MINISTRY OF HEALTH
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

PREPARATORY SURVEY REPORT ON THE PROJECT FOR STRENGTHENING HEALTH SERVICE NETWORK IN SOUTHERN PROVINCES IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

MAY 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

ORIENTAL CONSULTANTS CO., LTD.
FUJITA PLANNING CO., LTD.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to a joint venture consist of Oriental Consultants Co., Ltd. and Fujita Planning Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Government of the Lao People's Democratic Republic, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Lao People's Democratic Republic for their close cooperation extended to the survey team.

May 2013

Nobuko KAYASHIMA
Director General,
Human Development Department
Japan International Cooperation Agency

SUMMARY

SUMMARY

1. Outline of the Recipient Country

(1) Territory and Nature

The Lao People's Democratic Republic (hereinafter referred to as the "Lao PDR") is situated in latitude 14~23º N and longitude 100~108ºE as a landlocked country in Indochina bordered by Vietnam to the east, Thailand to the west, Cambodia to the south, China and Myanmar to the north. Land area is approximately 240,000 km^2 as large as the main island of Japan. Mekong River runs through the border between Myanmar and Thailand, the southern part of Lao PDR, Cambodia and Vietnam and reaches to the South China Sea. Lao PDR is in the centre of the Greater Mekong Sub-region (GMS) consists of 6 countries along the Mekong valley.

According to the World Bank (the data for the year 2011), total population of Lao PDR is about 6.28 million and approx. 10% of the total population is concentrated in Vientiane. Lao PDR belongs to tropical monsoon area of the South-east Asia and there is a distinct rainy season from May to October due to a seasonal wind followed by a dry season from November to April. Average temperature of Vientiane is 22.1ºC in dry season and 28.0ºC in rainy season and average annual precipitation is about 1,630mm. Precipitation of rainy season in 2011 reached 144% of average under the influence of Typhoon No. 6 (Typhoon Haima) and Typhoon No. 8 (Typhoon Nock-Ten) which caused floods of Mekong river and its branch and damaged roads, bridges and agricultural land heavily.

As for the four (4) target provinces of this Project i.e. Attapeu, Champasak, Salavan and Sekong, an average maximum temperature in April is more than 35ºC which is the highest in a year. While an average minimum temperature in January is about 18ºC in Attapeu, Champasak and Salawan and about 16ºC in Sekong.

The four (4) target provinces of this Project which are located in southern region of Lao PDR are situated along Mekong River and there are quite a few poor villages in its mountainous areas. The distance from the capital Vientiane to the provincial capital of Champasak,and Salavan,is 670km while the distance to Sekong and Attapeu is 740km and 820km respectively. According to the data for the year 2008, 352 villages in this region out of 1,664 villages in total are recognized as poorest village with high poverty level by Lao PDR.

(2) Socio-economic Conditions

According to the World Bank, the nominal GDP of Lao PDR is about 8.29 billion US dollars, GNI per capita is 1,130 US dollars, GDP growth rate is 8.0%, and price increase rate is 4.4% as of 2011. Poverty headcount ration at national poverty line is 27.6% (2008) and unemployment

rate is 1.4% (2005).

Since 1975, Lao PDR maintains political stability under the leadership of the single party, People's Revolutionary Party and introduced the new thought as to the market economy in 1986 to promote "New Economy Mechanism". However, the Lao PDR is still recognized as Less Developed Country (LDC) and a rank of Human Development Index (HDI) is 138 among 187 countries in total[1].

Lao PDR is a land locked country bordering with five (5) countries; namely, China, Myanmar, Thailand, Cambodia and Vietnam and because of it coupled with geographical limitation and impacts caused by the past domestic war, the economy development in Lao PDR was behind the neighbouring countries. However, in recent years, Lao PDR is looking at it from different angle i.e. from "land locked country" to "land linked country" i.e. Lao PDR has a geographical advantage as it is situated in the centre of Indochina and trying to find a means of survival with economic development by enhancing a regional connectivity such as securing a foothold for physical distribution within a region etc.

As for the economy of Lao PDR, at the time of the global financial crisis in 2008, its impact on the domestic financial market was very minimal since the connection with the global financial market was relatively weak. Thus, a growth rate of real GDP was 8.0% in 2011 and Lao PDR maintains a steady growth with a good trading of mineral resources, hydro-electric power generation etc. With consideration of such good economic growth, the Government of Lao PDR declared to reach per capita GDP of 700 US Dollars in "the 7th 5 Year Socio-economic Development Plan".

The share of primary industry in GDP is 29%, secondary industry is 26% and tertiary industry is 45% in Lao PDR according to the ODA evaluation by the Ministry of Foreign Affairs of Japan in 2011, however, 80% of working population is engage in the primary industry (agriculture). Bolaven plateau is famous for high-quality coffee, cabbage, potato and coffee is the most exported agricultural products.

2. Background and Outline of Proposal for Official Grant Aid

Although the national health indicators in the Lao PDR have been improving steadily over the past decades, the maternal mortality rate[2] (470 per 100,000 live births) and under 5 mortality rate (54 per 1,000 live births) which are the indicators of MDG4 "Reduce child mortality" and MDG5 "Improve maternal health" remain very high, compared to the neighboring countries (the average of western pacific region: U5MR=19, MMR=49).

[1] UNDP "Human Development Report 2011"

[2] Figures of "Target by 2015": The Seventh Five-years National Health Sector Development Plan 2011-2015

Especially, it is assumed that achieving the target of MMR will be unlikely[3] .

The government of Lao PDR aims to graduate from the status of least-developed Country (LDC) and to achieve the Millennium Development Goals (MDGs) by 2015. The health sector is one of main four (4) sectors described in "National Growth and Poverty Eradication Strategy (NGPES)" developed in 2003, the priorities of which include strengthening and improvement of the quality of health care at communities in particular[4].

MOH of Lao PDR identified eight priority areas (most of them are related to strengthening of maternal and child health) at the sixth national health conference held in 2007. Proceeding to further development of these priority areas focusing on strengthening of maternal and child health was confirmed in the mid-term evaluation report of the sixth National Health Sector Development Plan (NHSDP) in 2008.

Accordingly, the current Seventh Five-years NHSDP 2011-2015 was developed. In the said 7th NHSDP, strengthening of the health system for improvement of mother and child health especially the expansion of health care service network down to all rural and out of remote mountainous areas is set as one of main directions[5].

The Lao government planned to modernize HCs (construction of facilities and allocation of health staff including midwives and nurses) and takes count of the role of HCs as a fixed site of support of delivery in community and outreach service to remote areas as well.

In addition, various health strategies and plans such as "Strategy and planning Framework for the Integrated Package of Maternal, Neonatal and Child Health Services 2009-2015" which aims to provide the complete package of MNCH services from family planning, antenatal care, delivery, immunization to IMCI (Integrated Management of Childhood Illness) at all levels of health facilities, "Policy on Primary Health Care, 2000" which aims to improve the effectiveness of primary health care, "SBA (Skilled Birth Attendants) Development Plan 2008-2015" which aims to develop the capacity of SBAs, "Drug Revolving Fund" for maintaining the operational cost for HCs, "Health Equity Fund" and "Free delivery and care for children under five" for reducing the financial barrier on access to healthcare services for all poor and underserved targets and so on have been developed and the Lao government implements those strategies and plans with technical and financial supports by international organizations and donors.

On the other hand, in southern region of Lao PDR, only 54% of people live within 10km to the nearest hospitals and the rest of the people rely on services provided by HCs or outreach

[3] Millennium Development Goals 2008 Progress Report Lao PDR, Lao PDR Government and UN, 2008

[4] National Growth and Poverty Eradication Strategy, Lao PDR Gov., 2003

[5] The 7th Five-Year Health Sector Development Plan 2011-2015, Ministry of Health, Lao PDR, 2011

service. There are hard-to-reach areas in southern provinces due to not only distance to health facilities but also living in mountainous areas and having inadequate access road and rivers to cross for reaching nearest HC which will make more difficult during rainy season.

Securing of health staff (especially skilled birth attendant) is in difficult situation since there is a tendency to have little appreciation for allocation to rural areas along with lack of health staff. Besides, it is difficult to secure the service quality due to aging health facilities and lack of medical equipment, and a few patients come to use the services. Therefore there are some facilities with lack of operating cost due to low income from user fee and drug charge. The severity of poverty is high in the southern region and so-called ethnic minority groups who have original languages, culture and custom live in the areas near the border with Vietnam[6]. The southern provinces have the factors of slow progress of utilization of health service.

Consequently, the challenges of the southern region are 1) low accessibility to health facilities, 2) difficulty to allocate health staff, 3) aged and inadequate facility and equipment, 4) lack of operating cost of health facility, 5) financial difficulties of residents and 6) Lao women's culture and custom for childbirth.; thus, It is required not only new construction of HCs but also re-construction of HCs as well as construction of staff house because of low level of retention of health staff which are considered to be an urgent challenge. Accordingly, this Project covers four (4) southern provinces.

Under the circumstances described hereinbefore, in order to expand health service network to all rural, remote and mountainous areas in aiming to integrate MNCH services as a package, MOH of the Government of Lao PDR requested "the Project for the Strengthening Health Service Network in Southern Provinces" to the Government of Japan in July 2009, the project of which targets four (4) southern provinces i.e. Attapeu, Champasak, Salavan and Sekong having low level of indicators for the maternal, neonatal and child health (MNCH).

Since the objectives of the Project are to contribute to strengthening the healthcare services and to improving the quality thereof by means of procuring the equipment to District Hospitals (DHs), new construction and re-construction of Health Centres (HCs) and construction of Staff Houses (SHs) in four (4) target southern provinces so as to improve the access to the primary healthcare including MNCH services and the environment of the health service facilities, the components for the Project requested by the Government of Lao PDR are as follows:

< Facilities >

- New construction of 22 health centres (incl. water supply system and PV system)
- Re-construction of 29 health centres (incl. water supply system and PV system)

[6] Lao PDR National Census 2005, Lao PDR Gov.

- Renovation of 4 health centres (incl. water supply system and PV system)
- Re-construction and renovation of MCH Clinic for 14 District Hospital
- New construction of Staff House for health centres in remote area

< Equipment >

- Procurement of equipment and furniture for the above-mentioned health centres and district hospitals

3. Outline of the Study Results and Contents of the Project

The Preparatory Survey Team (hereinafter referred to as the "Team") conducted discussions on the Project including the field surveys at the project target sites with MOH, PHOs, DHs and other relevant authorities while their stay in Lao PDR from 26th February to 21st March 2012 for 1st Preparatory Survey, from May 20th to June 17th 2012 for 2nd Preparatory Survey, from December 2nd to December 13th 2012 for 3rd Preparatory Survey, and from April 21st to April 27th 2013 for 4th Preparatory Survey for the explanation of the reference tender documents.

Although support components originally requested by Lao side are as described above, total number of the target site for HC was increased to 67 sites due to additional request made by Lao side during the 1st Preparatory Survey; and thereafter, the priorities of the support components for each target site for HC (67 sites) and DH (14 sites) were classified into Scope of Works (SOW) i.e. SOW-I, SOW-II and SOW-III as shown hereinafter, based on the selection criteria agreed by Lao side.

And consequently, as for the facilities construction for HC, it was agreed by Lao side that the Project should undertake only SOW-I and SOW-II; however, the procurement of the equipment shall include all target sites for HC i.e. 67 sites.

On the other hand, according to the observation during 1st and 2nd Preparatory Surveys, the maternal, neonatal and child health (MNCH) services at district level are provided in different ways; for example, the birth assistance is provided by the hospital staff at the delivery room in the hospital and other MNCH services such as antenatal care are provided by hospital staff at the hospital or by MCH district health officers at a detached building. And, it seems that a package of MNCH services integrated with antenatal care, delivery, postnatal care, neonatal and child health care at a MNCH unit which is combined district health office with district hospital will be unlikely provided very soon.

Therefore, as for the district hospitals, the procurement of the equipment for 9 target sites having deteriorated MCH equipment and re-construction and/or renovation of MCH clinic are classified as SOW-I and SOW-III respectively since integration of MNCH services at the district

level has not been confirmed. In addition, it was confirmed that none of the existing building being used as MCH unit is deteriorating and requires either re-construction thereof or immediate repair works.

In the preparation of the outline design for the Project, considerations have been given carefully to the natural and social conditions of Lao PDR as well as the capacity for the operation and maintenance of the implementing agencies and the cooperation with technical cooperation projects. And consequently, three (3) type of HC i.e. Type A, Type B and Type B' are planned for the Project by giving consideration of the covered/ beneficial population and a requirement of the laboratory and as for the equipment and other facilities such as water supply system and PV system are also planned based on the result of analysis in Japan and the design policies described in Section 2-2-2, Chapter 2.

