

The Republic of Sudan

FY 2017 Ex-Post Evaluation of Technical Cooperation Project

“Frontline Maternal and Child Health Empowerment Project” and “Frontline Maternal and Child Health Empowerment Project Phase 2”

External Evaluator: Keiko Watanabe, Mitsubishi UFJ Research & Consulting Co., Ltd.

## 0. Summary

The project<sup>1</sup> was implemented aiming at promoting safe delivery throughout Sudan by enhancing the quality of maternal and child health services provided by Village Midwife (hereinafter referred to as “VMW”<sup>2</sup>). “Frontline Maternal and Child Health Empowerment Project” (commonly known as “Mother Nile Project”, hereinafter referred to as “MNP”) developed an empowerment model which strengthened the capacity of VMW and the support system for VMW’s activities in the pilot state, Sinnar state. In the subsequent “Frontline Maternal and Child Health Empowerment Project Phase 2” (hereinafter referred to as “MNP2”), the empowerment model developed by MNP was scaled up in other eight states. In addition, in Sinnar state a comprehensive approach for mother and child health centered on VMW was established including the strengthening of medical facilities and equipment and capacity of medical personnel that MNP could not cover.

The objective of the project is consistent with health policy and development needs of the country and “support for improvement of basic human needs” which is the priority issue of Japan’s assistance to Sudan. Therefore, the relevance is high. Although the achievement of the project purposes could not be quantitatively verified in part, considering the achievement of each output and the interview results from the stakeholders, it can be thought that the projects largely achieved their project purposes at the time of completion. Since MNP2 was implemented based on the achievement of MNP, overall goal of MNP and MNP2 were both considered as “implementation of high quality of continuum of care by VMW in whole country”. In-service training (hereinafter referred to as “INSET”) for VMW introduced by the project has continued even at the time of ex-post evaluation and about half of VMW in the country has been covered by the training. Although the reliable quantitative data on continuum of care<sup>3</sup> and referral<sup>4</sup> by the strengthened VMW was not obtained, it was confirmed from the results of qualitative interview as well as quantitative survey in the visited states conducted at the time of

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<sup>1</sup> The “project” indicates the target two projects.

<sup>2</sup> The condition for becoming a VMW must be woman who has completed primary education and has graduated from midwifery school (18 months). VMW is called community midwife (CMW) at the time of ex-post evaluation. They are currently positioned as a part of community health workers in health administration from the volunteer position in the past. During the project period, they were called VMW. Thus, VMW is used throughout this ex-post evaluation report.

<sup>3</sup> Continuum of care refers to an integrated maternal and child care such as antenatal care, delivery care, newborn care, postnatal care taking each period of pregnancy, delivery and child rearing as a series. In this project, emphasis is put on antenatal care, delivery care and postnatal care for expectant and nursing mothers.

<sup>4</sup> Referral means to introduce/transfer patients who cannot cope with lower medical facilities like primary medical facilities to upper medical institutions such as secondary and tertiary levels.

ex-post evaluation that VMW were providing more appropriate maternal and child services than before the project to a certain extent. Therefore, overall goal was judged as almost achieved. The other positive impacts were also observed. Therefore, the effectiveness and impact of the project are high. The project period was as planned, on the other hand, the project cost exceeded the plan. Thus, the efficiency is fair. The sustainability of the project effect is fair since some problems have been observed in terms of organizational aspect and maintenance status.

In light of the above, this project is evaluated to be satisfactory.

## 1. Project Description



Project Locations

(Green: Pilot state, Yellow: Eight target states in MNP2)



Women and Families Waiting for Treatment

(Wad Nile Rural Hospital, Sinnar State)

### 1.1 Background

After the civil war that continued since 1983 in Sudan, the Comprehensive Peace Agreement was signed in 2005. However, due to the severe economic situation under the civil war of more than 20 years, the level of health status was low. In particular, indicators relating to maternal and child health were in a severe situation and those were even lower than the average level of developing countries. In response to the request from the Sudanese government, JICA implemented a technical cooperation project “Frontline Maternal and Child Health Empowerment Project (MNP)” for three years from June 2008, which contributed to the improvement of maternal and child health. The project aimed to establish the system to provide qualitative maternal and child health services to the local communities by improving the capacity of VMW, a key player of reproductive health<sup>5</sup> (hereinafter referred to as “RH”) at the community level, strengthening the systems surrounding VMW, and enhancing the capacity of the Federal Ministry of Health (FMOH) and State Ministry of Health (SMOH).

It was confirmed that MNP has largely achieved its objective at the time of terminal

<sup>5</sup> RH means health and rights related to reproductive process. In concrete, it includes the rights for safe delivery, rights to decide if, when and how often to give births and right to receive appropriate reproductive and sexual information and services.

evaluation. However, some issues have been remained in medical facilities to which VMW refers high risk pregnant women. Those facilities were obsolete, their equipment was short and medical personnel at the referral hospitals lacked knowledge and skills of emergency obstetric care. In addition, it was necessary to further strengthen the support system for VMW in Sudan. Under such background, “Frontline Maternal and Child Health Empowerment Project Phase 2” (MNP2) was implemented for three years from August 2011.

## 1.2 Project Outline

		MNP	MNP2
Overall Goal		VMWs are empowered and organized in the Primary Health Care (PHC) <sup>6</sup> context to perform ideal continuum of care for maternal and child health (MCH) in Sudan.	Maternal and infant mortality is reduced in Sudan.
Project Purpose		VMWs are empowered and organized in the PHC context to perform ideal continuum of care for MCH in Pilot State.	More women receive quality cares related to pregnancy and childbirth in Sudan.
Output	Output 1	Organizational capacity of FMOH and SMOH, and rules and regulations of VMW are strengthened to perform appropriate MCH services.	Institutional capacity of FMOH and SMOH in maternal and newborn health is strengthened.
	Output 2	MCH services are provided through empowered and organized VMWs in Pilot State.	Capacity of VMWs is strengthened in order to provide quality maternal and newborn care in the 8 states <sup>7</sup> .
	Output 3	Horizontal communication network among northern states <sup>8</sup> and relevant stakeholders is strengthened to address the issue on MCH.	A model of comprehensive approach to improve maternal and newborn health is established in Sinnar state.
Total Cost (Japanese Side)		317 million yen	716 million yen
Period of Cooperation		June, 2008 – June, 2011	August, 2011 – August, 2014
Implementing Agency		FMOH Sinnar SMOH	FMOH SMOHs in the target 9 states
Other Relevant Agencies / Organizations		None	None

<sup>6</sup> PHC is an approach that provides comprehensive, accessible, community-based care that meets health needs of individuals throughout their life.

<sup>7</sup> 8 states: North Kordofan State, Gezira State, White Nile State, Northern State, River Nile State, Red Sea State, Gedaref State and Khartoum State. With adding Sinnar State which is the target state of Output 3, MNP2 target total of 9 states out of 15 states in Sudan.

<sup>8</sup> During the project period of MNP, South Sudan has not separated from Sudan (Independent in July 2011) and the current Sudan was called the northern Sudan.

Supporting Agency/Organization in Japan	None	None
Related Projects	<p><b>【Technical Cooperation】</b>  “Project for Human Resources Development for Darfur and the Three Protocol Areas” (2009-2013)  “Capacity Development Project for Provision of the Services for Basic Human Needs in Kassala” (2011-2015)  “Primary Health Care Expansion Project” (2016- on going)  <b>【Grant Assistance for Grassroots and Human Security Project】</b>  “Rehabilitation of two midwifery schools in Sinnar State” (2008)</p>	

### 1.3 Outline of the Terminal Evaluation

#### 1.3.1 Achievement Status of Project Purpose at the Terminal Evaluation

According to the terminal evaluation of MNP, it was judged that the project purpose was likely to be achieved considering the fact that one of the indicators of the project purpose “referral cases made by VMWs are increased” has been achieved and other information received from the evaluation survey. However, the other indicator “rate of continuum of care provided by trained VMWs in pilot state is increased” could not be verified its achievement. MNP2 was judged to be achieved since it was confirmed that the quality and access of maternal and child health services has been improved by the comprehensive approach in Sinnar state which included capacity development of VMW and their organization as well as strengthening of medical facilities and personnel, and capacity development of VMW in the eight target states.

#### 1.3.2 Achievement Status of Overall Goal at the Terminal Evaluation (Including other impacts.)

In MNP, 52 facilitators for INSET for VMW were fostered in six states other than the pilot state. The initiative for scaling-up INSET for VMW nationwide has already begun. Therefore, it was judged that the overall goal is likely to be achieved as a medium to long-term perspective. In MNP2, it was considered that the basic foundation for reducing Maternal Mortality Rate (hereinafter referred to as “MMR”) has been established considering the fact that the level of maternal and child health services was upgraded. This is because the number of facilitators for INSET for VMW and VMW with improved skills increased nationwide, the comprehensive approach model implemented in Sinnar state found to be effective for continuum of care for maternal and child health, and the institutional capacity of FMOH and SMOH on VMW has been strengthened. In addition, it was considered that this would contribute to the reduction of Infant Mortality Rate (hereinafter referred to as “IMR”) in the long term. Therefore, it was judged that the overall goal is likely to be achieved.

### 1.3.3 Recommendations from the Terminal Evaluation

Following recommendations were posed from the terminal evaluation.

#### <MNP>

	Main Recommendations
Recommendations during project period	<ol style="list-style-type: none"> <li>1) Completion of VMW empowerment model</li> <li>2) Approval of guideline of INSET for VMW by FMOH</li> <li>3) Objective assessment of comparison results before and after training on the procedure for prevention of infection by VMW</li> <li>4) Monitoring of qualitative and management of INSET for VMW in the five states including Darfur</li> <li>5) Completion of a grand design of scaling-up of VMW's empowerment model in cooperation with each state and other development partners.</li> <li>6) Prepare for verification of project effect utilizing health indicators</li> </ol>
Recommendations done by Sudanese side after the completion of the project (medium /long term)	<ol style="list-style-type: none"> <li>1) Scaling-up of the empowerment model to nationwide</li> <li>2) Further capacity development of Health Visitors (HV), supervisor of VMW and Assistant Health Visitors (AHV)<sup>9</sup></li> <li>3) Strengthening of cooperation network of maternal and child health personnel</li> <li>4) Implementation of training on emergency obstetric care to general practitioners of rural hospitals</li> <li>5) Rehabilitation of facilities and improvement of equipment of rural hospitals, especially for obstetric care units</li> <li>6) Making recommendation on fostering RH related human resources in formulation of the national health human resources strategy</li> </ol>

#### <MNP2>

	Main Recommendations
Recommendations during project period	<ol style="list-style-type: none"> <li>1) Formulation of the guideline of empowerment model</li> <li>2) Documentation of training of emergency obstetric and newborn care</li> <li>3) Documentation of community activities by VMW</li> <li>4) Dissemination of the maintenance guideline of medical equipment and user manual</li> <li>5) Implementation of End-line survey at Sinnar state</li> </ol>
Recommendations done by Sudanese side after the completion of the project (medium /long term)	<ol style="list-style-type: none"> <li>1) Promotion of empowerment of VMW (Provision of salary and incentives, necessary tools and consumptions, etc.)</li> <li>2) Enhancement of support for continuation of community activities</li> <li>3) Continuation of monitoring activities for VMW</li> <li>4) Allocation of the provided car to RH division of Sinnar SMOH for the above 3)</li> </ol>

<sup>9</sup> HV is health care worker in the position to direct, supervise, and assess VMW. HV is qualified as a nurse, enrolled at midwifery schools for three years and has undergone enrollment at HV School for two years after a one-year clinical experience. HV is mainly enrolled at local health center. In this project, HV was expected to direct and supervise VMW, as well as to become facilitators of INSET for VMW. AHV is a preparatory position to become HV in the future. The position of AHV was set as emergency measure due to the lack of the number of HV.

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Keiko Watanabe, Mitsubishi UFJ Research & Consulting Co., Ltd.

### 2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: November, 2017 – December, 2018

Duration of the Field Study: February 18, 2018 – March 16, 2018, July 14-22, 2018

### 2.3 Constraints during the Evaluation Study

Quantitative data on indicators related to continuum of care (for example, number and rate of ANC) could not be obtained from relevant organizations, or even when there was data, the reliability was low<sup>10</sup>. Thus, it was difficult to judge the achievement of indicators by numerical values. The evaluation was done by gathering qualitative information as much as possible from various viewpoints such as interviews with relevant parties and site surveys<sup>11</sup>.

