23,000	29,000	12,000	36,800	10,000
Expenses for Lighting, Water and Fuel	16,914	27,300	9,000	26,772	13,920	10,560	15,360	9,720
Workshop, Seminar & Meeting Cost	3,600	90,000	5,860	17,100	108,400	10,900	112,400	54,400
Field Survey	4,800	57,000	17,400	32,400	28,200	31,800	33,000	27,000
Others	12,000	290,500	2,400	12,000	7,200	59,040	9,000	30,000
Total	200,159	676,850	217,741	293,662	544,236	399,990	650,629	459,119

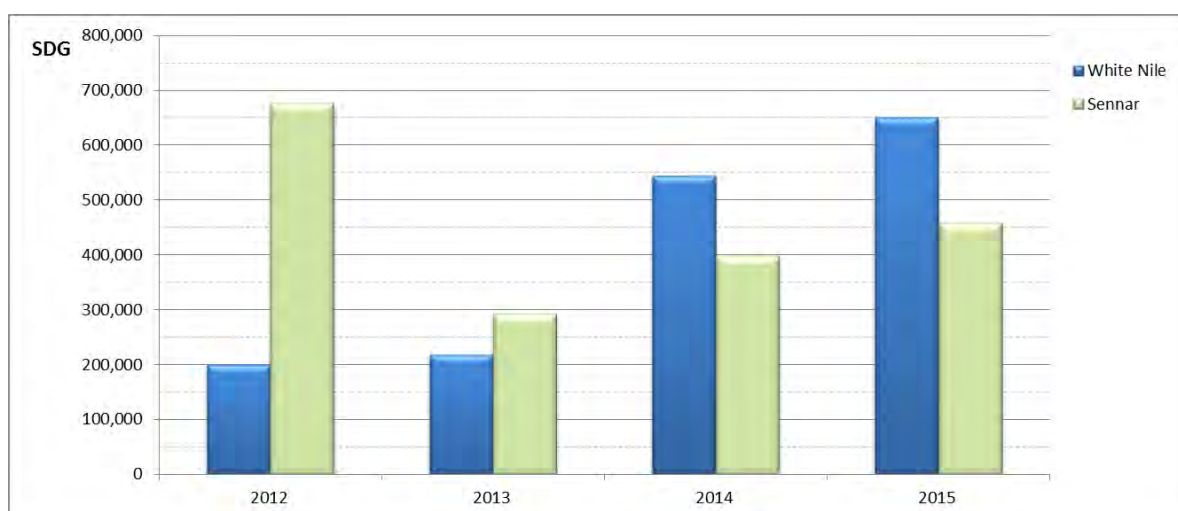


Figure 4.2.2 Training Budget of the Pilot SWCs

5 PDM Activities and Outputs

5-1. Summary of the Activities and Outputs

The Overall Goal of Phase 2 is described in PDM “Water supply system is properly managed in Sudan” while the Project purposes is set to be “Human Resources Development in Water Sector are properly trained in Sudan.” Table 5.1.1 shows the summary of the outputs and indicators for them. Table 5.1.2 outlines the activities in the PDM.

Table 5.1.1 Summary of the PDM

Output	Objectively Verifiable Indicators	Results	Chapter
Overall Goal	Water Supply system is properly managed in sudan.		
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.	Total 5851 trainees were received the training during the Phase 2 period. DWST was 1469, PSWCs was 1147 and other SWCs were 3235. 5-2-2 5-5-1
	2	The number of annually maintained water yards** is increased to more than 20 in each PSWC.	Total number of water yard rehabilitation of White Nile is 48 and Sennar is 32. 5-3-4
Output 1	1-1	Mid-term/long-term human resources development plan is completed by March 2013.	The DWST submitted the plan to Ministry of Water Resources and Electricity in February 2015. Finally, the Ministry of National Human Resources Development was approved this plan. 5-2-1
	1-2	Percentage of contributions from training coordinator on the planning and implementation of training courses increases by 100%.	The DWST implemented all training courses by their own efforts. 5-2-2
	1-3	Training courses at DWST are implemented more than 20 times annually.	The DWST implemented the training course more than 20 from 2012. 5-2-3
Output 2	2-1	Percentage of contributions from training coordinators on the planning and implementation of training courses is increased by 80% in the PSWCs.	The training contribution ratio of both Sennar and White Nile SWCs was exceeded more than 80%. 5-3-1
	2-2	Training courses are implemented according to the SWC training implementation plan.	Many SWCs established the training center and implemented the training based on the training plan. 5-5
Output 3	3-1	Monitoring manual is completed by March 2015.	The Monitoring Manuals were deliveries to the SWCs and others at the JCC on March 11, 2015. 5-4
	3-2	Monitoring activities are implemented according to schedule.	The DWSU and PSWCs established monitoring units. The PSWCs implemented the monitoring activities which number is 114 was White Nile and 116 was Sennar. 5-4-5
Output 4	4-1	Human resources development manual is completed by March 2015.	The Human Resources Development Manuals were deliveries to the SWCs and others at the JCC on March 11, 2015. 5-4-4
	4-2	Joint Seminar to share and disseminate the outputs of PSWCs are implemented 6 times.	Total 7 times Joint Seminars were implemented by September, 2015. 5-4-5

Table 5.1.2 Final Results of PDM Activities

No.	Activities of the PDM	Results
1	Training courses are implemented by DWST based on its mid-term/long-term human resources development plan.	
1-1	DWST elaborates draft plan for mid-term/long-term human resource development.	Completion
1-2	DWST prioritizes actual needs for the training courses.	Completion
1-3	DWST elaborates its training implementation plan based on the draft plan for mid term/long term human resource development.	Completion
1-4	DWST implements training courses based on the training course implementation plan.	Completion
1-5	DWST evaluates the training courses.	Completion
1-6	DWST revises training course contents, textbooks and manuals based on the evaluation results of the training courses.	Completion
1-7	DWST improves its capacity responding to the expansion of training center.	Not yet
1-8	DWST finalizes the mid-term/long-term human resources development plan, which is to be authorized by the government of Sudan.	Completion
2	Training course implementation structures in PSWCs are developed by PSWCs in collaboration with DWST.	
2-1	DWST strengthens its leadership through the support of below activities of SWC.	Completion
2-2	PSWCs establish training units within the organization.	Completion
2-3	PSWCs develop the draft SWC activities plan.	Completion
2-4	PSWCs prioritize actual needs for the training courses.	Completion
2-5	PSWCs develop training course implementation plan based on the priority.	Completion
2-6	PSWCs' training units develop training course curriculum(including OJT in Localities)and textbooks.	Completion
2-7	PSWCs' training units implement training courses.	Completion
2-8	PSWCs' training unit evaluate the training courses.	Completion
2-9	PSWCs' training units revise training course curriculum and textbooks based on the evaluation results of the training courses.	Completion
2-10	PSWCs reflect the monitoring result of draft SWC activities plan to training course implementation plan	Completion
3	Monitoring system is established within DWSU and pilot SWCs for training course implementation and O&M of water supply system of PSWCs.	
3-1	DWSU and PSWCa establish monitoring units within the organization.	Completion
3-2	DWSU develops the draft version of monitoring manual to be used by PSWCs.	Completion
3-3	PSWCs implement baseline survey on the O&M status of current water supply system.	Completion
3-4	PSWCs regularly monitor the current situation of training implementation, examples identified in the State, and O&M of water supply system based on the draft of monitoring manual	Completion
3-5	DWSU and DWST analyze and evaluate the monitoring result and give feedbacks such as lessons learned and good practices etc. to SWC monitoring unit.	Completion
3-6	DWSU maintains and manages monitoring data at information center.	Not yet
3-7	DWSU finalizes monitoring manual based on the evaluation of monitoring of training courses and O&M of water supply system.	Completion
4	Training course implementation structure is developed within each SWC in Sudan in collaboration with DWST	
4-1	Each SWC (excluding PSWCs) establishes training unit within the organization.	Completion
4-2	DWST develops Human Resources Development Manual to each SWC based on the outputs of 1, 2 and 3.	Not yet
4-3	DWST implements Joint Seminar(s) to share and disseminate the outputs of PSWCs' activities, and distribute Human Resource Development Manual to each SWC.	Completion
4-4	Each SWC (excluding PSWCs) develops training course implementation plan.	Completion

5-2. Output 1

Activity for the Output 1 aims at reinforcement of the training center in national level. The final output for this activity is to formulate a mid and long term human resources development plan in the DWST. For sustainable support, the project team leader has been assigned to be staying in Sudan consistently. The DWST conducted 37 training courses in 2015. The DWST has now enough capacity to manage training as they establish new training program every year and get feedback from every training program.

Most of the activity item in the table above have been done except for the activity 1-7. This is because the delay of the new training center construction.

Following sections (5-2-1, 5-2-2 and 5-2-3) outlines details of the output 1.

5-2-1. Establishment of the Mid and Long Term HRD Plan

Endorsement of “The Mid and Long Term Human Resources Development Plan (HRD Plan)” in water supply sector in Sudan is one of the main objectives of the Output 1. Based on a series of discussion with the DWST and SWCs, the DWST finally determined the details of the HRD Plan (shown in Table 5.2.1). The HRD Plan is composed of two parts, namely, the Mid Term Plan and the Long Term Plan. The Mid Term Plan (2012-2018) aims at capacity building of basic skill such as computers. While the target of the Long Term Plan (2012-2026) is management capacity in seven

fields. This HRD plan was finally approved by the Ministry of Human Resources Development on 13th August 2015. While it was supposed to be done by June 2015 as the Terminal Evaluation team recommended.

Table 5.2.1 Outline of the Mid and Long Term Human Resources Development Plan

Target Skill/Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1.Target Skill for Mid Term HRD Plan															
1-1.Computer Skill															
1-2.Data Analysis Skill															
1-3.Report Writing Skill															
1-4.Presentation Skill															
1-5.English Communication Skill															
2.Target Skill for Long Term HRD Plan															
2-1.Organizational Management Skill															
2-2.Survey and Desing Skill															
2-3.Project Management Skill															
2-4.Facility Management Skill															
2-5.Equipment Management Skill															
2-6.Quality Management Skill															
2-7.Monitoring and Evaluation Skill															

5-2-2. Training Plan and Contribution of the Training

(1) Training Plan in DWST

The DWST has managed the entire training program autonomously as they acquired enough skill and knowledge from the JICA Expert since the Phase 1. The training schedule is shown in Table 5.2.2.1. Besides this plan, the DWST responded to the request from international agencies flexibly.

Table 5.2.2.1 Training Plan of the DWST

No.	Training Course Name	2014												Total		
		January	February	March	April	May	June	July	August	September	October	November	December			
1	Water Supply Facilities															3
2	Operation&Maintenance of Water Treatment Plant															3
3	Water Quality															4
4	Well Management															3
5	Data Management															2
6	Supply Chain Procurement Management															2
7	Organizational Management															2
8	Management Skills & Projects Planning															1
9	Evaluation & Monitoring															1
10	Pipe Network															3
11	Project Cycle Management															1
12	Statistical Package for the Social Sciences															1
13	Sanitation Management															2
14	Integrated Management of Water															1
	UNOPS	3	3	2	2	4	2	0	3	3	3	3	3	3	3	31
	Africa Development Bank															

(2) Fluctuation of the Trainees

The Training program in the DWST started in 2009. As of February 2015, the accumulated numbers of trained people is 2101 (see Table 5.2.2.2). This Table reveals that numbers of trainees and training programs are constantly increasing. This is an evidence to support the fact that the DWST disburses the budget.

Table 5.2.2.2 Trainees of the DWST from 2009 to 2015

Phase		Category		Phase 1			Phase 2			
No	Training Course	Engineering	Soft Wear	2009	2010	2011	2012	2013	2014	2015
1	Water Treatment Plant	○		41	17	15	29	0	29	45
2	Water Supply Facility	○		64	18	31	29	52	16	16
3	Data Management /GIS		○	46	27	16	26	31	0	13
4	Well Management	○		19	37	17	16	0	44	17
5	Organizational Management		○	12	25	0	0	13	16	15
6	Water Quality	○			33	32	29	39	26	45
7	Pipe Network Management	○			35	30	26	54	48	30
8	Water Facility Management	○			39	0	0	0	0	0
9	Advanced Well Management	○				0	9	0	0	0
10	Borehole camera	○				0	8	0	0	0
11	Estimation Cost & Equipment Management		○			0	0	9	0	0
12	Isotope Hydrology	○				8	0	0	0	0
13	Procurement and Storage		○			13	19	10	10	0
14	Water Well Design	○				16	16	49	0	32
15	Hydrometric and Surface Water	○				25	0	0	0	0
16	Management of Project Cycle		○			16	15	0	0	0
17	Geo Electrical Imaging	○					26	0	0	13
18	Presentation Skill		○				15	0	0	0
19	Training of Trainer		○				13	0	0	13
20	Report Writing		○				11	11	0	0
21	Planning Monitoring and Evaluation		○					18	0	26
22	Economic Impact of Well Rehabilitation		○					12	0	0
23	Engineering Economy		○					14	15	0
24	Solar System	○						24	0	0
25	Groundwater Treatment & Chromatography Techniques		○					25	27	0
26	Basic of PLC	○						17	0	0
27	Computer Basic Excel		○					12	0	13
28	Sanitation Management		○					15	34	13
29	Management Skills & Projects Planning		○						26	0
30	Integrated Management of Water		○						25	0
31	Social Stactics		○						11	12
32	Technical Management of Water Yard		○						18	0
33	Workshop of Water Atlas		○							73
34	Rural water Supply and Development		○							14
35	Tender and Contract		○							13
36	Humanresources Development		○							13
37	Pension and Insurance		○							16
Trainee	Total	0	0	182	231	219	287	405	345	432
	Phase Total			632			1,469			
Courses	Total			5	8	16	20	28	31	37
	Phase Total			29			116			
	Engineering Course	14		3	6	8	9	7	7	7
	Soft Wear Course		22	2	2	3	6	10	7	12

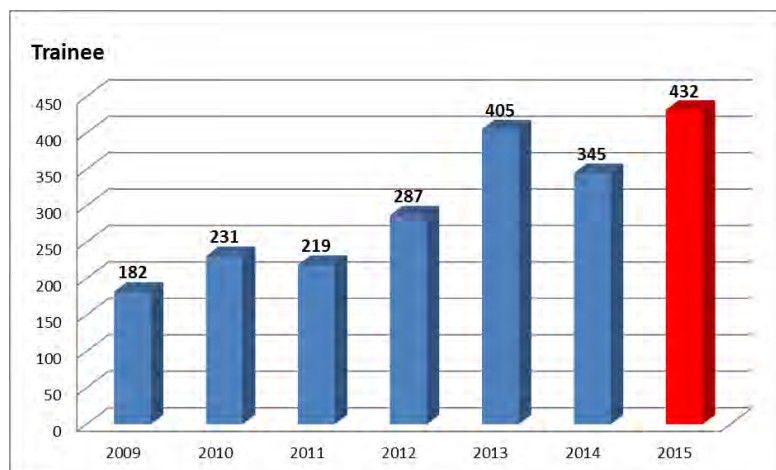


Figure 5.2.2.1 Trainees of the DWST

5-2-3. Training Courses in the DWST

From the point of the variety of the training program, the DWST has established many kinds of training courses responding to the training needs of all SWCs. While the indicator of the latest PDM requires the DWST to establish more than 20 training courses a year, it has been actually achieved in 2012.

Table 5.2.3 Training courses in the DWST

NO	Engineering Training Course	Soft Wear Training Course
1	Water Treatment Plant	Data Management /GIS
2	Water Supply Facility	Organizational Management
3	Well Management	Estimation Cost & Equipment Management
4	Water Quality	Procurement and Storage
5	Pipe Network Management	Management of Project Cycle
6	Water Facility Management	Presentation Skill
7	Advanced Well Management	Training of Trainer
8	Borehole camera	Report Writing
9	Isotope Hydrology	Planning Monitoring and Evaluation
10	Water Well Design	Economic Impact of Well Rehabilitation
11	Hydrometric and Surface Water	Engineering Economy
12	Geo Electrical Imaging	Computer Basic Excel
13	Solar System	Sanitation Management
14	Groundwater Treatment & Chromatography Techniques	Management Skills & Projects Planning
15	Basic of PLC	Integrated Management of Water
16		Social Stactics
17		Technical Management of Water Yard
18		Workshop of Water Atlas
19		Rural water Supply and Development
20		Tender and Contract
21		Humanresources Development
22		Pension and Insurance
Total	15	22
		27

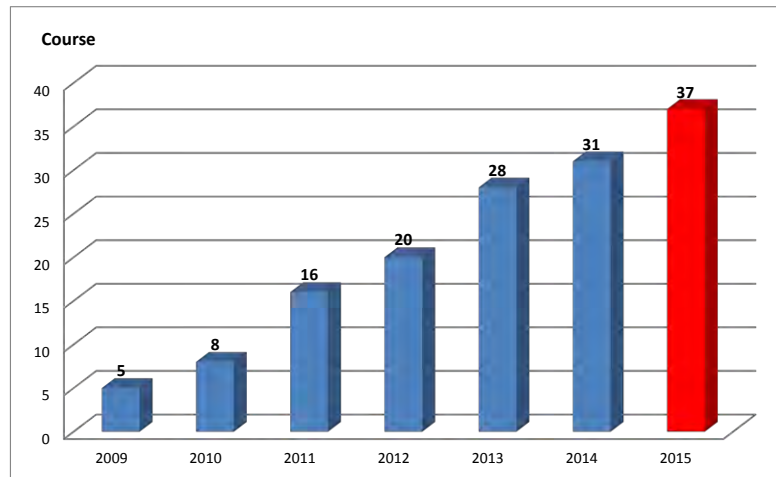


Figure 5.2.3.1 Training Course of the DWST




Item	Before(2008)	After(2015)
Facility		
Staff	5	18
Budget	0	13,129,824 SDG
Course	0	38
Trainee	0	2,101
		

Figure 5.2.3.2 Summary of the DWST Training Facility and Trainings

5-3. Output 2

The Output 2 aims at HRD in state level while the target of the Output 1 is for central level.

To establish models of training implementation in State level, two pilot SWCs, White Nile SWC and Sennar SWC were selected. Both states are adjacent and located 200-300 km south of Khartoum.

Phase 2 assigned 8 JICA Experts to respond to the specific needs in training since unlike the HRD in the DWST, HRD in state level is much more practice oriented. Regarding the activity 2-3 in the PDM, the project team decided to utilize the current Strategic Plans of SWCs since it was unrealistic to formulate a new corporate plan of SWCs.

5-3-1. Result of Training

Table 5.3.1.1 and 5.3.1.2 show the training results from 1st year to the 4th year. The Training period has been in line with the assignment of the JICA Experts. Sennar SWC has implemented 35 training courses and White Nile SWC has implemented 39. The total number of trainees is 352 in Sennar SWC and 572 in White Nile SWC. The training system was the same as Phase 1 project at the DWST, the PSWC evaluated four training items.

The training course, training environment and lecturers were evaluated by the trainees. Evaluation for those items has been going up since the project started.

Meanwhile, the contribution rate of the counterpart for the training implementation is exceeding to 80% as described in the PDM.

Table 5.3.1.1 Training Results of Sennar SWC

No.	Course ID	Training Course	Period	Day	Trainee	Lecturer	Evaluation (%)				JICA Expert	Year
							Course	Lecturer	Facility	Contribution		
1	WM-001	Well Management	6/3-6/7	5	10	3	92.1	92.5	-	65.0	Oshika	1
2	OM-001	O/Management	6/10-6/15	6	9	4	97.0	95.5	80.1	59.0	Onodera	1
3	DM-001	Data Management	11/18-11/22	5	10	2	94.8	93.9	88.8	71.8	Sato	2
4	WQM-002	Water Quality	11/25-11/30	6	5	3	94.8	89.8	91.8	67.0	Matsuo	2
5	EQM-001	Eqp. Management	12/2-12/6	5	10	1	96.4	95.8	80.0	61.0	Kimura	2
6	OM-002	O/Management	12/2-12/6	5	7	4	98.4	98.0	93.0	74.0	Onodera	2
7	MM-001	Mechanical	1/13-1/17	5	11	2	96.3	93.4	84.0	78.0	Kimura	2
8	EM-001	Electrical	1/20-1/24	5	7	2	82.2	92.2	76.5	86.0	Kimura	2
9	WM-002	Well Management	2/17-3/7	19	9	3	82.6	86.4	93.3	64.1	Oshika	2
10	PN-001	P/N/Management	4/7-4/11	5	9	5	91.1	88.3	89.0	77.1	Yamamoto	2
11	WT-001	W/T/Plant	4/21-4/25	5	12	4	94.7	93.7	92.6	81.1	Yamamoto	2
12	CM-001	C/Development	4/14-4/18	5	15	3	96.6	94.5	92.8	78.7	Sasaki	2
13	DM-002	Data Management	10/27-11/7	10	9	1	93.5	98.0	90.8	87.8	Sato	3
14	PN-002	P/N/Management	11/10-11/14	5	8	4	96.9	93.3	89.0	83.5	Yamamoto	3
15	WTM-001	Tariff Management	11/18-11/21	4	12	3	97.1	98.2	92.0	87.0	Onodera	3
16	OM-003	O/Management	12/1-12/5	5	10	3	98.3	96.7	92.9	76.9	Onodera	3
17	EQM-002	Eqp. Management	12/15-12/19	5	10	1	96.4	95.8	80.0	81.4	Kimura	3
18	WM-003	Well Management	12/8-12/29	18	8	3	96.8	94.7	94.6	91.1	Kimura	3
19	EM-002	Electrical	1/19-1/30	10	7	2	98.8	98.8	82.4	92.4	Kimura	3
20	WT-002	Water T/Plant	2/16-2/27	10	8	4	95.0	92.3	91.0	87.1	Yamamoto	3
21	MM-002	Mechanical	2/23-3/5	9	9	3	98.1	97.4	87.0	87.5	Kimura	3
22	WQM-002	W/Q/Management	4/20-4/24	5	10	2	95.0	95.7	83.5	82.0	Matsuo	3
23	CM-002	C/Development	5/11-5/15	5	12	4	96.2	96.7	91.0	86.7	Sasaki	3
24	MNT-001	Monitoring	11/2-11/6	5	15	1	-	-	-	-	Sato	4
25	SM-001	Sanitation/M	11/9 - 11/13	5	9	3	97.6	96.6	96.7	92.0	Kadokami	4
26	MM-003	Mechanical	11/9-11/20	10	9	2	98.1	87.0	97.7	97.3	Kimura	4
27	EQM-003	Eqp. Management	11/23-11/27	5	7	2	99.1	98.9	98.3	81.4	Kimura	4
28	WQM-003	Water Quality	12/14-12/25	10	9	4	93.9	95.2	92.6	94.0	Matsuo	4
29	PN-003	P/N/Management	12/14-12/18	5	5	4	100	97.9	89.0	94.0	Yamamoto	4
30	WT-003	W/T/Plant	12/28-1/8	10	26	5	93.2	87.9	78.7	94.3	Yamamoto	4
31	MNT-002	Monitoring	1/25-1/28	4	22	1	-	-	-	-	Sato	4
32	CM-003	C/Development	2/1-2/4	4	11	2	98.2	98.4	88.9	94.7	Sasaki	4
33	WM-004	Well Management	2/10-3/3	16	8	3	96.8	94.7	92.4	95.9	Oshika	4
34	EM-004	Electricity	3/8-3/19	10	5	2	93.6	93.2	94.1	92.4	Kimura	4
35	SM-002	Sanitation/M	8/23-8/27	5	9	5	94.8	96.2	94.1	97.1	Kadokami	4
Total				251	352	100						
Average				7	10	3	95.3	94.5	89.3	83.0		