As a result of afore-mentioned selection of the target sites and formulation of support components, the Project is planned to be consist of the followings:

1) Building facilities construction: 58 target sites
   - HC only : 33 target sites
   - SH only : 13 target sites
   - HC + SH : 12 target sites

2) Provision of water supply system: 58 target sites
   - Public water supply system :3 target sites
   - Community water supply system :3 target sites
   - Spring water supply system :5 target sites
   - Existing well :19 target sites (incl. 4 test boreholes)
   - New well :28 target sites

3) Provision of PV system: 9 target sites

4) Procurement of equipment: 76 target sites
   - DH: 9 target sites
   - HC: 67 target sites

< Support Components: 67 HC Target Sites >

Site No.	Target Site	District	Building Facilities				Infrastructure (Other Facilities)					EQ
			HC			SH	Water Supply System		PV System			
			A	B	B'		Well	EWT	HC +/or SH	RF	WP	
A-01	Bengphoukham / Lak52	Samarkxay		Ⅲ		I	-	I	-	-	-	I
A-02	Halang Nhai	Samarkxay		I			I	I	-	-	-	I
A-03	Dak Yieng	Xaysettha		I			-	I	-	-	-	I
A-04	Sompoi	Sanamxay	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ

Site No.	Target Site	District	Building Facilities				Infrastructure (Other Facilities)					EQ
			HC			SH	Water Supply System		PV System			
			A	B	B'		Well	EWT	HC +/or SH	RF	WP	
A-05	Ban Thae	Sanamxay	I				I	I	-	-	-	I
A-06	Ban Mai	Sanamxay				III	-	-	-	-	-	I
A-07	Namsou	Sanxay	III			I	-	I	I	I	I	I
A-08	Sapuan	Xaysettha				II	II	II	II	II	II	I
A-09	Keng Mhkhua	Xaysettha				II	II	II	II	II	II	I
A-10	Na Seuak	Phouvong		I			I	I	-	-	-	I
A-11	Ka Ouan	Phouvong				III	-	-	-	-	-	II
A-12	Honay Keo	Phouvong				II	II	II	-	-	-	I
A-13	Nam Kong	Phouvong				III	-	-	-	-	-	I
A-14	Beng Vilai	Sanamxay				I	-	I	I	I	I	I
A-15	Pak Bo	Sanamxay				I	I	I	I	I	I	I
A-17	Kum Khan	Samarkxay				III	-	-	-	-	-	I
A-18	Langnao	Samarkxay				II	-	II	-	-	-	I
A-19	Somsanouy	Samarkxay	*repair roof			II	-	II	-	-	-	I
A-20	Ban Moon	Sanxay				III	-	-	-	-	-	I
A-22	Phou Home	Phouvong				II	-	II	II	II	II	I
C-01	Ban song	Pakse	II				II	II	-	-	-	II
C-02	Saphai	Sanasomboum	II				II	II	-	-	-	II
C-03	Km 21th	Bachiang	II				II	II	-	-	-	II
C-04	Vernsay	Phonthong	I			II	I	I	-	-	-	I
C-05	Pathumphon	Pathoumphone	I				I	I	-	-	-	I
C-06	HouyNgern	Champasak	I			I	-	I	-	-	-	I
C-07	Vernyang	Moonlapamok		III		III	-	-				II
C-08	Nafang/ Bankeang	Khong	II			III	-	II	-	-	-	II
C-09	Salow	Sanasomboum		I			I	I	-	-	-	I
C-10	Banphon	Phonthong	I				I	I	-	-	-	I
C-11	Koudchick	Phonthong	II				-	II	-	-	-	II
C-12	Kalae	Pathoumphone	I			I	I	I	-	-	-	I
C-13	Phonthong	Phonthong	I				-	I	-	-	-	I
C-14	Champasak	Champasak	III				-	-				I
C-15	Phapho	Pathoumphone	III				-	-				II
C-16	Phonsikai	Pakse	II				II	II	-	-	-	II
C-17	Noonsavang	Pakse	II				-	-	-	-	-	II
C-18	Selabom	Sanasomboum	I				I	I	-	-	-	I
C-19	Kuangxi	Bachiang	III				-	-				II
C-20	Nam-orm	Pathoumphone	I				I	I	-	-	-	I
S-01	Naxay	Salavan	I				-	I	-	-	-	I

Site No.	Target Site	District	Building Facilities				Infrastructure (Other Facilities)					EQ
			HC			SH	Water Supply System		PV System			
			A	B	B'		Well	EWT	HC +/or SH	RF	WP	
S-02	Beng Oudom	Salavan	I				-	-	-	-	-	I
S-03	Kasa Ngai	Salavan	II				II	II	-	-	-	II
S-04	Nadonkhuang	Salavan	I			II	-	I	-	-	-	I
S-05	Phakkha	Salavan	I				I	I	-	-	-	I
S-06	Buengxay	Salavan	I				-	I	-	-	-	I
S-07	Dan Nalao	Lakhonpheng	II				II	II	-	-	-	II
S-08	Phonsung	Lakhonpheng	I				-	I	-	-	-	I
S-09	Lak 90	Lakhonpheng	I				I	I	-	-	-	I
S-10	Nadou Kao	Lakhonpheng	I				-	I	-	-	-	I
S-11	Khonsay	Vapi	II				II	II	-	-	-	II
S-12	Saphat	Vapi	I				-	-	-	-	-	I
S-13	Tanpio	Khongsedon	II				-	-	-	-	-	II
S-14	Thaluang	Khongsedon	II				-	II	-	-	-	II
S-15	Kenghuad	Khongsedon	II				-	-	-	-	-	II
S-16	Nong Kae	Laongam	I				I	I	-	-	-	I
S-17	Dong Nhai	Laongam	I			II	I	I	-	-	-	I
S-18	Vang Peui	Laongam	I			II	I	I	-	-	-	I
X-01	Dakdin	Dakchung				II	-	II	II	II	II	I
X-02	Tateu	Dakchung				I	-	I	I	I	I	I
X-03	Chalea	Kaleum				I	-	I	I	I	I	I
X-04	Paxay	Kaleum		I		I	-	I	-	-	-	I
X-05	Donechan	Lamam	II			II	II	II	-	-	-	II
X-06	Phon	Lamam	I			II	-	-	-	-	-	I
X-07	Tanum	Lamam			I	I	-	I	-	-	-	I
X-08	Nongkan	Tateng	II			II	-	II	-	-	-	II
X-09	Yup	Tateng		I		II	-	I	-	-	-	I
		Total	**38**	**6**	**1**	**25**	**28**	**52**	**9**	**9**	**9**	**67**

Note: HC: Health Centre SH: Staff House
EWT: Elevated Water Tank RF: For Vaccine Refrigerator WP: For Water Pump EQ: Equipment
I: SOW I II: SOW II III: SOW III

The outline of the planned facilities and the list of equipment for HC and DH agreed with the Government of Lao PDR are as shown in the tables below:

< Outline of Planned Facilities >

Facilities	Structure	Contents of Facilities	Total Floor Area
Health Centre	Reinforced Concrete Frame + Wooden Truss (single storey)	Pharmacy/ Accounting, OPD/ Treatment Room, Pregnant Women's Consultation Room, Delivery Room, Laboratory (only Type A and B'), Ward, Waiting Hall, WC and Shower Room	Type A: 128.31 ㎡ Type B: 113.91 ㎡ Type B': 121.11 ㎡
Staff House (2 households)	Reinforced Concrete Frame + Wooden Truss (single storey)	Bedroom, Living Room, Kitchen, WC, Shower Room and Entrance Hall	71.40 ㎡
PV System	Galvanized Steel Supporting Frames	For facilities and Vaccine Refrigerator	-
Water Supply System	Reinforced Concrete Frame for EWT Structure and Water Reservoir Tank	SUS Storage Tank(1.0 or 2.5m^3) , Structure for EWT and Water Reservoir Tank	-

< List of Equipment: HC >

OPD/Treatment Room		HC-21	Sphygmomanometer	Ward	
HC-1	Instrument Trolley	HC-22	Stethoscope for Fetus	HC-41	Bed
HC-2	Weighing Scale for Infant	HC-23	Exam'n Table for Gynecology	HC-42	IV stand
HC-3	Weighing Scale for Adult	HC-24	Desk	Laboratory	
HC-4	Sphygmomanometer	HC-25	Chair	HC-43	Microscope
HC-5	Stethoscope	HC-26	Vaccine Refrigerator (AC)	HC-44	Shallow Tray
HC-6	Tongue Depressor	HC-27	Vaccine Refrigerator (DC)	HC-45	Instrument Cabinet
HC-7	Thermometer	HC-28	Vaccine Bag for Outreach	HC-46	Drug Refrigerator
HC-8	Examination Table	HC-29	Round Chair	HC-47	Laboratory Instrument Set
HC-9	Dirty Plate	Pharmacy/Accounting		HC-48	Rack for Slide
HC-10	Treatment Instrument Set	HC-30	Desk	HC-49	Blood Cell Counter (manual)
HC-11	Instrument Cabinet	HC-31	Chair	HC-50	Box for Slide
HC-12	Kidney Dish	HC-32	Drug Cabinet	HC-51	Pipette
HC-13	Boiling Sterilizer	HC-33	Shelf for Documents	HC-52	Pipette
HC-14	Examination Light	Delivery Room		For Outreach Activities	
HC-15	Hand Light	HC-34	Instrument Trolley	HC-53	Motorcycle
HC-16	Desk	HC-35	Delivery bed	HC-54	Stethoscope
HC-17	Chair	HC-36	Delivery Instrument Set/ HC	HC-55	Thermometer
HC-18	Lantern	HC-37	Autoclave	HC-56	Thermometer
HC-19	Round Chair	HC-38	Dry Heat Sterilizer	HC-57	Back Pack for Outreach
Women's Consultation Room		HC-39	Delivery Light	HC-58	Weighing Scale for Adult
HC-20	Thermometer	HC-40	Delivery Instrument Set/ Home	HC-59	Sphygmomanometer

< List of Equipment: DH >

MCH		**Delivery Room**	
DH-1	Examination Table	DH-8	Delivery Table
DH-2	Examination Table for Gynecology	DH-9	Delivery Instrument Set for Hospital
DH-3	Sthethoscope	DH-10	Delivery Light
DH-4	Sphygmomanometer	DH-11	IV stand
DH-5	Vaccine Bag for Outreach	DH-12	Autoclave
DH-6	Thermometer		
DH-7	Vaccine Refridgerator (AC)		

4. Implementation Schedule and Project Cost

Since the construction works for the Project are planned to be implemented by three (3) batches starting from Batch 1 for well construction works and followed by Batch 2 and Batch 3 for facilities construction works with overlapping period of 3.5 months. Thus, the entire project implementation period from the conclusion of the Consulting Services Agreement to the completion of the Project and the closing of the office for the Procurement Agent (not including the warranty period) is estimated to be 25 months.

The construction period for the building facilities is assumed to be 8 months in total; 1 month for preparation works, 6 months for facilities construction and 1 month for inspection and remedial works. On the other hand, the procurement period of the equipment is assumed to be 4.5 months in total; 3 months for manufacturing and procuring including transportation and 1.5 months for inspection and acceptance.

And, an estimated cost to be borne by the Recipient for the implementation of the Project is as follows:

(1) Cost to be borne by the Recipient (Laos) : 16.7 Million Japanese Yen
(1,711,550.11 Thousand Lao Kip)

5. Project Evaluation

(1) Validity

Grounds for indicating the validity of the Project are as follows:

1) The government of Lao PDR aims to graduate from the Least Developed Country (LDC) and to achieve the Millennium Development Goals (MDGs) by 2015. Improvement of quality of health care at provincial level by the implementation of the Project will contribute toward improving the standard of living and poverty reduction at provincial level.

2) Health facilities construction/renovation by the implementation of this Project in southern provinces accords with one of the direction of 7th National Health Sector Development Plan (NHSDP) “Strengthening of the health system for improvement of mother and child health especially the expansion of health care service network down to all rural and out of reach mountainous areas”.

3) Maternal, Neonatal and Child Health (MNCH) indicators remains at very low level. Improvement of access to health services at provincial level and expansion of MNCH services are issues to be addressed immediately in order to achieve MDG-4

"Reducing of under Five Mortality Rate" and MDG-5 "Improvement of Maternal Health". HCs to be constructed and/or improved by the implementation of this Project is the centre of MNCH services in the community. Access and quality of MNCH will be improved by means of the increase in the number of newly constructed HCs, re-construction of the existing HCs and procurement of equipment in consideration of MNCH services provision and the reinforcement of MNCH clinic at district hospital which supports HCs.

4) There is a regional difference in health conditions of resident between urban and rural area. Health indicators of southern region are worse than the average of Lao PDR as a whole and the utilization rate of MNCH services is especially low. There are many mountainous areas and the area difficult to access due to inadequate road for which the health service coverage is not sufficient. Under these circumstances, validation of covering the southern region by the implementation of this Project is quite high.

5) Japanese government is focusing on the provision of the improved health care services as one of the top priority issues on the "Aid program for the Lao PDR" toward the achievement of MDG-4 and 5. Improved health care services consist of improvement of MNCH services, human resources development, institutionalization and capacity development for health care in community. Therefore, this Project accords with an aid policy of Japan.

6) "The Project for Strengthening Integrated Maternal, Neonatal and Child Health Services" by JICA is to support "Strategy and Planning Framework for the Integrated Package of Maternal, Neonatal and Child Health Services 2009-2015" by Lao PDR comprehensively with soft and hard components. The synergy by this Project as hard component and Technical Assistance as soft component is expected.

7) Deployment of health worker is one of the issues of MNCH services and MOH is implementing "Skilled Birth Attendant Development Plan" supported by UNFPA and formulating the strategy for low retention rate of health workers. Also "Health Equity Fund" and "Free treatment fee for pregnant woman and infant under 5 years old" are implemented with assistance by development partner such as ADB and WB to address the financial burden for health services. Regarding the promotion of utilization of health services, "The Project for Strengthening Integrated Maternal, Neonatal and Child Health Services" and health promotion by UNFPA are being implemented. However, only this Project is planned for the improvement of health facilities such as HCs in a large scale in the southern region at this moment and takes

an important role in strengthening of the health service network.