## 3. Results of the Evaluation (Overall Rating: B<sup>12</sup>)

### 3.1 Relevance (Rating: ③<sup>13</sup>)

#### 3.1.1 Consistency with the Development Plan of Sudan

*5-Year Health Sector Strategy* (2007-2011) which was effective at the planning period of MNP (2008) considers “improvement of mother and child health” as one of important issues. *Sudan National Strategy for Reproductive Health* (2006-2010) sets “protection of mothers focused on safe pregnancy” as a priority issue and stipulates the strengthening of capacity of VMW as a concrete strategy in order to develop skilled health personnel.

The said policies were effective at the times of completion of MNP and planning of MNP2 (2011). In particular, FMOH put emphasis on reduction of infant mortality rate (IMR) and improvement of maternal health, which are the Millennium Development Goals (MDGs). In order to achieve these goals, the improvement of quality of mother and child health services through INSET for healthcare workers including VMW, strengthening of referral system and

<sup>10</sup> For example, since the data was compiled for each year without considering large variation of monthly collection rate by VMW, the trends by year cannot simply be compared. In addition, the problem was seen such that the reason is unknown even if the value of one year is far from the trend so far.

<sup>11</sup> At the time of ex-post evaluation, the interview was conducted to the five states; Sinnar, Gezira, North Kordofan, White Nile and Khartoum (Only local consultant visited for North Kordofan state due to the security reason). The interview was conducted to the following persons in each state; Director General of SMOH (5), 3-4 persons in charge of mother and child health, 23 HV (Sinnar 7, Gezira 4 (1 AHV), North Kordofan 3 (1 AHV), White Nile 5, Khartoum 4), 30 VMWs (Sinnar 14, Gezira 6, North Kordofan 4, White Nile 3, Khartoum 3), Others: Target hospitals personnel in Sinnar (3 Doctors, 2 Nurse Midwives, 4 Biomedical Engineers), 6 teachers and principals of midwifery schools in Sinnar, Gezira and North Kordofan states. Except 3 doctors, 2 biomedical engineers and Director General of each SMOH are women.

<sup>12</sup> A: Highly satisfactory, B: Satisfactory, C: Partially Satisfactory, D: Unsatisfactory

<sup>13</sup> ③: High, ②: Fair, ①: Low

enhancement of health information system are identified as strategy. At the time of completion of MNP2, *Primary Health Care (PHC) Expansion Project (2012-2016)* promotes one village one VMW and *National Human Resources for Health Strategic Plan for Sudan (2012-2016)* also stipulates the increase in number and capacity development of VMW.

Therefore, both the projects are in line with the development policies at the time of planning and completion.

### 3.1.2 Consistency with the Development Needs of Sudan

According to the Sudan Household Health Survey (SHHS, 2006), which was effective at the time of planning for both MNP and MNP2, MMR was 534 (per 100,000 live births). It was higher than 339, the average of lower middle income countries to which Sudan belongs, and 288, the world average in the same year<sup>14</sup>. Thus, the need for safe delivery was high. Inadequate maternal and child health services and lack of medical personnel in rural areas were raised as its reasons. Furthermore, the proportion of home delivery was very high<sup>15</sup> in Sudan at the time of planning and completion of MNP and MNP2, accordingly, it was urgent to strengthen the capacity of VMW who implement antenatal and postnatal care and assist deliveries at home. Therefore, both MNP and MNP2 are in line with the development needs at the time of planning and completion.

### 3.1.3 Consistency with Japan's ODA Policy

Japan raises the importance of health and medical area in *Japan's ODA Charter (2003)*. At the time of planning of MNP, efforts to strengthen health system, improve maternal and child health and reduce MMR were stipulated in Yokohama Action Plan of the fourth Tokyo International Conference on African Development (TICAD IV) (2008). At the time of planning of MNP2, in TICAD V (2013) MMR has been listed as one of the outcome goals and the expansion of health coverage as well as providing effective basic health services for maternal, newborn and child health and RH was raised for promotion. According to *Japan's ODA Data by Country* at the time of planning of MNP and MNP2 (2008 and 2010), both the projects are positioned as "assistance to basic human needs", which is a priority area of Japan's assistance to Sudan and propose the improvement of maternal and child health services in rural areas to rectify regional disparity in Sudan. Therefore, both MNP and MNP2 were in line with the Japan's assistance policy at the time of planning.

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<sup>14</sup> Average of lower middle income countries and world average are from open data of the World Bank. (Data source is from State of the World's Children (UNICEF), Childinfo, Demographic and Health Surveys in every other year.)

<sup>15</sup> According to SHHS (2006), at the time of planning of MNP, delivery rate at health facility in Sudan varies by state, from 5% (Blue Nile state) to 54% (Khartoum state) but only about 20% in average. That is to say, overwhelmingly there were many home deliveries. SHHS II (2010) and Multi Indicators Cluster Survey (MICS, 2014) at the time of completion of MNP and planning of MNP2, showed that delivery rate at health facility was still low as 20.5% (2010) and 27.7% (2014) each on the national average.

This project was highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

### 3.2 Effectiveness and Impact<sup>16</sup> (Rating:③)

#### 3.2.1 Effectiveness

##### 3.2.1.1 Achievement of Project Purpose

###### (1) MNP

MNP aimed to build a system to provide continuum of care by strengthened and organized VMW. It was tried to be achieved through strengthening institutional set up of VMW and capacity of FMOH and Sinnar SMOH of the pilot state (Output 1), building capacity of VMW and their supporting system (Output 2), and sharing achievements and experiences of the project to other states (Output 3). Three outputs were judged as achieved (details of achievement of each output are in Annex Table 1). Based on the achievement of the two indicators shown in Table 1, MNP contributed to the realization of safe delivery. Thus, it can be judged that the project purpose has largely been achieved.

Table 1 Achievement of Project Purpose (MNP)

Project Purpose	Indicator	Actual				Achievement																					
VMWs are empowered and organized in the PHC context to perform ideal continuum of care for MCH in Pilot State.	1. Rate of continuum of care (ANC, delivery, PNC) provided by trained VMW in pilot state is increased.	<ul style="list-style-type: none"> <li>According to the terminal evaluation report, the rate of ANC and delivery assistance could not be calculated since the total number of pregnant women were unknown. The number of implementation was as in the below table.</li> </ul> <p style="text-align: center;">&lt;Transition of Number of Continuum of Care and Referral Cases in Pilot State&gt;</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Indicator</th> <th style="width: 15%;">BL (Jan.-Dec. 2008)</th> <th style="width: 15%;">At the Mid Term Review (Jan.- Dec. 2009)</th> <th style="width: 15%;">EL (Jan.-Sep. 2010)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Continuum of Care (Indicator 1)</td> <td>No. of ANC</td> <td>21,330</td> <td>24,330</td> <td>8,282</td> </tr> <tr> <td>No. of delivery</td> <td>13,660</td> <td>20,585</td> <td>7,643</td> </tr> <tr> <td>No. of PNC per delivered mother (recommended 4 times)</td> <td>2.2 times</td> <td>-</td> <td>3.8 times</td> </tr> <tr> <td>No. of referral cases (Indicator 2)</td> <td>1,168</td> <td>-</td> <td>2,082</td> </tr> </tbody> </table>				Indicator	BL (Jan.-Dec. 2008)	At the Mid Term Review (Jan.- Dec. 2009)	EL (Jan.-Sep. 2010)	Continuum of Care (Indicator 1)	No. of ANC	21,330	24,330	8,282	No. of delivery	13,660	20,585	7,643	No. of PNC per delivered mother (recommended 4 times)	2.2 times	-	3.8 times	No. of referral cases (Indicator 2)	1,168	-	2,082	Fair
		Indicator	BL (Jan.-Dec. 2008)	At the Mid Term Review (Jan.- Dec. 2009)	EL (Jan.-Sep. 2010)																						
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BL : Baseline Survey, EL: End-line Survey Source: MNP Terminal Evaluation Report																											
Although the Indicator 1 which is the implementation rate of continuum of care could not be obtained, through the interview with the relevant officers of FMOH and Sinnar state at the time of ex-post evaluation, it was confirmed that VMW who have built capacity and organized have been implementing																											

<sup>16</sup> Sub-rating for Effectiveness is to be put with consideration of Impact.



		continuum of care more appropriately than before the project. Thus, the level of achievement of the indicator was fair.	
	2. Referral cases made by VMW are increased.	<ul style="list-style-type: none"> <li>The number of referral cases by VMW was increased as in the above table. According to the data obtained at the time of ex-post evaluation, the number of delivery at facility has increased more than double from 5,913 (2008) before MNP to 12,663 (2012) after MNP. From the interview to the relevant stakeholders at the time of ex-post evaluation, it was confirmed that ANC, PNC and referral which were carried out appropriately by VMW led to delivery at facility. Thus, the indicator was judged as achieved.</li> </ul>	Achieved

Source: MNP Terminal Evaluation Report, Interview Results from SMOH, HV, VMW in Sinnar state at the time of ex-post evaluation

## (2) MNP2

MNP2 further enhanced the system for VMW which had been strengthened in MNP and contributed to facilitate the implementation of FMOH's "*PHC Expansion Project*". In addition, MNP2 improved the MNP's empowerment model for VMW and applied to the target eight states. Furthermore, in Sinnar state MNP2 built a comprehensive approach centered on VMW by improving the environment through improvement of medical facilities and equipment provision as well as strengthening the capacity of medical personnel, which contributed to the realization of safe delivery. The indicator to verify the achievement of project purpose was set as "Numbers of ANC, delivery and referral services provided by VMWs are increased in nine model localities<sup>17</sup> (all seven localities of Sinnar state and one each from North Kordofan and Gezira states)". The BL survey and EL survey<sup>18</sup> were conducted for the above nine localities in MNP2 (Table 2). However, since MNP2 was targeting the nine states, the supplementary data was tried to collect in the five states visited at the time of ex-post evaluation. Although clear quantitative data could not be obtained in these states, the interview to the relevant persons in the visited five states revealed that the number of ANC has increased, the delivery has been assisted with appropriate method and treatment, and that the referral has been implemented in timely manner by VMW who have received INSET in any of the states. Therefore, it was assumed that the behavior change of VMW has been made and that improvement of quality of continuum of care by VMW was surely realized. According to the information provided by JICA, the numbers of ANC and the facility-based delivery have been increased by 39% and by 51% respectively in comparison of 2010/2013 in the three hospitals in Sinnar state that have been improved by constructing the obstetric care units and providing equipment. It was also reported that the hospitals with improved facilities and equipment was used more often by pregnant women and that VMW became easier to refer to those hospitals. Therefore, it can be

<sup>17</sup> Locality is the administrative division under state.

<sup>18</sup> Baseline survey was conducted from November 2011 to May 2012. End-line survey was conducted from October 2013 to January 2014.

said that the improvement of medical facilities and equipment also contributed to the increase in number of continuum of care. The three outputs of MNP2 have largely been achieved (Annex Table 1). It is considered after judging comprehensively that the project purpose of MNP2 has largely been achieved.