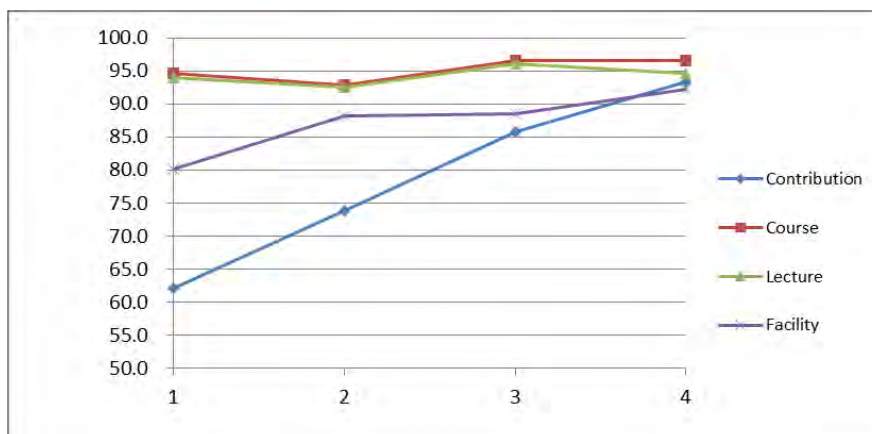


Figure 5.3.1.1 Results of the Training Indicator in Sennar SWC

Table 5.3.1.2 Training Results of White Nile SWC

No.	Course ID	Training Course	Period	Day	Trainee	Lecturer	Evaluation (%)				JICA Expert	Year
							Course	Lecturer	Facility	Contribution		
1	OM-001	O/Management	6/2-6/4	3	11	4	87.0	98.0	89.7	40.0	Onodera	1
2	WM-001	Well Management	6/10-6/15	6	10	3	65.4	66.0	76.2	60.0	Oshika	1
3	WQM-001	Water Quality	11/11-11/15	5	10	3	80.6	82.2	82.9	66.0	Matsuo	2
4	OM-002	O/Management	11/18-11/22	5	8	4	89.7	92.6	89.7	40.0	Onodera	2
5	EQM-001	Eqp. Management	11/25-11/30	6	13	1	98.8	98.2	95.5	65.0	Kimura	2
6	DM-001	Data Management	12/2-12/6	5	10	2	96.2	95.9	92.9	61.7	Sato	2
7	MM-001	Mechanical	12/16-12/20	5	11	4	93.8	92.0	88.7	67.0	Kimura	2
8	EM-001	Electrical	12/23-12/27	5	7	1	89.1	91.7	92.2	73.2	Kimura	2
9	WM-002	Well Management	1/13-1/31	19	12	2	76.4	52.0	60.1	63.0	Oshika	2
10	PN-001	P/N/Management	3/10-3/14	5	9	5	91.1	88.3	89.0	86.0	Yamamoto	2
11	WT-001	W/T/Plant	3/24-3/28	5	14	4	93.9	92.4	90.6	82.6	Yamamoto	2
12	CM-001	C/Development	4/21-4/25	5	17	3	94.5	96.3	96.0	82.6	Sasaki	2
13	PN-002	P/N/Management	10/27-10/31	5	8	5	90.1	87.2	89.8	87.4	Yamamoto	3
14	DM-002	Data Management	11/3-11/14	10	14	1	99.1	88.2	93.6	87.2	Sato	3
15	WTM-001	Tariff Management	11/24-11/28	5	13	4	93.9	92.4	90.6	82.6	Onodera	3
16	OM-003	O/Management	12/8-12/12	5	19	6	97.4	94.1	92.9	87.9	Onodera	3
17	EQM-002	E/Management	12/1-12/5	5	13	1	92.5	95.1	89.2	86.1	Kimura	3
18	EM-002	Electrical	1/5-1/15	9	13	2	89.2	91.7	91.8	90.6	Kimura	3
19	WM-003	Well Management	1/19-2/8	19	11	3	92.9	89.8	85.0	86.7	Ohika	3
20	MM-002	Mechanical	2/9-2/19	9	11	2	93.2	92.6	90.9	86.1	Kimura	3
21	WT-002	Water T/Plant	2/23-3/8	12	24	6	93.8	89.6	88.7	86.3	Yamamoto	3
22	WQM-002	Water Quality	4/6-4/10	5	21	5	91.3	84.1	86.2	84.0	Matsuo	3
23	CM-002	C/Development	5/4-5/8	5	17	4	94.1	95.3	94.1	85.0	Sasaki	3
24	MNT-001	Monitoring	10/26-10/30	5	24	1	-	-	-	-	Sato	4
25	SM-001	Sanitation/M	11/2 - 11/5	4	19	4	85.5	89.9	87.7	91.0	Kadokami	4
26	MM-003	Mechanical	11/9-11/13	5	14	2	93.2	96.3	92.4	95.7	Kimura	4
27	KS-001	Kosti Special	11/16-1/20	5	25	1	96.9	96.8	88.9	-	Kimura	4
28	WTM-002	Tariff Management	11/16-1/20	5	25	1	98.4	97.2	86.4	96.4	Onodera	4
29	PN-003	P/N/Management	12/7-12/11	5	14	4	90.4	90.0	89.7	94.0	Yamamoto	4
30	WQM-003	Water Quality	12/13-12/24	10	26	3	89.9	91.2	84.6	94.0	Matsuo	4
31	WT-003	W/T/Plant	12/21-12/31	11	9	3	93.5	93.8	94.1	92.3	Yamamoto	4
32	WM-004	Well Management	1/18-2/2	16	12	1	97.1	95.3	94.6	93.3	Oshika	4
33	CM-003	C/Development	1/26-1/29	4	15	1	91.4	95.1	84.2	92.5	Sasaki	4
34	MNT-002	Monitoring	2/1-2/4	4	20	1	-	-	-	-	Sato	4
35	OM-004	O/management	2/8-2/12	5	8	1	89.0	96.7	99.0	-	Onodera	4
36	KS-002	Kosti Special	3/1-3/5	5	9	2	96.6	97.7	90.8	93.8	Kimura	4
37	EM-004	Electricity	3/8-3/12	5	12	1	91.9	92.5	89.7	-	Kimura	4
38	KS-003	Kosti Special	3/22-3/26	-	-	-	-	-	-	-	Kimura	4
39	SM-002	Sanitation/M	8/16-8/20	5	19	5	92.3	95.1	85.3	95.0	Kadokami	4
Total				257	547	106						
Average				7	14	3	91.4	90.9	89.0	81.1		

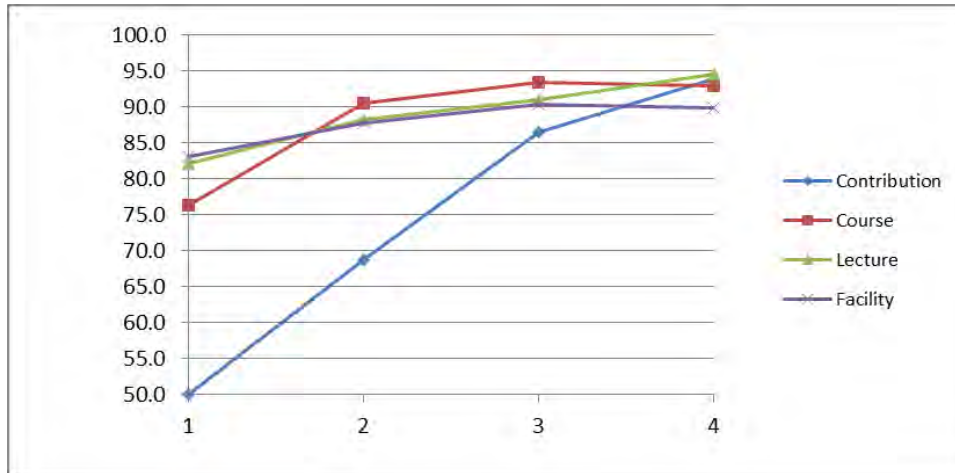


Figure 5.3.1.2 Results of the Training Indicator in White Nile SWC

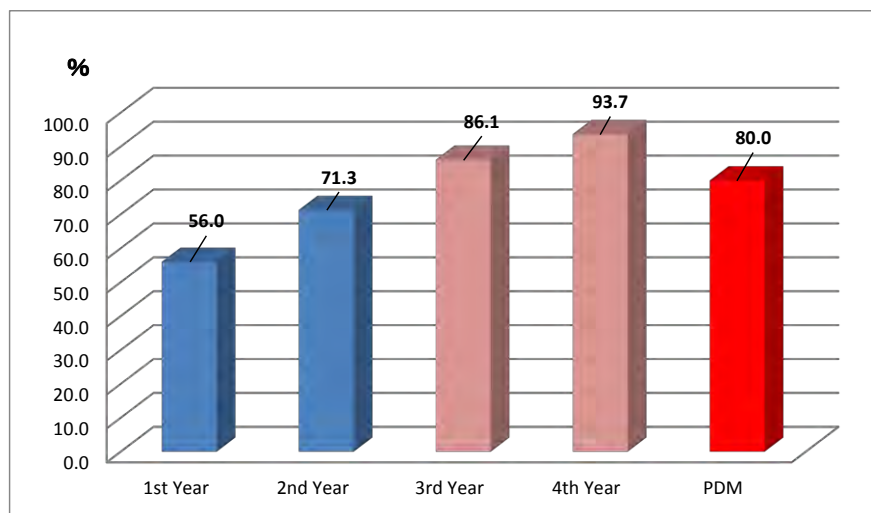




Figure 5.3.1.3 Fluctuation of Counter Part Contribution of the Training

Item	Before(2011)	After(2015)
Facility		
Staff	0	30
Budget	0	1,831,121 SDG
Course	0	47
Trainee	0	551
















Figure 5.3.1.4 Training Center of Sennar SWC

Item	Before(2011)	After(2015)
Facility		
Staff	0	32
Budget	0	1,612,765 SDG
Course	0	37
Trainee	0	563












Figure 5.3.1.5 Training Center of White Nile SWC

5-3-2. Training Pictures

Following pictures show the training activity in PSWC of the 4th year.

(1) Sanitation Management




(2) Equipment Management



(3) Pipe Network and Water Treatment Plant, White Nile

		
Orientation	Practical training on maintenance	Presentation by the JICA Expert
		
Discussion with CP	Class lesson	Practical training

(4) Management of Water Treatment

		
Study tour in Singa, Sennar, backwashing	Study tour to WTP granted by Japan in Kassala	Shite Dam

(5) Management of Water Quality







		
Class lesson	Group photo	Practical training

(6) Well Management

		
Practical training at Alsayal	Pre-pumping test	Checking borehole camera

		
Checking well at Alsenaat	Borehole check at Elnorania	Air lifting

(7) Community Development

		
Water Resources Conservation in Abrukba Village	Water Resources Conservation in Abrukba Village	Water Resources Conservation in Abrukba Village
		
Discussion at Guadiat Village	Water resources conservation activity at Guajjat	Wrap up meeting

(8) Tariff Management and Organization Management

		
Problem analysis workshop	Water Cost calculation	Fishbone Tree

5-3-3. Kosti Special Training

In April 2014, the preliminary survey for the Project for Improvement of the Water Treatment Plant in Kosti City (Kosti Project) was launched. This survey concludes that capacity building for operation and maintenance must be reinforced as a soft component plan when the Water Treatment Plant is completed. To support the soft component plan in the Kosti Project, the JICA Expert team proposed to conduct an additional training program in the 4th year.

The special training program for Kosti was implemented for the staff and operators who were expected to work in the new Water treatment Plant, although training was conducted, utilizing the existing facility. It is convenient to conduct this training program since the existing Kosti Water

Treatment Plant is located next to the Training Center of the White Nile SWC. Thus, this training program is expected to be supplemental for the soft component plan of the Kosti Project.

(1) Outline of the Training

Training for mechanical management, electricity management and equipment management are conducted. The duration is for five days for each course respectively. The main program of the training is to identify problems and how to improve, those aiming for the trainee to be able to utilize lesson learning, knowledge and skills to further the training program.

(2) Implementation of the Training

The training began with the explanation on the background of the program. The JICA Expert, Mr. Kimura, explained that the purpose of this course is to strengthen the capacity of O&M of the staff in the water treatment plant. O&M skills are an important capacity for the engineers and operators since the lifetime of the water treatment plant will be shortened if these capacities are poor.

The training was entirely conducted by the JICA Expert, unlike other normal training program. Mr. Kimura facilitated main lectures in workshop style since it is believed that it is the best way for all trainees to think about the causes and solutions by themselves. The JICA Expert began with the explanation on the concept of “workshop” itself because the JICA Expert found that most trainees were not accustomed to the workshop style where the trainee is expected to state his opinion freely.

(3) Contents of the Training

1) Mechanics Sector

The training, first, focused on checking the condition of the existing water treatment plant in Kosti before understanding the importance of O&M. Trainees were instructed to discuss what kinds of material and equipment they have, the history of the water treatment plant and challenges to the existing plant one by one.

2) Electrical Sector

Preventive maintenance is the main topic in this training. A check list was prepared in this training so as to be able to provide a routine.

3) Equipment Management Sector

According to the interview from mechanical engineers and electric engineers, it is said that the most serious challenge in the management here is lack of spare parts and consumable items due to the poor budget. However, it was found that the real cause is not a poor budget but the skill to check and quantify the requirements and cost estimation for spare parts. Therefore, the JICA Expert prepared a practical training program for managers in each division aiming at learning how to estimate the cost of O&M.



5-3-4. Water Yard Rehabilitation

The indicators for project purpose in the PDM is **“The number of annually maintained water yards** is increased to more than 20 in each PSWC.”**

Before commencement of phase 2 project, the PSWCs didn’t have enough budget and equipment, the water yard rehabilitation carried out mainly slight maintenance. However, after procured necessary equipment to the PSWCs, the water yard rehabilitation work was drastically improved (Figure 5.3.4).

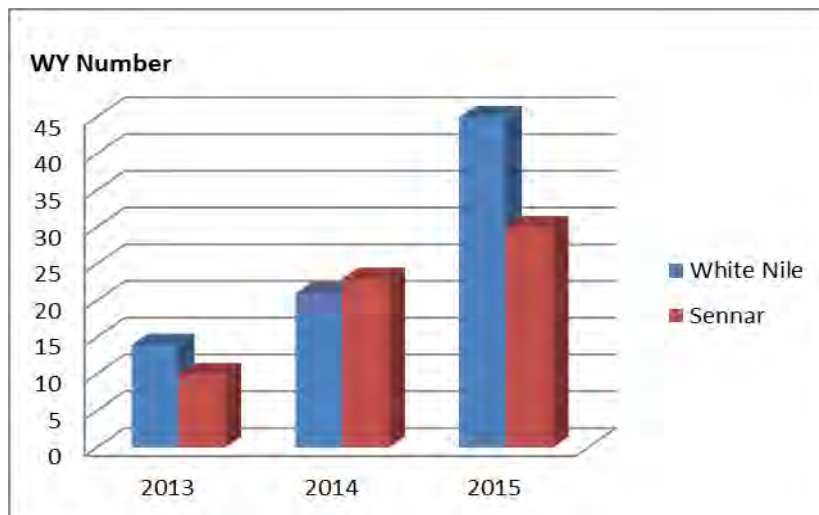


Figure 5.3.4 Water Yard Rehabilitation Results in the PSWCs

5-4. Output 3

The objectives of the Output 3 is to establish monitoring system for training system and current status of water supply facility while the DWSU and SWCs will have a network for the monitoring. It enable national and state level to share training achievement. Feedback each other brings about synergetic effect. Also, the monitoring for water facility will enhance SWCs to utilize human resources.

It is important to utilize human resources to achieve the goal of the Project. Therefore, The Output 3 aims at improvement of management and water facility rehabilitation through problem analysis as a result of the monitoring while the Output 2 focuses on HRD.

However, the monitoring system in the DWSU remains to be functioned yet although the monitoring

system was established in the DWSU. In addition, so far the monitoring target is limited to the water yards while there are several kinds of water facilities in urban and rural water supply.

5-4-1. Monitoring Activities

(1) Problem Analysis for Monitoring

1) Problem analysis for monitoring system in water supply sector in Sudan

In order to establish monitoring systems of both trainings and water yards, Phase 2 started analysis of the monitoring purpose as shown below; this is composed of 1) Current situation, 2) Analysis, and 3) Purpose of the monitoring.

Table 5.4.1.1 Problem Analysis for Monitoring System in Water Supply Sector in Sudan

Challenges in Water Sector in Sudan		
	Federal Level (DWSU)	State and On-site Level (SWCs)
Influences to water supply sector caused by no monitoring system	<ul style="list-style-type: none"> • These is a gap between needs from SWCs and provided equipment from development partners, Thus, provided equipment have been long stacked in the storage of the DWSU. • The DWSU is not able to propose new project design based on accurate data to the federal government and development partners. • DWSU cannot monitor the progress of the “National Water, Sanitation and Hygiene Strategic Plan” due to the lack of monitoring data of water supply facilities in each state. 	<p><SWC></p> <ul style="list-style-type: none"> • As well as situation at National Level, it is reported that a gap between needs of each site and provided equipment from development partners. Thus, provided equipment has been long stacked in the storage of the SWCs. • Due to lack of data of O&M cost (consumable parts, spare parts, fuels, expense for electricity, etc.) for each water yard, SWC can’t propose the appropriate water tariff rate to State Government. • When SWCs developed the “Strategic Plan”, SWC could not specify priority to be developed, due to lack of data for water consumption in the state. <p>< On-site ></p> <ul style="list-style-type: none"> • Delay of procurement of spare parts for facility, due to the lack of data of the facility • Ground water level draw down, due to over pumping. • Generator is damaged due to delay of spare parts exchange. • Control panel is damaged due to instability of the voltage. • Facilities are damaged, due to lack of capacity of operator for water yard operation. • Shortage of water supply amount, due to short operation time of the water yard
Challenges on establishment of monitoring system	<ul style="list-style-type: none"> • Items to be monitored are not been identified. • Budget for monitoring has not secured. • Data related to water supply facility has not been managed in an integrated way. • Relationship between federal government and state is fragile. • Task allocation for monitoring between federal government and state has not been defined. 	<ul style="list-style-type: none"> • Items to be monitored are not identified. • Budget for monitoring is not secured. • Data of water supply facilities is scattered in each locality office*. • Data related to water supply facilities has not been updated since it’s construction • The purpose of the monitoring for water supply has not clearly identified. • The information sharing system has not been established. • It is difficult for the monitoring of water level (Dynamic Water Level, Static Water Level) because most of water yards have not installed observation boreholes.

Challenges in Water Sector in Sudan		
Main purpose of monitoring	<ul style="list-style-type: none"> Monitoring of the progress of “National Water, Sanitation and Hygiene Strategic Pan (2011-2016)”, and planning of the next period. Coordination and promotion of the water supply projects proposed by development partners. Efficient distribution of the equipment provided by development partners to SWCs. 	<ul style="list-style-type: none"> The monitoring of the progress of “State Water, Sanitation and Hygiene Strategic Pan (2011-2016)”, and planning of the next period. Planning of the water supply facility O&M and the rehabilitation plan Implementation of the rehabilitation and O&M for water supply facility. Efficient distribution of the equipment provided by Federal Government and development partners to SWC locality offices.

*Branch office of the SWC is commonly called “Locality Office” or “Sector Office” in Sudan

Table 5.4.1.2 Problem Analysis for Monitoring system for Training System

Challenges in Water Sector in Sudan		
	Central governmental level (DWSU)	State and On-site Level (SWCs)
Influences caused by no monitoring system	<ul style="list-style-type: none"> Due to lack of training needs analysis, the DWST is not able develop the proper training plan. Inappropriate duplication of the trainees is found from each related organization, due to lack of training data. Duplication of the training program is found because information sharing system among training providers such as UN agencies has not been established 	<ul style="list-style-type: none"> Due to lack of training needs from each SWC locality office, SWC training center is not able to develop proper state training plan Inappropriate duplication of the trainees is found from each related organization, due to lack of training data. Impact of training is not measured since the training data has not been managed properly.
Challenges on establishment of monitoring system	<ul style="list-style-type: none"> Items to be monitored are not clearly identified. Training information sharing system among stakeholders (SWCs – DWST - development partners, etc.) has not been established. Relationship between Federal Government and State is fragile. Task allocation for monitoring between federal government and state is not clearly defined. 	<ul style="list-style-type: none"> Items to be monitored are not clearly identified The purpose of the monitoring is not clearly identified. Training information sharing system between DWST and SWC training center has not been established.
Main Purpose of the monitoring	<ul style="list-style-type: none"> Formulation of the training plan based on the needs in SWCs Development and update of the HRD plan Coordination of training conducted by DWST, SWC and other organizations Training impact assessment. 	<ul style="list-style-type: none"> Formulation of the SWC training plan based on the needs from SWC staff. Training impact assessment Securement of the training budget

2) Monitoring manuals, database and other related documents

As a feedback of the activity for the Output 3, the project have developed manuals, database and other related documents through monitoring activity since 1st fiscal year of the Project. Table 5.4.1.3 shows the list of the monitoring documents.

Table 5.4.1.3 Monitoring Manuals, Database and Other Related Documents

Document & Database	Water Supply Facility	Training	Prepared by;	Remarks
Monitoring Manual*	1	1	DWSU/DWST/PSWC	Responsible persons revised the draft monitoring manuals in the monitoring workshop (1 st to 3 rd), and finalized it.
State Monitoring Plan (PSWC)	2	2	DWSU/DWST/PSWC	Responsible persons developed and revised plans in the monitoring workshop (1 st to 3 rd)
Monitoring Format	3	6	DWSU/DWST/PSWC	Responsible persons revised the draft formats in the monitoring workshop (1 st to 3 rd) Water Supply Facility ; (Water Yard, Water Treatment Plant, Water Quality) Training ; (Training Needs, Training Budget, Training Course, Training Schedule, Trainee, etc.)
Daily Monitoring Sheets for Operators (PSWC)	2	-	DWSU/DWST/PSWC	Responsible persons developed it under discussion with operator in the 3 rd Monitoring Workshop. SWCs have instructed the method of the monitoring to operators in five water yard.
Monitoring Sheets for Monitoring Unit	6	-	DWSU/DWST/PSWC	Responsible persons developed it in the 2 nd and 3 rd Monitoring Workshop. (Monitoring sheet for baseline, annual and monthly survey)
Water Yard Rehabilitation Plan (Action Plan)	2	-	PSWC	Based on the monitoring implementation of water yards, SWC monitoring unit developed the rehabilitation plan. Three (3) water yards have been rehabilitated at moment of March 2013.
Training Database	-	2	PSWC/Project	The SWC training staff has developed and being updated the training database.
SWC Staff Database	-	2	PSWC/Project	In order to nominate trainees, SWC training center developed the SWC staff database.

5-4-2. Establishment of Monitoring Units in the DWSU

The “Monitoring and Evaluation (M&E) Department” was established in December 2014 as an organization for monitoring of water supply facilities.

As of March 2015, five staff have been allocated the M&E Department in the DWSU.

Meanwhile, the PSWCs established the monitoring unit in December 2014 as well when the training system in PSWCs began to run smoothly. The responsible organizations for monitoring at the DWSU and the PSWC are shown in Table 5.4.2.1 and Table 5.4.2.2.