(2) Effectiveness

The following effects are expected from the implementation of the Project and therefore it is considered that the Project will be confidently effective.

Quantitative Effects

1) Covered population and beneficiary

Current health services provided by the existing DHs and HCs cover 74.2% of population in four (4) southern provinces. The population newly covered by 15 new HCs to be built under this Project will be about 65,000 and the coverage ratio will rise to 79.3% which is an increase of approx. 5%. Number of population who will benefit from the target HCs and DHs is 341,067 in total which represents 26.9% of the total population in four (4) southern provinces, which is calculated based on the conditions that HC covers all resident in the area and DH only covers infant under 5 years old and women between 15-49 years old.

2) Health services utilization rate

With consideration of the effects achieved by the similar projects implemented by other donors, health services utilization rate at HC and DH after the completion of the Project will increase. (Please refer to Section 3-2-2-1 (2), Chapter 3 for details)

3) Effects from the Construction of Staff House

Based on the assumption of that the minimum number of staff will be secured on account of the construction of staff house (4 staff for HC Type A, 2 staffs for HC Type B), health services utilization rate is expected to increase notably e.g. from 50% to 75% in Attapeu and from 22.2% to 100% in Sekong.

4) Quantitative Output Indicators

Targets of each output indicator are set as shown in the table below, assumptions of which are made based on the quantitative effects mentioned above, health services utilization rate in particular.

< Target of Quantitative Output >

Indicators	Actual	Target (2018)
Population rate covered by DHs and HCs in four (4) southern provinces (incl. those not targeted by the project)	74.2% (2010)	79.3%
ANC1 rate in the southern 4 provinces	60.1% (2010)	86.2%
Measles immunization Rate in four (4) southern provinces	64.8% (2010)	85.1%
Number of outpatient of DHs and HCs in four (4) southern provinces	376,978	536,535
Number of staff at the target HCs	172	230

Targets of each output indicator shown in the table above are computed based on the record of effects of similar project mentioned hereinbefore (~2015) and reasonable growth rate of 5% (2016~2018).

Qualitative effects

1) Construction of SH helps: emergency medical examination and treatment beyond office hours at HC can be available for the resident.

2) Photovoltaic (PV) system helps: improvement of the quality of nighttime medical examination and delivery, keep quality of vaccine in good condition by means of continuous running of the vaccine refrigerator, and improvement of the quality of medical examination by means of use of the equipment which consumes the electricity.

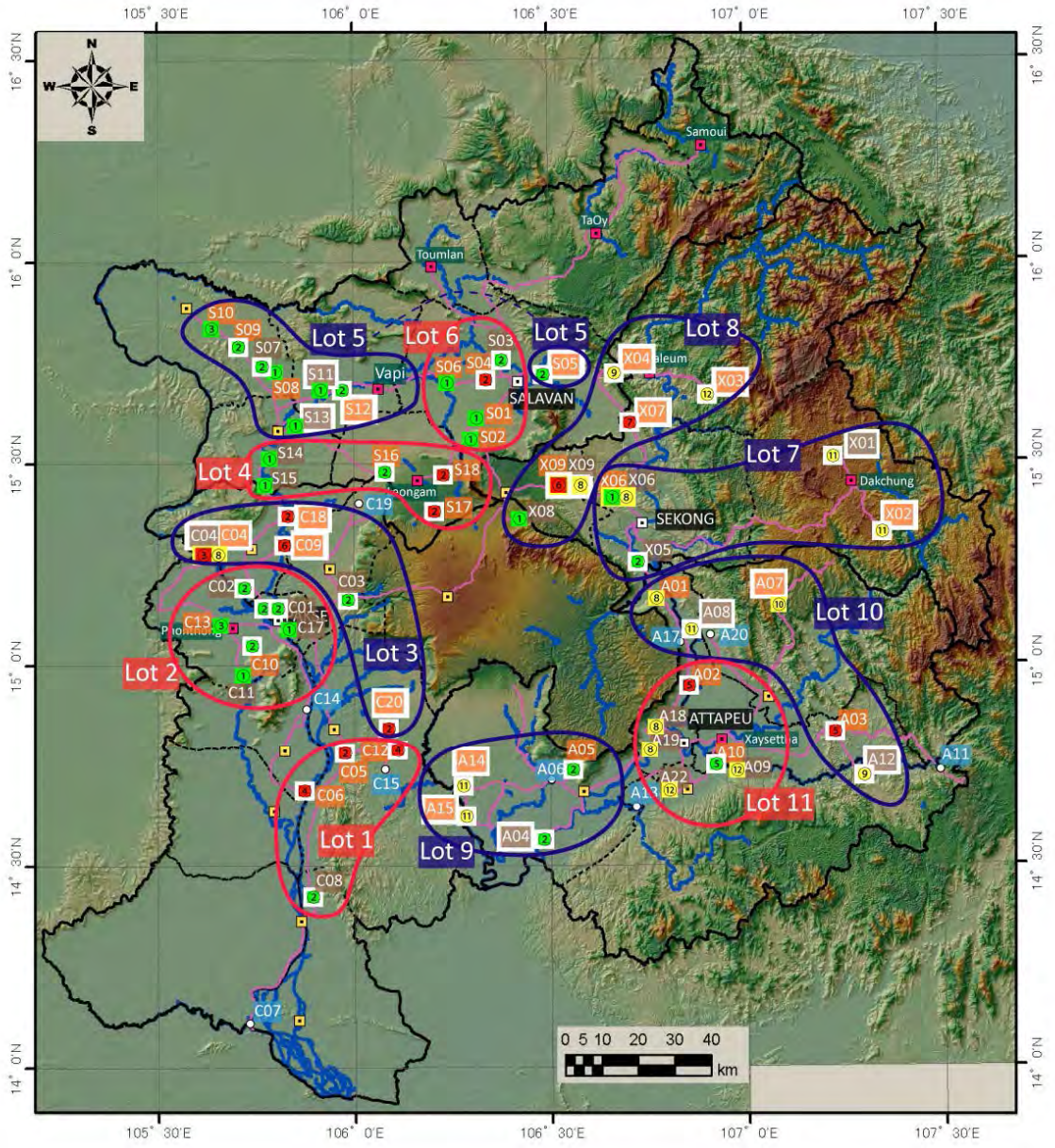
3) Water supply system helps: realization of the hygienic environment suitable for provision of the health services, improvement of the safety in health care services, and to enable to installing flush toilet to give instructions for hand washing to the patients which will lead to hygiene control among the community by HC.

CONTENTS

Location Map-1

Location Map

Location Map-2



LEGEND

① HC-A
② HC-A w/BH+WT
③ HC-A w/WT
④ HC-A + SH w/BH+WT
⑤ HC-B w/BH+WT
⑥ HC-B' w/BH+WT
⑦ HC-B + SH w/BH+WT
⑧ SH
⑨ SH + w/BH+WT
⑩ SH w/S(H+S)
⑪ SH w/BH+WT, S(H+S+W)
⑫ SH w/S(H+S+W)

Green: Re-construction
Red: New construction
Yellow: Existing HC

HC: Health Center
SH: Staff House
BH: Borehole
WT: Water Tank
S : Solar
(H) : for Health Center
(S) : for Staff House
(W): for Water Pump

■ PRIORITY (SOW)

SOW Ⅰ
SOW Ⅱ
SOW Ⅲ

■ REMARKS

A04 2 Bad Accessibilty
Borehole planed

■ FACILITY CONSTRUCTION BATCH

Lot X Batch 2(Phase Ⅰ) 5 lots 27 sites
Lot X Batch 3(Phase Ⅱ) 6 lots 31 sites

Site Location Map

Perspective

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Abbreviations

Abbreviations	ENGLISH
A/A	Agent Agreement
A/M	Agreed Minutes
AC	Alternating Current
ADB	Asian Development Bank
ARI	Acute Respiratory Infections
CB	Concrete Block
CE	Conformite Europeene /European Conformity
CHC	Community Health Committee
DC	Direct Current
DH	District Hospital
DOHUP	Department of Housing and Urban Planning
DRF	Drug Revolving Fund
E/N	Exchange of Notes
EPI	Expanded Programme on Immunization
FDA	Food and Drug Administration
G/A	Grant Agreement
GACE	Grant Aid for Community Empowerment
GAVI	GAVI Alliance (formerly The Global Alliance for Vaccines and Immunisation)
HC	Health Center
IMCI	Integrated Management of Childhood Illness
IMR	Infant Mortality Rate
JICA	Japan International Cooperation Agency
JICS	Japan International Cooperation System
JIS	Japanese Industrial Standards
LAK	Laos Kip
LDC	Least Developed Countr y
M/D	Minutes of Discussions
MDGs	United Nations Millennium Development Goals
MMR	MMR. Vaccine. (Measles, Mumps,. & Rubella)
MOH	Ministry of Health
MOPWT	Ministry of Public Works and Transport
MPSC	Medical Products Supply Centre: MPSC
NGPES	National Growth and Poverty Eradication Strategy
NHSDP	National Health Sector Development Plan

Abbreviations	ENGLISH
NSEDP	National Socio-Economic Development Plan
OPD	Out Patient Department
SB	Safety Box
SH	Staff House
SOW	Scope of Works
TB	Pulmonary tuberculosis
TDS	Total Dissolved Solid
UNICEF	United Nations Children's Fund
UXO	Unexploded Ordnance
WB	World Bank
WHO	World Health Organization

CHAPTER 1
BACKGROUND OF THE PROJECT

Chapter 1 Background of the Project

1-1 Present Conditions and Issues of the Sector

Although the national health indicators in the Lao PDR have been improving steadily over the past decades, the maternal mortality rate[1] (470 per 100,000 live births) and under 5 mortality rate (54 per 1,000 live births) which are the indicators of MDG4 "Reduce child mortality" and MDG5 "Improve maternal health" remain very high, compared to the neighboring countries (the average of western pacific region: U5MR=19, MMR=49). Especially, it is assumed that achieving the target of MMR will be unlikely[2].

1-1-1 Present Conditions and Issues

1-1-1-1 Present Conditions and Issues for Health Sector in Lao PDR

(1) Present Conditions and Issues based on the Health Indicators and National Policy

Lao PDR aims to achieve the MDGs by 2015; however, the child mortality rate for MDG4 "Reduce child mortality" and maternal mortality rate for MDG5 "Improve maternal health" in Lao PDR remain very high. (Please refer to Table1-1 hereinafter)

According to the "MDGs 2008 Progress Report Lao PDR", it is assumed that the target of MMR will be unlikely met. The poor utilization of maternal and child health services by residents is one of the main reasons of it. According to "Lao Reproductive Health Survey in 2005", 84.8% of the births were delivered at home and 63.4% of the births were delivered with the assistance of the family and/or relatives.

In order to achieve MDG4 and MDG5, efforts to improve access to rural health facilities and to upgrade and expand the maternal and child health services such as antenatal and postnatal care, births attended by skilled birth attendant, neonatal care and family planning are required, and therefore, there is an urgent need to strengthen the health service network.

[1] Figures of "Target by 2015": The Seventh Five-years National Health Sector Development Plan 2011-2015

[2] Millennium Development Goals 2008 Progress Report Lao PDR, Lao PDR Government and UN, 2008

Table 1-1 Health Indicators for MDG4 and MDG5

MDG	Indicators	1995	Present	Target by 2015
4	Under 5 mortality rate (per 1000 live births)	170	76.4 (2010)*1	70
4	Infant mortality rate (per 1000 live births)	104	56.6 (2010)*1	45
4	Measles vaccination rate among 1-year olds (%)	68	64 (2009-10)*3	90
5	Maternal mortality rate (per 100,000 live births)	650	405 (2005)*2	260
5	Proportion of birth attended by SBA (%)	14 (1994)	37 (2009-10)*3	50
5	Contraceptive prevalence (%)	20 (1994)	38 (2005)	55
5	Adolescent fertility rate (per 1,000 girls aged 15-19 years)	96(2000)	76 (2005)	N/A
5	Antenatal care coverage at least 1 visit (%)	21 (2000)	71(2009-10)*3	69
5	Unmet need for family planning (%)	40 (2000)	27 (2005)	N/A

Sources: Data of the year of 1995 and current data without *number: Millennium Development Goals 2008 Progress Report Lao PDR, joint work of Lao PDR and United Nations

*1: Lao PDR Statistical Yearbook 2010, Ministry of Planning and Investment

*2: Lao PDR National Census 2005, Government of Lao PDR

*3: National Health Statistics Report FY 2009-2010, Ministry of Health

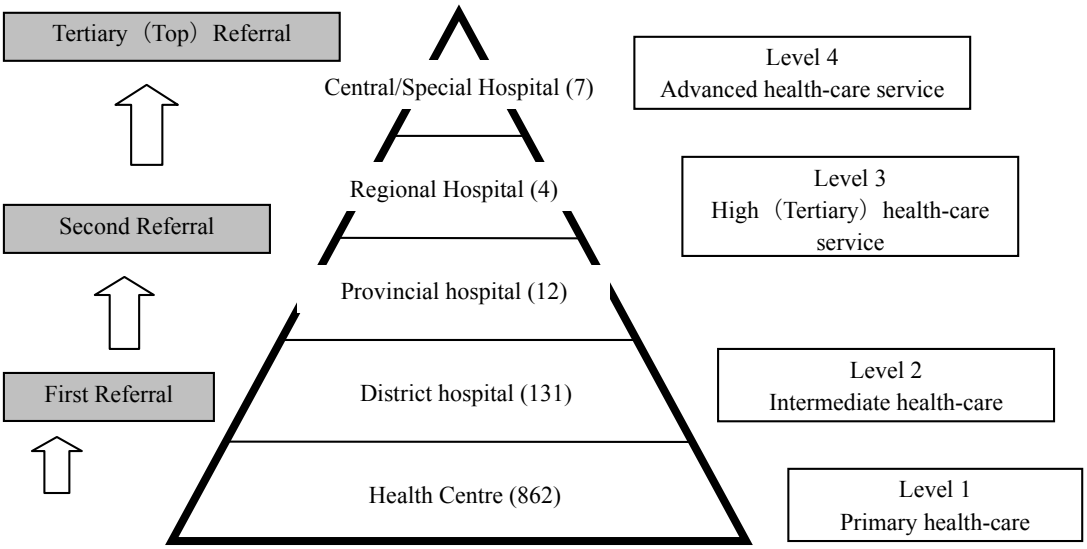
Figures of "Target by 2015": The Seventh Five-years National Health Sector Development Plan 2011-2015

(2) Health-care System in Lao PDR

According to the Decree No, 139/PDR on the Law on Health Care in 2005 issued by the Presidential Office, the health-care system in the Lao PDR is divided into 2 sectors, public and private health-care systems. And, public health-care system which is the target of this Project consists of four (4) health service levels.