Table 2: Achievement of Project Purpose (MNP2)

Project Purpose	Indicator	Actual	Achievement										
More women receive quality cares related to pregnancy and childbirth in Sudan.	Numbers of ANC, delivery and referral services provided by VMWs are increased in 9 model localities.	<p>Based on the results of BL survey and EL survey implemented in MNP2, the achievement of the indicator is as below (Annex Table 2, Annex Table 3)</p> <p>&lt;7 Localities in Sinnar state&gt;</p> <p><b>【No. of ANC】</b> A statistically significant increase was observed. The increase was observed by about 39% in the three target hospitals in Sinnar state, which were from 10,333 (2010) to 14,376 (2013).</p> <p><b>【No. of Assistance in Delivery】</b> The monthly average number of assistance in delivery at home by VMW increased from 1.4 to 3.3 times. However, it was not statistical significance.</p> <p><b>【No. of Referral】</b> A significant increase was confirmed in the number of referral during delivery assistance. The annual average number of referral during high risk delivery by VMW was increased from 1.6 to 3.5 times.</p> <p>Based on the above, it is considered that more pregnant women received the continuum of care in improved form in Sinnar state at the time of project completion. Therefore, it can be said that the project purpose was largely achieved.</p>	Largely Achieved										
		<p>&lt;South Gezira Locality, Gezira State&gt;</p> <p><b>【No. of ANC】</b> The absolute number decreased but it was not statistically significant. According to the state record of the same period obtained at the time of ex-post evaluation, as shown in the table below, the increase rate exceeded 40% both for the ANC 1 and ANC 4 (comparison 2012/2014). However, since these figures shows the whole state of Gezira, the contribution degree of MNP2 is not clear.</p> <p>&lt;Transition of Number of ANC in Whole Gezira State&gt;</p> <table border="1"> <thead> <tr> <th>No. of ANC</th> <th>2012</th> <th>2014</th> <th>Rate of Increase</th> </tr> </thead> <tbody> <tr> <td>ANC 1</td> <td>14,009</td> <td>25,685</td> <td>45.5%</td> </tr> <tr> <td>ANC 4</td> <td>6,417</td> <td>10,929</td> <td>41.3%</td> </tr> </tbody> </table> <p>Source: Gezira SMOH</p> <p><b>【No. of Assistance in Delivery】</b> A statistically significant increase was confirmed.</p> <p><b>【No. of Referral】</b> There was a significant increase in the</p>		No. of ANC	2012	2014	Rate of Increase	ANC 1	14,009	25,685	45.5%	ANC 4	6,417
No. of ANC	2012	2014	Rate of Increase										
ANC 1	14,009	25,685	45.5%										
ANC 4	6,417	10,929	41.3%										

	<p>number of referral during delivery.</p> <p>Based on the above, statistically significant increase in the numbers of assistance in delivery and referral were confirmed except the number of ANC in the target locality in Gezira state. It was also confirmed by the interview with the relevant persons at the time of ex-post evaluation that the pregnant women were able to receive continuum of care in quality-wise improved form. Therefore, it can be said to be largely achieved.</p> <p>&lt;Oum Ruwaba Locality, North Kordofan State&gt;  <b>【No. of ANC】</b> A statistically significant decrease was observed. According to the information provided by JICA, there was a possibility that deterioration of security situation may have affected to the number of visit. On the other hand, the data of the target locality shown in the below table which was obtained at the time of ex-post evaluation, although the number of ANC 4 decreased in the comparison of 2012/2014, the increase was confirmed totally by about 30%.</p> <p>&lt;Transition of Number of ANC in Oum Ruwaba Locality&gt;</p> <table border="1" data-bbox="539 987 1222 1205"> <thead> <tr> <th>No. of ANC</th> <th>2012</th> <th>2014</th> <th>Rate of Increase</th> </tr> </thead> <tbody> <tr> <td>ANC 1</td> <td>1,330</td> <td>2,087</td> <td>36.3%</td> </tr> <tr> <td>ANC 4</td> <td>344</td> <td>291</td> <td>-18.2%</td> </tr> <tr> <td>ANC 1 + ANC 4</td> <td>1,674</td> <td>2,378</td> <td>29.6%</td> </tr> </tbody> </table> <p>Source: North Kordofan SMOH</p> <p><b>【No. of Assistance in Delivery】</b> There was no statistically significant difference.</p> <p><b>【No. of Referral】</b> A statistically significant increase was confirmed for both number and rate of referral during assistance in delivery. According to the information from SMOH obtained at the time of ex-post evaluation, the number of delivery at facility was increased by 54.8% from 2,855 (2012) to 6,311 (2014). It is considered that the appropriate referral and ANC implemented by VMW was a great impact.</p> <p>From the above, although the improvement by referral was confirmed in the target locality in North Kordofan state, clear improvement on the numbers of ANC and assistance in delivery could not be confirmed. Therefore, the effectiveness is fair.</p>	No. of ANC	2012	2014	Rate of Increase	ANC 1	1,330	2,087	36.3%	ANC 4	344	291	-18.2%	ANC 1 + ANC 4	1,674	2,378	29.6%	Fair
No. of ANC	2012	2014	Rate of Increase															
ANC 1	1,330	2,087	36.3%															
ANC 4	344	291	-18.2%															
ANC 1 + ANC 4	1,674	2,378	29.6%															

(3) MNP and MNP2

FMOH is planning to apply the VMW empowerment model to all states, which was established in this project, aiming of implementing INSET for VMW as well as strengthening

VMW support system. At the time of completion of MNP2, about 20% of the VMW in the target nine states, that is, about 12% of the total VMW in all states of Sudan in the same period, have received INSET for VMW by the project (Table 3). Considering the fact that VMW has important role in Sudan where birth delivery at home was common while INSET for VMW has rarely been implemented before this project, it can be said that the project has greatly contributed to the realization of safe delivery of women in Sudan. The degree of achievement of indicators of project purposes of both MNP and MNP2 were not verified since clear justification based on the quantitative data could not be obtained. However, the interview with the relevant persons at the time of ex-post evaluation revealed that the quality of mother and child health services that VMW provides has been improved. It can be said that the project has contributed to the realization of safe delivery. Therefore, it can be considered that the project purpose of the project has largely been achieved.

Table 3: INSET for VMW conducted under this project (MNP+MNP2)

State	No. of VMW (2012)	No. of VMW who received INSET				Proportion of VMW among state VMW	
		MNP	MNP2		Total		
			Contract with UNICEF <sup>19</sup>				
1	North Kordofan	1,189	-	104	149	253	21%
2	Gezira	1,509	-	111	210	321	21%
3	River Nile	513	-	-	-	-	-
4	White Nile	1,033	-	-	189	189	18%
5	Northern	339	-	-	126	126	37%
6	Red Sea	331	-	-	126	126	38%
7	Gedaref	776	-	-	-	-	-
8	Khartoum	1,416	-	-	-	-	-
9	Sinnar	684	556	-	-	556	81%
	Total	7,789	556	215	800	1,571	20%

Note: Total number of VMW in all states of Sudan was 13,260 as of 2012.

Source: Information provided by JICA

### 3.2.2 Impact

#### 3.2.2.1 The Situation Leading to Achievement of Overall Goal after the Completion of the Projects

The following impacts have been found after confirming the project effects of project outputs and project purpose during the period between project completion and ex-post evaluation.

<sup>19</sup> In the output 2 of MNP2, UNICEF was contracted as the implementing agency in order to implement INSET for VMW in other target states.

(1) Situation of INSET for VMW

According to FMOH, INSET for VMW has been carried out after the completion of MNP2 as in Table 4. FMOH also pointed out that the target states was decided based on the request from the states, unattended rate of INSET for VMW, situation of mother and child health and so on. INSET has been also continued at each SMOH visited at the time of ex-post evaluation. FMOH has also provided VMW kits<sup>20</sup> to VMW after the training. The curriculum of INSET for VMW developed in MNP has been further improved and utilized. The facilitators of INSET for VMW who have been fostered in the project are also active. Therefore, the continuity of the project effects was recognized.

Table 4 The situation of INSET for VMW after the Completion of the Project

(Sudan Total)			(Achievement of INSET in the Visited States)				
Year	No. of Participants/ No. of Training	Funding Source	State/Year	2015	2016	2017	Total
2014	1,000 / 40	FMOH	Sinnar	60	45	50	155
2015	1,000 / 40	FMOH	Gezira	41	0	0	41
	300 / 12	UNFPA	North Kordofan	84	212	92	388
	200 / 8	WHO	White Nile	40	0	93	133
2016	200 / 8	UNFPA	Khartoum			255	255
2017	1,500 / 60	FMOH	Note: Funding source for training includes UNFPA, WHO, NGO besides FMOH				
	100 / 4	UNFPA	Source: SMOH in each state				
2018 Plan	1,000 / 40	FMOH					
	500 / 20	WHO					

Source: FMOH

(2) Situation of Employment of VMW and Provision of Incentives

By the presidential decree of 2013, a policy was laid out that VMW is to be employed officially from the status of volunteer. As in Annex Table 4, the employment rate of VMW increased from 23% as of 2012 to 49% as of the end of 2017. A certain number of VMW regularly receive incentives from FMOH even if they are not employed (6% of the total). The employment rate of VMW in Sinnar state also increased from about 30% at the time of EL survey of MNP2 to 51% according to the quantitative survey conducted at the time of ex-post evaluation<sup>21</sup> (Annex Figure 1). The interview with VMW revealed that their lives have been stabilized since there was a fixed payment every month and it was confirmed that VMW is positioned as a profession that stable income can be obtained.

<sup>20</sup> Minimum necessary tools and consumables for VMW to assist delivery (stethoscope, scissors, disinfectant, absorbent cotton, soap, etc.)

<sup>21</sup> Quantitative survey was conducted in Sinnar state with sample of 120 VMWs at the time of ex-post evaluation. Based on the VMW list in Sinnar state (958 VMWs), the sample size was decided taking into consideration of the percentage of VMW in seven localities. Firstly, the target VMWs were extracted randomly from the VMW list of each locality. Those VMWs who could not be contacted and were at remote location were excluded. Ultimately, the VMWs who could come to the neighboring medical facilities or SMOH office were selected as target samples. The similar questions were posed in order to compare with BL and EL surveys carried out in MNP2.

### (3) Obstetric Care Units Additionally Constructed in Two Hospitals in Sinnar State

Obstetric care units additionally constructed in MNP2 have been generally utilized as below.

#### (a) Obstetric Care Unit at Wad Nile Rural Hospital

Some troubles were found in this obstetric care unit such that the usual delivery room has not been operational due to poor drainage system since 2017. However, the theater for caesarean operation has been utilized. There was no record on number of obstetrical outpatients in the hospital. According to the hospital officials, the caesarean operation was about 13 to 15 times a month prior to the implementation of MNP2. However, it was said that it increased to 30 to 35 times a month (45 times at maximum month) due to the construction of the operation theater. Before the MNP2, many patients could not be admitted because of lack of theater and they have been transferred to the tertiary hospitals<sup>22</sup> of the state, where took nearly two hours. The addition of the theater also contributed to reduce the risk associated with transport. A care unit for ANC and PNC was under construction by the community fund near the obstetric care unit at the time of ex-post evaluation. It is expected that the unit would be more effectively utilized after its construction<sup>23</sup>.

#### (b) Obstetric Care Unit at Suki Locality Hospital

The obstetric care unit has been daily utilized. However, structurally significant cracks occurred in the entire building from two years after the completion and the rehabilitation of the building has begun at the time of ex-post evaluation (details are described in 3.4 “Sustainability”). There was no record on obstetric outpatients in this hospital as well. However, according to the staff in charge of summarizing total outpatients in the hospital since 1993, surrounding residents who used to go to the tertiary level hospitals in the state before the establishment of facilities and provision of equipment by MNP2 turned to come to this hospital. The same staff also stated that about 10 to 15 people per day came for maternal consultation before implementation of MNP2 and the number increased to about 40 people per day after the implementation. The number of caesarean operations turned to be 5 to 7 cases per day and the number of normal deliveries turned to be 7 to 8 cases per day in the newly established obstetric care unit.

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<sup>22</sup> In Sudan, the health services are divided into three levels. Primary level means rural clinics and health centers, secondary level is for rural hospitals and locality hospitals and tertiary level stands for specialized hospitals and education hospitals. Wad Nile Rural Hospital and Suki Locality Hospital at which the obstetric care units were constructed in MNP2 are secondary level hospitals.

<sup>23</sup> According to the hospital officials, although the construction has been delayed due to cash flow, it is planned to be completed by mid-2019.

(4) Provided Equipment

Although some of provided equipment to the above two hospitals have not been utilized as described later in 3.4 “Sustainability”, other equipment provided to Sinnar Teaching Hospital, midwifery schools, and health centers have been utilized with generally good conditions. It was confirmed from the interview with SMOH and hospital officials that the provision of equipment led to the improvement of quality of services.

On the other hand, according to the interview with VMW and HV, among the VMW kits granted after INSET for VMW and graduating from midwifery school, there were many cases that rubber balls of blood pressures gauge have deteriorated in two weeks to two months and become useless under the severe weather in Sudan.



VMW Kits provided after INSET for VMW



Unutilized Incubator (Obstetric Care Unit at Wad Nile Rural Hospital)



Training Equipment provided to Dindir Midwifery School (Sinnar State)



Rehabilitated Obstetric Care Unit at Suki Locality Hospital at the Time of Ex-post Evaluation



Rehabilitated Delivery Bed  
(Obstetric Care Unit at Suki Locality Hospital)



Operation Theater  
Obstetric Care Unit at Wad Nile Rural Hospital

### 3.2.2.2 Achievement of Overall Goal

The overall goal of MNP2 is “maternal and infant mortality is reduced in Sudan” and the reductions of MMR and IMR were set as its indicators. However, in order to achieve the objective of reduction of MMR and IMR in Sudan, the change of many external factors are necessary such as development of medical personnel including VMW, upgrading of medical facilities and access to those facilities, improvement in nutrition, and expansion of immunization. Therefore, the said overall goal is difficult to be achieved in three years after the completion of the project as well as it is hard to specify the contribution made by MNP2.