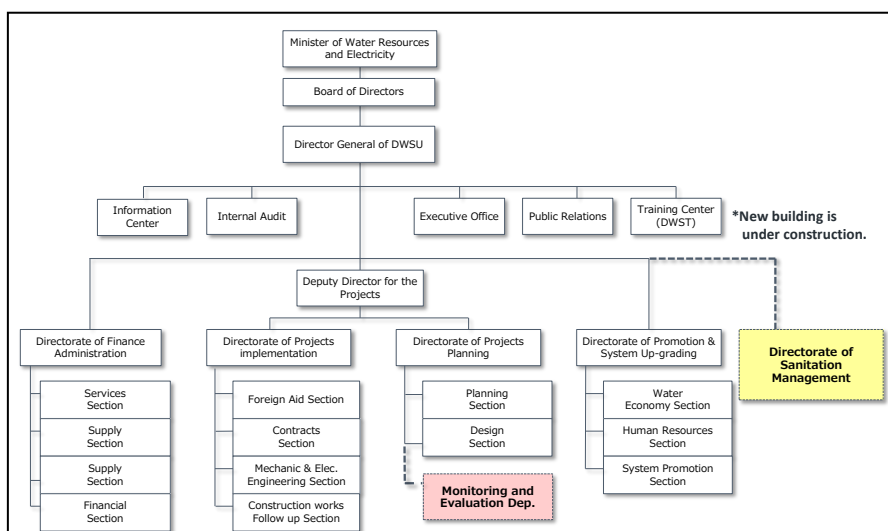


Figure 5.4.2 DWSU Structure and Monitoring and Evaluation Department

Table 5.4.2.1 Responsible Organizations for Monitoring of the Water Supply Facilities

Organization	Monitoring Unit	Established in	Staff	Main Task
DWSU	Monitoring & Evaluation Department	December 2014	5 staff	<ul style="list-style-type: none"> • Instruction of the monitoring methodology to SWCs • Feedback the analysis result to SWCs • Promotion and expansion of the monitoring activity to whole areas in Sudan • Holding Joint Seminars twice a year to share monitoring results. (April, November).
White Nile SWC	Monitoring & Evaluation Unit / SWC Locality Office	December 2014	9 staff + each SWC Locality Office (Sector)	<p><u>Monitoring Unit (SWC Headquarters)</u></p> <ul style="list-style-type: none"> • Preparation of the state monitoring plan • Data collection from each SWC Locality Office (Sector office) • Input, manage, analysis of the monitoring data • Feedback analysis result of the monitoring data to each SWC Locality Office (Sector office) • Instruction of the monitoring methodology to each SWC Locality Office (Sector office) • Data sharing among stakeholders (SWC staff, DWSU, NGOs, UN Agencies, etc.) • Regular data sharing with DWSU M&E Department (February, August) <p><u>SWC SWC Locality Offices (Sector offices)</u></p> <ul style="list-style-type: none"> • The monitoring budget • The monitoring survey on site (Baseline/Annual/Monthly). • Collection of the daily monitoring sheet from operator once a month. • Data sharing with SWC Monitoring Units
Sennar SWC	Monitoring Follow-up & Evaluation Unit / SWC Locality Office	December 2014	10 staff + each SWC Locality Office (Sector)	<p><u>SWC SWC Locality Offices (Sector offices)</u></p> <ul style="list-style-type: none"> • The monitoring budget • The monitoring survey on site (Baseline/Annual/Monthly). • Collection of the daily monitoring sheet from operator once a month. • Data sharing with SWC Monitoring Units

Table 5.4.2.2 Responsible organizations for monitoring of training

Organization	Responsible Organization	Main Staff	Task
DWSU	DWST	3 staff	<p>< Training Data Management ></p> <ul style="list-style-type: none"> • Development and update of standardized monitoring formats and the data base • Analysis of the monitoring data shared by SWCs • Feedback the analyzed results to SWCs <p>< Information sharing among stakeholders (Good Practice)></p> <ul style="list-style-type: none"> • Holding Joint Seminars twice a year (April, November) • Instruction of the monitoring methodology to SWCs <p>< Development and update of Training Plan ></p> <ul style="list-style-type: none"> • Development of Training Plan in accordance with training needs from each SWC
White Nile SWC	SWC Training Centre	5 staff	<ul style="list-style-type: none"> • Training data management • Data sharing with DWST every 3 months by email. (February, May, August, November) • Training needs collection from SWC Locality Offices (Sectors) • Analysis of the training data
Sennar SWC		4 staff	<ul style="list-style-type: none"> • Holding monitoring workshop among SWC staff. • Training data sharing among SWC staff • Information sharing among stakeholders

5-4-3. Monitoring Activities

(1) Monitoring Workshop

The PSWCs conducted three monitoring workshops in cooperation with the DWST, and the DWSU of M&E Department, aiming at formulating monitoring plans based on the draft monitoring manuals. Monitoring activities for water yards and training were followed by a series of these workshops from November 2014.

As of August 2015, monitoring for a training system is in process as scheduled in the PSWCs. Collected data have been shared with the DWST. Regarding water yards, PSWCs have completed the monitoring in model areas. The PSWCs have completed monitoring data analysis. It is also being shared with the DWST of the M&E Department as well. Thus, monitoring activities are expanding to other areas of the PSWCs. The process to achieve the Output 3 is shown in below.

Table 5.4.3 Monitoring Flow

<u>Year/Month</u>	<u>Activity</u>	<u>Training</u>	<u>Water Supply</u>
~ October 2014	Development of Draft Monitoring Manuals		
October to November 2014	Development of the PSWC Monitoring Plans (The 2 nd Monitoring Workshop)	<ul style="list-style-type: none"> Based on the Draft Training Monitoring Manual, the plan was developed. Establishment of Monitoring Unit 	<ul style="list-style-type: none"> Based on the Draft Water Yard Monitoring Manual, the Plan was developed. Establishment of Monitoring Unit
November 2014 to January 2015	Implementation	<ul style="list-style-type: none"> Training Needs, Budgets, Implementation Structure, Training Courses, Schedule, Trainee, Oversea Training, etc. 	< Water Yard (Model Area) > White Nile State ; 115 (Tandalti) Sennar State ; 116 (Sinja)
January 2015	Monitoring data sharing	<ul style="list-style-type: none"> Sharing with DWST. 	<ul style="list-style-type: none"> Sharing with DWSU M&E Department
January to February 2015	Revision of the PSWC PSWC Monitoring Plan (The 3 rd Monitoring Plan)	<ul style="list-style-type: none"> Reflect lesson learned from from the implementation. 	<ul style="list-style-type: none"> Reflect lesson learned from from the implementation.
From March 2015	Implementation (Continuance)		<ul style="list-style-type: none"> Expansion of the activities to whole areas of State

(2) Framework of Monitoring

It is difficult to cover all water yards only by the SWC monitoring units which belong to the Headquarters Office in SWCs since there is a large number of water yards scattered in the large area of the state. In order to carry out water yard monitoring effectively, it is necessary to have close coordination among the Headquarters Office of the SWC, Locality Offices (Sector offices) of the SWC which manage water yards and operators in charge of water yard operation on site.

Therefore, the third workshop in January - February 2015, agreed on the monitoring framework including coordination among related organizations. The Water Yard Monitoring Manual also clarifies this framework to assign the tasks for relevant factors such as the DWSU M&E Department, of the SWC Monitoring Unit, SWC Locality Office and operators.

To be more effective on the site survey, a daily monitoring sheet for operators was developed through discussion with operators. Operators were instructed on how to fill in the daily monitoring forms in the Monitoring Workshop.

The PSWCs are expected to instruct operators on data collection continuously.

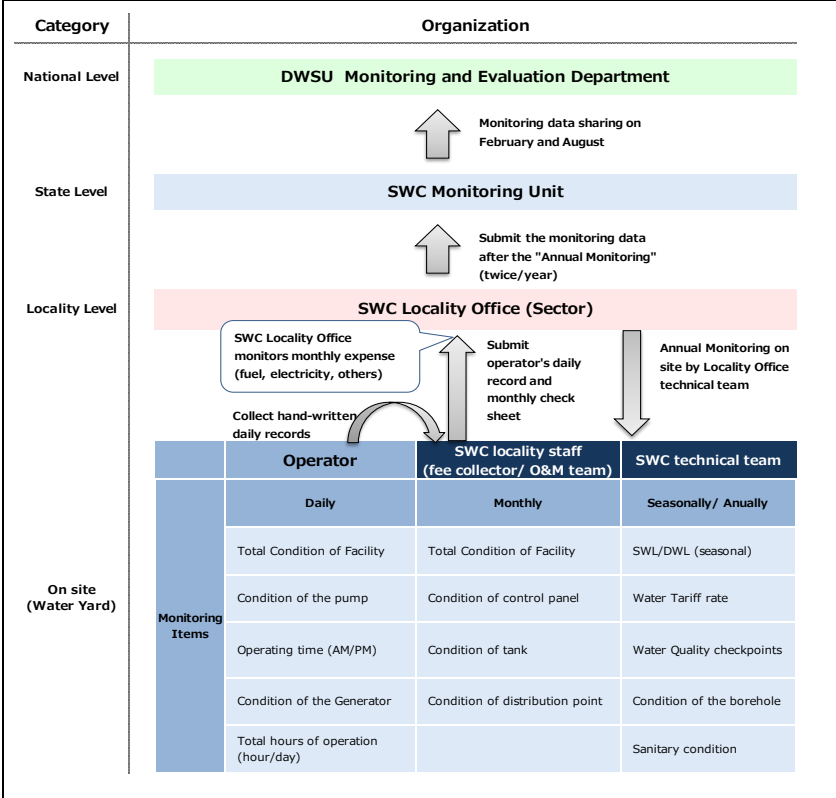


Figure 5.4.3 Outline of Monitoring Framework for Water Yards

5-4-4. Monitoring Data Sharing

(1) Monitoring for Training System

As described, monitoring data on training achievements were shared between the PSWC and the DWST in February 2015. The monitoring data are expected to be shared regularly between the SWC Training Centre and the DWST every three months (February, May, August and November) .

Table 5.4.4 Data sharing on training achievement

Training Monitoring Data		Implementation Agency	Interval of the Data Sharing (DWST↔SWC Training Centre)
1.	Training Needs	DWST,SWC Training Centre	Every three month (February, May, August and November) <Data shared by emails>
2.	Training Budget	DWST, SWC Training Centre	
3.	Implementation Structure	DWST, SWC	
4.	Training Course	DWST, SWC Training Centre	
5.	Training Schedule	DWST, SWC Training Centre	
6.	Trainee’s Information	DWST	
7.	Oversea Training	DWST, SWC Training Centre	

(2) Monitoring on Water Yards

As of March 2015, monitoring data on training achievements began to be shared between the PSWC and the DWST since January 2015. The monitoring data are expected to be shared between the PSWCs and the DWSU regularly and updated through Joint Seminars (February and August).

5-4-5. Expansion of monitoring activities

(1) Activities of DWSU M&E Department and DWST

1) Training program for monitoring (March 15-19, 2015)

In the wake of the success in the PSWC, the DWST started a training program for monitoring and evaluation. It aims at technical transfer of the monitoring system to other SWCs. The target trainees are staff who will be assigned to a monitoring unit in each SWC. The training instructed them about a series of all process of monitoring such as planning (scheduling and budgeting), survey methods, data input & analysis and utilization of collected data.

This training program also had a chance to review the monitoring manual and discussed on how the manual should be prepared. The DWSU will update it based on the feedback.

2) Holding Joint Seminars (twice a year)

The DWSU are expected to hold Monitoring Joint Seminars at Khartoum to introduce monitoring activities of PSWCs as good practices aiming at spreading monitoring activities to other SWCs.

(2) Activities of PSWCs

1) Training program on Monitoring (Mid – end of April, 2015)

PSWCs conducted training courses to transfer the knowledge and skills of monitoring to other locality offices. The target trainees are personnel who will be assigned to monitoring units. Planning (scheduling and budgeting), survey methods, data input & analysis and utilization of collected data are instructed.

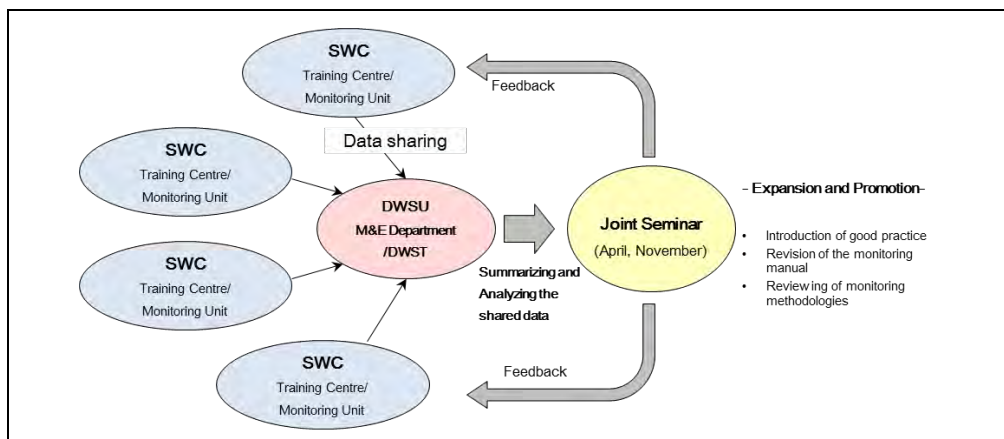


Figure 5.4.5.1 Reinforcement of Monitoring System in Sudan through Joint Seminars

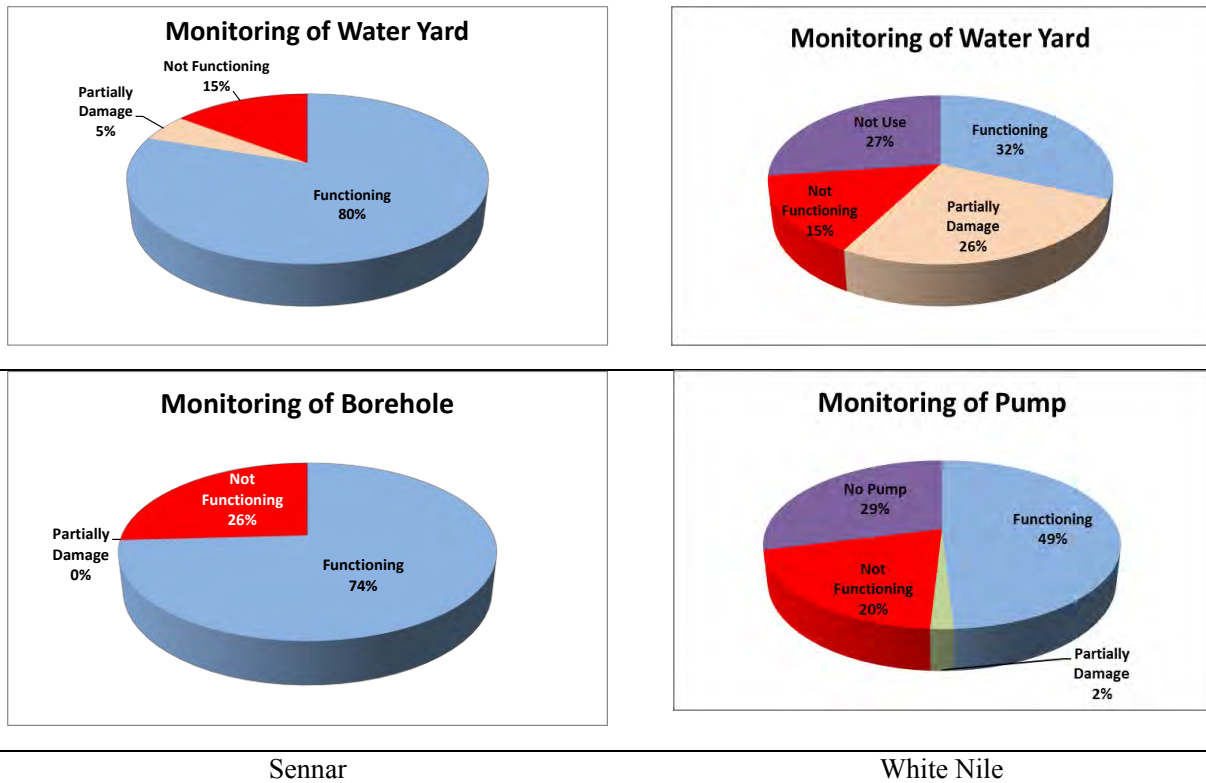


Figure 5.4.5.2 Monitoring Results of the PSWCs

5-4-6. Utilization of Monitoring Data

(1) Monitoring Data on Training Activity

The monitoring data analysis is followed by the formulation of the training plan for three years (2016 – 2018). The PSWCs’ training plan is composed of the following eight points, referring to the “Strategic Plan”, namely, 1) Mission of the Training Centre, 2) Objective of the Training, 4) Training Methodology, 5) Training Target, 6) Training Schedule, 7) Training Budget, 8) Facility and Equipment. Meanwhile, the DWST formulated a “Human Resources Development Manual” and “Mid-term/Long-term Human Resources Development Plan”, referring to the monitoring data.

The expected monitoring cycle is shown in Figure 5.4.6.

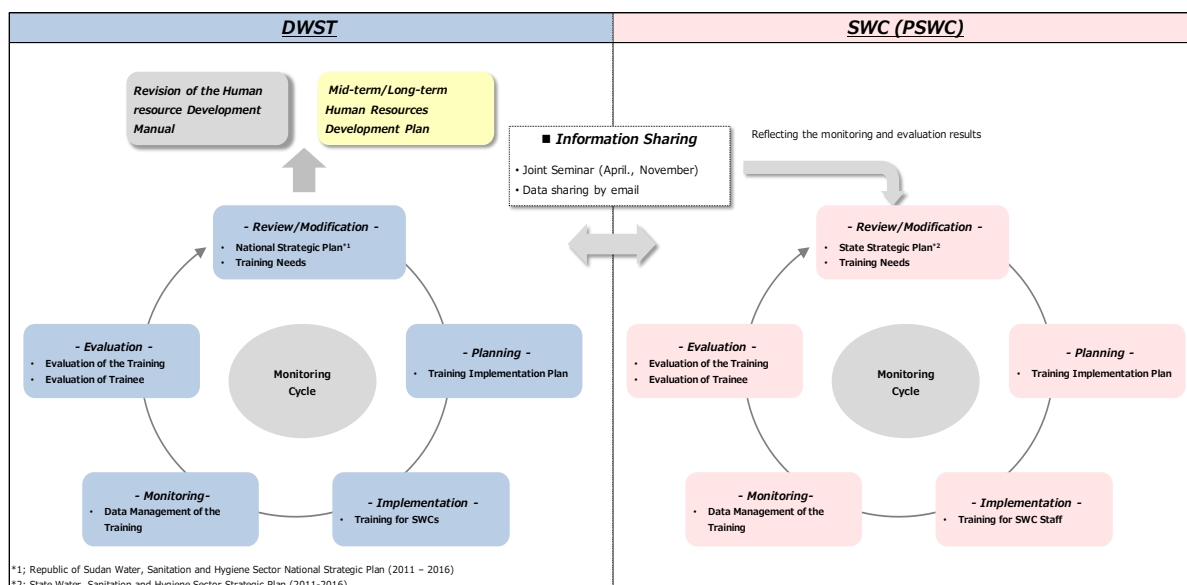


Figure 5.4.6 Monitoring Cycle (For Training system)

(2) Monitoring of Water Yards

Water yard monitoring data is expected to be utilized to improve the water supply situation of each state. To utilize the monitoring data effectively, it is necessary to prepare plans such as a Rehabilitation Plan, O&M Plan, Equipment Procurement Plan, etc. based on the data analysis.

Third Monitoring Workshop focused on the formulation of the Water Yard Rehabilitation Plan of model areas in PSWCs.

The outline of the Water Yard Rehabilitation Plan is shown below.

Table 5.4.6 Water Yard Rehabilitation Plan in PSWCs

Title	Contents
Analysis of the monitoring data	<ul style="list-style-type: none"> Condition of facilities (generator, pump, fence, control panel, elevated tank, etc.) Water quality
Period of the rehabilitation	<ul style="list-style-type: none"> From February 2015 to February 2016 for one year
Selection of the water yard to be rehabilitated	<ul style="list-style-type: none"> Water yards located in area suffering from drinking water shortage High cost effectiveness (Low cost for rehabilitation but many beneficiaries)
Target water yards	<ul style="list-style-type: none"> White Nile State; 10 (Tandalti Locality) Sennar State; 14 (Sinja Locality)
Contents of the rehabilitation and budget	<ul style="list-style-type: none"> Required rehabilitation types and necessary costs
Implementation schedule	<ul style="list-style-type: none"> Scheduling based on the type of rehabilitations

5-4-7. Monitoring Manuals

The monitoring manuals both for training system and water yard monitoring were finalized based on monitoring activity results, and the final versions were distributed to other SWCs at the 9th JCC in 11th March 2015.

The process to finalize monitoring manuals is shown in Figure 5.4.7.

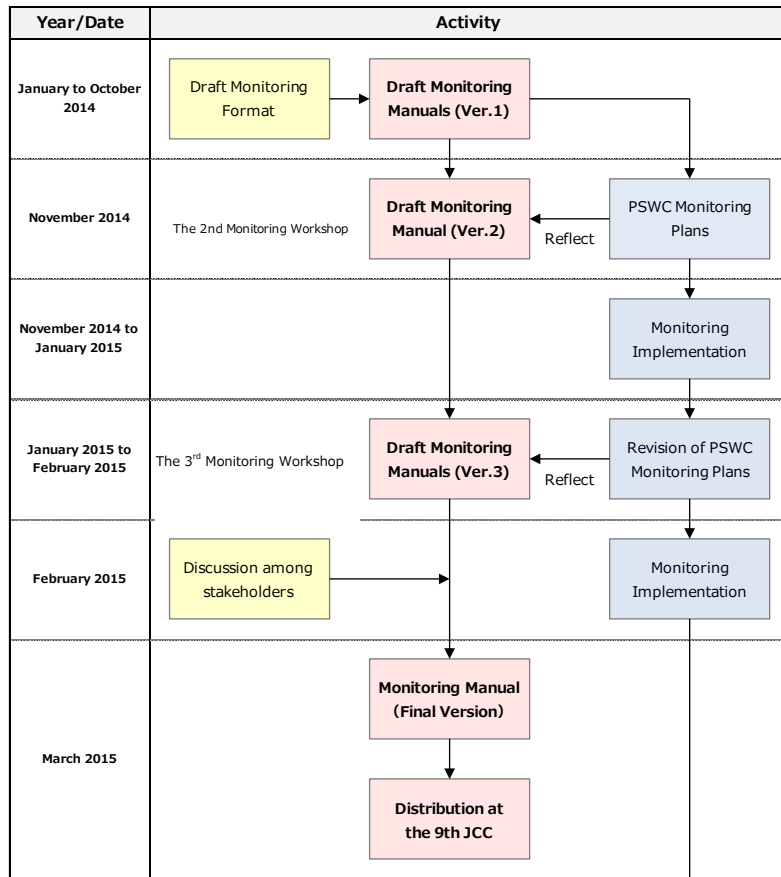
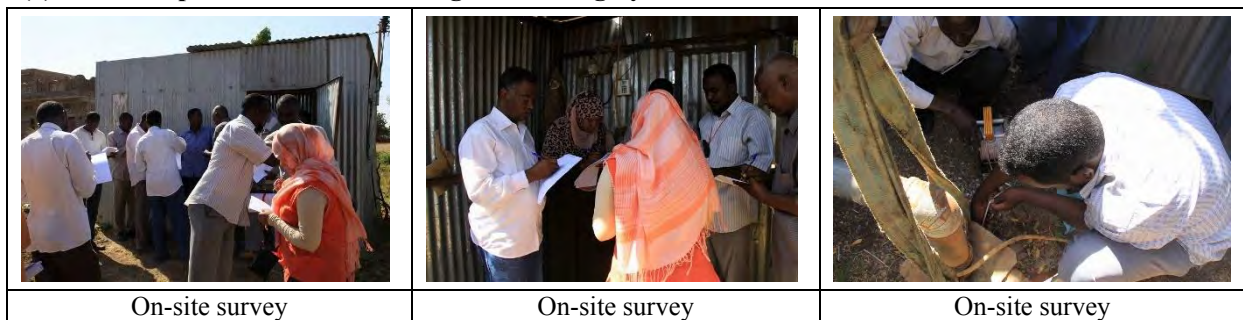


Figure 5.4.7 Finalization of Monitoring Manual

The Manuals in March 2015 are thought to be the first edition so as to be updated by the feedback of the future monitoring activity.