Level 1:	Primary health-care services: The medical treatment provided by the village drug kits and health centres
Level 2:	Intermediate health-care services: The medical treatment provided by the district and municipal hospitals
Level 3:	High-level health-care services: The medical treatment provided by the provincial and regional hospitals
Level 4:	Advanced-level health –care services: The medical treatment provided by the central and specialist health care centres

The referral system that patients are referred from the primary level through intermediate, high level, up to advanced level according to the severity is as shown in Fig. 1 -1 below. However, emergent and/or serious cases can be treated at higher level directly.



Source: Statistical Yearbook 2010 Lao PDR, Ministry of Planning and Investment, Lao Department of Statistics, June 2011

Figure 1-1 Public Health-care System in Lao PDR

Table 1-2 shows the covered area, services to be provided and the roles and staff allocation of the health facilities by level which are specified in “Law on Health Care, 2005”, "Policy on Primary Health Care, 2000" and “the Seventh Five-years National Health Sector Development Plan 2011-2015”. The health centre (HC) has Type A and Type B, and the setting standard is described in "Agreement of the Minister of Ministry of Health on the Organization and Activations of Health Centres, 2006" of Ministry of Health as shown in Table 1-2 below:

Table 1-2 Summary of the Health Facilities by Level

Level	Health Facility	Area	Service and Roles	Staff
1	Health Centre Type A	Village/ Sub-district Pop. Covered =3,001~5,000	Primary health care service (chronic diarrhoea, prolonged flu, wound suture etc.), MCH including birth assistance, overnight accommodation, Vaccination, Primary health care, Disease prevention, Health promotion, Monitoring and supervision of VHV/TBA/Traditional healer, Outreach, Management of Drug Revolving Fund, Coordination between VHV and district health services, Collection of general health information, Management of facility	4~5 staff Physician, Assistant physician, Nurse, Midwife, Laboratory staff
	Health Centre Type B	Village/ Sub-district Pop. Covered =1,000~3,000	Primary health care service (chronic diarrhoea, prolonged flu, wound suture etc.), MCH including birth assistance, overnight accommodation, Vaccination, Primary health care, Disease prevention, Health promotion, Monitoring and supervision of VHV/TBA/Traditional healer, Outreach, Management of Drug Revolving Fund, Coordination between VHV and district health services, Collection of general health information, Management of facility	2~3 staff Physician, Assistant physician, Nurse, Midwife, Laboratory staff (if labo available)

Level	Health Facility	Area	Service and Roles	Staff
2	District Hospital Type A	A Group of District	Consultation and treatment(Internal medicine, external medicine, obstetrics and gynecology, pediatrics), CemONC, In-patient, Primary health care, Disease prevention, Health promotion, Outreach service with DHO, First referral, Training/ Supervision/ Technical support for all health professionals, Practical training for lower level of health facilities	Physician, Assistant physician, Dentist, Nurse, Midwife, Medical technician, Anesthesist
	District Hospital Type B	Small Rural District	Consultation and treatment(Internal medicine, external medicine, obstetrics and gynecology, pediatrics), BemONC, In-patient, Primary health care, Disease prevention, Health promotion, Outreach service with DHO, First referral, Training/ Supervision/ Technical support for all health professionals, Practical training for lower level of health facilities	Physician, Assistant physician, Dentist, Nurse, Midwife, Medical technician,
3	Provincial Hospital	Province	Consultation and treatment(Internal medicine, external medicine, obstetrics and gynecology, pediatrics, others), In-patient, Surgery/ Blood transfusion, Rehabilitation, Primary health care, Disease prevention, Health promotion, Secondary referral hospital, Monitoring and Training for all category of health professionals	Physician, Assistant physician, Dentist, Nurse, Midwife, Various medical technician, Anesthesist
	Regional Hospital	Region		
4	Central Hospital Specialized Hospital	Countrywide	Consultation and treatment(Internal medicine, external medicine, obstetrics and gynecology, pediatrics, others), In-patient, Surgery/ Blood transfusion, Rehabilitation, Disease prevention, Health education, Scientific research, Third(Top) referral, Training site for medical professionals and students	Specialist, Physician, Dentist, Nurse, Midwife, Various medical technician, Anesthesist

It is prescribed that HCs, both type A and B, are located at villages or sub-district (Kum-ban) under the administration and technical management and guidance from district health office (DHO) and district hospital (DH) in the vertical line sector as well as under the management and facilitation from local authorities through health committees or Mother and Child Health Committees at villages/regions in horizontal line sector. DH is under the management by DHO and district health committee.

The health committees of the communities sub-district and district mentioned above consists of local authorities, mass organization members and so on. According to the interview with every provincial health office (PHO), community health committee supports management of HCs and public health activities concentrating on maternal and child health.

HC is the nearest health facility to provide primary health services for the communities and it is a front-line base of birth assistance in community and outreach service to remote area. The contents of outreach service such as maternal and child health service, vaccination and health education by HC are listed in "Agreement of the Minister of Ministry of Health on the

Organization and Activations of Health Centres, 2006"(Please refer to Table 1-3 below for detail description of the outreach activities). DH provides intermediate health-care service (first referral) including emergent delivery and newborn resuscitation.

Table 1-3 Description of Outreach Services

No.	Duties
1	Health Education/Health Information Dissemination – Encourage the practice of 3 rules of Hygiene
2	Immunization (Guide, Supervise and implementation)
3	Post-natal Follow-up and Promoting Nutritional Status
4	Examination of Post-partum Mother – Birth Spacing
5	Examination and Health Promotion – Nutrition in Schools
6	Supervise and Directing the Practice of Insecticide Treated Mosquito Net
7	Supervise and Directing the Implementation of Safe Water
8	Supervise and Directing the Construction of Latrine in Household and Schools
9	Examination – Treatment of not severe disease
10	Normal Delivery
11	Monitoring and Treatment of Patients with Chronic Disease
12	Involve in the team of plastic surgery for cleft palate, cataract, etc.

1-1-1-2 Present Conditions and Issues in Southern Region (4 southern provinces and districts thereof)

Most of the health indicators except the vaccination rate in the southern provinces covered by the Project show lower values than the national average as shown in Table 1-4 below, especially the infant mortality rates are the highest in the country. Although it is relatively good in Champasak province, maternal and child health service utilization rates in southern provinces as a whole are lower than the national average and the regional gap can be seen. Characteristically, since the southern provinces are malarial endemic area, the mortality rate due to malaria is relatively high. The mortality rate by Acute Respiratory Infections (ARI) is also quite high.

Table 1-4 Main Health Indicators in 4 (four) Southern Provinces

Indicators	National	Target by 2015 *1	Whole Southern Provinces	AT	CP	SL	SK	Ref.
Prevalence of underweight children under 5 years of age (%)	37	22	N/A	N/A	N/A	N/A	N/A	*2
Infant mortality rate(per 1000 live births)	70	45	N/A	113.4	67.9	102.9	128.1	*3
Measles vaccination rate among 1-year olds(%)	64	90	65	67	61	69	66	*4
Proportion of births attended by SBA(%)	37	50	28	15	34	25	21	*4
Contraceptive prevalence(%)	38.4	55	26.6	N/A	N/A	N/A	N/A	*5

Indicators	National	Target by 2015 *1	Whole Southern Provinces	AT	CP	SL	SK	Ref.
Adolescent fertility rate (per 1,000 girls aged 15-19 years)	76	-	151	N/A	N/A	N/A	N/A	*5
Antenatal care coverage at least 1 visit (%)	71	69	60	47	66	57	55	*4
Malaria mortality rate (per 100,000 pop.)	0.4	0.2	1.2	2.3	0.6	1.6	2.0	*4
ARI mortality rate(per 100,000 pop.)	3.2	-	5.4	7.8	4.5	5.7	7.0	*4

AT: Attapeu、CP: Champasak、SL: Salavan、SK: Sekong

Reference: *1 indicates vertical data, others indicate horizontal data、*1: The 7th Five-Year Health Sector Development Plan 2011-2015, MoH *2: Millennium Development Goals Progress Report Lao PDR 2008, Lao Gov. and the United Nations *3: Lao PDR National Census 2005, Lao Gov. *4: National Health Statistics Report FY 2009-2010, MoH *5: Lao Reproductive Health Survey 2005, National Statistics Centre and UNFPA

Infant mortality rate (per 1,000 births): Figures by province are calculated as 70 (National Rate) × relative level of each province

In southern region, only 54% of people live within 10km to the nearest hospitals[3] and the rest of the people rely on services provided by HCs or outreach service. There are hard-to-reach areas in southern provinces due to not only distance to health facilities but also living in mountainous areas and having inadequate access road and rivers to cross for reaching nearest HC which will make more difficult during rainy season.

Securing of health staff (especially skilled birth attendant) is in difficult situation since there is a tendency to have little appreciation for allocation to rural areas along with lack of health staff. Besides, it is difficult to secure the service quality due to aging health facilities and lack of medical equipment, and a few patients come to use the services. Therefore there are some facilities with lack of operating cost due to low income from user fee and drug charge. The severity of poverty is high in the southern region and so-called ethnic minority groups who have original languages, culture and custom live in the areas near the border with Vietnam[4]. The southern provinces have the factors of slow progress of utilization of health service.

Consequently, the challenges of the southern region are 1) low accessibility to health facilities, 2) difficulty to allocate health staff, 3) aged and inadequate facility and equipment, 4) lack of operating cost of health facility, 5) financial difficulties of residents and 6) Lao women's culture and custom for childbirth.

It is required not only new construction of HCs but also re-construction of HCs as well as construction of staff house because of low level of retention of health staff which are considered to be an urgent challenge. Accordingly, this Project covers four (4) southern provinces.

[3] Application for the Grant Aid for this Project, Lao PDR 2009

4 Lao PDR National Census 2005, Lao PDR Gov.

1-1-1-3 Background of the Request of MCH Units for District Hospitals

Some of the roles of DHOs and DHs are; technical and administrative management of HCs, receiving the patients referred from HCs and provision of outreach services for remote areas by the mobile team (only DHOs or DHOs with DHs). which contribute to expand MNCH service to residents in rural areas who are not accessible to DHs.

MCH unit of DHO provides MCH services such antenatal care, immunization and child monitoring; however, delivery care is provided at the obstetrics department in DH. MCH unit is a part of public health service (Hygiene and Disease Prevention) and delivery is one of curative service, and therefore, they are under the different jurisdictions.

"The Project for Strengthening Integrated Maternal, Neonatal and Child Health Services" which is an on-going JICA technical cooperation project aims to establish a framework to provide the complete package of MNCH services including delivery care at the same place of district level in the future.

1-1-2 Development Plans

The government of Lao PDR aims to graduate from the status of least-developed Country (LDC) and to achieve the Millennium Development Goals (MDGs) by 2015. The health sector is one of main four (4) sectors described in "National Growth and Poverty Eradication Strategy (NGPES)" developed in 2003, the priorities of which include strengthening and improvement of the quality of health care at communities in particular[5].

MOH of Lao PDR identified eight priority areas (most of them are related to strengthening of maternal and child health) at the sixth national health conference held in 2007. Proceeding to further development of these priority areas focusing on strengthening of maternal and child health was confirmed in the mid-term evaluation report of the sixth National Health Sector Development Plan (NHSDP) in 2008.

Accordingly, the current Seventh Five-years NHSDP 2011-2015 was developed. In the said 7th NHSDP, strengthening of the health system for improvement of mother and child health especially the expansion of health care service network down to all rural and out of remote mountainous areas is set as one of main directions[6].

The Lao government planned to modernize HCs (construction of facilities and allocation of health staff including midwives and nurses) and takes count of the role of HCs as a fixed site of support of delivery in community and outreach service to remote areas as well.