MNP2 expanded the capacity building and organization of VMW which MNP implemented in the improved form to other states. MNP2 also implemented the mother and child health approach centered on VMW comprehensively by tackling the issues which MNP could not deal with in Sinnar state, which were improvement of medical facilities and equipment, and upgrading capacity of medical personnel. Therefore, the evaluation was implemented considering that the overall goal of MNP2 was judged as the same as “high-quality continuum of care is expanded in whole country”, which is the overall of MNP as a matter of fact. Table 5 shows the achievement of indicators of overall goal (the indicators of MNP2 are used as reference indicators).

Table 5 Achievement of Overall Goal

Overall Goal	Indicator	Actual	Achievement
VMW are empowered and organized in PHC context to perform ideal continuum	<MNP Indicator> Number of states which conduct VMWs training in accordance with state policy and	<ul style="list-style-type: none"> <li>As stated above, FMOH has been continuing INSET for VMW in all 18 states in Sudan. The number of VMWs received INSET for VMW was 10,058 VMW as of the end of 2017 including VMW in the JICA relevant projects (Details are described in 3.2.2.3 “Other Positive and Negative Impacts”), which consists of about 43% of total number of VMW in every state of Sudan in the same period (Annex Table 5).</li> </ul>	Achieved



of care for maternal and child health in Sudan	guideline	<ul style="list-style-type: none"> <li>• The guideline of INSET for VMW which MNP has developed has been utilized with some improvement.</li> </ul>																
	<MNP2 Indicator>  Reduction of MMR and IMR <sup>24</sup> (as a reference)	<ul style="list-style-type: none"> <li>• Since official data on MMR is available only from SHHS (2006), trends could not be identified over the years.</li> <li>• The reduction of IMR is observed, however, as mentioned above, there are many factors other than this project. It cannot be confirmed the causal relation with this project.</li> </ul> <p style="text-align: center;">&lt;Trends of MMR and IMR in Sudan&gt;</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>MMR (Per 100,000 live births)</th> <th>IMR (per 1,000 live births)</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>2006</td> <td>534</td> <td>83</td> <td>SHHS</td> </tr> <tr> <td>2010</td> <td>-</td> <td>60</td> <td>SHHS II</td> </tr> <tr> <td>2014</td> <td>-</td> <td>52</td> <td>MICS</td> </tr> </tbody> </table>		MMR (Per 100,000 live births)	IMR (per 1,000 live births)	Source	2006	534	83	SHHS	2010	-	60	SHHS II	2014	-	52	MICS
	MMR (Per 100,000 live births)	IMR (per 1,000 live births)	Source															
2006	534	83	SHHS															
2010	-	60	SHHS II															
2014	-	52	MICS															

In order to supplementary verify the achievement of overall goal, the degree of implementation of continuum of care was attempted to be confirmed. However, as mentioned in 2.3 “Constraints during the Evaluation Study”, reliable quantitative data could not be obtained in any of the visited states. On the contrary, from the interviews with the concerned parties such as SMOH, HV, VMW in the visited states at ex-post evaluation, it was confirmed that the number of implementation of continuum of care has been increased, appropriate referral was made and the quality of records and report was improved through close supervision and guidance to VMW. In particular, the following effect was confirmed by the quantitative survey at ex-post evaluation in Sinnar state.

(1) Implementation Status of Continuum of Care (ANC, PNC, and Birth Assistance)

There is no major change in the number of ANC implemented at home, however, the number of ANC at medical facility has been increased (Annex Figure 2). Similarly to the result of EL survey, more than 90% of VMW answered in self-evaluation that ANC has been improved after INSET for VMW (Annex Figure 3). The main reasons for this include that “they could give advice and guidance to pregnant women on nutrition, medicine and vaccination (about 50%)”, “they could sterilize tools appropriately (about 20%)”, and that “the awareness of mother towards ANC has been improved (about 15%)”. From these reasons, it is assumed that VMW have been utilizing knowledge improved by INSET. In addition, it can be thought that improvement of ANC was realized by appreciation of VMW by mothers and community as described later.

<sup>24</sup> International organizations such as WHO publish the estimated value of MMR and IMR, however, those figures are far from the figures certified by FMOH. Therefore, those figures are not adopted as information in this ex-post evaluation.

ANC has been implemented by all VMW. Almost half of the VMW has implemented ANC for four times recommended frequency by FMOH. The result was the same at the time of EL survey.

There is no major change in the number of assistance in delivery at medical facility. However, it was found that 60% of VMW assisted delivery at home more than seven times a month. The number of assistance in delivery at home has been surely increased (Annex Figure 6 and Figure 7).

## (2) Implementation Status of Referral

There was no major change in the number of referral between at the times of EL survey and ex-post evaluation (Annex Figure 4). However, the number of VMW who answered that it became easier to refer to hospitals increased largely (Annex Figure 5). Many answered for its reason that “awareness of pregnant women was raised (40%)” and “pregnant women recognized referral in advance due to making a delivery plan with VMW (32%)”. From the above, it was apparent that mother’s consciousness for delivery at facility was raised. It can be thought that there was improvement of VMW’s ability and strengthening relationship with mothers behind this. Furthermore, by strengthening relationship between VMW and medical facilities as well as medical personnel, the interview results showed that the referral became easier<sup>25</sup>. In addition, the interview with SMOH in Sinnar and other states confirmed that pregnant women have rarely died during delivery assisted by VMW at home because VMW referred them in timely manner. According to the interview with VMW, it was pointed out that external factors such as improving traffic access and prevailing mobile phones had an influence on ease of referral, however, it is sure that the project also contributed to some extent from the above.

## (3) Supervision and Guidance to VMW

It can be seen that the frequency of VMW’s receiving supervision and guidance from HV was increased (Annex Figure 8). In addition, the location where the supervision and guidance was received was a medical facilities such as health centers and hospitals which was the same as at the time of the EL survey (Annex Figure 9). The supervision and guidance in Sinnar state have been carried out more frequently after the project and it was confirmed that regular meetings at medical facilities recommended by the project have been established<sup>26</sup>.

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<sup>25</sup> In the interview with VMW, there were many comments that “previously doctors and nurses were distant persons for VMW and VMW felt that they did not trust them”.

<sup>26</sup> Before implementing this project, HV used to visit VMW at home, however, there were many cases that HV visited once a year to VMW who lives remote areas without transport means. In this project, instead of HV’s visiting VMW, VMW went to nearby medical facilities and received supervision and guidance through a regular meeting with HV. FMOH also recommends this format to all states.

#### (4) Records and Reports by VMW

The practice of monthly reporting from VMW to HV has been established (Annex Figure 10). According to the interview with SMOH and HV, the percentage of submission of the activity report obligated every month has much increased and it helped the information management on continuum of care and referral.

#### (5) Strengthening Relationship with Community

Even at the time of ex-post evaluation, 66% of the VMW has been continuing awareness raising activities to the community, although the implementation ratio decreased compared with that at BL and EL surveys (Annex Figure 11). Despite the absence of provision of incentives such as transport expenses, about 70% are continuing for awareness activities. Therefore, it can be said that awareness activities have been almost established as activities of VMW. The principal of midwifery school in Sinnar state pointed out that the project triggered the awareness raising activities to community into the curriculum of the class. The understanding of community on the role of VMW became deepened through awareness raising activities to the families of pregnant women such as explaining how to treat pregnant women and how to respond in case of emergency. In addition, as part of awareness raising activities, the emergency funds established in seven model villages during MNP2, and meant to be used for emergency referral during pregnant and delivery period, have been mostly continued. Total number could not be identified, however, disseminated cases to other villages were confirmed. According to the quantitative survey at the time of ex-post evaluation, the result came out that all VMW who have answered have established trustful relationship with community and they felt they were appreciated by the community.

Accordingly, the improvement of continuum of care and establishment and strengthening of relations between VMW and their supervisor as well as community were confirmed to a certain extent in the five states visited at the time of ex-post evaluation. As stated above, the curriculum of INSET for VMW developed by MNP was further improved by FMOH and was utilized in training in the whole country. In addition, it was confirmed that FMOH has been disseminating the approach established by the project throughout the country. Therefore, it can be inferred that implementation of continuum of care has been improved nationwide. Furthermore, FMOH has strengthened the institutional set up for VMW and the system has established that allows FMOH to consolidate basic information such as the numbers of VMW and employment in each state through INSET. Thus, it is judged that overall goal of the project was largely achieved.

### 3.2.2.3 Other Positive and Negative Impacts

#### (1) Collaboration Effect with JICA Related projects and Improving Recognition of JICA in the Area of Maternal and Child Health

MNP is the first full-scale maternal and child health project from Japanese aid which has resumed after Comprehensive Peace Agreement in Sudan. Triggered by MNP, mother and child health activities were implemented in “Project for Human Resources Development for Darfur and the Three Protocol Area” (2009-2013) (hereinafter referred to as “SMAP”<sup>27</sup>), and “Capacity Development Project for Provision of the Services for Basic Human Needs in Kassala” (2011-2015) (hereinafter referred to as “K-TOP”<sup>28</sup>), in collaboration with the project. For example, the facilitators of INSET for VMW who were fostered in MNP have implemented INSET for VMW in SMAP and K-TOP (Annex Table 5). Total of 5,758 VMW (43% of total number of VMW in Sudan at that time) have been received INSET by November 2013 through the project and the above JICA related projects. Considering the fact that INSET for VMW was hardly implemented before the project, it can be said that impact made to VMW was large. In addition, due to synergistic effect with the related projects, it was found by the ex-post evaluation that the word “Om Nile” (“Mother Nile” in Arabic which is the nickname of the project) has become widespread to village people and even to the students of midwifery school. It was also confirmed that the recognition of JICA in the area of mother and child health has been improved.

#### (2) Increase in Number of VMW

The number of VMW has been increasing by about 44% from 2012 to 2017. Through the interview with FMOH, it was confirmed that the Sudanese government recognized the importance of VMW triggered by the project and has been promoting increase in number of VMW. In addition, it was also confirmed the case from the interview with the midwifery school that influenced by the project and JICA related projects even the traditional village that had not fostered VMW became to send villagers to midwifery schools. Some states have increased midwifery schools such as Sinnar and White Nile states. It can be said that the project made a certain contribution to the increase in number of VMW.

#### (3) Establish Networks among VMW

As a result of the projects, VMW received INSET for VMW and participated in regular meetings at medical facility. This led to strengthen the relationship with HV, supervisor as well as enhance the networks with VMW in other villages. According to the interview with VMW, they made friends who can easily consult the problems. Meeting with friends also motivated to further participation in regular meetings.

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<sup>27</sup> Nickname of the project, which covered North Darfur, South Darfur, West Darfur, South Kordofan and Blue Nile.

<sup>28</sup> Nickname of the project. The target state is Kassala.

#### (4) Impact on Policy and Organization

The project focusing on enhancing capacity of VMW targeting improvement of MMR and IMR was the first attempt in Sudan. It can be considered that the project has contributed to a certain degree to the formulation and implementation of strategies and plans<sup>29</sup> that emphasize the roles of VMW which were issued during and after the completion of the project. According to the JICA officials, based on the action plan, which was developed by one of the FMOH participants during the training in Japan under the project, the idea of VMW kits and salary payment was incorporated into *PHC Expansion Project*.

In addition, the establishment of a new department of biomedical engineer by Sinnar SMOH to control maintenance and management of provided equipment contributed to strengthening of the system. Two staff members were assigned in the department during implementation of MNP2 and five staff members have been assigned at the time of ex-post evaluation.

MNP established a capacity strengthening and organizing model of VMW, while MNP2 expanded the achievement of MNP to other states and implemented a comprehensive approach in Sinnar. This led to upgrading of the quality of services which VMW provides to pregnant women. Thus, it can be said that the projects have largely achieved the project purpose. Regarding to the overall goal, it was not possible to be quantitatively confirmed. However, INSET for VMW has been sustained nationwide, about 40% of VMW nationwide has received INSET, and “implementation of qualitative continuum of care” has been confirmed to a certain extent from the results of interviews with the relevant persons and quantitative survey in Sinnar state at the time of ex-post evaluation. Therefore, effectiveness and impact of the project are high.

### 3.3 Efficiency (Rating: ②)

#### 3.3.1 Inputs

Table 7 and Table 8 show the plan and actual inputs of the project.

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<sup>29</sup> For example, *National Strategy on VMW* (2010) pointing out the importance of improvement of working condition of VMW, *PHC Expansion Project* (2012-2020) focusing role of VMW and aiming of increase in number and employment of VMW, and *Ten in Five Strategy* (2016-2020) likewise advocating one village one VMW.