5-4-8. Pictures on the Monitoring Activity




(1) Workshop Aimed at Establishing Monitoring System in the PSWCs



(2) Monitoring Workshop (Sennar)



(3) Monitoring Workshop (W.Nile)

		
On-site survey	On-site survey	Data processing

(4) Training course in DWST

		
Practical training in Kilo Ten Workshop	GPS handling instruction	Measuring Water level

5-5. Output 4

In order to support to establish training system in other SWCs, the Project provided a certain amount of equipment to six SWCs for the training purpose. Those six SWCs were selected from the SWCs which were more proactively motivated. Providing training equipment to the SWCs has great impact to promote training center establishment. For instance, one of the PSWCs, Sennar SWCs established a LAN network system in the headquarters office by their own effort. It was triggered by computer installation which was provided by the Project. It was found that providing the equipment triggered to construct training center in other SWCs.

It was not completed for all SWCs to establish training system when the Output 4 expects the result in every SWCs. However, even though not all SWCs, training units have been established in most SWCs. Some SWCs even have training plans. It will take more time to complete the Output 4 since civil wars in Sudan still remains.

5-5-1. Trainee at the DWST and the SWCs

Table 5.5.1 shows the number of trainees at the DWST and the SWCs. In Phase 1, there were 1225 trainees in the DWST. At the beginning of Phase 1, only the Khartoum SWC had experience to conduct training, and the number of trainees was reported as 38. However, it was also found that some SWCs conducted training during the period of Phase 1. It was voluntary activity by the SWC staff who have experienced training courses in DWST. The DWST transferred the importance of human resource development to other SWC staff.

After launched Phase 2, the training activity in PSWCs and Gezira SWC became proactive. The total numbers of trainees amounted to 1,296 in 2013. Furthermore, it is expected that 2,225 persons will

be trained in 2015. The grand total number of trainees from 2008 to 2015 is approximately 7,000.

1,301 trainees in Gezira state stands out compared with other SWCs. This numbers represents same as the total in both PSWCs. Thus the training in Sudan water sector is being improved although there are some SWCs which are not so active. For instance, trainees of Khartoum, Gedaref, West Kordofan, Central Darfur and East Darfur SWCs are less than 100 persons. Therefore, these SWC need further support by the DWST except Khartoum SWC since staff of Khartoum SWC are able to be trained at the DWST, it is not a problem.

Table 5.5.1 The Number of trainee at DWST and SWCs

No.	Phase Organization	1				2				Total
		2008	2009	2010	2011	2012	2013	2014	2015	
0	DWST	0	182	231	219	287	405	345	432	2,101
1	Northern	0	0	0	20	20	20	104	237	401
2	River Nile	0	20	20	20	16	96	53	40	265
3	Khartoum	38	0	0	0	0	0	0	0	38
4	El Gezira	0	0	30	30	31	286	302	622	1,301
5	Gedaref	0	0	10	20	30	0	0	0	60
6	Kassala	0	0	25	24	20	13	14	155	251
7	Red Sea	0	0	20	20	0	0	20	80	140
8	Sennar	0	0	11	16	92	174	155	130	578
9	W.Nile	0	0	20	26	82	133	222	86	569
10	N.Kordofan	0	0	18	26	21	30	160	207	462
11	Blue Nile	0	0	22	7	35	10	0	96	170
12	S. Kordofan	0	0	30	35	37	40	11	0	153
13	W.Kordofan	0	0	0	0	0	0	17	0	17
14	N.Darfur	0	0	0	30	30	35	13	140	248
15	W.Darfur	0	0	0	35	44	20	20	0	119
16	S.Darfur	0	0	0	20	25	34	45	0	124
17	C.Darfur	0	0	0	0	0	0	44	0	44
18	E.Darfur	0	0	0	0	0	0	35	0	35
Total		38	202	437	548	770	1,296	1,560	2,225	7,038
		1,225				5,851				

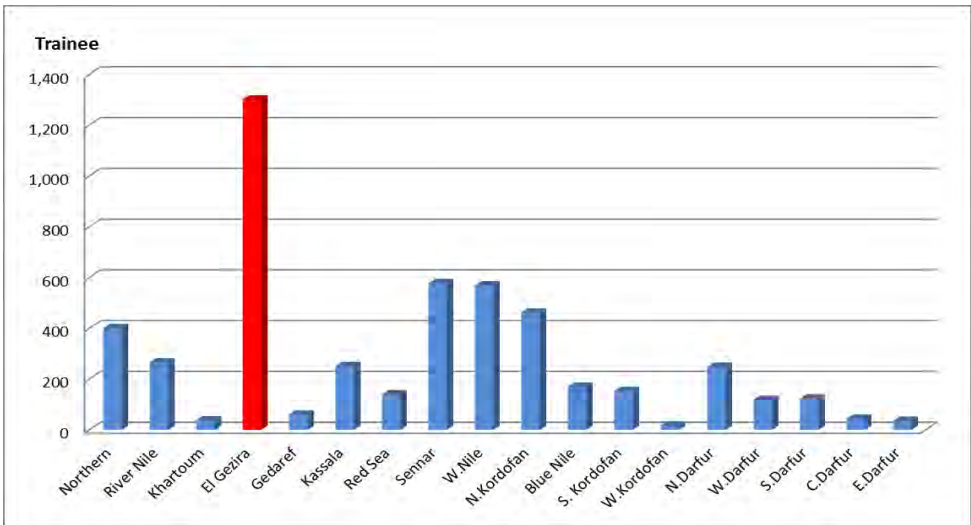


Figure 5.5.1 The Number of Trainee at SWCs by Own Training

5-5-2. Training Implementation in the DWST and the SWCs

In Sudan, Human resources development for water supply has started since June 2008. Before then, most of the SWC had no training system except Khartoum SWC which had experiences of oversea training.

Table 5.5.2 shows the status of training centers establishment in Sudan water sector. As shown in Table 5.5.2, only the DWST and Gedaref state constructed the training center in 2008. At that time, both training centers did not equipped well and not functioned as well.

However, as of September 2015, 12 SWCs training systems have already constructed a training center, and two others are supposed to be construct training centers in the near future. Sennar state, which has been faced with the problem of building quality, decided to reconstruct the training center within two years under the approval of the Minister of Public Utility and Physical Planning.

In 2015, training centers in 10 SWCs are working at the state level. It is significant result, comparing in 2008.

Table 5.5.2 Training Center in Sudan

No.	Organization	Training Center				Training				Remarks
		2011		2015		2011		2015		
0	DWST	Completion	1	Completion	1	On going	1	On going	1	
1	Northern	Non	0	Completion	1	Non	0	On going	1	
2	River Nile	Non	0	Completion	1	Non	0	On going	1	
3	Khartoum	Non	0	Non	0	Non	0	On going	0	Substitute of DWST
4	Er Gezira	Non	0	Completion	1	Non	0	On going	1	
5	Gedaref	Partially	0.5	Completion	1	Non	0	On going	0	Training Plan Only
6	Kassala	Non	0	Completion	1	Non	0	On going	1	
7	Red Sea	Non	0	On going	0.5	Non	0	On going	1	
8	Sennar	Non	0	Completion	1	Non	0	On going	1	Expansion of Center
9	White Nile	Non	0	Completion	1	Non	0	On going	1	
10	North Kordofan	Non	0	Completion	1	Non	0	On going	1	Prohibition Area
11	Blue Nile	Non	0	On going	0.5	Non	0	On going	1	Prohibition Area
12	South Kordofan	Non	0	Non	0	Non	0	Non	0	Prohibition Area
13	West Kordofan	Non	0	Non	0	Non	0	Non	0	Prohibition Area
14	North Darfur	Non	0	Completion	1	Non	0	On going	1	Prohibition Area
15	West Darfur	Non	0	Completion	1	Non	0	Non	0	Prohibition Area
16	South Darfur	Non	0	Completion	1	Non	0	Non	0	Prohibition Area
17	Central Darfur	Non	0	Non	0	Non	0	Non	0	Prohibition Area
18	East Darfur	Non	0	Non	0	Non	0	Non	0	Prohibition Area
Total		1.5		13.0		1.0		11.0		



* 1 : 100% 0.5 : 50% 0 : 0%

5-5-3. Training Centers Construction in the SWCs

It was the White Nile SWC that first established a training center when Phase 2 started in November 2011. The Sennar SWC training center was constructed in April 2012. Besides the PSWCs, the Gezira SWC has constructed a training center in December 2012 by their own efforts. The Northern SWC and North Kordofan SWC also constructed training centers in 2014, with the JICA Experts and the DWST staff support. To save the cost, those SWCs utilized the existing building to be renovated. Another factor to accelerate the construction is that the SWCs Director Generals secured the construction budgets by negotiating with the State Ministry of Finance.

Figure 5.5.3.1 and Figure 5.5.3.4 show the training status of SWCs before-and-after of the Project.

These SWCs have started training at the state level, supported by the project members and the DWST staff. It is being expanded to other states such as Kassala, Gedaref, Blue Nile and North Kordfan SWCs.

Item	Before(2011)	After(2015)
Facility		
Staff	0	10
Budget	0	717,240 SDG
Course	0	68
Trainee	0	1,301














Figure 5.5.3.1 Training Center of Er Gezira SWC

Item	Before(2012)	After(2015)
Facility		
Staff	0	15
Budget	0	621,212 SDG
Course	0	39
Trainee	0	462
















Figure 5.5.3.2 Training Center of North Kordofan SWC

Item	Before(2011)	After(2015)
Facility		
Staff	0	17
Budget	0	858,040 SDG
Course	0	14
Trainee	0	401






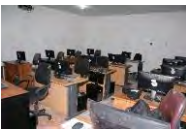









Figure 5.5.3.3 Training Center of Northern SWC

Item	Before(2012)	After(2015)
Facility		
Staff	0	15
Budget	0	306,062 SDG
Course	0	9
Trainee	0	265












Figure 5.5.3.4 Training Center of River Nile SWC

5-5-4. Development of Manuals

Table 5.5.4 shows the technical output in Phase 2 including manuals. The Monitoring Manual and Human Resources Development Manual were prepared in English while the other manuals were prepared in Arabic and English. Due to the large file size, those documents are attached in the CD of this final report. Figure 5.5.4 shows some snippet view of the Human Resources Development Manual.

Table 5.5.4 Prepared Manuals and Plans for Phase 2

1. Mid and Long Term of Human Resources Development Plan	English, Arabic
2. Training Course Cariculum,Text Book and Manuals for DWST	English, Arabic
3. Training Plan	English, Arabic
4. Training Course Cariculum,Text Book and Manuals for SWC	English, Arabic
5. Monitoring Manual	English
6. Human Resources Development Manual	English

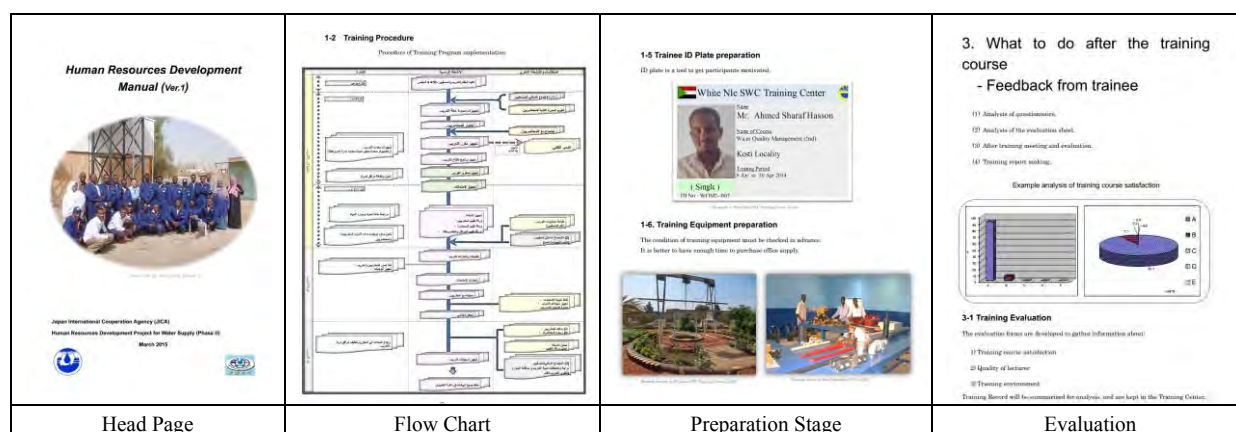


Figure 5.5.4 Sample of Manual

5-5-5. Joint Seminar

Holding Joint Seminars started since Phase 2 project. The purpose of the Joint Seminars is to encourage the SWCs to establish a training system. Those seminars offered valuable opportunities to share good practices in SWCs, and technical advices while it is good chances for the leaders of SWCs to convene in one place to discuss various challenges. The seminar also contributes to awareness raising of people concerned as it was found that a series of seminars accelerated the establishment of training centers in SWCs.

During Phase 2 project period, 7 Joint Seminars were implemented in total. The contents of the Joint Seminars are shown in Table 5.5.5

Figure 5.5.5.1 shows the participants. It is clear that the numbers of participants are increasing from the beginning to the end of the seminar. The participant's organizations in the 1st seminar was four, but in the final seminar 15 organizations participated. Figure 5.5.5.2 shows the comparison of the participants of each SWC. The attendance of the DWST, JICA Experts and Sennar SWC were 100 %. However, that of Gedaref, Khartoum and Darfur SWCs was low.

Table 5.5.5 Summary of all Joint Seminars

No	Year& Date	Venue	Main Topics	Participant
1	2012.04.18	Sennar SWC Training Center	①Explanation of the significance of the training center in Pilot State Water Corporation by JICA Expert	41 persons (Sennar SWC,White Nile SWC,JICA Experts)
2	2012.11.10	El Gezira SWC Training Center	① Inspection of the Training Center ②Explanation of the Training Center	22 persons (DWST,White Nile,Sennar,Northern,El Gezira,JICA Experts)
3	2013.02.11	White Nile SWC Training Center	①Progress of the Training Center Construction. Information exchange about training activity ②Role sharing between DWST and SWCs	30 persons (DWST,Gezira, Red Sea,Sennar,North Kordofan,White Nile,JICA Experts)
4	2013.11.17	White Nile SWC Training Center	①Good example of the maintenance of White Nile Training center ②The Best Award of the Training Center ③Explanation of the Training Center and Training Course by each SWC	50 persons (DWST,Gezira, Kassala, Sennar,Blue Nile,North Kordofan,South Kordofan,West darfur, Hawata,JICA Experts)
5	2014.04.28	North Kordofan SWC Training Center	① Inspection of the new Training Center ②The Best Award of the Training Center ③Presentation of the water supply problems by each SWC	70 persons (DWST,Northern,River Nile,Red Sea,Geziura,Sennar,North Kordofan,South Kordofan,North Darfur,Hawata,JICA Experts)
6	2014.11.27	Northern SWC Training Center	①Introduction of new Training Center of Northern SWC ②Presentation of the Training center activity by each SWC	40 persons (Northern,River Nile,White Nile,Sennar,Gedaref, Red Sea,North Kordofan,Gezira,Hawata,West Darfur,JICA Experts)
7	2015.09.02	DWST Training Center	① Activity of each SWC Training Center ② Information Sharing for Future Activity	50 persons (Northern,Khartoum,Er Gezira,White Nile,Sennar,Gedaref, Red Sea,North Kordofan,West Kordofan,Blue Nil,East Darfur,Central Darfur,JICA Sudan, Embassy of Jaapan, JICA Mission,JICA Experts)



Photo of the 6th Joint Seminar in Northern SWC

Group photo of all participants

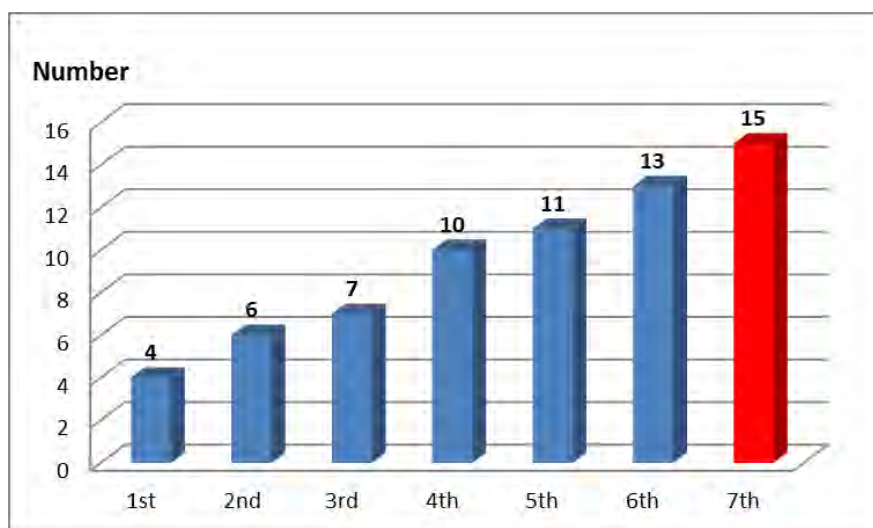


Figure 5.5.1 Participants of organization for all Joint Seminars

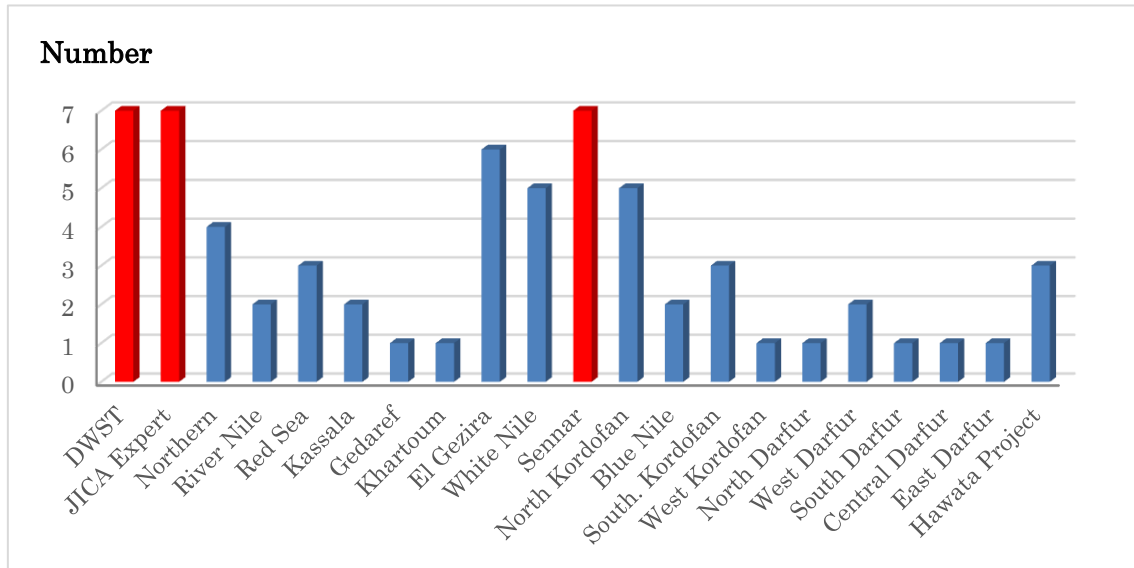


Figure 5.5.5.2 Participants of SWCs for all Joint Seminars

6 Other Outputs

6-1. Procurement

Phase 2 procured training equipment during the second and third year. That equipment is provided to two PSWCs and other six SWCs. All equipment was procured in Sudan and Japan, utilizing the database in the JICA Sudan Office and the database in Phase 1. Around 56% of the equipment was for PSWCs, 17% was for the DWST and 27% was for other six SWCs.

The total amount was 2,420 million Japanese Yen, which is three times bigger than the total amount of equipment procured in Phase 1. This was because Phase 2 decided to add the distribution target SWCs.

Sudanese capacity for operation and maintenance is reliable enough to manage the equipment. As described, the equipment provision promoted SWCs to establish a training center. Thus, the JICA Expert believes that it is important to provide equipment for technical cooperation projects.

Table 6.1 Equipment supplied by JICA for Phase 2 Project

Organization	Well Management	WY Management	Pipe Management	Water Quality	Survey	Office	Training	Total
1.DWST	11,278	13	0	11,986	7,371	3,064	8,597	42,308
2.Sennar	46,232	8,931	1,612	2,196	286	7,167	51	66,474
3.White Nile	49,076	8,931	1,612	2,196	286	7,167	51	69,319
4.Northern	2,712	1,693	1,612	3,007	0	3,733	0	12,757
5.River Nile	63	1,380	0	3,007	0	2,577	0	7,027
6.El Gezira	2,837	3,471	1,612	3,813	190	5,361	0	17,285
7.Gedaref	63	1,380	0	3,025	0	1,489	0	5,957
8.Red Sea	63	2,349	0	2,545	0	2,941	0	7,898
9.North Kordofan	2,712	2,388	1,612	3,025	0	3,436	0	13,173
Total	115,034	30,536	8,062	34,799	8,133	36,934	8,700	242,198

Unit: 1000 Yen

(1) For DWST



Crane Truck



4 WD Pick up Car



Micro Bus



Bromic Acid Analysis Kit



Air Conditioner



Photocopy and Printer

(2) For PSWC



Crane Truck



4WD Pick up Car



Riser Pipe



Generator



Air Compressor



Pumping Test Equipment

(3) For 6 SWCs



Generator



Submersible Electric Pump



HDPE Welding Machine



Turbidity Meter



Desk top Type Computer



Photocopy and Printer

6-2. JCC

Phase 2 has held JCC meetings 10 times in total since 2011 (Table 6.2). Major attendants are the Embassy of Japan, JICA Sudan Office, JICA Experts, DWSU, DWST and SWCs. Every JCC discussed project activities, presentation of outputs, and result of Mid-term Review and the Terminal Evaluations. In addition, the JCC members discussed challenges in the water sector in Sudan.

Table 6.2 Participants of JCC from SWCs

No	SWC	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Total
1	Northern	1	1	1	1	1	1	2	3	1	2	14
2	River Nile	1	2	1	1	1	0	0	1	1	0	8
3	Red Sea	1	2	1	0	1	0	2	1	0	1	9
4	Kassala	1	1	1	0	0	1	1	4	1	1	11
5	Gedaref	0	1	0	0	1	0	1	1	0	0	4
6	Khartoum	1	0	0	0	0	3	0	0	0	2	6
7	El Gezira	3	1	2	2	3	5	3	3	3	2	27
8	W.Nile	1	3	2	2	1	2	2	3	5	2	23
9	Sennar	0	3	2	2	2	1	1	2	5	2	20
10	N.Kordofan	1	1	1	0	1	0	1	2	0	2	9
11	Blue Nile	1	1	0	2	1	1	1	1	1	1	10
12	S. Kordofan	0	1	2	0	1	0	1	0	1	1	7
13	W.Kordofan	0	0	0	0	1	0	1	1	1	1	5
14	N.Darfur	1	1	1	1	1	1	1	1	1	0	9
15	W.Darfur	2	1	1	2	2	0	1	0	0	0	9
16	S.Darfur	2	1	1	1	2	1	1	1	0	0	10
17	C.Darfur	0	0	0	2	2	1	1	1	1	1	9
18	E.Darfur	0	0	0	1	1	1	1	1	0	1	6
19	El Hawata WC	0	1	0	1	2	1	1	2	1	1	10
Total		16	20	16	17	22	18	21	26	21	19	196

Figure 6.2 shows the participant lists in Phase 2. The biggest numbers of participation is from the El Gezira SWC as they sent 27 persons in total. White Nile SWC sent 23 persons as well. Sennar

SWC sent 20. In sum, it proved that Gezira SWC was the most proactive State, which sent people to the JCC much more than those of PSWCs. In contrast, Gedaref SWC proved to be worst as this SWC sent only four people in total.