In addition, various health strategies and plans such as "Strategy and planning Framework for

[5] National Growth and Poverty Eradication Strategy, Lao PDR Gov., 2003

[6] The 7th Five-Year Health Sector Development Plan 2011-2015, Ministry of Health, Lao PDR, 2011

the Integrated Package of Maternal, Neonatal and Child Health Services 2009-2015" which aims to provide the complete package of MNCH services from family planning, antenatal care, delivery, immunization to IMCI (Integrated Management of Childhood Illness) at all levels of health facilities, "Policy on Primary Health Care, 2000" which aims to improve the effectiveness of primary health care, "SBA (Skilled Birth Attendants) Development Plan 2008-2015" which aims to develop the capacity of SBAs, "Drug Revolving Fund" for maintaining the operational cost for HCs, "Health Equity Fund" and "Free delivery and care for children under five" for reducing the financial barrier on access to healthcare services for all poor and underserved targets and so on have been developed and the Lao government implements those strategies and plans with technical and financial supports by international organizations and donors.

1-1-3 Socioeconomic Conditions

According to the World Bank, the nominal GDP of Lao PDR is about 8.29 billion US dollars, GNI per capita is 1,130 US dollars, GDP growth rate is 8.0%, and price increase rate is 4.4% as of 2011. Poverty headcount ration at national poverty line is 27.6% (2008) and unemployment rate is 1.4% (2005).

Since 1975, Lao PDR maintains political stability under the leadership of the single party, People's Revolutionary Party and introduced the new thought as to the market economy in 1986 to promote "New Economy Mechanism". However, the Lao PDR is still recognized as Less Developed Country (LDC) and a rank of Human Development Index (HDI) is 138 among 187 countries in total[7].

Lao PDR is a land locked country bordering with five (5) countries; namely, China, Myanmar, Thailand, Cambodia and Vietnam and because of it coupled with geographical limitation and impacts caused by the past domestic war, the economy development in Lao PDR was behind the neighbouring countries. However, in recent years, Lao PDR is looking at it from different angle i.e. from "land locked country" to "land linked country" i.e. Lao PDR has a geographical advantage as it is situated in the centre of Indochina and trying to find a means of survival with economic development by enhancing a regional connectivity such as securing a foothold for physical distribution within a region etc.

As for the economy of Lao PDR, at the time of the global financial crisis in 2008, its impact on the domestic financial market was very minimal since the connection with the global financial market was relatively weak. Thus, a growth rate of real GDP was 8.0% in 2011 and Lao PDR maintains a steady growth with a good trading of mineral resources, hydro-electric

[7] UNDP "Human Development Report 2011"

power generation etc. With consideration of such good economic growth, the Government of Lao PDR declared to reach per capita GDP of 700 US Dollars in "the 7th 5 Year Socio-economic Development Plan".

The share of primary industry in GDP is 29%, secondary industry is 26% and tertiary industry is 45% in Lao PDR according to the ODA evaluation by the Ministry of Foreign Affairs of Japan in 2011, however, 80% of working population is engage in the primary industry (agriculture). Bolaven plateau is famous for high-quality coffee, cabbage, potato and coffee is the most exported agricultural products.

1-2 Background and Outline of Proposal for Official Grant Aid

MOH of Lao PDR requested "The project for the strengthening health service network in southern provinces (Grant aid for community empowerment)" from Japan for four (4) southern provinces with low level of health indicators particularly in maternal and child health (Attapeu, Champasak, Salavan and Sekong provinces). The project aims for the expansion of health service network in every region and remote mountainous area, and the packaged maternal and child health services at primary HCs covering the period before childbirth until infant, giving consideration of the background described in 1-1-1 Present Conditions and Issues and 1-1-2 Development Plans.

The summary of the request from Lao PDR is as follows:

(1) Requested Date : July 2009
(2) Requested Amount : JPY500,000,000
(3) Requested Components :

< Facilities >

- Construction of 22 HCs (incl. water supply system and PV system)
- Re-construction of 29 existing HCs (incl. water supply system and PV system)
- Renovation of 4 existing HCs (incl. water supply system and PV system)
- Re-construction and/or renovation of MCH clinic at 14 DHs
- Construction of 8 SHs for health workers

< Equipment >

- Procurement of medical equipment and accessories for above-mentioned DHs and HCs

Target sites and project components as well as priority thereof were identified and confirmed at the first stage of survey. Outline design, outline project cost estimate and reference tender documents were prepared continuously through the further field surveys at the second stage.

Although the request made by the government of Lao PDR was as described hereinbefore, the project components were revised through 1st and 2nd preparatory surveys and agreed with Lao

PDR as follows:

< Facilities >

- Construction of 15 HCs (incl. water supply system and PV system for some HCs)
- Re-construction of 30 HCs (incl. water supply system and PV system for some HCs)
- Repair of roof for 1 HC
- Construction of 25 SHs for health workers (incl. water supply system and PV system for some SHs)

< Equipment >

- Procurement of equipment and furniture for 67 HCs
- Procurement of equipment and furniture for 9 DHs

1-3 Japan's Past Assistance

The record of Technical Assistance and Grant Aid from Japan for health sector in Lao PDR is as follows. Loan project has not been implemented for this sector yet

Table 1-5 Record of Technical Assistance from Japan (Health Sector)

Scheme	Year	Project	Summary
Technical Assistance	2002～2007	Project for strengthening for health services for children	Strengthening management system for improvement of child's health service at central and target province through the positive involvement of concerned parties.
	2005～2008	Project for strengthening medical logistics	Establishment of system at central and province level in order to manage and operate medicines, medical products and equipment in a proper and effective way.
	2005～2010	Project for human resources development of nursing/midwifery	Strengthening nursing education system and improvement of administrative institutions for human resources development of nursing/midwifery.
	2006～2010	Capacity development for sector-wide coordination in health	Systematic and effective implementation of 7th 5-Year Health Development Plan and strategic plan for its sub-sector program based on harmony of implementation procedure.
	2007～2010	Project for medical education and research for the Setthathirath Hospital	Improvement of quality of undergraduate clinical training and early postgraduate clinical training for those who graduate from Faculty of Medicine Science within 2 years at Setthathirath Hospital.
	2008～2012	Project for upgrading diploma nurses	Strengthening nursing education system and improvement of administrative institutions for human resources development of nursing/midwifery.
	2010～2015	Capacity development for sector-wide coordination in health phase-2	Systematic and effective implementation of 7th 5-Year Health Development Plan and strategic plan for its sub-sector program based on harmony of implementation procedure.
	2010～2015	Project for strengthening integrated maternal, neonatal and child health services	Improvement of maternal and child health care service recipients ratio in southern 4 provinces.

Scheme	Year	Project	Summary
	2012～2016	Project for sustainable development of human resource for health to improve maternal, neonatal and child health services	Strengthening human resource development system for health based on the concept of Complex Hospital Institute Project University (CHIPU) in order to provide steady and quality health services.

Table 1-6 Record of Grant Aid from Japan (Health Sector)

(Unit: Million Japanese Yen)

Scheme	Year	Project	Amount of Grant	Summary
Grant Aid	2007	Project for expansion of immunization （through UNICEF）	292	Implementation of Expanded Program of Immunization by Ministry of Health of Lao PDR including procurement of cold chain equipment such as refrigerator and vaccine for 2008.
Grant Aid	2007	Project for the improvement of district hospitals phase-3	658	Renovation of existing hospitals and procurement of medical equipment for 4 northern districts.
Grant Aid	2006	Project for the improvement of district hospitals phase-2	413	Renovation of existing hospitals and procurement of medical equipment for 2 southern districts.
Grant Aid	2005	Project for the improvement of district hospitals phase-1	150	Procurement of medical equipment for 10 district hospitals
Grant Aid	2006	Improvement of training institutions for health workers	546	Construction and/or renovation of building and procurement of medical equipment for college of health technology and 5 nursing schools in rural area.
Grant Aid	2001	Project for malaria control (Phase 2) and parasitic diseases control	305	Comprehensive malaria control through insecticide-treated mosquito net and parasitic diseases control through school health.
Grant Aid	1998	Project for the construction of new Setthathirath hospital	1,696	Construction of Setthathirath hospital in Vientiane and procurement of medical equipment.

1-4 Other Donor Assistance

The record of assistance for the health sector of Lao PDR from other donors and organizations is as shown in Table 1-7 below:

Table 1-7 Record of Assistance from other Donors and Organizations

(Unit: Thousand US Dollars)

Partner	Project/ Program	Type of assistance	Amount	Period	Outline of Project/ Program
Asian Development Bank (ADB)	Second Greater Mekong Sub-region Regional Communicable Diseases Control Project	Grant	12,000	2011-2016	Improvement of capacity for regional cooperation in communicable diseases control, Expansion of surveillance and response systems, Targeted support for the control of Dengue and Neglected Tropical Diseases
	Building capacity for the Health Sector Program Approach	Technical assistance	500	2010-2011	Strengthening of capacity of health financial management
	Health Sector Development Program	Grant	10,000	2010-2014	Strengthening of provincial planning and financing including HEF, Increasing of access to MNCH services (health infrastructure), Capacity development of health staff (Midwives) focusing on Northern Lao PDR
	Developing Model Healthy villages in Northern Lao PDR	Grant	3,000	2009-2013	Strengthening of village capacity for primary health care activities, Improvement of village infrastructure, Capacity building of health facilities
World Bank (WB)	Poverty Reduction Fund □	Specific Investment Loan	25,000	2011-2016	Improvement of the access to and the utilization of basic infrastructure and services for the project's targeted poor communities
	Health Services Improvement Project	Specific Investment Loan (Added 10 million US dollars in 2011)	25,000	2005-2014	Support for HEF and piloting free deliveries, outreach, training of midwives, upgrading of health infrastructure for southern provinces
	Community Nutrition Project	Emergency Recovery Loan	2,000	2009-2013	Improvement of coverage of essential MCH services and caring practices among pregnant and lactating women and children less than 2 years old in the seven southern and central provinces
GAVI	Procurement of vaccines and strengthening of health system	Grant	11,100	2001-2012	Procurement of vaccines, Support for EPI activities and Strengthening of health system

Partner	Project/ Program	Type of assistance	Amount	Period	Outline of Project/ Program
GFATM	Programmes to fight against HIV/AIDS, Tuberculosis and Malaria	Grant	101,700	2003-2013	Support for the programmes on HIV/AIDS, Tuberculosis, Malaria including health system strengthening
Lao/Swiss Red Cross	Health Programme Laos	Technical and financial cooperation	2,100	2010-2014	Support of HEF in 10 provinces including southern area and Support of basic health service including maternal and child health
Luxemburg	Nursing Training in Vientiane Province	Bilateral cooperation	€1,500	2005-2010	Strengthening of nursing training system focusing on Vientiane province
	Health in Vientiane province	Bilateral cooperation	€5,500	2003-2010	Intensified health staff training, Decentralization of health care services and Strengthening of referral system
	Lao-Luxemburg health Initiatives Support Programme	Bilateral cooperation	€16,800	2008-2012	Support for provincial and district health offices, Strengthening of management and supervisory capacity of EPI and Support for health technical services, MNCH and health care financing strategy
UNFPA	Country programme	Technical and financial support	33,000	2007-2015	Assistance for maternal and child health (Health promotion, Development of human resources and Procurement of contraceptives, etc.)
UNICEF	Country program	Technical and financial support	39,300	2007-2011	Maternal and Child Health, Water and Sanitation and Education
WHO	Country Cooperation Strategy	Technical support	13,600	2000-2011	Strengthening of health system and Support for development of health policy and implementation

1-5 Current Situations of the Project Sites

1-5-1 Status of Infrastructure

Status of the infrastructure in and around all 67 target sites for HC at the time of Preparatory Survey is as described herein below:

1-5-1-1 Status of Power Supply at the time of Preparatory Survey

Outline of the status of the power supply for the target sites is as follows:

Table 1-8 Outline of the Status of the Power Supply

Power Supply System	Attapeu	Champasak	Salavan	Sekong	Total
Low voltage (LV) distribution line in neighbourhood	13 sites	18 sites	16 sites	6 sites	53 sites

Power Supply System	Attapeu	Champasak	Salavan	Sekong	Total
No LV distribution line in neighbourhood but medium voltage (MV) distribution line in neighbourhood	1 site	2 sites	2 sites	N/A	5 sites
No LV and MV distribution line	1 site	N/A	N/A	2 sites	3 sites
Small-scale PV system	6 sites	N/A	N/A	1 site	7 sites
Total	21 sites	20 sites	18 sites	9 sites	68 sites

1-5-1-2 Status of Water Supply at the time of Preparatory Survey

Outline of the status of the water supply for the target sites is as follows:

Table 1-9 Outline of the Status of the Water Supply

Water Supply System	Attapeu	Champasak	Salavan	Sekong	Total
Urban/community water supply	N/A	2 sites	3 sites	1 site	6 sites
River water	3 sites	N/A	1 site	N/A	4 sites
Spring water	N/A	N/A	N/A	1 site	1 site
GFW	2 sites	N/A	N/A	1 site	3 sites
Deep well with hand pump	4 sites	7 sites	7 sites	1 site	19 sites
Deep well with lifting pump	1 site	1 site	4 sites	N/A	6 sites
Deep well with well pump and elevated water tank	8 sites	2 sites	N/A	N/A	10 sites
Total	18 sites	12 sites	15 sites	4 sites	49 sites

1-5-1-3 Status of PV System Installations at the time of Preparatory Survey

Only 7 sites are with the existing PV system (incl. 1 site for SOW III). 3 sites do not have either low or medium voltage power distribution line in the neighbourhood and 6 sites have only the medium voltage power distribution line.