Table 7 Plan and Actual of Inputs of MNP

<b>Inputs</b>	<b>Plan</b>	<b>Actual (Project Completion)</b>
(1) Experts	Number and MM not stated • Expertise (Team Leader, Vice Team Leader/Mother and Child Health (MCH) , Training Plan, Information/Education/Communication (IEC)/Behavior Change Communication (BCC), Community Involvement, etc.	Short-term experts: total of 13 experts in 9 areas (85.86 MM) • Expertise: Team Leader, Vice Team Leader, MCH, Training Plan, IEC/BCC, Community Involvement, Scaling up of Sinnar Model, Nutritional Education Coordination
(2) Trainees received	Number not stated	Training in Japan: 3 persons Training in Third Country: 3 persons in Jordan “Regional Workshop of Sharing Experiences and Learning from Good/Successful Practices in the Islamic Communities”
(3) Equipment	Vehicle necessary for project activities	2 Vehicles, OA equipment, Training equipment
(4) Local Expenses	Amount not stated (A part of cost necessary for project implementation)	Amount not stated
Japanese Side Total Project Cost	280 million yen	317 million yen
Sudanese Side Total Project Cost	Amount not stated • Project offices both in FMOH and SMOH • Basic training and re-education for relevant stakeholder, rehabilitation for training facilities, training equipment, and equipment necessary for VMW activities	Amount not stated • Project offices both in FMOH and SMOH in Sinnar state • Incentive for two months for existing VMW in Sinnar state, equipment necessary for VMW activities, etc.

\*MM stands for man month.

Source: Information provided by JICA, MNP Terminal evaluation report

Table 8 Plan and Actual of Inputs of MNP2

<b>Inputs</b>	<b>Plan</b>	<b>Actual (Project Completion)</b>
(1) Experts	Number and MM not stated • Expertise (Chief Advisor, MCH, Health Information System Management, Institutional Capacity Development, Training Management, Medical Facility, Medical Equipment, Dispatch other expertise as necessary)	Short-term Expert: total of 20 experts in 11 areas (119.97 MM) • Expertise (Chief Advisor/Capacity Development, Deputy Advisor, Training Management, MCH, Medical Facility, Medical Equipment, Medical Equipment for PHC, Health Information System Management, Community and Health Facility Relations, Monitoring and Evaluation, Project

		Coordinator/assisting MCH)
(2) Trainees received	Number not stated	<ul style="list-style-type: none"> <li>• Training in Japan: 16 people for 12 courses</li> <li>• Training in Third Country: 10 people in 3 courses (2 courses in Jordan and 1 course in Egypt)</li> </ul>
(3) Equipment	Construction and Equipment necessary to improve medical facilities and equipment in Sinnar state	<ul style="list-style-type: none"> <li>• Provision of equipment to medical facilities in Sinnar state (27 HC, target 3 hospitals)</li> <li>• Training equipment for INSET for VMW</li> <li>• VMW Kits, etc.</li> </ul>
(4) Local Expenses	<ul style="list-style-type: none"> <li>• Construction cost to improve the target medical facilities in Sinnar state</li> <li>• Additional operation expenses necessary for training for facilitators and INSET, part of cost necessary for project implementation</li> </ul>	<p>182 million yen</p> <p>Including construction cost of obstetric care units in two hospitals in Sinnar state (51 million yen)</p>
Japanese Side Total Project Cost	470 million yen	716 million yen
Sudanese Side Total Project Cost	<p>Amount not stated</p> <ul style="list-style-type: none"> <li>• Project offices both in FMOH and SMOH</li> <li>• Necessary activity costs for project implementation</li> <li>• Running cost necessary for midwifery school and INSET</li> <li>• Tools and consumable necessary for VMW Kits, Provision of incentive</li> </ul>	<p>Amount not stated</p> <ul style="list-style-type: none"> <li>• Project offices (in FMOH and SMOH in eight target states and Sinnar state)</li> <li>• INSET expenses for additional 5 days in two target localities in North Kordofan and Gezira state, Provision of accommodation and training facilities for INSET in eight target states, etc.</li> </ul>

\*MM stands for man month

Source: Information provided by JICA, MNP2 Terminal evaluation report

### 3.3.1.1 Elements of Inputs

The plan and actual could not be compared both in MNP and MNP2 since number and amount of experts, trainees received, and equipment at the time of planning were not stated. However, in MNP2, according to the terminal evaluation report and the information provided by JICA, it pointed out that there were areas where Japanese experts were fragmentally inputted and replaced frequently, which have affected the productivity of the project and establishment of mutual trust relationship. The common understanding with the implementing agency was promoted such as on how to proceed and direction of the project through changing a dispatch plan of Japanese experts and inputting the JICA senior expert regularly and so on. However, it can be thought that there was a problem in terms of inputting Japanese experts.

### 3.3.1.2 Project Cost

The project cost of MNP was 317 million yen in actual figure against 280 million yen in planning figure, which exceeded the plan (113% of the planned amount). According to the implementing consultant, the reason of increase was due to the additional activities including subsidy for running cost and training equipment for two midwifery schools, purchasing of VMW kits provided after graduation, 5S seminars<sup>30</sup> for hospitals and health centers. Those additional activities for midwifery schools are considered as necessary for strengthening of VMW who are the target of the project and as supplementary activities to achieve the project purpose. Thus, it is considered as reasonable.

The project cost of MNP2 was 716 million yen in actual figure against 470 million yen in planning figure, which was significantly higher than plan (152%). According to the information provided by JICA, the reasons were additional activities including; 1) provision of equipment to 27 health centers in Sinar state, 2) implementation of INSET for VMW directly contracted with UNICEF (for five states)<sup>31</sup>, 3) implementation of the training in third country, 4) additional implementation of the training in Japan. These activities were considered as necessary to produce effectiveness of the project. It was confirmed that the additional activities contributed to produce the outputs as seen in the above that the additional training in Japan triggered the formulation of *PHC Expansion Project* of FMOH.

Therefore, the project cost for both MNP and MNP2 exceeded the plan.

### 3.3.1.3 Project Period

The project period of MNP was for three years (36 months) from 10 June, 2008 to 9 June, 2011. That of MNP2 was for three years (36 months) from 10 August, 2011 to 9 August, 2014. Both projects were as planned (100% of the planned period).

Although the project period was as planned, the project cost exceeded the plan. Therefore, efficiency of the project is fair.

## 3.4 Sustainability (Rating: ②)

### 3.4.1 Policy and Political Commitment for the Sustainability of Project Effects

The following policies and strategies have been developed after August 2014 when MNP2 was completed. The long-term policy of *National Health Policy (2016-2025)* emphasizes development of health human resources as one of priority issues and stipulates that efforts to

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<sup>30</sup> 5S (Sort, Set in order, Shine, Standardize, Sustain) is methodology to improve the work environment.

<sup>31</sup> According to JICA officials, initially the plan was to implement INSET for VMW by each target SMOH. However, it was actually difficult for SMOH alone to manage implementation of INSET for VMW including financial management. Considering the situation, JICA contracted with UNICEF.



achieve Universal Health Coverage (UHC)<sup>32</sup> will contribute to the reduction of MMR and IMR. *Ten in Five Strategy* (2016-2020), which the Sudanese government developed to implement ten strategies in five years under the vision of *Global Strategy for Women's Children's and Adolescents' Health* (2016-2030), puts the reduction of MMR and IMR as a priority issue and emphasizes VMW's capacity development, increase in number and employment as its strategy. In addition, *PHC Expansion Project* (2012-2016) which focuses on the role of VMW in order to achieve UHC has been extended to 2020 and continues to emphasize the strengthening of the capacity of VMW and their institutional aspects. *National Health Sector Strategic Plan* (2016-2020) also advocates the continuity of INSET for VMW (requiring retraining every three years).

Therefore, the necessary policies and institutional aspects for sustaining the project effects are installed.

#### 3.4.2 Institutional/Organizational Aspect for the Sustainability of Project Effects

The function and roles of the relevant departments of FMOH, the implementing agency, are the same as during the project implementation period. Mother and Child Health Division under PHC department was in charge of the project, among which RH section is in charge of training and strengthening VMW. RH section is divided into three units. Safe Motherhood unit is responsible for strengthening the capacity of VMW. Information unit of the RH section has database information on VMW. There are about 30 staff members in total in RH section. Five are allocated in Safe Motherhood unit (including three doctors). In addition to VMW issues RH section is responsible for wide range of areas including family planning, prevention of mother to child transmission, and cervical cancer. Therefore, it cannot be said that the number of staff members is sufficient. However, the situation has been the same as during the project implementation period. Considering the fact that they have been continuously implementing INSET for VMW and improving supporting system, it can be considered that a certain level of organizational arrangement is ensured. In addition, the facilitators for INSET for VMW have been developed in each state of Sudan through the project. Accordingly, there is a system that can continue INSET in each state.

In Sinnar state, with the provision of facilities and equipment in MNP2, the Biomedical Engineering section, which is in charge of maintenance and management of the medical equipment, was newly established at SMOH and 22 biomedical engineers were deployed at the time of ex-post evaluation (5 in SMOH, 17 in 34 primary and secondary hospitals). Five engineers allocated in SMOH visit hospitals in the state quarterly where biomedical engineers are not allocated. Regarding the equipment in health centers, the system is that they respond on

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<sup>32</sup> "All people receive the appropriate services on health promotion, prevention, treatment, restoration of function at payable expenses" (<https://www.jica.go.jp/aboutoda/sdgs/UHC.html> Accessed in Japanese on 14 September, 2018)

call basis. Although it is not enough staff members to cover whole Sinnar state, it can be said that a certain degree of system is in place. However, it should be noted that some cases that the system has not been functioned fully. For example, a biomedical engineer appointed in Suki Locality Hospital has been on long sabbatical leave since 2017, however, the support has not been made by the biomedical engineer department of SMOH. Other case as stated later in 3.4.5 “Status of Operation and Maintenance” was that some problems were observed in maintenance situation of provided equipment in the said hospital and Wad Nile Rural Hospital. Furthermore, among 24 general practitioners in Sinnar state who have received training on Emergency Obstetric and Neonatal Care (EmONC), none of them remained in Sinnar state<sup>33</sup>. However, Nurse Midwife who received EmONC training have continuously worked at health facility in Sinnar state. Therefore, the system to ensure the project effects to a certain degree is installed.

Thus, some minor problems have been observed in terms of organizational aspects to sustain the project effect.

#### 3.4.3 Technical Aspect for the Sustainability of Project Effects

FMOH officials have updated the training curriculum and teaching materials developed by the project and conducted training by themselves. There is no major technical problem for FMOH officials concerning INSET for VMW. FMOH is also carrying out technical training for facilitators on newly required issues in order.

Biomedical engineers in SMOH who implements maintenance and management of provided equipment in hospitals and health centers in Sinnar state have opportunities to receive technical training from FMOH. They have been conducting maintenance activities in accordance with the maintenance guideline of FMOH.

Thus, no major problems have been observed in technical aspects on VMW capacity development and maintenance of facilities and equipment.

#### 3.4.4 Financial Aspect for the Sustainability of Project Effects

The detailed budget on mother and child health in FMOH could not be obtained since it was not disclosed. However, as stated above FMOH has continued INSET for VMW and training of facilitators which are necessary to continue the effect of the project. Although the number of the training which they have done is not enough compared to the needs, it can be appreciated that budget has been allocated continuously even in the tight fiscal circumstances of Sudan<sup>34</sup>. In addition, according to FMOH, WHO has decided to support two training courses of

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<sup>33</sup> According to FMOH and SMOH, doctors in rural areas in Sudan move on a rotation of two to three years and it is a problem that the retention rate is very low.

<sup>34</sup> According to *African Economic Outlook 2018* by the African Development Bank, the real GDP growth rate was 3.3% on average from 2011 to 2016, compared to an average of 7.1% from 2000 to 2010. It is forecasted to be 4% in 2018 as domestic demand decreases. In addition, according to IMF, the inflation rate is rapidly rising from 17.8% in 2016 to 32.4% in 2017 and to 43.5% in 2018.

facilitators (20 people) and INSET for VMW for 500 VMW in five states<sup>35</sup> in FY 2018. Continued support can be expected from FY 2019 onwards, therefore, it is anticipated that a certain degree of effect will sustain in capacity development of VMW.

At the time of ex-post evaluation, the proportion of VMW who is hired by SMOH or receives incentives has steadily increased from about 20% at the time of completion of MNP2 to 55% of the total VMW. Therefore, financial allowance for VMW has been secured to a certain extent.