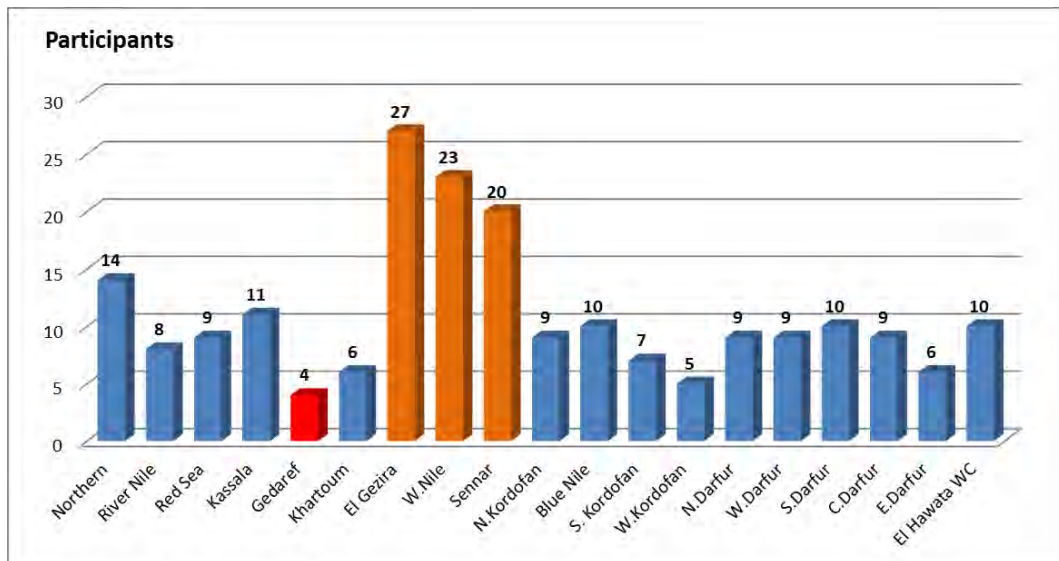


Figure 6.2 Participants of JCC from SWCs



Award for encouragement to the Director General of DWSU by Ambassador of Japan



Presentation by the Project Leader



Group Photo of all JCC Members

6-3. Collaboration with other Development Partners

As of 2015, four international agencies participated in the training program in the DWST. In most cases, international agencies tend to manage their own project without collaboration with other organizations (Figure 6.3.1). However, these agencies are getting involved in the training program in the DWST as they recognize the impact of the training. The first organization, which did cooperation with JICA, was UNOPS. Then, IOM and AfDB joined the program in DWST (Figure 6.3.2). Both agencies have a similar project area where conflict is still going on such as South Kordfan and the Darfur region.

Thus, it became widely recognized that human resources development for the water supply sector was initiated by JICA. It also implies that Japan's efforts for human resources development since 2008 resulted in success as a first runner. As a result, such collaboration among international agencies has been realized.



Meeting with UNOPS



Trainees from UNOPS



Trainees from AfDB

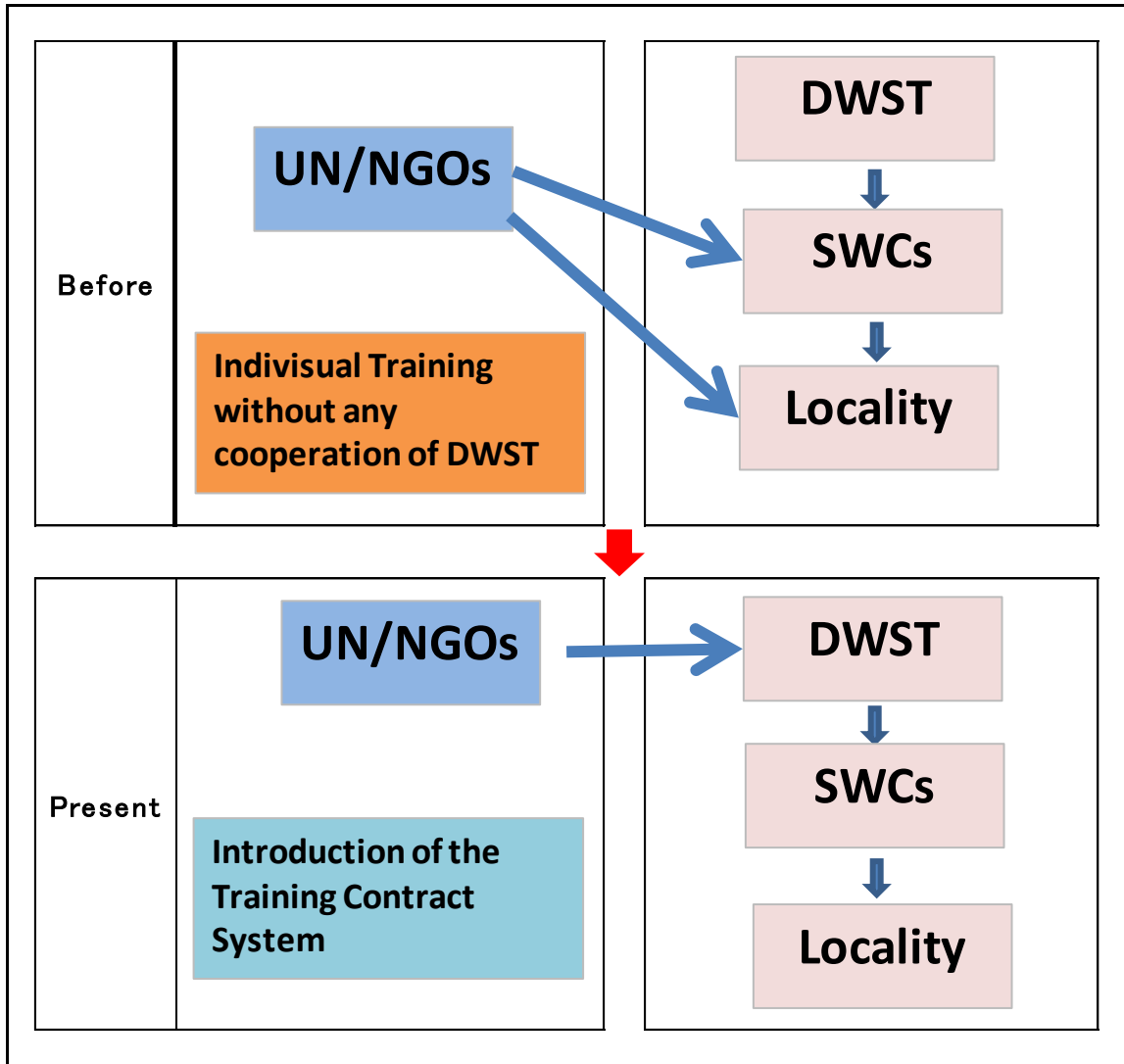


Figure 6.3.1 Changing of the Training System

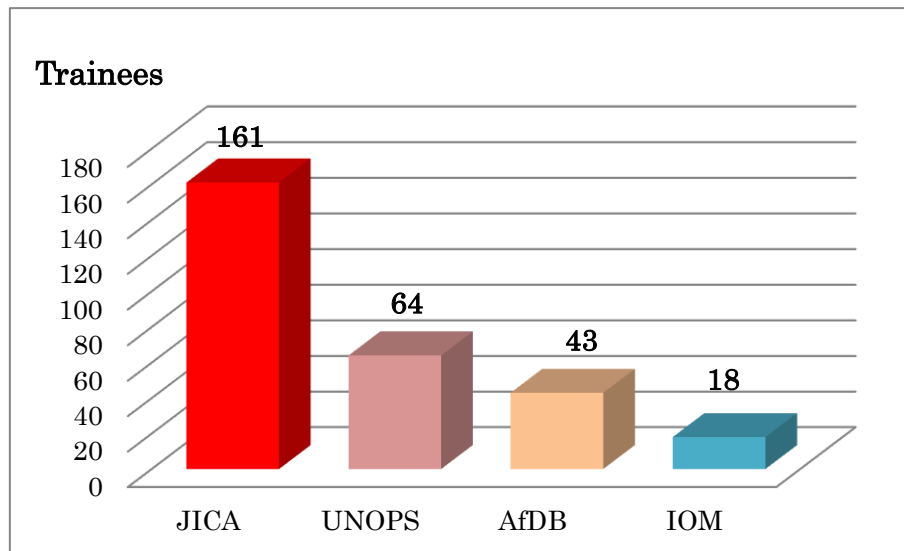


Figure 6.3.2 Acceptance of the Trainees from International Organizations

6-4. Collaboration with Morocco

The PDM of Phase 2 expects overseas training; however, target countries are not specified. Discussion on candidate countries concluded that Morocco was the most appropriate country.

Good security, the Islamic countries in Africa, and Mr. Uemura's much experience in Morocco were the main reason of this preference.

In the past, the water supply coverage in Morocco used to be extremely low, especially in rural areas until 1980s. To improve this situation, the Government of Morocco formulated a national strategic plan (PAGER) for water sector. It led many donors and international organizations to be involved in the development projects. Japan became the first country to have implemented Grant Aid projects in Morocco. Ten years successive project implementation has achieved great improvement of water supply coverage up to more than 94 percent.

It was meaningful for the Sudanese to learn the development process in Morocco. Not only the process but also advanced practices of water facilities and water sources development, and operation and maintenance (O&M) would be definitely applicable in Sudan.

The importance of the overseas training was to bring out changes in thinking. Generally, if the trainees of developing countries attended the training in Japan and visited water supply facilities, they might feel admiration just by the idea that "Japan has already been an advanced country". The Moroccan case, on the other hand, can be more impressive to the Sudanese trainees because the water supply condition of Morocco was similar to Sudan 20 years ago, but it has been improved by efforts of the people in Morocco. To show the Moroccan success, this overseas training should be conducted continuously to encourage their ownership.

In addition to the overseas training in Morocco, several Moroccan experts have been invited to Sudan during Phase 2. Generally, the Moroccan service mind as a public servant seemed much higher than the Sudanese and many of them were quite competent. The Moroccan experts visited the DWSU and the SWC offices to have meetings to exchange their opinions. Many Sudanese were impressed by

their high motivation. Arabic communication was also highly appreciated as some Sudanese are less familiar with foreign languages.

Table 6.4.1 Invited Moroccan Experts

No.	2012		2013		2014					
1		ONEE		ABHSMD		ONEE				
	Mr. Abderrafii Mardi		Mr. NRHIRA Abdessadek		Mr. Samir Bensaid					
2		ONEE		ONEE		ABHBC				
	Mr. Outair Abdelouahed		Mr. Driss Ben Abdellah		Mr. Zerouali Abdelaziz					
3		ONEE		ONEE	/					
	Mr. Mohamed Laouan		Mr. Ahamed Garbaoui							
4		ONEE		ONEE			/			
	Dr. Mustapha MAHI		Dr. Mahmoud HAFSI							
5		ONEE	/						/	
	Mr. HILALI Jawad									
Total	5				4					
	11									



Study at the Nile River



Jabel Aulia Water Treatment Plant


















































Discussion with secretary of Federal Ministry of MWIRE

Table 6.4.2 Outline of Training in Morocco

	Period	Theme	Participants	Reporting
0	2012.03.18-03.29	<ul style="list-style-type: none"> • Visiting and learning about water resources management and drinking water supply in urban area and rural areas, water-saving irrigation, sewage treatment, waste water recycle plan • Discussion with organizations receiving Sudanese trainees (National Drinking Water and Electricity Corporation in Morocco (ONEE), National Water Corporation (ONEP), Department Water, Hydraulic Basin Office of Tenshift (ABHT), Hydraulic Basin Office of Sus Massa Darra (ABHSMD)) 	<ul style="list-style-type: none"> • DWST (1), JICA Expert (1) 	2012.3.29
1	2012.05.13-05.27 (14 days)	<ul style="list-style-type: none"> • Visiting and learning from advanced training facilities, training implementation framework, water resources development & protection, urban water supply system, rural water supply system, sewage treatment & wastewater recycle, water-saving irrigation, and discussion with relevant personnel of the Moroccan side. • Study about how Morocco could achieve the most advanced water resources development and human resources development as well as water supply in Africa. 	16 persons (Target group: Engineers of SWCs) <Trainees> DWST (1), Sennar state (2), White Nile state (2), Kassala state (3)**, Darfur areas (3)*, South Kordofan state (1)*, Blue Nile state (1)* <Organizers> Coordinator (1), JICA Experts (2)]	2012.6.20
2	2013.04.06-04.14 (9 days)	<ul style="list-style-type: none"> • Lecture and site visits in ONEP, Department of Water, ABHT, ABHSMD, Department of Equipment • Fez water treatment plant and water supply facilities • Overall training management 	17 persons (Target group: SWCT director, Engineers) <Trainees> DWST (1), Northern state (1), River Nile state (1), Khartoum state (1), Gezira state (1), Sennar state (1), White Nile state (1), North Kordofan state (1)*, North Darfur state (1)*, West Darfur state (1)*, South Darfur state (1)*, South Kordofan state (1)* <Organizers> JICA Experts (2), JICA Sudan Office (1)	2013.4.29
3	2014.04.05-04.13 (9 days)	<ul style="list-style-type: none"> • Rural water supply, fee collection method, set-up of water meters, Operation and management of facilities and equipment etc. • Sewage treatment & waste water recycle, water-saving irrigation 	12 persons <Trainees> DWST (1), Sennar state (1), White Nile state (1), Kassala state (2), Red Sea state (1), River Nile state (1), Northern state (1), Gedaref state (1) <Organizers> Coordinator (1), JICA Experts (1)	2014.5.14
4	Planned for 2015.03.28-04.5 (9 days)	<ul style="list-style-type: none"> • Operation and management methods of facilities and equipment of water treatment plant of ONEE • Discussion on future approaches for human resources development in Sudan and Morocco 	13 persons <Trainees> DWST(1), DWSU, Sennar state (1), White Nile (2), Kassala state (1), Northern state (1), River Nile state (1), Khartoum state (1), Gaedaref state (1), Gezira state (1) <Organizers> Coordinator (1), JICA Expert (1)	2015.4.7

Table 6.4.3 Participants List of Training in Morocco

Organization	2012		2013		2014		2015		Total	
DWST										6
White Nile										6
Kassala										6
Sennar										5
River Nile										3
El Gezira										3
Blue Nile										2
North Kordofan										2
South Kordofan										2
North Darfur										2
West Darfur										2
South Darfur										2
Northern										2
Khartoum										1
Red Sea										1
Gedaref										1
Hawata Project										1
Total	13		13		10		11		47	

6-5. Mid Term Review and Terminal Evaluation

6-5-1. Midterm Review

The Midterm Review of Phase 2 Project was implemented in January, 2014. The results were explained by the JICA Mission Team in the 6th JCC on January 29, 2014. The Mission Team suggested to the DWSU three important issues, construction of a new training center in Kilo Ten, establishment of the Monitoring Unit and implementation of the monitoring, establishment of the Sanitation Unit. Based on the suggestion of the Mission, the PDM was modified and approved by all JCC members.



Discussion with JCC members



Explanation of the results



Question and Answer

6-5-2. Results of each Evaluation by JICA

The terminal evaluation for Phase 2 was conducted from February 22 to March 12, 2015. The JICA Experts provided necessary documents and assisted the consultant to have interviews with the counterparts. The evaluation results are shown in Table 6.5.2. The Table also shows the comparison of the evaluation between “the Terminal Evaluation” and “the Mid Term Review” in January 2014. With regards to “Impact”, one of the evaluation criteria, the result was evaluated “moderate” the same as the midterm review. The terminal evaluation team explained the reason that “impact” was moderate in the 9th JCC. They stated that it was not because the activities in this project were appropriate but because the overall goal was not appropriate.

Table 6.5.2 Evaluation Results of Phase 2

Evaluation Items	Project Phase-2		Results
	Mid term review	Terminal evaluation	
Relevant	5	5	Same
Effectiveness	3	5	Improved
Efficiency	3	4	Improved
Impact	3	3	Same
Sustainability	3	4	Improved
Total	17	21	



Explanation of results



Participants



Explanation of Monitoring

6-6. Website of the DWST

In March 2014, the JICA Terminal Evaluation Team suggested a couple of recommended activities to be done by the DWST. The establishment of a web site was one of the recommendations by the Terminal Evaluation Mission. Recently, the DWST is gaining attention by various international and domestic organizations such as UNOPS, IOM and AfDB, which have sent trainees to the DWST. It is because those organizations understand that the HRD in the DWST proved to have much impact. Therefore, it is important for the DWST to disclose training information to the public.

To respond to the recommendation by JICA, the DWST established a web site to disclose the training program to the public. As a result, it is expected that DWST will obtain new customers which make income enriched.

Those movements are also influential to the other SWCs. Some of the SWCs started to develop web sites to introduce their training activities.



Figure 6.6 Original Web Site of the DWST

6-7. Public Relations (PR)

Various PR activities have been done since Phase 1. 60 articles for Phase 1 and 184 for Phase 2 were uploaded to the page of "Project News" of the JICA Website. It was expected that it promotes public to understand the project in Sudan.

Table 6.7.1 Project New shown on JICA WEB site

Month/Year	Phase 1			Phase 2					Total
	2008	2009	2010	2011	2012	2013	2014	2015	
1			4		5	8	11	1	29
2		1			7	8	8	1	25
3		1	5		5	9	3	2	25
4					8	7	7	1	23
5					7				7
6	3	2	4		8				17
7	2	1	4		2				9
8	6	2	2					5	15
9	0	0						6	6
10	4	4			14	7	1		30
11	6	1	4	4	8	11	3		37
12	0	4		2	6	8	1		21
Total	21	16	23	6	70	58	34	16	244
	60			184					

On the other hand, information related to the project such as outcome of this project has been publicized by various opportunities such as academic forum, lectures, seminars, publications and interviews. In Particular, it is remarkable that a book titled "Water in Sudan" was published, which was written by all JICA Experts in Phase 2 project. This book introduces water issues in Sudan. Generally, publication of such a book seems difficult as tremendous efforts and time are needed. However, it is important for the experts to introduce their experiences by publishing such a book since many experts and consultants are able to get fresh information on the site. The information from the book would help the people promote their understanding of ODA projects as well as contribute to recipient countries.

Table 6.7.2 Other Public Relations

The Association of Japanese Geographers	March 2009	Present Situation of Drinking Water Sources of Sudan
	September 2013	Mid Chanel Bar of Nile River in Sudan
	September 2013	Relationship Between Mid Chanel Bar and Turbidity of Nile River
Lecture	May 2011	Hokkaido University: About Salinity Groundwater in Sudan
	June 2013	Kokugakuin University: About Natural Environment and Utilization of Water
	July 2013	Geological Information Utilization and Promotion Initiative: About Water in Sudan
Seminar	March 2012	UNESCO: International Water Day " About JICA Project for Human Resources Development for Sudan Water Sector"
	October 2013	IWA; Results of Human Resources Development Project for Water in Sudan" Nairobi
	December 2013	Inter National Desalination Seminar;" Desalination System in Red Sea Area" Port Sudan
	March 2014	UNESCO: International Water Day " About Water and Electricity in Sudan"
Publishing	November 2013	About Water in Sudan; International Development Journal
	July 2015	ODA White Paper
Interview	March 2012	Kumamoto Nichinichi Shinbun: From Dawn Country of Sudan
	September 2013	International Development Journal; Information Share ring by Sudan Water

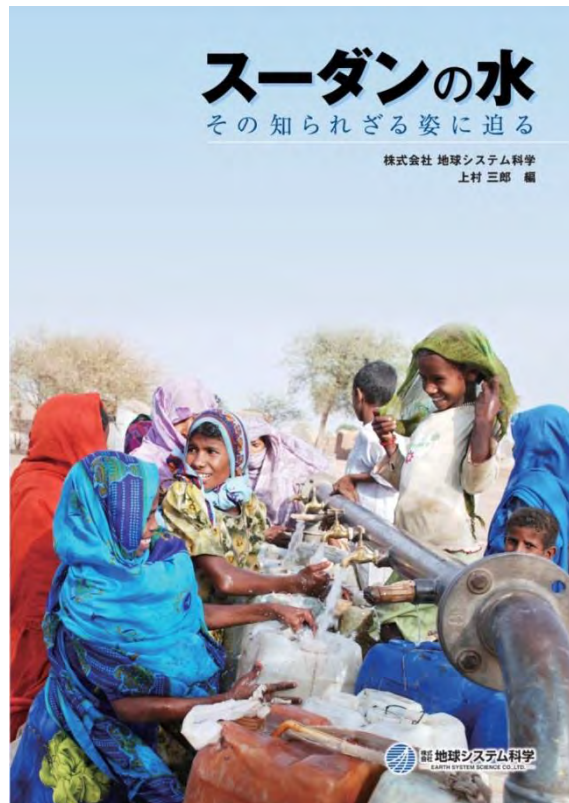


Figure 6.7 Water of Sudan

7 Encouragement of Ownership

7-1. Establishment of Mutual Trust

Building mutual trust among all the people concerned is essential not only for this project but also for any other works.

This project was the first one after Japan decided to resume ODA projects in Sudan in June 2008. At that time, the Government of Sudan had many expectations for this Phase 1 project as Sudan was one of the countries feeling friendly ties with Japan. Many challenges, however, had been accumulated such as “human resources, goods and capitals.” when Phase 1 started. In response to such a harsh condition, the experts firstly put their emphasis on building trust with the Sudanese side. For this purpose, an assignment schedule for the team leader was secured longer than that of other experts, which occupies 30 percent for Phase 1 and 25 percent for Phase 2 in the schedule of all the experts assigned (Figure 7.1). As a result, the team leader was able to get involved in much more activities of the project.

Meanwhile, four JICA experts who had been involved in Phase 1 project were assigned to Phase 2 as well, to keep the project going on smoothly by making use of the trust, which was already built in Phase 1. The Sudanese side, on the other hand, has kept the main counterparts for Phase 2 continuously from Phase 1. These efforts made by both Japanese and Sudanese side enabled to enhance their mutual trust. Ownership of Sudanese side was being increased after the counterparts strived to respond to the different technical advice given by the experts against various challenges.