Therefore, PV system is planned to be installed at 9 sites in total. 3 sites are without any power distribution line and 6 sites are with the existing small-scale PV system (excluding 1 site for SOW III) since there is a doubt that the existing system would still work sufficiently after the completion of the Project because of aging of the existing system besides the insufficient capacity thereof for operation of the equipment to be provided by the Project.

1-5-2 Natural Conditions

Lao PDR is situated in latitude 14~23º N and longitude 100~108ºE as a landlocked country in Indochina bordered by Vietnam to the east, Thailand to the west, Cambodia to the south, China and Myanmar to the north. Land area is approximately 240,000 km^2 as large as the main island of Japan. Mekong River runs through the border between Myanmar and Thailand, the

southern part of Lao PDR, Cambodia and Vietnam and reaches to the South China Sea. Lao PDR is in the centre of the Greater Mekong Sub-region (GMS) consists of 6 countries along the Mekong valley.

Lao PDR belongs to tropical monsoon area of the South-east Asia and there is a distinct rainy season from May to October due to a seasonal wind followed by a dry season from November to April. Average temperature of Vientiane is 22.1ºC in dry season and 28.0ºC in rainy season and average annual precipitation is about 1,630mm. Precipitation of rainy season in 2011 reached 144% of average under the influence of Typhoon No. 6 (Typhoon Haima) and Typhoon No. 8 (Typhoon Nock-Ten) which caused floods of Mekong river and its branch and damaged roads, bridges and agricultural land heavily.

Annual precipitation is about 1,000 ~ 2,000mm according to Meteorological Agency and more than 400mm precipitation falls in a rainy season from May to October. Annual average temperature is about 28 ºC. Maximum temperature rises to 38ºC in April and May and minimum temperature drops to 17 ºC in January at Vientiane. Mountainous area has heavy precipitation with a bit lower temperature. Lightning strikes many times in a rainy season and damages buildings.

(1) Climate

Lao PDR belongs to the tropical monsoon area as described herein above and as for the four (4) target provinces of this Project i.e. Attapeu, Champasak, Salavan and Sekong,, the meteorological data such as the monthly average minimum temperature, monthly average maximum temperature and precipitation are shown in Table 1-10, 1-11 and 1-12 as well as Figure 1-2 with graph hereinafter. These data are averages of past five (5) years from 2007 to 2011. Average maximum temperature in April is more than 35ºC which is the highest in a year. Average minimum temperature in January is about 18ºC in Attapeu, Champasak and Salavan and about 16ºC in Sekong.

Annual precipitation for the target provinces reaches to 1,900 ~ 2,000mm in Attapeu, Champasak and Salavan; however, it reaches only 1,400mm in Sekong.

Table 1-10 Monthly Average Minimum Temperature of Provincial Capital (ºC)

Minimum Temperature	1	2	3	4	5	6	7	8	9	10	11	12	Average
Attapeu	18.7	20.6	23.1	24.7	24.8	24.7	24.2	23.9	24.0	23.2	21.4	19.1	22.7
Pakse	18.6	21.6	23.7	25.7	25.2	25.2	24.7	24.4	24.3	23.5	20.8	19.4	23.1
Salavan	16.6	20.0	22.6	24.5	25.1	25.2	24.7	24.6	24.3	23.3	20.3	17.7	22.4
Sekong	15.7	18.5	21.6	23.7	24.6	24.9	24.4	24.2	23.9	22.9	19.8	16.7	21.7

Data Source: Department of Meteorology and Hydrology, Ministry of Natural Resources and Environment

Table 1-11 Monthly Average Maximum Temperature of Provincial Capital (ºC)

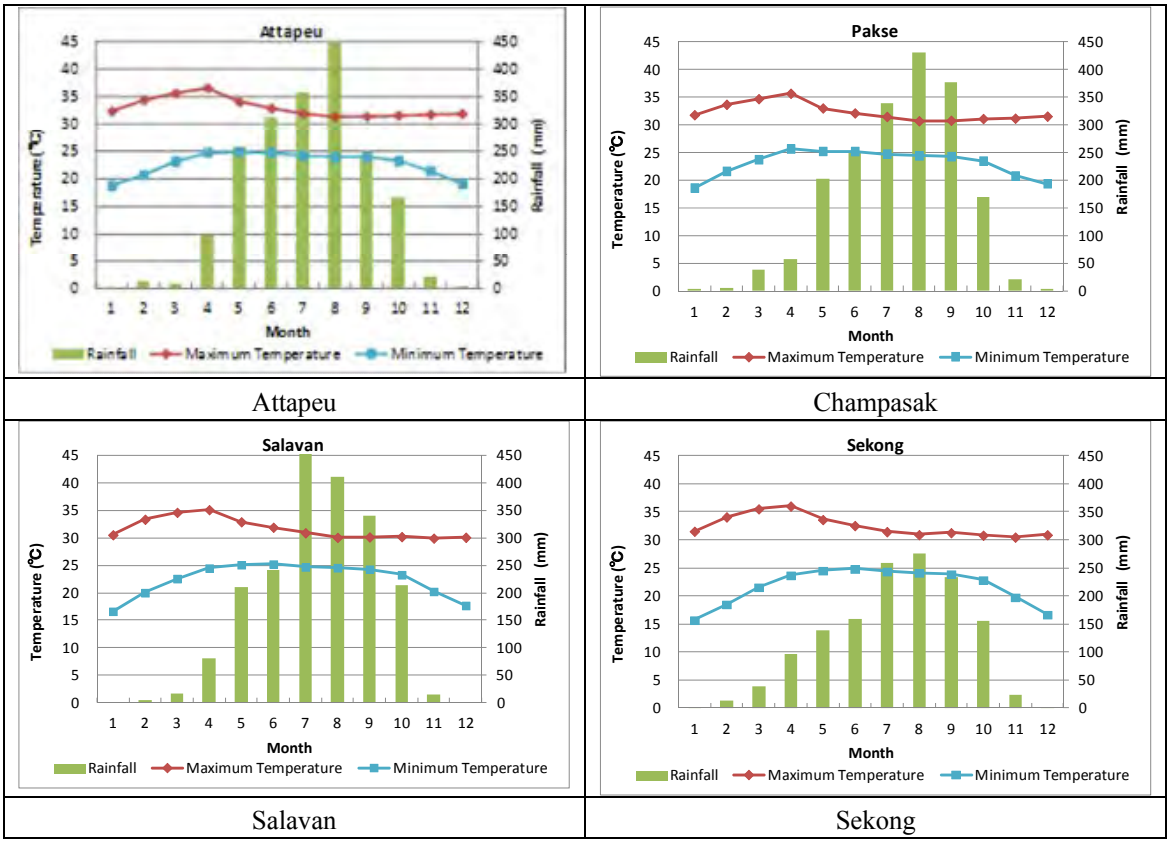
Maximum Temperature	1	2	3	4	5	6	7	8	9	10	11	12	Average
Attapeu	32.4	34.4	35.6	36.6	34.1	32.9	31.9	31.4	31.4	31.6	31.8	31.9	33.0
Pakse	31.8	33.7	34.6	35.6	33.0	32.1	31.4	30.7	30.7	31.1	31.1	31.5	32.3
Salavan	30.5	33.4	34.6	35.1	32.9	31.9	30.9	30.1	30.2	30.2	29.9	30.1	31.7
Sekong	31.6	34.1	35.6	36.1	33.7	32.6	31.5	31.0	31.3	30.9	30.5	31.0	32.5

Data Source: Department of Meteorology and Hydrology, Ministry of Natural Resources and Environment

Table 1-12 Precipitation of Provincial Capital (mm)

Rainfall	1	2	3	4	5	6	7	8	9	10	11	12	Total
Attapeu	2.5	11.9	8.6	98.6	257.4	313.7	358.6	448.3	244.0	166.3	20.4	4.6	1934.9
Pakse	3.3	6.4	37.9	57.2	201.8	249.3	338.9	430.5	376.6	169.9	21.3	4.5	1897.5
Salavan	1.5	4.4	17.5	81.4	211.0	242.1	461.6	410.5	340.0	213.7	15.9	1.4	2001.0
Sekong	1.2	14.1	38.4	95.7	137.9	159.7	258.7	275.2	233.3	155.1	23.9	0.2	1393.4

Data Source: Department of Meteorology and Hydrology, Ministry of Natural Resources and Environment



Attapeu | Champasak

Salavan | Sekong

Figure 1-2 Climate of Provincial Capital

(2) Earthquake

There are only unfelt earthquake in Lao PDR according to the past records and there is no earthquake recorded in southern region. However, reinforced concrete frame structure which

is common in Lao PDR will be adopted for building safety in consideration of seismic force based on previous grant aid project in neighboring countries.

1-5-3 Socio-environmental Considerations

Large development of land will not be necessary for any target site but some trees are required to be cut down in a few target sites out of 58 sites. Therefore, implementation of the Project will not cause a negative environmental impact. Also it will not cause a negative social impact since there is no compulsory move of resident due to the Project.

As for the classification of categories (A, B or C) giving consideration of the socio-environmental impacts to the target sites and its surrounding areas mentioned above, it is judged that this Project will fall into Category "C" after screening with "JICA Guidelines for Environmental and Social Consideration".

CHAPTER 2
CONTENTS OF THE PROJECT

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Objectives

(1) Overall Goal

The 7th Five-Year Health Sector Development Plan (NHSDP) 2011-2015 corresponding with 12 main strategic plans mentioned in "National Growth and Poverty Eradication Strategy (NGPES)" developed in 2003 is currently being implemented. And in the said 7th NHSDP, strengthening of the health system for improvement of the maternal, neonatal and child health (MNCH) especially the expansion of health care service network down to all rural and out of remote mountainous areas is set as one of main directions. (Please refer to Table 1-4 for main health indicators for four (4) southern provinces)

In addition, various health strategies and plans such as "Strategy and planning Framework for the Integrated Package of Maternal, Neonatal and Child Health Services 2009-2015" which aims to provide the complete package of MNCH services from family planning, antenatal care, delivery, immunization to IMCI (Integrated Management of Childhood Illness) at all levels of health facilities, " Policy on Primary Health Care, 2000" which aims to improve the effectiveness of primary health care, "SBA (Skilled Birth Attendants) Development Plan 2008-2015" which aims to develop the capacity of SBAs, "Drug Revolving Fund" for maintaining the operational cost for HCs, "Health Equity Fund" and "Free delivery and care for children under five " for reducing the financial barrier on access to healthcare services for all poor and underserved targets and so on have been developed and the Lao government implements those strategies and plans with technical and financial supports by international organizations and donors.

(2) Project Objectives

The objectives of the Project are to contribute to strengthening the healthcare services and to improving the quality thereof by means of procuring the equipment to District Hospitals (DHs), new construction and re-construction of Health Centres (HCs) and construction of Staff Houses (SHs) in four (4) target southern provinces so as to improve the access to the primary healthcare including MNCH services and the environment of the health service facilities.

(3) Project Aim

Health Centre (HC) and District Hospital (DH) will be established and/or improved within the target areas of the Project; thus, access to primary health care for integrated maternal and

child health care services for the residents in particular will be improved accordingly.

(4) Project Goal

The utilization rate of the integrated maternal and child health care services in the target four (4) provinces will be increased which is essential for the achievement of MDGs 4 and 5.

2-1-2 Outline of the Project

(1) Expected Effects

Level 1 and Level 2 health care facilities will appropriately be managed and operated in the target areas of the Project.

(2) Outline of the Request

< Facilities >

- New construction of 22 health centres (incl. water supply system and PV system)
- Re-construction of 29 health centres (incl. water supply system and PV system)
- Renovation of 4 health centres (incl. water supply system and PV system)
- Re-construction and renovation of MCH Clinic for 14 District Hospital
- New construction of Staff House for health centres in remote area

< Equipment >

- Procurement of equipment and furniture for the above-mentioned health centres and district hospitals

(3) Target Areas

Four (4) Southern Provinces (Attapeu, Champasak, Salavan and Sekong)

(4) Responsible Agency

Executing Agency : Ministry of Health (MOH)

Implementing Agency : Ministry of Health (MOH)
: Provincial Health Offices (PHOs)

(5) Outline of the Project

In order to achieve the project objectives described in Section 2-1-1 (2) hereinbefore, Health Centres (HCs) and Staff Houses (SHs) for four (4) Southern Provinces (Attapeu, Champasak, Salavan and Sekong) will be constructed and the necessary equipment for HCs and District Hospitals (DHs) will be procured.

2-2 Outline Design of the Requested Japanese Assistance

2-2-1 Design Policy

2-2-1-1 Basic Policy

This Project is expected to be implemented under Japan's Grant Aid for Community Empowerment (GACE) and it is planned to reduce a project cost and to achieve efficient implementation by means of adopting local standards and/or regulations as well as specifications and procuring local materials in construction of the facilities.

(1) Target Sites

Although the contents of the requests from the Government of the Lao PDR are described in Section 2-1-2 (2) hereinbefore, the target sites were selected using the following criteria for four (4) main components which have duly been agreed by the Lao side.