At the time of ex-post evaluation, FMOH introduced delivery kits consisting of necessary consumables for assisting delivery such as cotton, gloves, and vinyl sheets to reduce the burden on VMW. They were delivered to SMOH of each state although sufficient quantities cannot be secured due to budget constraints. The delivery kits are meant to be distributed to pregnant women, however, it was observed in the visited states<sup>36</sup> that many delivery kits were remained in warehouse of SMOH since there was no budget to distribute them around the state. As VMW have purchased necessary consumables from their pockets or rewards from pregnant women as usual, there was no particular indication that they could not perform due to lack of provided consumables. However, it is necessary for FMOH to conduct monitoring and provide guidance to SMOH as for distribution of delivery kits.

Therefore, it can be said that a certain level of finance has been secured to sustain the project effect for safe delivery by VMW and no major problems have been observed in financial aspect.

#### 3.4.5 Status of Operation and Maintenance

There have been serious cracks in the whole building of the obstetric care unit at Suki Locality hospital constructed by MNP2 since the second year of completion. The facility has been utilized as it was, however, large-scale rehabilitation and reinforcement began at the time of ex-post evaluation. It was judged by the hearing from Sinnar SMOH, officials from the hospital and JICA Sudan office as well as the report from JICA Project Formulation Advisor (Finance Cooperation) who has expertise on building maintenance that the cracks occurred primarily due to uneven settlement caused by soft ground (inclination of the building due to distortion of the ground, etc.) and it was not the matter of maintenance<sup>37</sup>. During the site survey at the time of ex-post evaluation, even after the rehabilitation some troubles were observed such that water was not available due to water tank problem and that air conditioners could not be used in some rooms. As for the obstetric care unit at Wad Nile Rural Hospital, it was confirmed

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<sup>35</sup> North Kordofan state, Gezira state, Gedaref state, Northern state, South Darfur state

<sup>36</sup> Sinnar state, White Nile state and Gezira state

<sup>37</sup> According to JICA Sudan office, it has been understood that the ground was soft from the design period and countermeasures to the extent possible have been undertaken. According to the JICA Project Formulation Advisor, the fact that construction site was weaker than the surrounding land, seemed to be the cause of the uneven settlement.

that the operation theatre was utilized every two days a week for caesarean operation<sup>38</sup>. However, the delivery room has not been used due to the hygienic problem. This is because the drainage system has not functioned well from the beginning of 2017 and the wastewater has returned into the room. Therefore, the delivery room which was existed before the project was utilized instead.

Some problems were observed in equipment. Regarding the incubators provided for the two obstetric care units, there was no problem in the condition, however, they have not been utilized for more than three years. According to Sinnar SMOH, a nurse with the qualification necessary for handling an incubator (senior nurse or specialized nurse) had not been in place for three years in Suki Locality Hospital and for more than two years in Wad Nile Rural Hospital. In addition, Suki Locality Hospital has reported the problem of suction machine to the biomedical engineering department of SMOH, it has not been repaired for more than two years.

The Minister of Health in Sinnar state who were interviewed at the time of ex-post evaluation expressed that he would clarify the roots of the problems and cope with them at an early stage with respect to the above two facilities and broken equipment. In addition, regarding the incubators, the Minister promised that the training for nurses would be conducted in order to be utilized them. Therefore, improvement of status of operation and maintenance is expected to be made.

Thus, it can be said that there are some problems in the status of operation and maintenance.

Some minor problems have been observed in terms of the organizational and operation and maintenance aspects. Therefore, sustainability of the project effects is fair.

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

The project was implemented aiming at promoting safe delivery throughout Sudan by enhancing the quality of maternal and child health services provided by VMW. MNP developed an empowerment model which strengthened the capacity of VMW and the support system for VMW's activities in the pilot state, Sinnar state. In the subsequent MNP2, the empowerment model developed by MNP was scaled up in other eight states. In addition, in Sinnar state a comprehensive approach for mother and child health centered on VMW was established including the strengthening of medical facilities and equipment and capacity of medical personnel that MNP could not cover.

The objective of the project is consistent with health policy and development needs of the

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<sup>38</sup> According to the officials of Wad Nile Rural Hospital, about eight caesarean operations a week have been implemented both in the operation theater which is existed before the project and in the operation theater built by the project. The days when operation is not done are devoted to disinfection.

country and “support for improvement of basic human needs” which is the priority issue of Japan’s assistance to Sudan. Therefore, the relevance is high. Although the achievement of the project purposes could not be quantitatively verified in part, considering the achievement of each output and the interview results from the stakeholders, it can be thought that the projects largely achieved their project purposes at the time of completion. Since MNP2 was implemented based on the achievement of MNP, overall goal of MNP and MNP2 were both considered as “implementation of high quality of continuum of care by VMW in whole country”. INSET for VMW introduced by the project has continued even at the time of ex-post evaluation and about half of VMW in the country has been covered by the training. Although the reliable quantitative data on continuum of care and referral<sup>39</sup> by the strengthened VMW was not obtained, it was confirmed from the results of qualitative interview as well as quantitative survey in the visited states conducted at the time of ex-post evaluation that VMW were providing more appropriate maternal and child services than before the project to a certain extent. Therefore, overall goal was judged as almost achieved. The other positive impacts were also observed. Therefore, the effectiveness and impact of the project are high. The project period was as planned, on the other hand, the project cost exceeded the plan. Thus, the efficiency is fair. The sustainability of the project effect is fair since some problems have been observed in terms of organizational aspect and maintenance status.

In light of the above, this project is evaluated to be satisfactory.

## 4.2 Recommendations

### 4.2.1 Recommendations to the Implementing Agency

FMOH has system to consolidate data in regards for VMW by each state. However, there is a problem with accuracy of collected data by VMW on maternal and child health (for example, numbers of ANC, PNC and referral) which is submitted to FMOH by SMOH. Accordingly, it is difficult to maintain the reliability of basic data necessary for capacity building training and assessment of effect of VMW. Instead of inputting data submitted by SMOH as it is, FMOH (Mother and Child Health Division) should foster critical eyes when the data differs greatly from the usual year after comparing the past years. It is important to upgrade the quality of data by firstly providing feedback to the staff members of SMOH.

Sinnar SMOH should immediately respond to the following problems; drainage problems in the obstetric care units in the two hospitals constructed in MNP2, repair of broken equipment including sucking machine in Suki Locality Hospital, and training of nurses in order for the incubators of both the hospitals to be utilized. In addition, in regard to the obstetric care unit at Suki Locality Hospital where the cracks were repaired, SMOH needs to undertake initiatives to

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<sup>39</sup> Referral means to introduce/transfer patients who cannot cope with lower medical facilities like primary medical facilities to upper medical institutions such as secondary and tertiary levels.

conduct periodical monitoring on the condition of building. Furthermore, since the biomedical engineer allocated in Suki Locality Hospital has been absent for a long time, it is desirable that SMOH build a system that can appropriately cope with such as through allocating substitute personnel or assigning a staff from the biomedical engineer department of SMOH to take in charge of the said hospital.

#### 4.2.2 Recommendations to JICA

JICA should confirm the reaction by SMOH on the above two hospitals in Sinnar state during FY 2018. Based on the assessment of JICA project formulation advisor in Kenya who has expertise in maintenance management, it is also necessary for JICA to monitor the obstetric care unit of Suki Locality Hospital for one year after rehabilitation in cooperation with Sinnar SMOH whether or not cracks do not occur in the building under the influence of the ground. In addition, based on the monitoring results, it is desirable that JICA encourage Sinnar SMOH to undertake initiative for maintenance and management.

#### 4.3 Lessons Learned

##### (1) Indicators that can grasp the effect of the project should be set.

“Reduction of MMR and IMR” was set as indicator of overall goal in MNP2. It was difficult to measure the contribution of the project since this indicator has too many external factors and there was a gap between project purpose and overall goal. When such indicators were set, it cannot grasp the project effect accurately. Furthermore, there are few data by donors in Sudan and reliability of official data obtained from the end such as VMW is low. When setting the project effectiveness by quantitative indicators in such countries, it is necessary to decide indicators with consideration of when the outcome of the project are shown as well as the timing of measuring outcome, and the reliability of those data. Otherwise, such activities to strengthen obtaining and scrutinizing data from relevant personnel should be included in the project.

##### (2) Establishment and verification of a comprehensive approach centered on VMW effective for continuum of care for mother and child

This project tried to establish a model of “comprehensive approach” including strengthening medical facilities and medical personnel as well as strengthening and organizing VMW. As a result of introducing this approach, the relationship between VMW and HV, their supervisor, has been strengthened, the understanding of community and medical personnel towards VMW has been nourished, the appreciation to VMW has increased, and the motivation of VMW themselves has been upgraded. In addition, there was a report that with regard to the upgraded and equipped medical facilities, the usage of pregnant women was promoted and

VMW became easier to refer. It can be said that such comprehensive approach resulted in improvement of the quality and promotion of implementation of continuum of care for mother and child. Even in the case of community based mother and child health projects, not merely focusing on strengthening VMW's capacity but comprehensively developing and strengthening the surrounding environment of VMW, that will lead to improvement of mother and child health services provided by VMW. However, since it was not compared with the areas where facilities and equipment have not been improved, it is necessary to verify in the future.

END

Annex Table 1 Achievement of indicators of Outputs (At the time of completion)

Output	Indicator	Achievement
<MNP>		
Output 1: Organizational capacity of FMOH and SMOH, and rules and regulations of VMW are strengthened to perform appropriate MCH services.  <Achieved>	1-1 VMW's policy is reviewed and strengthened.	<u>Achieved</u> • After reviewing the existing policy and institutional arrangement with FMOH, agreed on INSET for VMW, reconfirmed on the training policy and clarified roles and rights of VMW. In Sinner state, employment system was introduced since 2011.
	1-2 Curriculum of in-service training for VMW is developed.	<u>Achieved</u> • Curriculum for INSET for VMW was not existed. Seven-day program was developed in February in 2009 by the project.
	1-3 Guideline of in-service training for VMW is developed.	<u>Achieved</u> • A guideline was developed including the above curriculum, teaching methodologies, and procedure of training management. It was approved by FMOH.
	1-4 Assigned focal person of FMOH coordinate technical coordination meeting of VMW training with SMOH.	<u>Achieved</u> • Although there was a change of assigned personnel, FMOH officer, whether or not she/he was not in charge, visited Sinner state and coordinate issues on VMW with SMOH. • RH coordinator meetings were held twice a year. The achievement from MNP was shared with other states.
	1-5 Numbers of facilitator who can provide in-service training for VMW is increased (from 0 to 10).	<u>Almost Achieved</u> • Nine facilitators were developed.
	1-6 Administration staff in charge of VMW training is assigned in pilot state.	<u>Not Achieved</u> • Administration staff was not assigned due to financial reason.
	1-7 FMOH and SMOH submit technical report on the impact of VMW's in-service training in pilot state (including the assessment of job performance).	<u>Achieved</u> • HV conducted interview in EL survey and SMOH consolidated the report.
Output 2: MCH services are provided through empowered and organized VMWs in Pilot State.  <Achieved>	2-1 Number of VMW's graduated in-service training and pre-service training.	<u>Achieved</u> • 556 out of 566 VMW in Sinner state at the completion time received INSET (coverage is 98%). • According to the implementing consultant, 90 VMW graduated from pre-service training from midwifery schools, against target value of 100 VMW (50 VMW each from two midwifery schools) (Achievement 90%)
	2-2 Number of VMW participated in regular meetings at health facilities is increased.	<u>Almost Achieved</u> • Developed a VMW list in Sinner state and allocated medical facilities and supervisors for each VMW to be belong to. At the time of terminal evaluation, 65% of HV turned to have regular meetings with VMW. Before the project, there were VMW who have received visits from HV only once in two to three years. The mechanism of regular meetings at medical facilities was groundbreaking.
	2-3 Number of community events which are planned and implemented by VMW and community in model villages.	<u>Achieved</u> • Held community events in four model villages once each in order to raise community awareness. Community understood the importance of work conducted by VMW. That led to increase in user of ANC and family planning.
	2-4 Necessary equipment and materials for services are provided to VMWs by SMOH.	<u>Partially Achieved</u> • A part of VMW Kits were provided by SMOH to VMW (consumables such as cotton and gloves)