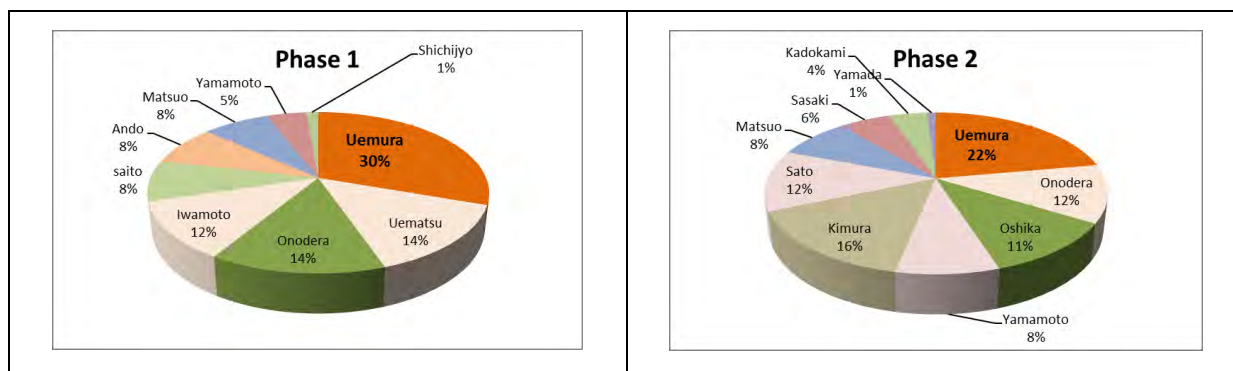


Figure 7.1 Assignments of Project Members in the Phase 1 and the Phase 2

Table 7.1 Comparison of the Assignment of Project Members

No	Phase 1							Phase 2							
	Name	Assign	Photo	2008	2009	2010	2011	Name	Assign	Photo	2011	2012	2013	2014	2015
1	Mr.Mitsuro Uemura	Team Leader Training Plan		●	●	●	●	Mr.Mitsuro Uemura	Team Leader Training Plan Water Supply Plan		●	●	●	●	●
2	Mr. Masakazu Saito	Well Management			●	●	●	Mr.Yusuke Oshika	Well Management		●	●	●	●	●
3	Mr. Masatoshi Iwamoto	Water Supply Facility		●	●	●	●	Mr. Makoto Yamamoto	Management of Water Treatment Plant and Pipe Network		●	●	●	●	●
4	Mr. Jun Onodera	Organizational Management		●	●	●	●	Mr. Jun Onodera	Sub Leader Organizational Management and Water Tariff		●	●	●	●	●
5	Mr. Kan Shichijyo	Equipment Management				●	●	Mr. Ryoich Kimura	Equipment Management Electricity and Mechanic		●	●	●	●	●
6	Mr. Shunsaku Matsuo	Water Quality Data Base		●	●	●	●	Mr. Shunsaku Matsuo	Water Quality Management		●	●	●	●	●
7	Mr. Masao Uematsu	Data Management GIS		●	●	●	●	Mr. Tadashi Sato	Data Management and Monitoring		●	●	●	●	●
8	Mr. Yusuke Ando	Management of Water Treatment Plant		●	●	●	●	Mr. Arata Sasaki	Community Development		●	●	●	●	●
9	Mr. Makoto Yamamoto	Pipe Network Management					●	Ms. Aya Kadokami	Sanitation Management				●	●	●
10								Mr. Hiroyoshi Yamada	Training Facility Water Supply Plan						●
11	Mr.Mohammed Hassan M.Ammar	Director general of PWC		●	●	●	●	Mr.Mohammed Hassan M.Ammar	Director General of DWSU		●	●	●	●	●
12	Ms.Eatidal Elyrah Malik	Director of PWCT		●	●	●	●	Ms.Eatidal Elyrah Malik	Director of DWST		●	●	●	●	●

7-2. Instruction of the Budgeting System

It is critical for recipient country to bear the cost for the project. In many African countries, international aid agencies and donors have no choice but to bear the cost when the recipient countries fail to secure the budget, which could jeopardize the sustainability of the project. Some projects might be successful if the recipient countries can secure the budget.

Role and responsibility by Japanese side have been explained repeatedly since Phase I project. What is

borne by the Japanese side is only the expert assignment and procurement of training equipment for the training activities. Further expenses for the training activities were covered by the Sudanese side. The Japanese side has never taken over any cost of travel allowance, transportation.

The strenuous efforts by the JICA Experts to give them the guidance on how to make the budget claim form enabled them to ensure the budget allocation, and subsequently enhanced their ownership.

Table 7.2 Training Budget Format

No	Item	Contents	Unit price	Quantity	Amount	Actual Payment	Remarks
1	Personnel expenses	Trainee daily allowance	25	400prs x 14days	140,000		
		Lecturer compensation	150	50prs x 12days	90,000		
		Counterparts fee	750	30prsx12Month	270,000		
		Skilled workshop labors	250	15prsx12Month	45,000		
Sub total					545,000		
2	Transportation expenses	Trainee use	50	400prsx2times	40,000		
		Lecturer use	50	100prsx12days	60,000		
		Investigation assistant use	250	15prsx12times	45,000		
		Exchange Experience	250	20prsx15days	75,000		
Sub total					220,000		
3	Welfare expenses	Food expenses of the lodgings	100	400prsx14days	560,000		
		Equipment costs of the lodgings	50	30unitx12month	18,000		
		Entertainment costs	2,000	10 sets	20,000		
Sub total					598,000		
4	Office work costs	Office supplies costs	10,000	12Month	120,000		
		Office work machine costs	4,000	20 set	80,000		
		Maintenance cost of center	10,000	12month	120,000		
Sub total					320,000		
5	Communication costs	Telephone / FAX costs	500	12month	6,000		
		The Internet cost	500	12month	6,000		
		Anti-virus cost	300	45 set	13,500		
Sub total					25,500		
6	Expenses for lighting and fuel	Electricity	6,000	12month	72,000		
		Water	500	12month	6,000		
		Gas	100	12month	1,200		
Sub total					79,200		
7	Training expense	Document purchase	200	1000 text	200,000		
		Machine parts purchase costs	2,000	24 sets	48,000		
		Document making costs	250	500prs	125,000		
		Meeting place costs	150	50 times x 20	150,000		
Sub total					523,000		
8	Workshop ,Seminar &Meeting costs	Tea&Light meal	80	50x5times	20,000		
		JCC meeting allowance cost	250	50x3times	37,500		
Sub total					57,500		
9	Cars & Field visits	Fuel	1,500	12month	18,000		
		Allowance	250	12prsx60 days	180,000		
		Lodging	200	12prsx60 days	144,000		
		Maintenance	2,000	12month	24,000		
Sub total					366,000		
10	Workshop Maintenance cost	Maintenance	50	12x100	60,000		
		Spare parts	2,000	12 month	24,000		
		Building Maintenance	40,000	1 set	40,000		
Sub total					124,000		
11	Lodging Maintenance	lodging utilities	2,000	12month	24,000		
12	Contingencies	Emergency payment	2,000	12month	24,000		
		Sub total					48,000
Grand Total(SDG)					2,906,200		

7-3. Procurement of Necessary Equipment and the Guidance of Utilization

Different from other African countries, Sudanese tend to take special care of keeping and using the equipment. For instance, in some places, drilling rigs and trucks given by Japanese Grant Aid in 1986 are still in use.

The Japanese Government has procured equipment necessary for human resource development activities in the Darfur Project, the Kassala Project, and this Project as well.

Phase 2 determined which SWCs the equipment must be provided to, considering the distribution balance of the equipment in whole country since target area of both the Darfur Project and the Kassala

Project is limited.

Consequently, the training equipment was procured to the DWST first and other six states were identified to be distributed excluding two PSWCs. These six states constructed the training center with their own funds. Those self-efforts were highly evaluated when the Project determined the target SWCs for training equipment provision. Procurement of the equipment to those six SWCs improved their training environment, with their own efforts. Eventually, each SWC expressed their gratitude for the assistance of Japan and set its signboards as shown in the pictures below. This activity definitely inspired them to enhance their ownership.



Figure 7.3 JICA Logos in many SWCs

7-4. Appropriate Capacity Development for Sudanese

It was common understanding among the JICA Experts that in general, Sudanese competency is relatively high. In particular, the counterpart staff of this Project had a certain level of technical capability since they studied hard for their specialties at top level universities as Khartoum or Sudan. However, even though they have high potential, there are not so much opportunities to optimize their skills for actual work. The main reason seemed that the salary for the Government officials was very low, and promotion and salary raises were always delayed due to an improper personnel management system.

To encourage the counterparts, the project has boosted their self-esteem and potential. Figure 7.4 shows the comparison between the level of development in Sudan and that of other countries. Generally, many Sudanese take pride in the development level of Sudan compared to South Sudan, though it has lagged behind compared to the Moroccan development level. To let them understand this situation, four times of study tours in Morocco as training programs took place. As a result, the development in Morocco was gradually understood. This awareness raising helped them enhance their ownership.





Level	South Sudan		Sudan		Morocco	
	Present Condition	Ratio (%)	Present Condition	Ratio (%)	Present Condition	Ratio (%)
 Level-1 (Point Source Type) 	<ul style="list-style-type: none"> • hand pump is the main system. • There are many operation and maintenance problems. 	80	<ul style="list-style-type: none"> • Sudan has already graduated this system. 	20	<ul style="list-style-type: none"> • Morocco graduated this system. 	0
Level-2 (Public Fountain Type) 	<ul style="list-style-type: none"> • This system is only for limited area. 	5	<ul style="list-style-type: none"> • Water Yard is the main supply system in rural area. • Operation and maintenance is still big problems. 	30	<ul style="list-style-type: none"> • This system is only for limited remote area • Excellent operation and maintenance system 	10
Level-3 (House Connection Type) 	<ul style="list-style-type: none"> • This system is only for Juba and other limited town 	15	<ul style="list-style-type: none"> • Many cities and towns have this system. • Operation and maintenance is still serious problems. 	50	<ul style="list-style-type: none"> • This system is the major in Morocco. • Operation and maintenance is good condition. 	90
Stable and Safety Water Supply	Low		Midium		High	

Figure 7.4 Development Process of Water Supply in Sudan

7-5. Activities Based on the Various Fields

In many developing countries, counterpart staff rarely visits project sites. Most of them tend to attribute no visit to the lack of vehicles and no travel allowances. Under this circumstance, the JICA experts have emphasized the importance of field visits since the Phase I Project. The JICA Experts tried to take the counterparts in to the field whenever they visited the SWC offices. The practical training of well management has also been implemented on the site.

Until now, water supply sector in Sudan has made various plans and policies. These policies and plans, however, have never been taken into further consideration. The main reason could be the reference data in these plans are not accurate. Generally, accurate data such as statistics are not available in Sudan when that plan is formulated. Hence, most plans used to be prepared without reflecting to the actual situation in the field.

To improve this situation, the JICA Experts encouraged the counterpart staff to visit the project sites with them and provided them the guidance on how to conduct interview surveys. It was a good opportunity for them to recognize many problems. Through these activities, a service mind as a public servant gradually emerged in the counterpart staff.

Figure 7.5 shows how much days the counterpart staff spend for field surveys. It is found that the days of visits by the DWST members gradually increased. This might be an evidence of emerging ownership.

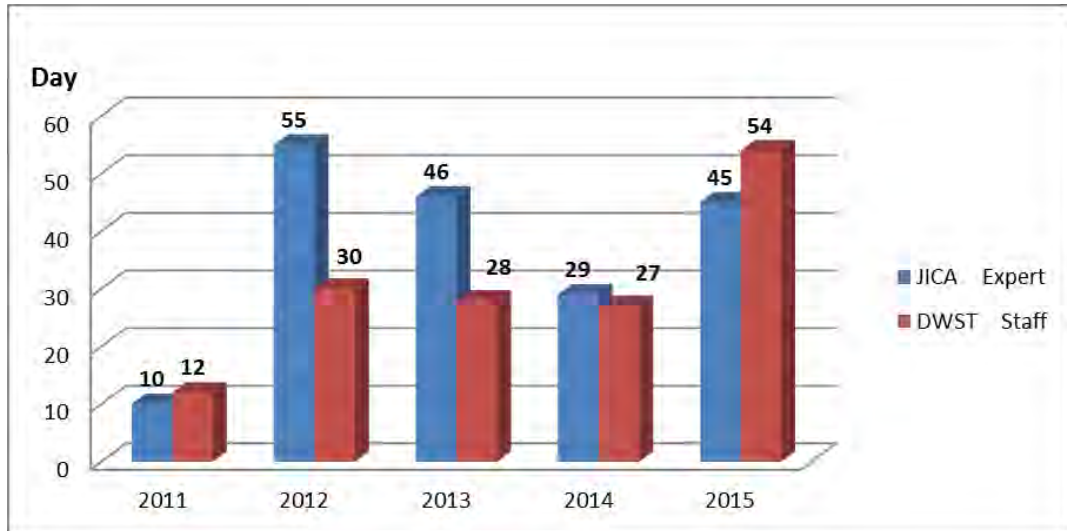


Figure 7.5 Site Visit by the DWST and Project Members



7-6. Data Accumulation and Discussion

At the beginning of Phase 1 in 2008, there used to be very few computers in offices in Sudan. Most of the document was made by hand writing, especially in rural area. Phase 1 and Phase 2 Projects, therefore, procured the office devices for the central and rural offices, and also provided training courses of basic data management. It improved the status of information sharing. However, there is still an issue to obtain some of the data such as for water supply coverage.

Under these circumstances, the experts instructed to the counterpart staff about how to get accurate data. The JICA Experts team was successful to develop a tool to measure the capacity improvement level although such a qualitative indicator is difficult to quantify by figures (as shown in Table 7.6).

This table is an attempt to visualize and digitalize the contribution ratio by the counterpart staff. The visualization of capacity led the counterpart staff to be confident. Such a strenuous instruction led Sudanese to obtain ownership.

Contribution of the counterpart staff in the PSWC is shown in the Attachment.

Table 7.6 Capacity Building of Staff of PSWC

No.	Activities	1st		2nd		3rd		4th		5th		Average	
		C/P	Expert	C/P	Expert	C/P	Expert	C/P	Expert	C/P	Expert	C/P	Expert
2	Maintenance of Lodgment	90	10	100	0	100	0	100	0	100	0	98	2
4	Data Management of Trainees	70	30	100	0	100	0	100	0	100	0	94	6
5	Data management of Lectures	70	30	90	10	100	0	100	0	100	0	92	8
6	Discussion and coordination with Lectures	90	10	70	30	80	20	100	0	100	0	88	12
7	Management of Training Schedule	80	20	80	20	80	20	100	0	80	20	84	16
9	Predation of texts	80	20	90	10	80	20	100	0	100	0	90	10
11	Preparation of examination questions and model answers	80	20	70	30	80	20	90	10	90	10	82	18
15	Arrangement of preparation meeting for training	0	100	0	100	50	50	100	0	100	0	50	50
16	Opening ceremony	50	50	80	20	100	0	100	0	100	0	86	14
19	Implementation of examination	100	0	100	0	100	0	100	0	100	0	100	0
23	Invigilating and marking of examination	90	10	100	0	80	20	90	10	100	0	92	8
24	Analysis of examination results	0	100	80	20	80	20	100	0	100	0	72	28
28	Closing ceremony	50	50	50	50	100	0	100	0	100	0	80	20
31	Analyzing results of interview to trainees	0	100	0	100	0	100	50	50	100	0	30	70
32	Analysis of monitoring sheets	0	100	80	20	100	0	90	10	100	0	74	26
34	Preparation of report	0	100	50	50	50	50	100	0	100	0	60	40
Average sharing rate (C/P)		53		71		80		95		98		80	

7-7. Information Sharing among the DWST and the SWCs

In Sudan, information sharing was not well done among the stakeholders as information which was centralized only in the top hierarchy such as the governor or the director general. The project, therefore, tried to solve this problem through many discussions with the Sudanese side such as the person in charge of the training and top level managers. At the central level, the JICA Experts had many chances to discuss with Mr. Ammar, the Director General of the DWSU. The meeting was also held every day with the directors of the DWST as well.

In the PSWCs, the meetings with the counterparts were held periodically in the pilot states to promote information sharing. In case critical issues occurred, the Directors of the Training Centers and the JICA Experts visited the field and had meetings with the governor, the minister of infrastructure and the Director General of SWCs. Through the transferring know-how from the project, the Sudanese side was becoming able to solve the problems on their own.

Regarding the DWST, many staff tend to be interested only in the specific training program in staff own charge, which could hinder a communication among all the staff and bring about less synergy effect of the training. Therefore, “All Staff Involvement” system was introduced in which the training allotment was unfixed. This “Japanese-wise” style was successfully adopted though such a working style was not so common in Sudan.

Meanwhile, it was found that many states in the country are also faced with poor information sharing with other States, especially after the decentralization in 1994. Accordingly, the Project provided the opportunities of the JCC and the Joint Seminars to share this common issue and discuss the solutions by studying good practices. These collaborative-minded activities contributed to encourage ownership among the Sudanese.

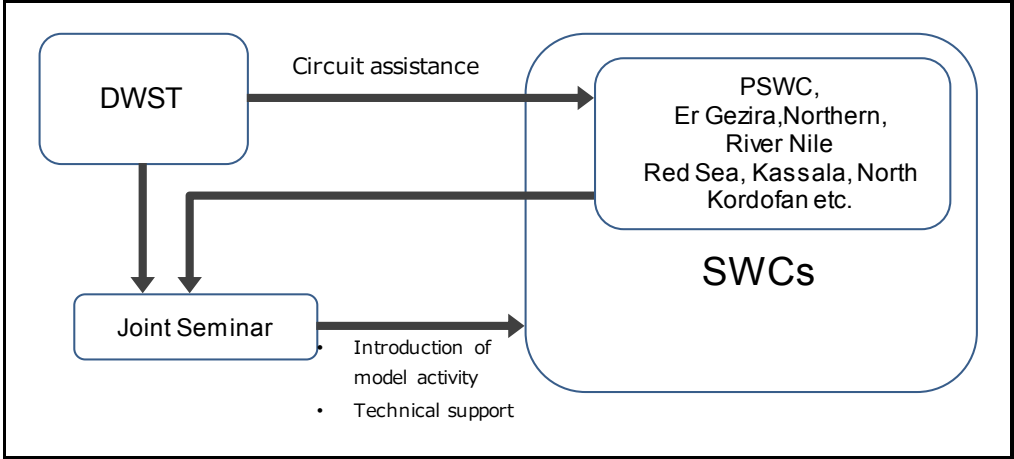


Figure 7.7 Information Sharing System between DWST and SWCs

7-8. The Award System

To encourage the motivation and ownership of the Sudanese side, the project introduced an award system since Phase 1 to give a prize or gratitude. Especially for those who attained a high grade in the training, the best presenter for the report meeting after attending the Morocco training, the directors of the training center who made dedicated efforts for constructing the training center and improving the training contents. The Staff in charge of the training in the DWST and in the PSWCs were also targeted for awards. Award for encouragement were given to Mr. Ammar by the Director General of DWSU and the Director of the DWST at the end of Phase 1 and Phase 2 respectively. The Awards ceremony was held in the JCC and the Joint Seminars where many stakeholders attended and many award holders could feel proud of the awards.

All the expenses for the training activities were borne by the Sudan side in this project and the related organizations made considerable efforts to secure the budget. Awarding their efforts in front of the different stakeholders resulted in encouragement of their ownership as well as motivation.



Best Training Center Award



Encouragement Award for the Director General of DWSU



Letter of appreciation for Director General of Kassala SWC

7-9. Goal of Water Sector in Sudan

Many Sudanese in the water sector already recognized the importance of human resource development. Therefore constructed the training centers and implemented the training programmer by themselves in various states until the end of the project. Such self-efforts made by the Sudanese side should be highly appreciated.

On the other hand, the HRD approach was not enough to achieve the stable water supply in Sudan. To achieve this goal, interventions such as budgeting, facility construction, and equipment procurement were also necessary.

Currently, a loan assistance project to procure 1,050 pumps has been procured by the Belgium Government, while construction of six water treatment plants is on-going by the Iranian Government. Moreover, the Project for Improvement of the Water Supply System at Kassala City Kassala has been completed by Japanese Grant Aid. Recently a new project for Kosti City launched.

The personnel targeted in the project will be expected to play important roles for those projects above. If the training program in the project accomplishes the improvement of stable and safe water supply in Sudan, many trainees will be performing as key personnel. This scenario would contribute to enhance the ownership of Sudan.

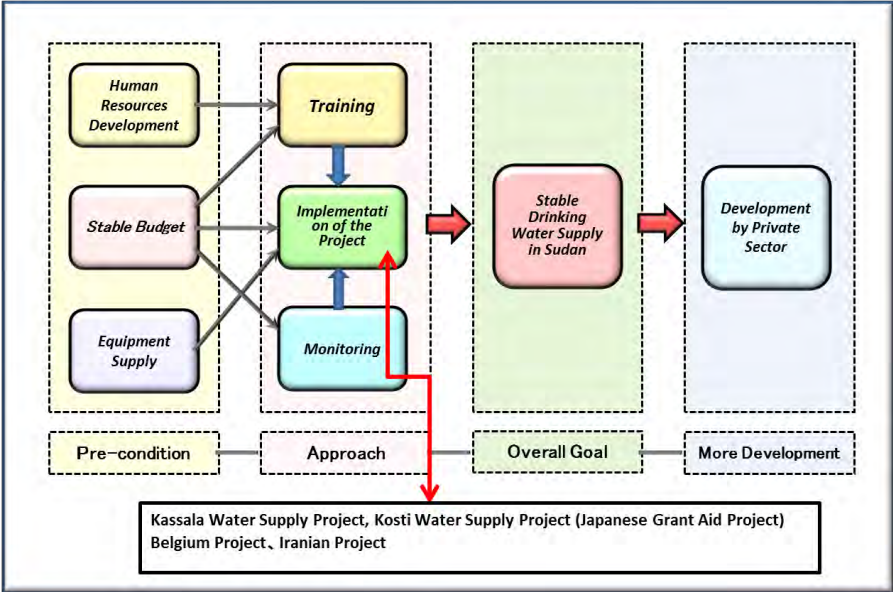


Figure 7.9 Image of Final Goal of Water Sector in Sudan

8 Challenges and Recommendations

8-1. Delaying of New Training Center’s Construction of the DWST

Construction of a new training center was behind the schedule though it was planned to be completed in April 2012 by the input of the Sudanese side. There was no progress even after the Director General of the DWSU issued a letter stating that the construction would be started by December 2012. The construction work for drilling of the basement was resumed from October 2014 as a part of the construction, which stopped at the end of May 2014. At the beginning, it was supposed by the DWSU/T that the duration of the construction work would take seven months. However, it has not been done at the end of the Project. The DWST was thereby not able to establish the training system for this training center, though this new training center construction was one of the pre-conditions in Phase 2 Project.

Mr. Ammar, the Director General of the DWSU and the Director of the DWST, Mm.Eatidal, both were trying to accelerate the completion of this new training center construction, which aimed to make it a top class training center in eastern Africa. There is, however, no promising sign of resumption at this moment.



8-2. Outflow of Human Resources to Saudi-Arabia

Outflow of skilled human resources to other countries seems to happen not only in Sudan but also many other developing countries. In case of Sudan, many valuable staff is leaving to the neighboring country, Saudi Arabia for seeking better jobs. The main reason might be caused by the fact the salary of Saudi Arabia is 10 times higher than Sudan.

In a word, the outflowed human resources resulted in contributing for other countries although they were expected to devote themselves for their own country. So far, no countermeasures have been taken to cope with this issue, while many felt disappointed or a sense of loss.



Photo 8.2 Outflow to Saudi Arabia from DWST

8-3. New Customers and Autonomous Budget System

The output of Phase 1 and Phase 2 Projects which have implemented human resource development for the public officials of the DWSU, the DWST and the SWC in Sudan, were becoming widely recognized more and more by different international organizations as well as local institutions. Actually, the DWST have received the requests for the training program by private companies, universities and farmers in several States.

Under this circumstance, the DWST and each SWC became aware of the necessity of establishing a development strategy. The training program for these customers will definitely be able to develop new financial resources for the centers. This new business could also influence the existing budgeting system of the centers, which could enable each center to become financially independent from central or local Governmental subsidies.

To attract others of as many prospects as possible, creation of their own homepage will be indispensable to inform the annual training schedule of each region and receive on-line applications of the prospects from different organizations and individuals.