1) Criteria for Health Centre
   - Securing land for facility construction
   - Availability or probability of securing a UXO free certificate
   - Availability of a plan of establishing health facilities
   - Securing the health staff and cost in operation and maintenance
   - Availability of a plan of installing infrastructures (water and electricity supply, etc.)
   - Securing access (distance, time, condition of the access road, etc.)
   - Prevalence and fatality in each facility (MMR, IMR, HIV, Malaria, TB, etc.)
   - Coverage of each facility (number of village, area, population etc.)
   - Coverage of accessible population to each health facility (Number of delivery per population, Number of ANC, etc.)
   - Distance from nearest District Hospital, Health Centre and other health facilities
   - Projection or probability of securing water source and electricity supply

2) Criteria for District Hospital
   - Availability of a plan of establishing health facilities
   - Coverage of each facility (number of village, area, population, etc.)
   - Condition of each existing facility
   - Securing the health staff and required budget for operation and maintenance
   - Number of referrals from Health Centre to District Hospital

3) Criteria for Staff House
   - Availability of a plan of constructing staff house

- Availability of an alternative facilities such as Community Centre

4) Criteria for Equipment
   - Condition of each existing facility
   - Availability of a plan of establishing health facilities
   - Securing the health staff and required budget for operation and maintenance

Based on the above-mentioned criteria, the priority of the target sites have been classified as the Scope of Works (SOW) i.e. SOW-I, SOW-II and SOW-III and it was agreed with Lao side that this Project will undertake SOW-I and SOW-II only. However, it shall be noted that all 67 target sites are categolised as SOW-I and SOW-II as to the procurement of the equipment.

According to the observation during 1st and 2nd Preparatory Surveys, the maternal, neonatal and child health (MNCH) services at district level are provided in different ways; for example, the birth assistance is provided by the hospital staff at the delivery room in the hospital and other MNCH services such as antenatal care are provided by hospital staff at the hospital or by MCH district health officers at a detached building. And, it seems that a package of MNCH services integrated with antenatal care, delivery, postnatal care, neonatal and child health care at a MNCH unit which is combined district health office with district hospital will be unlikely provided very soon.

Therefore, as for the district hospitals, the procurement of the equipment and re-construction and/or renovation of MCH clinic are categolised as SOW-I and SOW-III respectively since integration of MNCH services at the district level has not been confirmed.
In addition, it was confirmed that none of the existing building being used as MCH units is deteriorating and requires either reconstruction thereof or immediate repair works.

(2) Project Components

The summary of the overall support component for each target site and each SOW planned for the Project which has prepared based on the priority of the target sites enumerated hereinbefore is as shown in Table 2-1 hereinafter.

As for the building facilities and equipment component, the Project follows standard plan and standard list of equipment prepared by the Ministry of Health (MOH) in principle. However, some facilities shown on the MOH standard plan which deemed to be able to undertake by community's self-help efforts such as fence etc. as well as components which are not suitable for Japan's Grant Aid are excluded from the Project.

In addition, since provision of clean water is inevitable for consultation and maintaining hygiene at health centres, the Project set securing of clean water source for all target sites as a basic condition for construction of building facilities. Therefore, the target sites where usable

existing water source has been confirmed within the sites or surrounding areas thereof are planned to utilize such existing water source while the wells are planned to be constructed under the Project for the remaining target sites.

As a result of afore-mentioned selection of the target sites and formulation of support components, the Project is planned to be consist of the followings:

1) Building facilities construction: 58 target sites
   - HC only : 33 target sites
   - SH only : 13 target sites
   - HC + SH : 12 target sites

2) Provision of water supply system: 58 target sites
   - Public water supply system :3 target sites
   - Community water supply system :3 target sites
   - Spring water supply system :5 target sites
   - Existing well :19 target sites (incl. 4 test boreholes)
   - New well :28 target sites

3) Provision of PV system: 9 target sites

4) Procurement of equipment: 76 target sites
   - DH: 9 target sites
   - HC: 67 target sites

Table 2-1 Summary of the Overall Support Components for Each Target Site and SOW

Site No.	Target Site	District	Building Facilities				Infrastructure (Other Facilities)					EQ
			HC			SH	Water Supply System		PV System			
			A	B	B'		Well	EWT	HC +/or SH	RF	WP	
A-01	Bengphoukham / Lak52	Samarkxay		Ⅲ		Ⅰ	-	Ⅰ	-	-	-	Ⅰ
A-02	Halang Nhai	Samarkxay		Ⅰ			Ⅰ	Ⅰ	-	-	-	Ⅰ
A-03	Dak Yieng	Xaysettha		Ⅰ			-	Ⅰ	-	-	-	Ⅰ
A-04	Sompoi	Sanamxay	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
A-05	Ban Thae	Sanamxay	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
A-06	Ban Mai	Sanamxay				Ⅲ	-	-	-	-	-	Ⅰ
A-07	Namsou	Sanxay	Ⅲ			Ⅰ	-	Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ
A-08	Sapuan	Xaysettha				Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅰ
A-09	Keng Mhkhua	Xaysettha				Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅰ
A-10	Na Seuak	Phouvong		Ⅰ			Ⅰ	Ⅰ	-	-	-	Ⅰ
A-11	Ka Ouan	Phouvong				Ⅲ	-	-	-	-	-	Ⅱ
A-12	Honay Keo	Phouvong				Ⅱ	Ⅱ	Ⅱ	-	-	-	Ⅰ
A-13	Nam Kong	Phouvong				Ⅲ	-	-	-	-	-	Ⅰ
A-14	Beng Vilai	Sanamxay				Ⅰ	-	Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ
A-15	Pak Bo	Sanamxay				Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ
A-17	Kum Khan	Samarkxay				Ⅲ	-	-	-	-	-	Ⅰ
A-18	Langnao	Samarkxay				Ⅱ	-	Ⅱ	-	-	-	Ⅰ

Site No.	Target Site	District	Building Facilities				Infrastructure (Other Facilities)					EQ
			HC			SH	Water Supply System		PV System			
			A	B	B'		Well	EWT	HC +/or SH	RF	WP	
A-19	Somsanouy	Samarkxay	*repair roof			Ⅱ	-	Ⅱ	-	-	-	Ⅰ
A-20	Ban Moon	Sanxay				Ⅲ	-	-	-	-	-	Ⅰ
A-22	Phou Home	Phouvong				Ⅱ	-	Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅰ
C-01	Ban song	Pakse	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
C-02	Saphai	Sanasomboum	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
C-03	Km 21th	Bachiang	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
C-04	Vernsay	Phonthong	Ⅰ			Ⅱ	Ⅰ	Ⅰ	-	-	-	Ⅰ
C-05	Pathumphon	Pathoumphone	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
C-06	HouyNgern	Champasak	Ⅰ			Ⅰ	-	Ⅰ	-	-	-	Ⅰ
C-07	Vernyang	Moonlapamok		Ⅲ		Ⅲ	-	-				Ⅱ
C-08	Nafang/ Bankeang	Khong	Ⅱ			Ⅲ	-	Ⅱ	-	-	-	Ⅱ
C-09	Salow	Sanasomboum		Ⅰ			Ⅰ	Ⅰ	-	-	-	Ⅰ
C-10	Banphon	Phonthong	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
C-11	Koudchick	Phonthong	Ⅱ				-	Ⅱ	-	-	-	Ⅱ
C-12	Kalae	Pathoumphone	Ⅰ			Ⅰ	Ⅰ	Ⅰ	-	-	-	Ⅰ
C-13	Phonthong	Phonthong	Ⅰ				-	Ⅰ	-	-	-	Ⅰ
C-14	Champasak	Champasak	Ⅲ				-	-				Ⅰ
C-15	Phapho	Pathoumphone	Ⅲ				-	-				Ⅱ
C-16	Phonsikai	Pakse	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
C-17	Noonsavang	Pakse	Ⅱ				-	-	-	-	-	Ⅱ
C-18	Selabom	Sanasomboum	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
C-19	Kuangxi	Bachiang	Ⅲ				-	-				Ⅱ
C-20	Nam-orm	Pathoumphone	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
S-01	Naxay	Salavan	Ⅰ				-	Ⅰ	-	-	-	Ⅰ
S-02	Beng Oudom	Salavan	Ⅰ				-	-	-	-	-	Ⅰ
S-03	Kasa Ngai	Salavan	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
S-04	Nadonkhuang	Salavan	Ⅰ			Ⅱ	-	Ⅰ	-	-	-	Ⅰ
S-05	Phakkha	Salavan	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
S-06	Buengxay	Salavan	Ⅰ				-	Ⅰ	-	-	-	Ⅰ
S-07	Dan Nalao	Lakhonpheng	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
S-08	Phonsung	Lakhonpheng	Ⅰ				-	Ⅰ	-	-	-	Ⅰ
S-09	Lak 90	Lakhonpheng	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
S-10	Nadou Kao	Lakhonpheng	Ⅰ				-	Ⅰ	-	-	-	Ⅰ
S-11	Khonsay	Vapi	Ⅱ				Ⅱ	Ⅱ	-	-	-	Ⅱ
S-12	Saphat	Vapi	Ⅰ				-	-	-	-	-	Ⅰ
S-13	Tanpio	Khongsedon	Ⅱ				-	-	-	-	-	Ⅱ
S-14	Thaluang	Khongsedon	Ⅱ				-	Ⅱ	-	-	-	Ⅱ
S-15	Kenghuad	Khongsedon	Ⅱ				-	-	-	-	-	Ⅱ
S-16	Nong Kae	Laongam	Ⅰ				Ⅰ	Ⅰ	-	-	-	Ⅰ
S-17	Dong Nhai	Laongam	Ⅰ			Ⅱ	Ⅰ	Ⅰ	-	-	-	Ⅰ
S-18	Vang Peui	Laongam	Ⅰ			Ⅱ	Ⅰ	Ⅰ	-	-	-	Ⅰ
X-01	Dakdin	Dakchung				Ⅱ	-	Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅰ
X-02	Tateu	Dakchung				Ⅰ	-	Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ
X-03	Chalea	Kaleum				Ⅰ	-	Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ
X-04	Paxay	Kaleum		Ⅰ		Ⅰ	-	Ⅰ	-	-	-	Ⅰ
X-05	Donechan	Lamam	Ⅱ			Ⅱ	Ⅱ	Ⅱ	-	-	-	Ⅱ
X-06	Phon	Lamam	Ⅰ			Ⅱ	-	-	-	-	-	Ⅰ

Site No.	Target Site	District	Building Facilities				Infrastructure (Other Facilities)					EQ
			HC			SH	Water Supply System		PV System			
			A	B	B'		Well	EWT	HC +/or SH	RF	WP	
X-07	Tanum	Lamam			I	I	-	I	-	-	-	I
X-08	Nongkan	Tateng	II			II	-	II	-	-	-	II
X-09	Yup	Tateng		I		II	-	I	-	-	-	I
		Total	**38**	**6**	**1**	**25**	**28**	**52**	**9**	**9**	**9**	**67**

Note: HC: Health Centre SH: Staff House
EWT: Elevated Water Tank RF: For Vaccine Refrigerator WP: For Water Pump EQ: Equipment
I: SOW I II: SOW II III: SOW III

2-2-1-2 Policy for Natural Conditions

(1) Measures for Climatic Conditions

In order to cope with the climatic conditions of high temperature and high humidity in Laos, a comfortable room environment will be maintained by providing natural ventilation and shades for rooms to block sunlight and solar heat in order to suppress temperature rise. In addition, the size of openings and length of the eaves will be determined taking into account the degree of lighting appropriate for consultation rooms etc. and the needs for preventing rain blowing into the rooms as well as entrance hall.

(2) Flood Proof

Some existing health centres experience flooding during the rainy season when the greater part of the yearly rainfall is concentrated. Therefore, flood proof measures will be taken, such as raising the floor level above ground level.

(3) Earthquake Proof

Although it seems that it is not required to consider any seismic power in structural calculations since there is no record of earthquakes in Southern Region of Laos, earthquake-proof structural system i.e. reinforced concrete rigid-framed structure will be adopted for the facilities to be built for this Project.

(4) Termite Prevention

Since many buildings in the Southern Region of Laos are affected by termites, the use of wooden materials in the building will be limited and appropriate measures against termites such as selecting wooden species which are not prone to termite attack will be taken. In addition, anti-termite paint will be applied where wooden materials are used.

2-2-1-3 Policy for Socio-economic Conditions

(1) Clearance of Unexploded Ordnance (UXO)

Unexploded ordnance used in the Indochina War still remains in the Southern Provinces covered by this Project except a part of Champasak Province. This unexploded ordnance must be sought out and cleared of in order to prevent accidents caused by unexploded ordnance during the construction works and after handover of the facilities to be constructed under this Project. Thus, submittal of authorized certificate which confirms UXO Lao has carried out the search and clearance of unexploded ordnance will be a prerequisite for the implementation of this Project.

(2) Certificate of Land Use Right

The Land Law has been enacted only recently in Laos and the official system for land use rights has not yet been established in all regions. With regard to land use rights for the target sites covered by this Project, the existing health centres have been used as health centres and in the case of new health centres and health centres to be relocated to new sites, each community has committed to transfer the land use rights. Therefore, there will be a little likelihood of any problem with land use rights, but it is a prerequisite for starting this Project that a certificate of land use rights will be issued by the Land Authority of each Province prior to implementation of this Project.

2-2-1-4 Policy for Construction Procurement

(1) Manpower Conditions

Necessary engineers will be secured by means of awarding contracts to the contractors based in large cities such as Vientiane. And, since unskilled workers can be found even in the provincial towns including the villages nearby the construction sites, the contractor will procure necessary workers locally. On the other hand, local consultant will be secured in Vientian since it is quite difficult to employ the consultant in provincial town.