Output	Indicator	Achievement
Output 3: Horizontal communication network among northern states and relevant stakeholders is strengthened to address the issue on MCH.  <Achieved>	3-1 Number of publications by the Project	<u>Achieved</u> • Developed two kinds of pamphlet • Distributed progress reports in regular meetings and shared information.
	3-2 Number of regular meetings and exchange visits between SMOHs are increased.	<u>Achieved</u> • Attended the RH coordination meeting twice a year which was the core regular meetings. • Conducted TOT for INSET for VMW in total of six target states of SMAP and K-TOP. Total of 68 people received TOT and 52 out of them were certified as facilitators. • Conducted two field visits to other states. In Khartoum the project conducted INSET and seminar on methodology of training operation and management inviting five states.
	3-3 Progress and achievement of the project are shared among stakeholders.	<u>Achieved</u> • Project progress and achievement were shared with FMOH, SMOH in other states, and donors at the RH coordination meeting which were held twice a year. • After the completion of project, a presentation workshop on achievement was held inviting relevant persons in all 15 states and shared information.
<b>&lt;MNP2&gt;</b>		
Output 1: Institutional capacity of FMOH and SMOHs in maternal and newborn health is strengthened.  <Achieved>	1-1 More than 6 states (excluding Sinnar state) develop lists of VMW based on in-service training.	<u>Achieved</u> • Collected VMW lists from 8 target states through INSET. The information was compiled at FMOH by collecting the lists from other states than target and a list was developed.
	1-2 Number of VMWs who receive regular incentive or salary is increased.	<u>Achieved</u> • The indicator does not show the output achieved through the activities of the project. Instead of increase in the number of VMW who receive regular incentive or salary, “clarifying the VMW support system” including the development of document which was the basis of guideline on the VMW support system, is a result of strengthening the institutional capacity.
	1-3 Number of VMWs who receive supplies and consumables of VMW Kit from SMOHs is increased.	<u>Achieved</u> • The indicator is also similar to 1-2. The contribution of the project was that “The VMW Kit was standardized” instead of increasing the number of VMW who receives VMW kits.
	1-4 Number of actions taken according to the action plan of Medical Engineering Working Group (ME-EG).	<u>Achieved</u> • ME-EG consisted of FMOH, Sinnar SMOH, officers in charge of medical equipment. Based on the situation analysis, five action plans were developed to fill the gaps identified from the analysis of the survey results. By the completion of the project, five action plans were completed.
	1-5 FMOH has a workforce planning of VMW.	<u>Achieved</u> • Similar to the indicators 1-2 and 1-3, this indicator was achieved but it was not achieved through the project activities. However, the achievement of the indicator is largely influenced by MNP and MNP2’s approach to FMOH. The contribution of the project was that workforce planning of VMW and others were incorporated into <i>PHC Expansion Project</i> .
Output 2: Capacity of VMWs is strengthened in order to provide	2-1 80 facilitators for VMW in-service training are trained.	<u>Achieved</u> • As in Annex Table 6, 82 facilitators and 26 assistant facilitators were developed in MNP2.
	2-2 210 VMWs are trained in in-service training in model locality.	<u>Achieved</u> • As in Annex Table 5, in each model locality of Gezira

Output	Indicator	Achievement
quality maternal and newborn care in the 8 states.  <Almost Achieved>		state and North Kordofan state total of 215 VMW, 111 VMW and 104 people respectively, received INSET.
	2-3 More than 80% of VMWs receive regular training follow-up in selected model sites.	<u>Not Achieved</u> <ul style="list-style-type: none"> <li>The participation rate of regular meeting was 37.1% and 56.1% in North Kordofan state and Gezira state respectively. The reasons for not achieving were that there were no transportation expenses or incentives. In North Kordofan state, security deterioration was one of factors.</li> </ul>
	2-4 80% of VMWs increase knowledge and skills after participating in-service training in selected model sites.	<u>Achieved</u> <ul style="list-style-type: none"> <li>According to the tests conducted by the project before and after the training, the score increased 93% of VMW in North Kordofan state and 90% of VMW in Gezira state</li> </ul>
Output 3: A model of comprehensive approach to improve maternal and newborn health is established in Sinnar state.  <Almost Achieved>	3-1 Number of ANC, delivery and referral provided by skilled birth attendants at hospitals* in Sinnar state increases. (* Referral data is collected from Sinnar Teaching Hospital, Suki Locality Hospital and Wad Nile Rural Hospital.)	<u>Almost Achieved</u> <ul style="list-style-type: none"> <li>Number of ANC increased 39.1% from 2010 to 2013.</li> <li>Regarding assistance in delivery at facilities by skilled birth attendants increased 51% from 2010 to 2013. It can be said that the number of delivery at facility has increased due to the fact that the ratio was higher than the population increase.</li> <li>The trends of change on referral was not identified since data on referral was not recorded and collected at the hospitals.</li> </ul>
	3-2 80% of general practitioners increase knowledge and skills of EmONC after the training.	<u>Achieved</u> <ul style="list-style-type: none"> <li>95.8% of general practitioners increased the score before and after the training.</li> </ul>
	3-3 80% of Nurse Midwives increase knowledge and skills of EmONC after the training.	<u>Achieved</u> <ul style="list-style-type: none"> <li>After implementing training on obstetric session of EmONC and neonatal session for Nurse Midwife, the score increased 77.8% and 88.9% respectively.</li> </ul>
	3-4 Improved health facility and provided medical equipment is appropriately used and maintained according to the checklist developed.	<u>Achieved</u> <ul style="list-style-type: none"> <li>The obstetric care units at two hospitals in Sinnar state were constructed.</li> <li>Building and equipment checklists for the constructed obstetric care facility was formulated.</li> <li>Medical equipment was provided to three hospitals in Sinnar state and whole 27 health center in Sinnar state. A set of guideline and user manual is developed for medical equipment maintenance.</li> </ul>
	3-5 A person in charge of medical engineering/health facility maintenance is assigned to Sinnar SMOH.	<u>Achieved</u> <ul style="list-style-type: none"> <li>One official in charge of building was allocated in SMOH from February 2012.</li> <li>Biomedical Engineer section was established under the Division of Curative Medicine of SMOH. Total of three officers were assigned, one in September 2011 and the other two in January 2013.</li> </ul>
	3-6 More than 4 communities have pregnancy registration and emergency referral system.	<u>Achieved</u> <ul style="list-style-type: none"> <li>Information collection by volunteers and pregnancy registration by VMW were carried out in all eight villages where the project directly intervened.</li> <li>Community emergency referral fund was established in seven out of eight target villages.</li> </ul>

Annex Table 2 Results from Baseline and End-line Surveys (Sinnar State)  
(Summary of Difference of Means of Two Populations (2-sample t-test))

		7 Localities, Sinnar state			South Gezira Locality, Gezira state			Oum Ruwaba Locality, North Kordofan state		
		N	Average	Sig. (2-tailed)	N	Average	Sig. (2-tailed)	N	Average	Sig. (2-tailed)
No. of ANC	BL	125	7.64	<b>.001***</b>	90	6.17	.808	82	5.39	<b>.012*</b>
	EL	141	11.94		83	5.90		68	3.10	
No. of Referral from ANC	BL	125	1.10	.219	90	1.03	.372	82	.76	.125
	EL	141	1.37		83	.88		68	.43	
No. of Assisting delivery	BL	125	3.27	.499	90	2.12	<b>.026*</b>	82	2.94	.646
	EL	141	3.50		83	2.87		68	2.68	

Note: Services that VMW provided during the 30 days from the interview time \*p<0.5, \*\*p<.01, \*\*\*p<.001

N : Population

Baseline survey was conducted from November 2011 to May 2012. (Report issued in August 2012)

End-line survey was conducted from October 2013 to January 2014. (Report issued in August 2014)

Source: Information provided by JICA

Annex Table 3 Summary of Difference of Means of Two Populations (2-sample t-test)

State (Target locality)	Number of ANC	Referral from ANC	ANC Referral Rate	Number of deliveries	Referral from deliveries	Delivery Referral rate
Sinnar	Significantly increased (p=0.001)	Increased	Decreased	Increased	Significantly increased (p=0.019)	Increased
Gezira	Decreased	Decreased	Decreased	Significantly increased (p=0.026)	Significantly increased (p=0.004)	Significantly increased (p=0.003)
North Kordofan	Significantly decreased (p=0.012)	Decreased	Increased	Decreased	Significantly increased (p=0.001)	Significantly increased (p=0.002)

Source: Information provided by JICA

Annex Table 4 No. of VMW, Employment, Incentive Receiver, and VMW who received INSET for VMW by State (as of December, 2017)

No	State	No. of VMW	No. of VMW who are employed by SMOH	Employment Rate	No. of VMW who receive incentive from Social Security* 1	No. of VMW who receive incentive from FMOH*2	Rate of VMW received incentive from FMOH	No. of VMW received INSET*3
1	Gedaref	997	654	66%	0	105	11%	175
2	Kassala	1,137	981	86%	450	81	7%	150
3	Red Sea	634	590	93%	35	101	16%	75
4	Northern	642	419	65%	150	42	7%	200
5	River Nile	605	342	57%	310	28	5%	270
6	Khartoum	2,012	1,274	63%	325	38	2%	200
7	Gezira	2,318	1,048	45%	470	99	4%	150
8	Sinnar	1,056	295	28%	580	25	2%	150
9	Blue Nile	910	906	100%	225	108	12%	225
10	South Kordofan	1,029	937	91%	448	48	5%	175
11	West Kordofan	1,426	298	21%	482	52	4%	261
12	North Kordofan	2,500	0	0%	850	65	3%	200
13	White Nile	1,491	443	30%	735	52	3%	125
14	East Darfur	638	443	69%	170	100	16%	125
15	South Darfur	2,107	1,144	54%	582	173	8%	50
16	West Darfur	1,224	1,000	82%	400	146	12%	125
17	Central Darfur	775	350	45%	38	169	22%	0
18	North Darfur	2,084	355	17%	750	59	3%	75
	<b>Total</b>	<b>23,585</b>	<b>11,479</b>	<b>49%</b>	<b>7,000</b>	<b>1,491</b>	<b>6%</b>	<b>2,731</b>

Note: \*1: Implemented for only one year of 2016 due to the shortage of fund from Social Security. 250 SDG per month

\*2 : Although it may stuck sometimes, it is retroactively paid monthly. 250 SDG per month

\*3 : The numbers of VMW who received INSET by the project, JICA related projects and donor funded training courses are not included since it is the number implemented by FMOH as a part of *PHC Expansion Project* after 2015 when the new curriculum was introduced.

Source: FMOH

Annex Table 5 Achievement of INSET for VMW by JICA Related Projects

No	State	MNP 1	MNP 2		JICA SMAP		JICA K-TOP	Total (as of Nov. 2013)
			Direct	UNICEF Contract	UNICEF Contract	Grant assistance through UNICEF		
1	Gedaref	-	-	-	-	-	-	0
2	Kassala	-	-	-	-	-	177	177
3	Red Sea	-	-	126	-	-	-	126
4	Northern	-	-	126	-	-	-	126
5	River Nile	-	-	-	-	-	-	0
6	Khartoum	-	-	-	-	-	-	0
7	Gezira	-	111	210	-	-	-	321
8	Sinnar	556	-	-	-	-	-	556
9	Blue Nile	-	-	-	147	368	-	515
10	South Kordofan	-	-	-	126	667	-	793
11	West Kordofan*	-	-	-			-	
12	North Kordofan	-	104	149	-	-	-	253
13	White Nile	-	-	189	-	-	-	189
14	East Darfur*	-	-	-	147	697	-	1,079
15	South Darfur	-	-	-	235		-	
16	West Darfur	-	-	-	147	261	-	554
17	Central Darfur*	-	-	-	146		-	
18	North Darfur	-	-	-	215	854	-	1,069
	<b>Total</b>	<b>556</b>	<b>215</b>	<b>800</b>	<b>1,163</b>	<b>2,847</b>	<b>177</b>	<b>5,758</b>

Note:

1) JICA SMAP: "Project for Human Resources Development for Darfur and the Three Protocol Area"

2) JICA K-TOP: "Capacity Development Project for Provision of the Services for Basic Human Needs in Kassala"

3) Darfur states were divided into five states from three states from May 2011. East Darfur state and Central Darfur state were newly established. In July 2013, West Kordofan state was separated from South Kordofan state.