Figure 8.3 New Customer Developments by Original Web Site

8-4. Women’s Empowerment

Participation of women in workplaces was active in Sudan and many women took the post of supervisor. The majority of women were water quality experts and possessed high skill of water quality analysis. They were less likely to change their career and leave Sudan for finding their job. In a sense, women must be more utilized as significant players in the water sector.

Table 8.4 shows women who are expected to play key roles. Currently, three women are working as the Directors of the training centers in Sudan. There are some womanly points in their work such as good sense of texture on training environment, especially, the director of El Gezira State and North Kordfan training center. Empowerment of such women could bring further contributions to human resource development in the water sector of Sudan.

Table 8.4 High Capable Women Staff of each Organization

Name	Photo	Organization	Job Position	Remarks
Mm. Iatidal E Malik		DWST	Director of Training Center	She is the Director since 2008. Popularity and ability are very high.
Ms.Hanan M.Mahmoud		DWST	Secretary	She is the responsibl person of the DWST Data Base.
Ms.Safia Ali Babekir		DWST	Expert of Water Quality Analysis	She is the expert of Water Quality Analysis. She has experience of Japan and Morocco Trainings.
Ms.Afra Mustafa Mohammed		North Kordofan SWC	Director of Training Center	She is the Director since 2013. She is a very enorigish lady and Idea woman of many improvements. She received Best Training Center Award.
Ms.Batoul Saad Abdalla Faggad		Er Gezira SWC	Director of Training Center	She is the Director since 2012. She has experience of Japan and Morocco Trainings. She received Best Training Center Award.
Ms. Atega Eshag R.A		Khartoum SWC	Expert of Water Quality Analysis	She is the expert of Water Quality Analysis. She received the best presentation of Morocco Training.
Ms.Elrisala M.Yousif Abdu Elaziz		White Nile SWC	Expert of Well Management and Monitoring	She is an expert of well management. She is very positive and earnest woman.
Ms.Asmhan Altigany Algozoly		Northern SWC	Expert of Data Management	She is an expert of data management. She analyses many important data of SWC.
Ms.Maha Eltayb Elamen		Kassala SWC	Expert of Water Quality Analysis	She is the expert of Water Quality Analysis and her skill is very high.
Ms.Amal Osman Ibrahim		Red Sea SWC	Expert of Water Quality Analysis	She is the expert of Water Quality Analysis and her skill is very high.

8-5. Expectation to JICA Sudan Office

The JICA Sudan Office was established in March 2008 and Mr. Shishido took up the post of chief representative. Mr. Shishido had to manage both of the JICA Offices of Khartoum and Juba since Sudan was not yet divided into south and north at that time. There were a lot of challenges such as lack of staff when the office opened. Under such a circumstance, the Phase 1 was started in 2008.

Regular meetings and field visits were done together with the JICA office, and two borehole drillings in Kilo Ten for the training was supported by the JICA Office when water supply component was added into the framework of the Darfur Project.

Table 8.5 shows the representatives of the Water Resources Management Division at JICA Headquarters and the JICA Sudan Office, and the chief representatives in Sudan. Six representatives of Headquarters were placed, while five were in charge of the project during the seven years of the project.

The Experts stayed in Sudan between August and September 2015 to finish up with all the project activities of Phase 2. Through the meetings with the central and state level, one request was made by the Sudanese side that chances of meeting with the officials of the JICA Sudan Office should be increased. JICA becomes widely recognized in Sudan. Sudan feels friendly ties with Japan. To maintain such a good relationship, further active responses from the JICA side are looked forward to.

Table 8.5 Assignment of the JICA Staff from 2008 to 2015

Period	JICA HQs	JICA Sudan	Resident Representative
2008	Mr. Terumasa Matauzaki	Mr. Kentaro Akutrsu	Mr. Kenichi Shishido
2009	Mr. Hayato Sato	Mr. Hideaki Matsuoka	
2011	Mr. Juichiro Sahara	Mr. Daishiro Murakawa	
2012	Mr. Tadashi Kageyama	Ms. Hisae Kato	Mr. Hiroyuki Mori
2013	Mr. Akihiro Miyazaki		
2014	Mr. Koji Shimizu	Mr. Akihira Sano	Mr. Seiichi Koike

8-6. Formulation of Appropriate PDM

The overall goal of Phase 2 project is “water supply system is properly managed in Sudan”, while the project purpose is “human resources in water supply sector are properly trained in Sudan”. The project goal was almost achieved through seven years from Phase 1, though there were lots of challenges faced during the project. The overall goal, on the other hand, seems pretty difficult to be achieved only by the human resource development approach.

The PDM shows the basic principle of the project, and therefore, the contents should have been much more elaborated in terms of feasibility from the beginning of the project.

Table 8.6 Summary of the PDM

Target Area	Federal level: DWSU, DWST State level: All States (Pilot SWC: White Nile and Sennar SWC)
Overall goal	Water Supply System is properly managed in Sudan
Project Purpose	Human Resources in Water Supply Sector are properly trained in Sudan
Output-1	Training courses are implemented by DWST
Output-2	Training course implementation structures in PSWCs are developed by PSWCs in collaboration with DWST
Output-3	Monitoring system is established within DWSU and pilot SWCs for training course implementation and O&M of water supply system
Output-4	Training course implementation structure is developed within each SWC in Sudan in collaboration with DWST

Attachment

- Attachment-1 PDM
- Attachment-2 JCC Minutes of Meeting
- Attachment-3 Equipment Handover Certificates
- Attachment-4 Appreciation letter on Mid and Long Term Human Resources Development Plan
- Attachment-5 DWST Mid and Long Term Human resources Development Plan
- Attachment-6 DWST Human Resources Development manual
- Attachment-7 DWSU Monitoring Manual
(Water Supply Facility/Training)
- Attachment-8 Comparison of the Contribution of the Training Works in Sennar (Well Management Training)

Attached CD

1. Final Report (Japanese/English)
2. Technical Output
 - DWST Mid and Long Term Human resources Development Plan
 - DWST Human Resources Development manual
 - DWSU Monitoring Manual(Water Supply Facility/Training)
3. Training Reference data in Pilot SWCs
4. Action Plan for training in Pilot SWCs
5. Water Yard Rehabilitation Action Plan in Pilot SWC

Attachment-1 PDM

Project Design Matrix (PDM)

Project title: Project for Human Resources Development for Water Supply Phase 2

Duration : ○, 2011 ~ ○, 2015

Implementation Agency: PWC

Target area: 15 States in Northern Sudan

Target groups: PWC, PWCT, SWCs

Date: March 10, 2011

Narrative Summary	Indicators	Means of Verification	Important Assumptions
<p>< Overall Goal > Water supply system is properly managed in Northern Sudan.</p>	<p>SWC staffs utilizes their knowledge and technical skills to maintain and operate water supply facilities.</p>		
<p>< Project Purpose > Human resources in water supply sector are properly trained in Northern Sudan.</p>	<p>1. Training course evaluation results of PWCT trainees are higher than ○. 2. Training course evaluation results of pilot SWC trainees are higher than ○. 3. Functionality rate of water supply facilities in the pilot SWCs increases by ○% from the initial percentage obtained through baseline survey.</p>	<p>1. PWCT training implementation report 2. Pilot SWC training implementation report 3. Pilot SWC monitoring activities report</p>	<p>1. Economic situation does not worsen. 2. Political conflicts do not occur. 3. Personnel at PWC, PWCT and SWC does not change drastically. 4. Budget, human resources, and necessary equipment are properly provided.</p>
<p>< OUTPUTS > 1. Training courses are implemented by PWCT based on its mid-term/long-term human resource development plan. 2. Training course implementation structures are developed by Pilot SWCs in collaboration with PWCT. 3. Monitoring system is established within PWC and pilot SWCs for training course implementation and O&M of water supply system of pilot SWCs. 4. Training course implementation structure is developed within each SWC in collaboration with PWCT.</p>	<p>1. Mid-term/long-term human resources development plan is completed by ○. 2. Percentage of contributions from training coordinator on the planning and implementation of training courses increases by ○%. 3. Training courses are implemented ○ times annually. 1. Percentage of contributions from training coordinators on the planning and implementation of training courses is increased by ○%. 2. Training courses are implemented according to the SWC training implementation plan. 1. Monitoring manual is completed by ○. 2. Monitoring activities are implemented according to schedule. 3. The number of annually maintained water supply facilities is increased in pilot SWCs. 1. Human resources development manual is completed by ○. 2. Workshops to share and disseminate the outputs of pilot SWCs are implemented ○ times.</p>	<p>1. Mid-term/long-term human resources development plan 2. PWCT training coordinator questionnaire Japanese expert questionnaire 3. PWCT training implementation report 1. Pilot SWC training coordinator questionnaire Japanese expert questionnaire 2. Pilot SWC training implementation report 1. Monitoring manual 2. Monitoring report 3. Monitoring report 1. Human Resources Development Manual 2. Workshop report</p>	<p>1. Budget of PWC, PWCT, and SWC does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant.</p>
<p>< ACTIVITIES > 1-1. PWCT elaborates draft plan for mid-term/long-term human resource development. 1-2. PWCT prioritizes actual needs for the training courses. 1-3. PWCT elaborates its training implementation plan based on the draft plan for mid-term/long-term human resource development. 1-4. PWCT implements training courses based on the training course implementation plan. 1-5. PWCT revises training course contents, textbooks and manuals based on the evaluation results of the training courses. 1-6. PWCT improves its capacity responding to the expansion of training center. 1-7. PWCT finalizes the mid-term/long-term human resources development plan, which is to be authorized by the government of Sudan. 2-1. Pilot SWC establishes training units within the organization. 2-2. Pilot SWC develops the draft SWC activities plan. 2-3. Pilot SWC prioritizes actual needs for the training courses. 2-4. Pilot SWC develops training course implementation plan based on the priority. 2-5. Pilot SWC training unit develops training course curriculum(including OJT in Localities)and textbooks. 2-6. Pilot SWC training unit implements training courses. 2-7. Pilot SWC training unit evaluates the training courses. 2-8. Pilot SWC training unit revises training course curriculum and textbooks based on the evaluation results of the training courses. 2-9. Pilot SWC reflect the monitoring result of draft SWC activities plan to training course implementation plan. 3-1. PWC and Pilot SWC establish monitoring units within the organization. 3-2. PWC develops the draft version of monitoring manual to be used by pilot SWC. 3-3. Pilot SWC implements baseline survey on the O&M status of current water supply system. 3-4. Pilot SWC regularly monitors the current situation of training implementation, examples identified in the State, and O&M of water supply system based on the draft of monitoring manual. 3-5. PWC and PWCT analyze and evaluate the monitoring result and give feedbacks such as lessons learned and good practices etc. to SWC monitoring unit. 3-6. PWC maintains and manages monitoring data at information center. 3-7. PWC finalizes monitoring manual based on the evaluation of monitoring of training courses and O&M of water supply system. 4-1. Each SWC establishes training unit within the organization. 4-2. PWCT develops Human Resources Development Manual to each SWC based on the outputs of 1, 2 and 3. 4-3. PWCT implements workshop(s)to share and disseminate the outputs of pilot SWC activities, and distribute Human Resource Development Manual to each SWC. 4-4. Each SWC develops training course implementation plan.</p>		<p>< INPUTS > 1. Japanese side (1)Experts ①Team leader/training course management ②Organizational management/Administration ③Water supply facilities management (Water treatment plant/pipeline system) ④Machinery and electric equipment/Equipment management ⑤Well management ⑥Data management/Monitoring ⑦Water quality control and management ⑧Community sensitization (2)Equipment ①Necessary equipment for PWCT new training courses ②Necessary equipment for pilot SWCs training courses ③Necessary equipment for other SWCs (excluding Darfur 3 Protocol Areas, South Kordofan, Blue Nile, Kassala and Khartoum States) (3)Project activities fee (4)Training courses in Japan, Training courses in the third country 2. Sudanese side (1)Allocation of counterparts and administrative personnel 1) Project Director 2) Project Manager 3) Counterparts (2)Allocation of land, buildings and facilities 1) Office space for Japanese experts in the building of PWC 2) Office space for JICA experts in the building of pilot SWCs 3) Training space in PWCT and pilot SWCs 4) Other necessary facilities, equipment and materials for the administration of the Project (3)Project activities fee (4)Construction of fifteen training center (5)Procurement of office equipment and furniture for the training center</p>	<p>1. Budget of PWC, PWCT, and SWC does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant. 4. Budget, human resources, and necessary equipment for project implementation are properly provided. < Pre-Condition > 1. The economic situation does not worsen than that of initiation period of project implementation. 2. Political conflicts that prevent project implementation do not occur. 3. Personnel at PWC, PWCT and SWC does not change drastically. 4. Budget of PWC, PWCT and SWC does not drastically decrease.</p>
<p>< Remarks ></p>			

PWC: Public Water Corporation, PWCT: Public Water Corporation Training, SWC: State Water Corporation, O&M: Operation and Maintenance

*Monitoring manual includes the guideline of monitoring activities, the mandate of monitoring unit, the monitoring activity schedule and the reporting schedule from SWC and PWC.

This manual is used for the monitoring of SWC training course implementation, good practices and lessons learnt which are shared with other SWCs, and maintenance of water supply facilities in SWC.

Project Design Matrix (PDM1)

Project title: Project for Human Resources Development for Water Supply Phase 2

Duration: November, 2011 ~ September, 2015

Implementation Agency: PWC

Target area: 15 States in Sudan

Target groups: PWC, PWCT, SWCs

Date: December 15, 2011

Narrative Summary	Indicators	Means of Verification	Important Assumptions
<p>< Overall Goal > Water supply system is properly managed in Sudan.</p>	<p>SWC staffs utilizes their knowledge and technical skills to maintain and operate water supply facilities.</p>		
<p>< Project Purpose > Human resources in water supply sector are properly trained in Sudan.</p>	<p>1. Average of the training course evaluation result by PWCT trainees is A. 2. Average of the training course evaluation result by pilot SWC trainees is B. 3. Annual number of rehabilitated water supply facilities in the pilot SWCs increases from the initial number obtained through baseline survey.</p>	<p>1. PWCT training implementation report 2. Pilot SWC training implementation report 3. Pilot SWC monitoring activities report</p>	<p>1. Economic situation does not worsen. 2. Political conflicts do not occur. 3. Personnel at PWC, PWCT and SWC does not change drastically. 4. Budget, human resources, and necessary equipment are properly provided.</p>
<p>< OUTPUTS > 1. Training courses are implemented by PWCT based on its mid-term/long-term human resource development plan. 2. Training course implementation structures in Pilot SWCs are developed by Pilot SWCs in collaboration with PWCT. 3. Monitoring system is established within PWC and pilot SWCs for training course implementation and O&M of water supply system of pilot SWCs. 4. Training course implementation structure is developed within all SWCs in Sudan in collaboration with PWCT.</p>	<p>1. Mid-term/long-term human resources development plan is completed by March 2013. 2. Percentage of contributions from training coordinator on the planning and implementation of training courses increases by 100%. 3. 20 types of training courses are implemented annually. 1. Percentage of contributions from training coordinators on the planning and implementation of training courses is increased by 80% in White Nile State and 70% in Sennar State. 2. Training courses are implemented according to the SWC training implementation plan. 1. Monitoring manual is completed by December 2013. 2. Monitoring activities are implemented according to schedule. 3. The number of annually maintained water supply facilities is increased in pilot SWCs. 1. Human resources development manual is completed by March 2013. 2. Workshops to share and disseminate the outputs of pilot SWCs are implemented 6 times.</p>	<p>1. Mid-term/long-term human resources development plan 2. PWCT training coordinator questionnaire Japanese expert questionnaire 3. PWCT training implementation report 1. Pilot SWC training coordinator questionnaire Japanese expert questionnaire 2. Pilot SWC training implementation report 1. Monitoring manual 2. Monitoring report 3. Monitoring report 1. Human Resources Development Manual 2. Workshop report</p>	<p>1. Budget of PWC, PWCT, and SWC does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant.</p>
<p>< ACTIVITIES > 1-1. PWCT elaborates draft plan for mid-term/long-term human resource development. 1-2. PWCT prioritizes actual needs for the training courses. 1-3. PWCT elaborates its training implementation plan based on the draft plan for mid term/long term human resource development. 1-4. PWCT implements training courses based on the training course implementation plan. 1-5. PWCT revises training course contents, textbooks and manuals based on the evaluation results of the training courses. 1-6. PWCT improves its capacity responding to the expansion of training center. 1-7. PWCT finalizes the mid-term/long-term human resources development plan, which is to be authorized by the government of Sudan. 2-1. Pilot SWC establishes training units within the organization. 2-2. Pilot SWC develops the draft SWC activities plan. 2-3. Pilot SWC prioritizes actual needs for the training courses. 2-4. Pilot SWC develops training course implementation plan based on the priority. 2-5. Pilot SWC training unit develops training course curriculum(including OJT in Localities)and textbooks. 2-6. Pilot SWC training unit implements training courses. 2-7. Pilot SWC training unit evaluates the training courses. 2-8. Pilot SWC training unit revises training course curriculum and textbooks based on the evaluation results of the training courses. 2-9. Pilot SWC reflect the monitoring result of draft SWC activities plan to training course implementation plan. 3-1. PWC and Pilot SWC establish monitoring units within the organization. 3-2. PWC develops the draft version of monitoring manual to be used by pilot SWC. 3-3. Pilot SWC implements baseline survey on the O&M status of current water supply system. 3-4. Pilot SWC regularly monitors the current situation of training implementation, examples identified in the State, and O&M of water supply system based on the draft of monitoring manual. 3-5. PWC and PWCT analyze and evaluate the monitoring result and give feedbacks such as lessons learned and good practices etc. to SWC monitoring unit. 3-6. PWC maintains and manages monitoring data at information center. 3-7. PWC finalizes monitoring manual based on the evaluation of monitoring of training courses and O&M of water supply system. 4-1. Each SWC establishes training unit within the organization. 4-2. PWCT develops Human Resources Development Manual to each SWC based on the outputs of 1, 2 and 3. 4-3. PWCT implements workshop(s)to share and disseminate the outputs of pilot SWC activities, and distribute Human Resource Development Manual to each SWC. 4-4. Each SWC develops training course implementation plan.</p>		<p>< INPUTS > 1. Japanese side (1) Experts ① Team leader/training course management ② Organizational management/Administration ③ Water supply facilities management (Water treatment plant/pipeline system) ④ Machinery and electric equipment/Equipment management ⑤ Well management ⑥ Data management/Monitoring ⑦ Water quality control and management ⑧ Community sensitization (2) Equipment ① Necessary equipment for PWCT new training courses ② Necessary equipment for pilot SWCs training courses ③ Necessary equipment for other SWCs (excluding Darfur 3 States, South Kordofan, Blue Nile, Kassala and Khartoum States) (3) Project activities fee (4) Training in Morocco and Egypt 2. Sudanese side (1) Allocation of counterparts and administrative personnel 1) Project Director 2) Project Manager 3) Counterparts (2) Allocation of land, buildings and facilities 1) Office space for Japanese experts in the building of PWC 2) Office space for JICA experts in the building of pilot SWCs 3) Training space in PWCT and pilot SWCs 4) Other necessary facilities, equipment and materials for the administration of the Project (3) Project activities fee (4) Construction of kilo ten training center (5) Procurement of office equipment and furniture for the training center</p>	<p>1. Budget of PWC, PWCT, and SWC does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant. 4. Budget, human resources, and necessary equipment for project implementation are properly provided. < Pre-Condition > 1. The economic situation does not worsen than that of initiation period of project implementation. 2. Political conflicts that prevent project implementation do not occur. 3. Personnel at PWC, PWCT and SWC does not change drastically. 4. Budget of PWC, PWCT and SWC does not drastically decrease.</p>

< Remarks >

PWC: Public Water Corporation, PWCT: Public Water Corporation Training Center, SWC: State Water Corporation, O&M: Operation and Maintenance

*Monitoring manual includes the guideline of monitoring activities, the mandate of monitoring unit, the monitoring activity schedule and the reporting schedule from SWC and PWC.

This manual is used for the monitoring of SWC training course implementation, good practices and lessons learnt which are shared with other SWCs, and maintenance of water supply facilities in SWC.

Narrative Summary	Indicators	Means of Verification	Important Assumptions
<p>< Overall Goal > Water supply system is properly managed in Sudan.</p>	<p>SWC staff utilizes their knowledge and technical skills to maintain and operate water supply facilities.</p>		<p>1. Sudan's policies for human resources development for water supply does not change drastically. 2. Trainings are implemented continuously in SWCs(excluding pilot SWCs).</p>
<p>< Project Purpose > Human resources in water supply sector are properly trained in Sudan.</p>	<p>1. The number of trainees of training courses in Sudan that are trained is more than 2000 after establishment of New Training Center. 2. Functionality rate of water supply facilities in the pilot SWCs is higher than 80%.</p>	<p>1. PWCT training implementation report 2. Pilot SWC training implementation report 3. Pilot SWC monitoring activities report</p>	<p>1. PSWC's staff who completed training courses do not leave SWC. 2. There are no climate changes or disasters that affect the operations water facilities.</p>
<p>< OUTPUTS > 1. Training courses are implemented by PWCT based on its mid-term/long-term human resources development plan.</p>	<p>1. Mid-term/long-term human resources development plan is completed by March 2013. 2. Percentage of contributions from training coordinator on the planning and implementation of training courses increases by 100%. 3. Training courses at PWCT are implemented more than 20 times annually.</p>	<p>1. Mid-term/long-term human resources development plan 2. PWCT training coordinator questionnaire Japanese expert questionnaire 3. PWCT training implementation report</p>	<p>1. Necessary budget, personnels, equipments, etc are provided in a timely and appropriately.</p>
<p>2. Training course implementation structures in Pilot SWCs are developed by Pilot SWCs in collaboration with PWCT.</p>	<p>1. Contributions from training coordinators on the planning and implementation of training courses. 2. Training courses are implemented according to the SWC training implementation plan.</p>	<p>1. Pilot SWC training coordinator questionnaire Japanese expert questionnaire 2. Pilot SWC training implementation report</p>	
<p>3. Monitoring system is established within PWC and pilot SWCs for training course implementation and O&M of water supply system of pilot SWCs.</p>	<p>1. Monitoring manual is completed by December 2013. 2. Monitoring activities are implemented according to schedule. 3. The number of annually maintained water yards** is increased more than 100.</p>	<p>1. Monitoring manual 2. Monitoring report 3. Monitoring report</p>	
<p>4. Training course implementation structure is developed within each SWC in Sudan in collaboration with PWCT.</p>	<p>1. Human resources development manual is completed by March 2013. 2. Workshops to share and disseminate the outputs of pilot SWCs are implemented 6 times.</p>	<p>1. Human Resources Development Manual 2. Workshop report</p>	
<p>< ACTIVITIES > 1-1. PWCT elaborates draft plan for mid-term/long-term human resource development. 1-2. PWCT prioritizes actual needs for the training courses. 1-3. PWCT elaborates its training implementation plan based on the draft plan for mid term/long term human resource development. 1-4. PWCT implements training courses based on the training course implementation plan. 1-5. PWCT evaluates the training courses. 1-6. PWCT revises training course contents, textbooks and manuals based on the evaluation results of the training courses. 1-7. PWCT improves its capacity responding to the expansion of training center. 1-8. PWCT finalizes the mid-term/long-term human resources development plan, which is to be authorized by the government of Sudan. 2-1. PWCT strengthens its leadership through the support of below activities of SWC. 2-2. Pilot SWC establishes training units within the organization. 2-3. Pilot SWC develops the draft SWC activities plan. 2-4. Pilot SWC prioritizes actual needs for the training courses. 2-5. Pilot SWC develops training course implementation plan based on the priority. 2-6. Pilot SWC training unit develops training course curriculum(including OJT in Localities)and textbooks. 2-7. Pilot SWC training unit implements training courses. 2-8. Pilot SWC training unit evaluates the training courses. 2-9. Pilot SWC training unit revises training course curriculum and textbooks based on the evaluation results of the training courses. 2-10. Pilot SWC reflect the monitoring result of draft SWC activities plan to training course implementation plan. 3-1. PWC and Pilot SWC establish monitoring units within the organization. 3-2. PWC develops the draft version of monitoring manual to be used by pilot SWC. 3-3. Pilot SWC implements baseline survey on the O&M status of current water supply system. 3-4. Pilot SWC regularly monitors the current situation of training implementation, examples identified in the State, and O&M of water supply system based on the draft of monitoring manual. 3-5. PWC and PWCT analyze and evaluate the monitoring result and give feedbacks such as lessons learned and good practices etc. to SWC monitoring unit. 3-6. PWC maintains and manages monitoring data at information center. 3-7. PWC finalizes monitoring manual based on the evaluation of monitoring of training courses and O&M of water supply system. 4-1. PWCT develops Human Resources Development Manual to each SWC based on the outputs of 1, 2 and 3. 4-2. Each SWC (excluding pilot SWC) establishes training unit within the organization. 4-3. PWCT implements workshop(s)to share and disseminate the outputs of pilot SWC activities, and distribute Human Resource Development Manual to each SWC. 4-4. Each SWC (excluding pilot SWC) develops training course implementation plan.</p>	<p>< INPUTS > 1. Japanese side (1)Experts ①Team leader/training course management ②Organizational management/Administration ③Water supply facilities management (Water treatment plant/pipeline system) ④Machinery and electric equipment/Equipment management ⑤Well management ⑥Data management/Monitoring ⑦Water quality control and management ⑧Community sensitization (2)Equipment ①Necessary equipment for PWCT new training courses ②Necessary equipment for pilot SWCs training courses ③Necessary equipment for other SWCs (excluding Darfur 3 States, South Kordofan, Blue Nile, Kassala and Khartoum States) (3)Project activities fee (4)Training in Morocco (5)Acceptance Trainee from Morocco 2. Sudanese side (1)Allocation of counterparts and administrative personnel 1) Project Director 2) Project Manager 3) Counterparts (2)Allocation of land, buildings and facilities 1) Office space for Japanese experts in the building of PWC 2) Office space for JICA experts in the building of pilot SWCs 3) Training space in PWCT and pilot SWCs 4) Other necessary facilities, equipment and materials for the administration of the Project (3)Project activities fee (4)Construction of kilo ten training center (5)Procurement of office equipment and furniture for the training center</p>	<p>1. Budget of PWC, PWCT, and SWCs does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant. 4. Budget, human resources, and necessary equipment for project implementation are properly provided. < Pre-Condition > 1. The economic situation does not worsen than that of initiation period of project implementation. 2. Political conflicts do not occur 3. Organization (personnel) and budget at PWC, PWCT and SWC does not change drastically.</p>	
<p>< Remarks > PWC: Public Water Corporation, PWCT: Public Water Corporation Training Center, SWC: State Water Corporation, O&M: Operation and Maintenance *Monitoring manual includes the guideline of monitoring activities, the mandate of monitoring unit, the monitoring activity schedule and the reporting schedule from SWC and PWC. This manual is used for the monitoring of SWC training course implementation, good practices and lessons learnt which are shared with other SWCs, and maintenance of water supply facilities in SWC.</p>	<p>**Water yard is consisting of borehole, elevator tank, generator house and public fountains.</p>		

Narrative Summary	Indicators	Means of Verification	Important Assumptions
<p>< Overall Goal > Water supply system is properly managed in Sudan.</p>	<p>SWC staff utilizes their knowledge and technical skills to maintain and operate water supply facilities.</p>		<p>1. Sudan's policies for human resources development for water supply does not change drastically. 2. Trainings are implemented continuously in SWCs(excluding pilot SWCs).</p>
<p>< Project Purpose > Human resources in water supply sector are properly trained in Sudan.</p>	<p>1. The number of trainees of training courses in Sudan that are trained is more than 2000 after establishment of New Training Center. 2. Functionality rate of water supply facilities in the pilot SWCs is higher than 80%.</p>	<p>1. DWST training implementation report 2. Pilot SWC training implementation report 3. Pilot SWC monitoring activities report</p>	<p>1. PSWC's staff who completed training courses do not leave SWC. 2. There are no climate changes or disasters that affect the operations water facilities.</p>
<p>< OUTPUTS > 1. Training courses are implemented by DWST based on its mid-term/long-term human resources development plan. 2. Training course implementation structures in Pilot SWCs are developed by Pilot SWCs in collaboration with DWST. 3. Monitoring system is established within DWSU and pilot SWCs for training course implementation and O&M of water supply system of pilot SWCs. 4. Training course implementation structure is developed within each SWC in Sudan in collaboration with DWST.</p>	<p>1. Mid-term/long-term human resources development plan is completed by March 2013. 2. Percentage of contributions from training coordinator on the planning and implementation of training courses increases by 100%. 3. Training courses at DWST are implemented more than 20 times annually. 1. Percentage of contributions from training coordinators on the planning and implementation of training courses is increased by 80% in the PSWCs. 2. Training courses are implemented according to the SWC training implementation plan. 1. Monitoring manual is completed by December 2013. 2. Monitoring activities are implemented according to schedule. 3. The number of annually maintained water yards** is increased more than 100. 1. Human resources development manual is completed by March 2013. 2. Workshops to share and disseminate the outputs of pilot SWCs are implemented 6 times.</p>	<p>1. Mid-term/long-term human resources development plan 2. DWST training coordinator questionnaire Japanese expert questionnaire 3. DWST training implementation report 1. Pilot SWC training coordinator questionnaire Japanese expert questionnaire 2. Pilot SWC training implementation report 1. Monitoring manual 2. Monitoring report 3. Monitoring report 1. Human Resources Development Manual 2. Workshop report</p>	<p>1. Necessary budget, personnels, equipments, etc are provided in a timely and appropriately.</p>
<p>< ACTIVITIES > 1-1. DWST elaborates draft plan for mid-term/long-term human resource development. 1-2. DWST prioritizes actual needs for the training courses. 1-3. DWST elaborates its training implementation plan based on the draft plan for mid term/long term human resource development. 1-4. DWST implements training courses based on the training course implementation plan. 1-5. DWST evaluates the training courses. 1-6. DWST revises training course contents, textbooks and manuals based on the evaluation results of the training courses. 1-7. DWST improves its capacity responding to the expansion of training center. 1-8. DWST finalizes the mid-term/long-term human resources development plan, which is to be authorized by the government of Sudan. 2-1. DWST strengthens its leadership through the support of below activities of SWC. 2-2. Pilot SWC establishes training units within the organization. 2-3. Pilot SWC develops the draft SWC activities plan. 2-4. Pilot SWC prioritizes actual needs for the training courses. 2-5. Pilot SWC develops training course implementation plan based on the priority. 2-6. Pilot SWC training unit develops training course curriculum(including OJT in Localities)and textbooks. 2-7. Pilot SWC training unit implements training courses. 2-8. Pilot SWC training unit evaluates the training courses. 2-9. Pilot SWC training unit revises training course curriculum and textbooks based on the evaluation results of the training courses. 2-10. Pilot SWC reflect the monitoring result of draft SWC activities plan to training course implementation plan. 3-1. DWSU and Pilot SWC establish monitoring units within the organization. 3-2. DWSU develops the draft version of monitoring manual to be used by pilot SWC. 3-3. Pilot SWC implements baseline survey on the O&M status of current water supply system. 3-4. Pilot SWC regularly monitors the current situation of training implementation, examples identified in the State, and O&M of water supply system based on the draft of monitoring manual. 3-5. DWSU and DWST analyze and evaluate the monitoring result and give feedbacks such as lessons learned and good practices etc. to SWC monitoring unit. 3-6. DWSU maintains and manages monitoring data at information center. 3-7. DWSU finalizes monitoring manual based on the evaluation of monitoring of training courses and O&M of water supply system. 4-1. DWST develops Human Resources Development Manual to each SWC based on the outputs of 1, 2 and 3. 4-2. Each SWC (excluding pilot SWC) establishes training unit within the organization. 4-3. DWST implements workshop(s)to share and disseminate the outputs of pilot SWC activities, and distribute Human Resource Development Manual to each SWC. 4-4. Each SWC (excluding pilot SWC) develops training course implementation plan.</p>	<p>< INPUTS > 1. Japanese side (1)Experts ①Team leader/training course management ②Organizational management/Administration ③Water supply facilities management (Water treatment plant/pipeline system) ④Machinery and electric equipment/Equipment management ⑤Well management ⑥Data management/Monitoring ⑦Water quality control and management ⑧Community sensitization (2)Equipment ①Necessary equipment for DWST new training courses ②Necessary equipment for pilot SWCs training courses ③Necessary equipment for other SWCs (excluding Darfur 3 States, South Kordofan, Blue Nile, Kassala and Khartoum States) (3)Project activities fee (4)Training in Morocco (5)Acceptance Trainee from Morocco 2. Sudanese side (1)Allocation of counterparts and administrative personnel 1) Project Director 2) Project Manager 3) Counterparts (2)Allocation of land, buildings and facilities 1) Office space for Japanese experts in the building of DWSU 2) Office space for JICA experts in the building of pilot SWCs 3) Training space in DWST and pilot SWCs 4) Other necessary facilities, equipment and materials for the administration of the Project (3)Project activities fee (4)Construction of kilo ten training center (5)Procurement of office equipment and furniture for the training center</p>	<p>1. Budget of DWSU, DWST, and SWCs does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant. 4. Budget, human resources, and necessary equipment for project implementation are properly provided. < Pre-Condition > 1. The economic situation does not worsen than that of initiation period of project implementation. 2. Political conflicts do not occur 3. Organization (personnel) and budget at DWSU, DWST and SWC does not change drastically.</p>	
<p>< Remarks > DWSU: Drinking Water and Sanitation Unit, DWST: Drinking Water and Sanitation Training Center, SWC: State Water Corporation, O&M: Operation and Maintenance *Monitoring manual includes the guideline of monitoring activities, the mandate of monitoring unit, the monitoring activity schedule and the reporting schedule from SWC and DWSU. This manual is used for the monitoring of SWC training course implementation, good practices and lessons learnt which are shared with other SWCs, and maintenance of water supply facilities in SWC.</p>	<p>**Water yard is consisting of borehole, elevator tank, generator house and public fountains.</p>		

Narrative Summary	Indicators	Means of Verification	Important Assumptions
<p>< Overall Goal > Water supply system is properly managed in Sudan.</p>	<p>SWC staff utilizes their knowledge and technical skills to maintain and operate water supply facilities.</p>		<p>1. Sudan's policies for human resources development for water supply does not change drastically. 2. Trainings are implemented continuously in SWCs(excluding PSWCs).</p>
<p>< Project Purpose > Human resources in water supply sector are properly trained in Sudan.</p>	<p>1. The number of trainees of training courses in Sudan that are trained is more than 2000 after establishment of New Training Center. 2. Functionality rate of water supply facilities in the PSWCs is higher than 80%.</p>	<p>1. DWST training implementation report 2. PSWC training implementation report 3. PSWC monitoring activities report</p>	<p>1. PSWC's staff who completed training courses do not leave SWC. 2. There are no climate changes or disasters that affect the operations water facilities.</p>
<p>< OUTPUTS > 1. Training courses are implemented by DWST based on its mid-term/long-term human resources development plan.</p>	<p>1. Mid-term/long-term human resources development plan is completed by March 2013. 2. Percentage of contributions from training coordinator on the planning and implementation of training courses increases by 100%. 3. Training courses at DWST are implemented more than 20 times annually.</p>	<p>1. Mid-term/long-term human resources development plan 2. DWST training coordinator questionnaire Japanese expert questionnaire 3. DWST training implementation report</p>	<p>1. Necessary budget, personnels, equipments, etc are provided in a timely and appropriately.</p>
<p>2. Training course implementation structures in PSWCs are developed by PSWCs in collaboration with DWST.</p>	<p>1. Percentage of contributions from training coordinators on the planning and implementation of training courses is increased by 80% in the PSWCs (1. Contributions from training coordinators on the planning and implementation of training courses.) 2. Training courses are implemented according to the SWC training implementation plan.</p>	<p>1. Pilot SWC training coordinator questionnaire Japanese expert questionnaire 2. Pilot SWC training implementation report</p>	
<p>3. Monitoring system is established within DWSU and pilot SWCs for training course implementation and O&M of water supply system of PSWCs.</p>	<p>1. Monitoring manual is completed by December 2013. 2. Monitoring activities are implemented according to schedule. 3. The number of annually maintained water yards** is increased more than 100.</p>	<p>1. Monitoring manual 2. Monitoring report 3. Monitoring report</p>	
<p>4. Training course implementation structure is developed within each SWC in Sudan in collaboration with DWST.</p>	<p>1. Human resources development manual is completed by March 2013. 2. Workshops to share and disseminate the outputs of PSWCs are implemented 6 times.</p>	<p>1. Human Resources Development Manual 2. Workshop report</p>	
<p>< ACTIVITIES > 1-1. DWST elaborates draft plan for mid-term/long-term human resource development. 1-2. DWST prioritizes actual needs for the training courses. 1-3. DWST elaborates its training implementation plan based on the draft plan for mid-term/long-term human resource development. 1-4. DWST implements training courses based on the training course implementation plan. 1-5. DWST evaluates the training courses. 1-6. DWST revises training course contents, textbooks and manuals based on the evaluation results of the training courses. 1-7. DWST improves its capacity responding to the expansion of training center. 1-8. DWST finalizes the mid-term/long-term human resources development plan, which is to be authorized by the government of Sudan. 2-1. DWST strengthens its leadership through the support of below activities of SWC. 2-2. PSWC establishes training units within the organization. 2-3. PSWC develops the draft SWC activities plan. 2-4. PSWC prioritizes actual needs for the training courses. 2-5. PSWC develops training course implementation plan based on the priority. 2-6. PSWC training unit develops training course curriculum(including OJT in Localities)and textbooks. 2-7. PSWC training unit implements training courses. 2-8. PSWC training unit evaluates the training courses. 2-9. PSWC training unit revises training course curriculum and textbooks based on the evaluation results of the training courses. 2-10. PSWC reflect the monitoring result of draft SWC activities plan to training course implementation plan. 3-1. DWSU and Pilot SWC establish monitoring units within the organization. 3-2. DWSU develops the draft version of monitoring manual to be used by pilot SWC. 3-3. Pilot SWC implements baseline survey on the O&M status of current water supply system. 3-4. Pilot SWC regularly monitors the current situation of training implementation, examples identified in the State, and O&M of water supply system based on the draft of monitoring manual. 3-5. DWSU and DWST analyze and evaluate the monitoring result and give feedbacks such as lessons learned and good practices etc. to SWC monitoring unit. 3-6. DWSU maintains and manages monitoring data at information center. 3-7. DWSU finalizes monitoring manual based on the evaluation of monitoring of training courses and O&M of water supply system. 4-1. DWST develops Human Resources Development Manual to each SWC based on the outputs of 1, 2 and 3. 4-2. Each SWC (excluding PSWC) establishes training unit within the organization. 4-3. DWST implements workshop(s)to share and disseminate the outputs of PSWC activities, and distribute Human Resource Development Manual to each SWC. 4-4. Each SWC (excluding PSWC) develops training course implementation plan.</p>	<p>< INPUTS > 1. Japanese side (1)Experts ①Team leader/training course management/water supply plan ②Organizational management/Water tariff management ③Water supply facilities management (Water treatment plant/pipeline system) ④Machinery and electric equipment/Equipment management ⑤Well management ⑥Data management/Monitoring ⑦Water quality control and management ⑧Community development ⑨Sanitation management (2)Equipment ①Necessary equipment for DWST new training courses ②Necessary equipment for pilot SWCs training courses ③Necessary equipment for other SWCs (excluding Darfur 3 States, South Kordofan, Blue Nile, Kassala and Khartoum States) (3)Project activities fee (4)Training in Morocco (5)Acceptance Trainee from Morocco 2. Sudanese side (1)Allocation of counterparts and administrative personnel 1) Project Director 2) Project Manager 3) Counterparts (2)Allocation of land, buildings and facilities 1) Office space for Japanese experts in the building of DWSU 2) Office space for JICA experts in the building of pilot SWCs 3) Training space in DWST and pilot SWCs 4) Other necessary facilities, equipment and materials for the administration of the Project (3)Project activities fee (4)Construction of kilo ten training center (5)Procurement of office equipment and furniture for the training center</p>	<p>1. Budget of DWSU, DWST, and SWCs does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant. 4. Budget, human resources, and necessary equipment for project implementation are properly provided. < Pre-Condition > 1. The economic situation does not worsen than that of initiation period of project implementation. 2. Political conflicts do not occur 3. Organization (personnel) and budget at DWSU, DWST and SWC does not change drastically.</p>	
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<p>< Project Purpose > Human resources in water supply sector are properly trained in Sudan.</p>	<p>1. The number of trainees that are trained in Sudan exceeds 2000. 2. The number of annually maintained water yards** is increased to more than 20 in each PSWC.</p>	<p>1. DWST, PSWC, SWCs training implementation report 2. PSWC training implementation report</p>	<p>1. PSWC's staff who completed training courses do not leave SWC. 2. There are no climate changes or disasters that affect the operations water facilities. 3. Necessary budget, personnel, equipment, etc are provided in SWC at the appropriate timing.</p>
<p>< OUTPUTS > 1. Training courses are implemented by DWST based on its mid-term/long-term human resources development plan. 2. Training course implementation structures in PSWCs are developed by PSWCs in collaboration with DWST. 3. Monitoring system is established within DWSU and pilot SWCs for training course implementation and O&M of water supply system of PSWCs. 4. Training course implementation structure is developed within each SWC in Sudan in collaboration with DWST.</p>	<p>1. Mid-term/long-term human resources development plan is completed by March 2013. 2. Percentage of contributions from training coordinator on the planning and implementation of training courses increases by 100%. 3. Training courses at DWST are implemented more than 20 times annually. 1. Percentage of contributions from training coordinators on the planning and implementation of training courses is increased by 80% in the PSWCs 2. Training courses are implemented according to the SWC training implementation plan. 1. Monitoring manual is completed by March 2015. 2. Monitoring activities are implemented according to schedule. 1. Human resources development manual is completed by March 2015. 2. Joint Seminar to share and disseminate the outputs of PSWCs are implemented 6 times.</p>	<p>1. Mid-term/long-term human resources development plan 2. DWST training coordinator questionnaire Japanese expert questionnaire 3. DWST training implementation report 1. PSWC training coordinator questionnaire Japanese expert questionnaire 2. PSWC training implementation report 1. Monitoring manual*** 2. Monitoring report 1. Human Resources Development Manual 2. Joint Seminar report</p>	<p>1. Necessary budget, personnel, equipment, etc are provided in a timely and appropriately.</p>
<p>< ACTIVITIES > 1-1. DWST elaborates draft plan for mid-term/long-term human resource development. 1-2. DWST prioritizes actual needs for the training courses. 1-3. DWST elaborates its training implementation plan based on the draft plan for mid-term/long-term human resource development. 1-4. DWST implements training courses based on the training course implementation plan. 1-5. DWST evaluates the training courses. 1-6. DWST revises training course contents, textbooks and manuals based on the evaluation results of the training courses. 1-7. DWST improves its capacity responding to the expansion of training center. 1-8. DWST finalizes the mid-term/long-term human resources development plan, which is to be authorized by the government of Sudan. 2-1. DWST strengthens its leadership through the support of below activities of SWC. 2-2. PSWCs establish training units within the organization. 2-3. PSWCs develop the draft SWC activities plan. 2-4. PSWCs prioritize actual needs for the training courses. 2-5. PSWCs develop training course implementation plan based on the priority. 2-6. PSWCs' training units develop training course curriculum(including OJT in Localities)and textbooks. 2-7. PSWCs' training units implement training courses. 2-8. PSWCs' training unit evaluate the training courses. 2-9. PSWCs' training units revise training course curriculum and textbooks based on the evaluation results of the training courses. 2-10. PSWCs reflect the monitoring result of draft SWC activities plan to training course implementation plan. 3-1. DWSU and PSWCa establish monitoring units within the organization. 3-2. DWSU develops the draft version of monitoring manual to be used by PSWCs. 3-3. PSWCs implement baseline survey on the O&M status of current water supply system. 3-4. PSWCs regularly monitor the current situation of training implementation, examples identified in the State, and O&M of water supply system based on the draft of monitoring manual. 3-5. DWSU and DWST analyze and evaluate the monitoring result and give feedbacks such as lessons learned and good practices etc. to SWC monitoring unit. 3-6. DWSU maintains and manages monitoring data at information center. 3-7. DWSU finalizes monitoring manual based on the evaluation of monitoring of training courses and O&M of water supply system. 4-1. Each SWC (excluding PSWCs) establishes training unit within the organization. 4-2. DWST develops Human Resources Development Manual to each SWC based on the outputs of 1, 2 and 3. 4-3. DWST implements Joint Seminar(s) to share and disseminate the outputs of PSWCs' activities, and distribute Human Resource Development Manual to each SWC. 4-4. Each SWC (excluding PSWCs) develops training course implementation plan.</p>		<p>< INPUTS > 1. Japanese side (1)Experts ①Team leader/training course management/water supply plan ②Organizational management/Water tariff management ③Water supply facilities management (Water treatment plant/Pipe network management) ④Machinery and electric equipment/Equipment management ⑤Well management ⑥Data management/Monitoring ⑦Water quality control and management ⑧Community development ⑨Sanitation management (2)Equipment ①Necessary equipment for DWST new training courses ②Necessary equipment for PSWCs training courses ③Necessary equipment for other SWCs (excluding Darfur 5 States, South Kordofan, West Kordofan, Blue Nile, Kassala and Khartoum States) (3)Project activities fee (4)Training in Morocco (5)Acceptance Trainee from Morocco 2. Sudanese side (1)Allocation of counterparts and administrative personnel 1) Project Director 2) Project Manager 3) Counterparts (2)Allocation of land, buildings and facilities 1) Office space for Japanese experts in the building of DWSU 2) Office space for JICA experts in the building of PSWCs 3) Training space in DWST and PSWCs 4) Other necessary facilities, equipment and materials for the administration of the Project (3)Project activities fee (4)Construction of kilo ten training center (5)Procurement of office equipment and furniture for the training center</p>	<p>1. Budget of DWSU, DWST, and SWCs does not drastically decrease. 2. Organizational restructuring does not occur for counterparts. 3. The number of trained SWC staff leaving the organization is not significant. 4. Budget, human resources, and necessary equipment for project implementation are properly provided. < Pre-Condition > 1. The economic situation does not worsen than that of initiation period of project implementation. 2. Political conflicts do not occur 3. Organization (personnel) and budget at DWSU, DWST and SWC does not change drastically.</p>
<p>< Remarks > DWSU: Drinking Water and Sanitation Unit, DWST: Drinking Water and Sanitation Training Center, PSWC: Pilot State Water Corporation, SWC: State Water Corporation, O&M: Operation and Maintenance * Project activities are conducted indirectly in areas that are inaccessible for Japanese side. **Water yard is consisting of borehole, elevator tank, generator house and public fountains.</p>		<p>***Monitoring manual includes the guideline of monitoring activities, the mandate of monitoring unit, the monitoring activity schedule and the reporting schedule from SWC and DWSU. This manual is used for the monitoring of SWC training course implementation, good practices and lessons learnt which are shared with other SWCs, and maintenance of water supply facilities in SWC.</p>	