Source: Information provided by JICA, Ex-post Evaluation Report on "Project for Human Resources Development for Darfur and the Three Protocol Area"

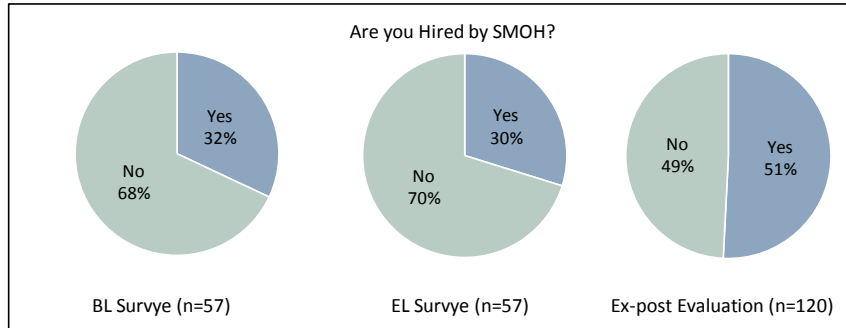
Annex Table 6 No. of HV/AHV who were approved as Facilitators and Assistant Facilitators after  
TOT of INSET for VMW

No	State	MNP1		MNP2		Total Facilitator
		Facilitator (HV)	Assistant Facilitator (AHV)	Facilitator (HV)	Assistant Facilitator (AHV)	
1	Gedaref	-	-	12	4	12
2	Kassala	6	3	-	-	6
3	Red Sea	-	-	6	1	6
4	Northern	-	-	7	1	7
5	River Nile	-	-	9	4	9
6	Khartoum	-	-	15	-	15
7	Gezira	-	-	9	6	9
8	Sinnar	9	-	-	-	9
9	Blue Nile	6	3	-	-	6
10	South Kordofan	7	3	-	-	7
11	West Kordofan	-	-	-	-	0
12	North Kordofan	-	-	12	6	12
13	White Nile	-	-	12	4	12
14	East Darfur	-	-	-	-	0
15	South Darfur	14	-	-	-	14
16	West Darfur	5	-	-	-	5
17	Central Darfur	-	-	-	-	0
18	North Darfur	14	-	-	-	14
	<b>Total</b>	<b>61</b>	<b>9</b>	<b>82</b>	<b>26</b>	<b>143</b>

Source: Results from questionnaire to MNP implementing consultants, Information provided by JICA

<Results of Quantitative Survey Conducted in Sinnar State at the Ex-post Evaluation>

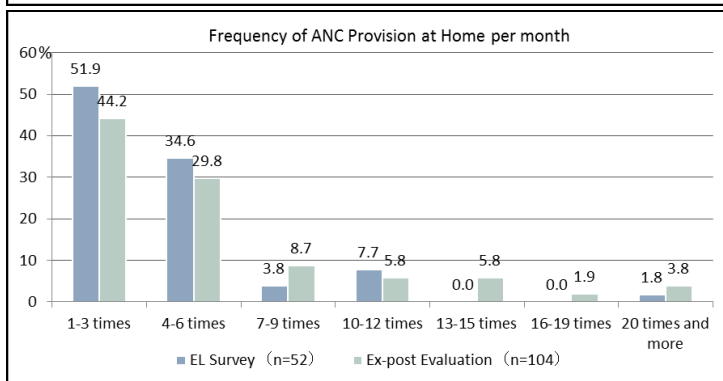
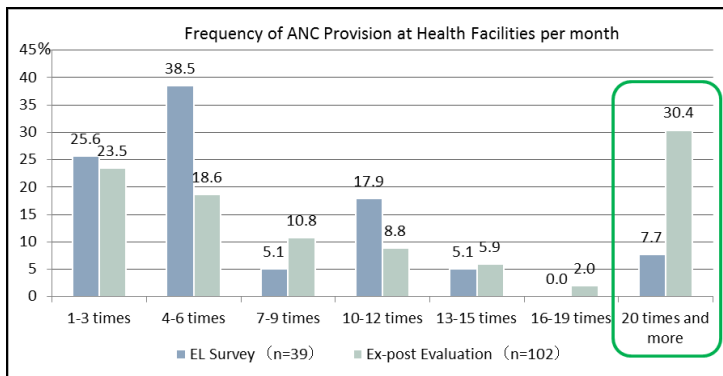
(1) Employment situation of VMW



Source: Results of the quantitative survey at the ex-post evaluation

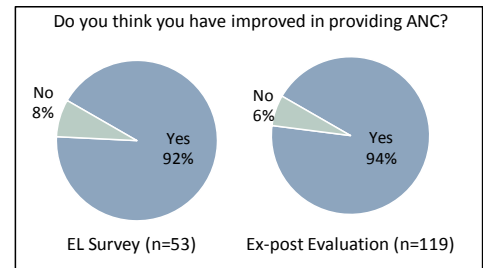
Annex Figure 1 Employment Status of VMW (Sinnar State)

(2) ANC situation



Source: Results of the quantitative survey at the ex-post evaluation

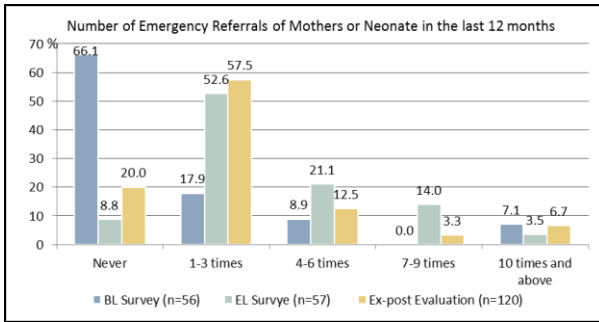
Annex Figure 2 Frequency of ANC (at Health Facility/at Home)



Source: Results of the quantitative survey at the ex-post evaluation

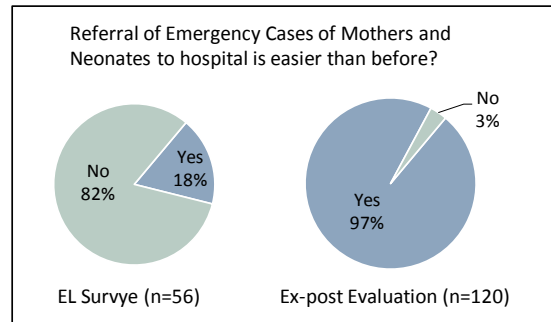
Annex Figure 3 Change in awareness on improvement of ANC

(3) Referral situation



Source: Results of the quantitative survey at the ex-post evaluation

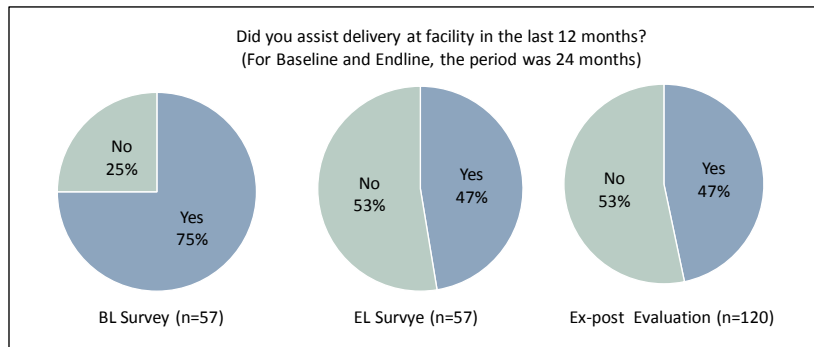
Annex Figure 4 Number of Emergency Referral



Source: Results of the quantitative survey at the ex-post evaluation

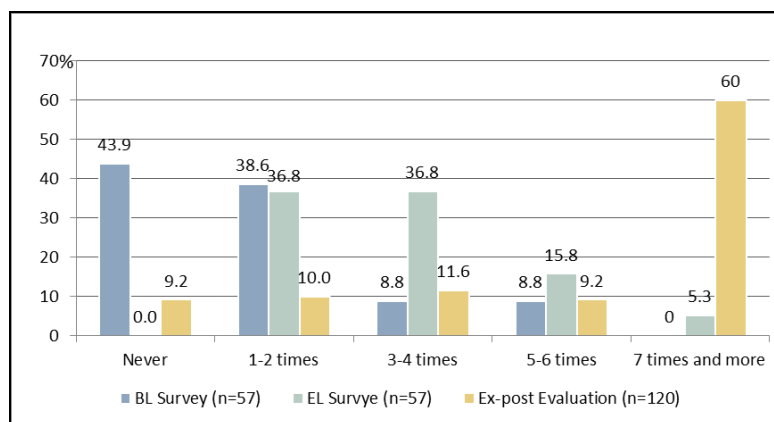
Annex Figure 5 Easiness of Referral

(4) Situation of Assisting in Delivery



Source: Results of the quantitative survey at the ex-post evaluation

Annex Figure 6 Assist in Delivery at Health Facility in the past two years (past 12 months only for the time of ex-post evaluation)

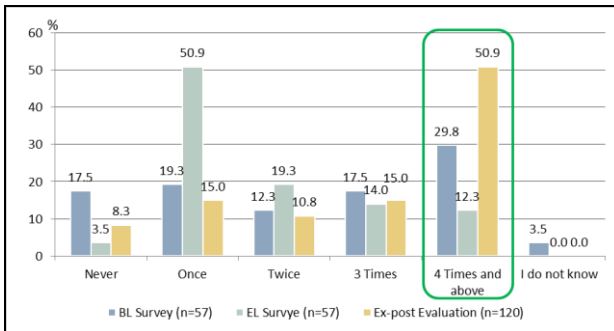


Source: Results of the quantitative survey at the ex-post evaluation

Annex Figure 7 Monthly Average Number of Assisting Delivery at Home

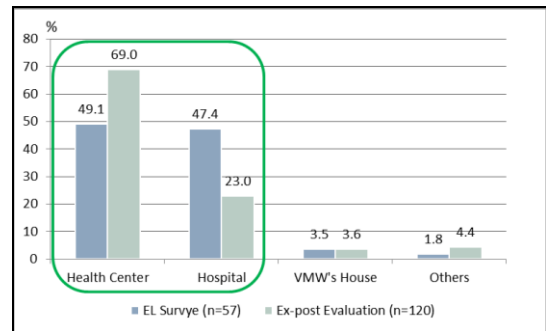


(5) Supervision and Guidance for VMW



Source: Results of the quantitative survey at the ex-post evaluation

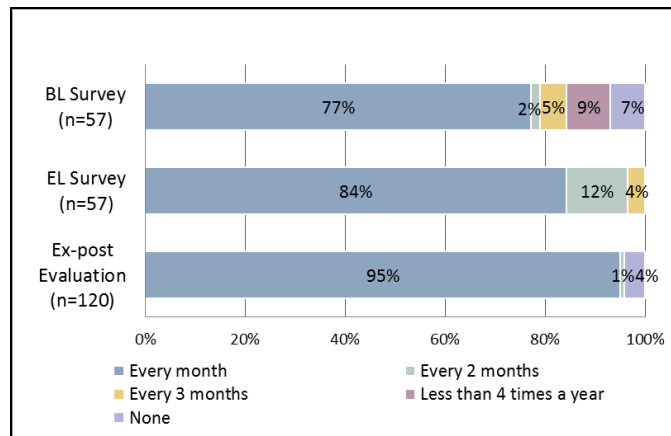
Annex Figure 8 Number of Times VMW's Received Supervision and Guidance per Month



Source: Results of the quantitative survey at the ex-post evaluation

Annex Figure 9 Place where Supervision is Usually Received by VMW

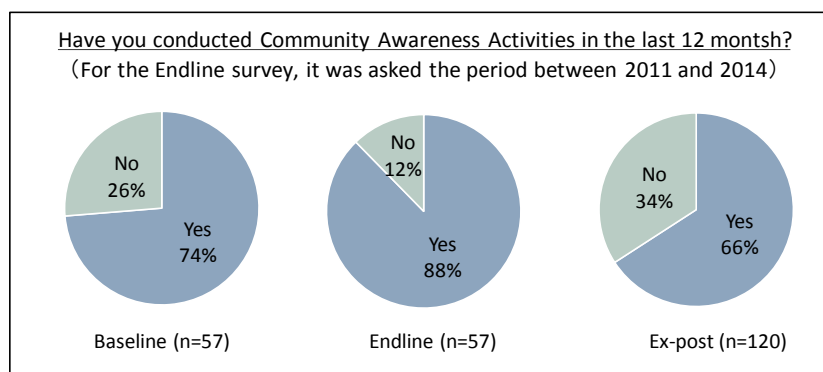
(6) Record / Report by VMW



Source: Results of the quantitative survey at the ex-post evaluation

Annex Figure 10 Frequency of Report Submitted to Supervisor

(7) Strengthening of Relations with Community



Source: Results of the quantitative survey at the ex-post evaluation

Annex Figure 11 Conducting Community Awareness Activities in the last 12 months