(2) Policy for Procurement

Most of building materials and industrial products available in Laos are imports and major local suppliers of such materials and products are concentrated in Vientiane and Pakse for four (4) southern provinces where target sites for the Project are located. However, the supplier for the materials and products to be procured by the contractors for this Project is recommended to be the one out of such major suppliers who can issue a necessary certificate for tax exemption.

Although the materials used for producing concrete on site such as aggregate, sand and water

are available either on site or its surrounding area, quality of such materials must be verified by providing and testing a few trial mixes beforehand.

MOH Standard List of Equipment shall be applied in principle to the equipment to be procured for this Project and all such equipment can be procured locally even though they are imports. However, since there is no construction company that can handle such procurement, equipment suppliers having experiences of supplying such equipment to health facilities in Laos will be selected. In addition, as for the procurement of motorbikes for outreach activities, specialized suppliers will be selected.

This Project will be implemented by Japan's GACE, and a Japanese Procurement Agent will procure the consultant for construction supervision, the construction companies and the suppliers of equipment etc. on behalf of the Lao PDR.

1) Consultant for construction supervision

The consultant for construction supervision will be selected out of the Japanese consultant who has undertaken the Preparatory Survey as recommended by JICA. The Japanese consultant will dispatch Japanese engineers to Laos who will be stationed in Laos to undertake the general management of all the works by utilizing local consultant company as sub-consultant.

2) Well construction companies

Well construction for this Project will be contracted out to specialized companies by separate batch i.e. Batch 1 and lots from building facilities construction contracts. Well construction companies will be selected by competitive tender for each contract lot.

3) Building construction companies

This Project consists of relatively large-scale works at all the project sites, with a great number of construction sites spread over a wide area, and therefore, it is inevitable to utilize quite a few construction companies. Thus, the contract will be divided into multiple contract lots taking into consideration of such factors as geography, construction volume and access during the rainy season. And, construction companies will be selected by competitive tender.

4) Equipment suppliers

Health centre construction project in Laos, a package of procurement of equipment is usually contracted out separately from a contract for the construction of building facilities. Therefore, in order to maintain equal quality of equipment and furniture, the equipment and furniture for this Project will also be procured with separate contract lots by specialized supplier which will be selected by competitive tender to be implemented along with tenders for the construction of

building facilities i.e. Batch 2 and Batch 3.

2-2-1-5 Policy for Utilization of Local Companies

(1) Local Consultant

Local consultant firm will be utilized for preparation of the tender documents and supervision of the construction works and their engineers will be assigned under Japanese consultant as supervisory engineers such as chief consultant and site engineers. The local consultant which is financially sound (confirmed by hearings from banks, other local consultants etc.) and free from any legal measures due to unfair practices such as breach of contract as well as having an experiment Japan's Grant Aid related works and an experience of construction supervision of some basic health facilities will be selected.

1) Tender evaluation and technical advisor

In the implementation of this Project, giving consideration of the facts that there is a past record of GACE in the Lao PDR and that MOH Facilities Planning Unit can provide technical advice for the construction of health centres and procurement of equipment, employment of a local consultant as a technical evaluation and technical advisor who is familiar with allied circumstances and/or local conditions as to the tender, contract, construction and procurement will not be considered.

2) Construction supervisory engineers

Since the target sites for the Project spread extensively in wide areas, consultant's office will be established in Pakse, Champasak Province. And, under a Japanese Resident Engineers to be assigned for the Project, a chief engineer and an assistant chief engineer who will be based in Pakse as well as site engineers for each contract lot i.e. one (1), five (5) and six (6) site engineers for Batch 1, Batch 2 and Batch 3 respectively will be assigned.

(2) Lawyer

The Procurement Agent may employ a local lawyer as a legal advisor in order to prevent problems in tender, contract and implementation before anything happens and to perform the legal negotiations with the contract partner in the Project smoothly when some kind of problems occur.

(3) Building and Well Construction and Equipment Suppliers

In this Project, building and well construction contractors and equipment suppliers will be selected from local companies by competitive tender. By setting the local companies which are financially sound (confirmed by hearings from banks, other contractors and suppliers etc)

and free from any leagal measures due to unfair practices such as breach of contract as basic requirements for participation in tender and based on regulations and market situation of each type of industry in Laos, appropriate companies will be selected.

1) Building construction companies

Local companies registered with Department of Housing and Urban Planning (DOHUP), Ministry of Public Works and Transport (MOPWT) can participate in any tenders for public works.

2) Equipment suppliers

As for the equipment suppliers, there is no registration system like the one for building contractor. Although it is unable to confirm the total number of the suppliers, existence of more than three (3) medical equipment suppliers and four (4) importers of motorbike that can undertake the procurement contract of similar nature were confirmed during the field surveys.

3) Well construction companies

As for the well construction contractor, there is no registration system like the one for building contractor. Although it is unable to confirm the total number of the well construction companies, it was confirmed that four (4) well construction companies participated to rural water supply projects during the field surveys.

2-2-1-6 Policy for Operation and Management Capacity of Implementing Organization

Maintenance of the facilities and equipment to be constructed and procured under this Project shall be appropriately carried out with coordination among Provincial Health Office (PHO), District Health Office (DHO), Community Health Committee (CHC) and staff of each health centre. In addition, in the facility plan, the health centres and staff houses will basically be designed to be durable and with consideration of easiness of operation and maintenance including cleaning and repair, in order to reduce the cost of operation and maintenance of the facilities.

2-2-1-7 Policy for Grading of Facilities and Equipment

Grading of facilities and equipment shall be established with consideration of appropriateness for grant aid projects and from the view point of functionality, economy and maintenance based on the scale and specifications set in the MOH standard plan and standard list of equipment for health centre. In addition, comparison of the specifications of the health centres built by other donors such as Asian Development Bank (ADB), World Bank (WB) etc. shall also be made.

Furthermore, although there are two (2) types of health centres i.e. Type A and Type B in

Laos which is determined in accordance with its beneficial population, grading is not determined by its structural system (e.g. durable, semi-durable, temporary etc.). Structural system of the health centre designed by MOH standard plan is reinforced concrete; thus, it is deemed to be “durable”.

(1) Policy for Facilities Quality

In conformity with the specifications of the health centre standard design shown in MOH standard plans (2011 version and 2012 latest version), facilities quality and specifications shall be determined appropriately from the viewpoint of functionality (line of flow of a patient and the staff, connection of each room etc.), economy, regionality and easiness of the maintenance.

(2) Policy for Equipment Quality

While the MOH standard equipment list will be used for reference purposes, the appropriate equipment will be procured that consists of the minimum required by the health centres and district hospitals to serve their intended function, taking durability, ease of maintenance and management as well as availability on the domestic market into consideration.

(3) Policy for Consumables and Spare Parts

Only a small quantity of spare parts and consumables are required for the equipment that has been planned under this project. Due to the fact that the respective target sites under this project are in remote areas in the Southern portion of Laos, meaning that it takes time to supply consumables and spare parts, consumables for six months and spare parts required for one replacement procedure will be supplied.

The spare parts (for autoclave and boiling sterilizer) will be procured under this plan as a consideration of the possibility that there may be delays in the supply (procurement) of spare parts and for repair work. In addition, while the rate of breakdowns of the motorcycles will vary depending upon their usage frequency and amount of travel on bad roads, the decision was made to supply spare parts for the motorcycles for one replacement procedure as a basic policy.

Furthermore, with regard to consumables, after the items that have been supplied under this Project have been used, the consumables are to be procured through self-reliant efforts of the provincial and district health service bureaus and local communities.

2-2-1-8 Policy for Quality Control

In the supervision of the construction works, the local consultant at each site will carry out quality control under the leadership of the Japanese consultant. For the concrete works for the main structures of the buildings in particular, the Japanese consultant will instruct the local consultants in the selection and mixing of appropriate materials and the concrete casting, and

should carry out meticulous quality control, implementing the concrete compression tests which are not popular in most regions of Laos.

2-2-1-9 Policy for Construction and Procurement Method and Implementation Schedule

Since the target sites (58 sites for building facilities construction, 37 sites for well construction and 67 sites for health centre equipment procurement) covered by this Project are spread over a wide area, it is quite difficult to construct all wells and building facilities simultaneously from the view point of supervision. Therefore, it is planned to let well construction start first as Batch 1 with four (4) lots and as for the building facilities construction, it is planned to divide into two (2) working groups i.e. one group for the dry season (Batch 2 with 5 lots for 27 sites). In addition, procurement of equipment is planned to be proceeded along with building facilities construction i.e. Batch 2 and Batch 3; however, equipment and motorbike shall be divided into separate lots.

At the implementation stage, it may be necessary to reduce the number of health centre and/or other components such as staff house to be constructed and/or installed due to fluctuation of the currency rate or a sharp price rise of construction materials. In this Project, with consideration of the process and the results of giving priorities for each target site as described in Section 2-1-1, the support components with lower priority may have to be excluded from the Project in order to adjust the project cost, if it becomes necessary.

2-2-2 Basic Plan (facilities plan/ equipment plan)

2-2-2-1 Site Layout Plan

58 target sites of building facilities construction are planned in this Project. It is not possible to make a common site plan since each target site has different shape and size and different on-site infrastructures available. Therefore, the layout plan shall be carried out appropriately in accordance with the basic policies describe hereinafter with the consideration of the characteristics of each target site, in order to grasp the detailed site condition, based on the results of geological survey and plane table survey as well as the conditions of site including the existing facilities such as health centre, staff house etc. on site and its location.

And, although the target sites for the building facilities construction for this Project consist of three (3) type of target sites; namely, the new construction on new site, reconstruction on the existing site or new site, it was confirmed that all target sites are legally available for the implementation of the Project and there are no problems with boundary lines since most of the target sites are belong to PHO, DHO or the village where the health centre and/or staff house will be constructed. (Copies of land registration certificate for all target sites have already been received)

(1) Basic Policy

The following points shall be considered carefully in preparationvgh of facilities layout plan:

1) The septic tank shall be located as far as possible from the well from hygiene's point of view giving consideration of the surrounding areas of each target site.

2) The facility layout plan shall be prepared to enable to secure a large open space as much as possible, giving consideration of the future extension on each target site.

3) The facility layout plan shall be considered to bear fewer shares such as cost for cutting tree, uprooting and site grading which will be implemented by Lao Government side.

(2) Layout Plan of Facilities on Site

The layout plan of the facilities on each target site shall be planned with the consideration of the following:

1) It was found that there was no distinguished planning between life-related facilities (sleeping room) and medical-related room (consultation room, etc.) at some existing health centre. Therefore, in order to improve the quality of health care environment, the basic policy in preparation of layout plan shall be clearly separating a medical zone where health care services are provided from living zone.

2) The health centre layout plan shall be prepared so as to face the main entrance the the main road in principle from user-friendly point of view so that the health centre can easily be accessed.

3) The outdoor walkway shall be planned between the health centre and staff house in order to avoid troubles on the normal business routine such as bringing mud into the health centre during the rainy season etc. from hygiene and user-friendly standpoint.

As for the reference example of the site layout plan, refer to Figure 2-6 in Section 2-2-3 hereinafter.

2-2-2-2 Facilities plan

(1) Confirmation of Validity of Facilities Components

The validity of each facilities component was confirmed considering the following points.

1) Information obtained through the field surveys and the hearings from MOH, PHOs, DHOs and the staff at the existing health centres.

2) The concept of composition of various compartments (rooms) that is understood from “the

MOH Standard Plan"

3) Consistency with the plan of the existing health centres and other community health centres built by other donors such as WB, ADB etc..

4) Basic and general information needed as health care facilities

5) The effective architectural planning approach method for achieving the project goal

(2) Confirmation of Priority and its Validity

The basic types of health centre shall be set in accordance with the number of beneficial population of the target sites in each province as follows:

- For the target site with population of more than 3,000 but less than 5,000 shall be Type A (4-5 beds with clinical laboratory)
- For the target site with population of more than 1,000 but less than 3,000 shall be either Type B (2-3 beds) or Type B' (2-3 beds but with clinical laboratory)

Based on the above-mentioned classification of the health centre, this Project consists of the following four (4) types of building facilities components:

1) Health Centre Type A
2) Health Centre Type B
3) Health Centre Type B'
4) Staff House

And, based on the above-mentioned four (4) types of the building facilities, the combination of the building facilities component for each target site can be classified into the following three (3) patterns in order to achieve the project goal effectively.

1) Health Centre only
2) Staff House only
3) Health Centre + Staff House

In addition, with the consideration of other components such as well and photovoltaic (PV) system, the combination of the support components for each target site was planned. As for the site by site and SOW by SOW support components, please refer to the Table 2-1 in Section 2-1-1.

Priority for the various components and rooms in the building facilities described above shall be verified by the following 3-stage evaluation.

A: To be considered as top priority for Japan's Grant Aid Project

B: Although to be considered as high priority for Japan's Grant Aid Project, a part of

contents shall be modified with consideration of a regional situation in each province. And, if the existing facilities are available, the Project will utilize such facilities in order to increase the efficiency of the project cost.

C: To be provided by self-help efforts of Lao PDR and not to be included for the Project.

Based on the results of the above-mentioned 3-stage evaluation, the priority for the facilities components were established as sown in Table 2-2 below:

Table 2-2 Priority for Components of Facilities

Facility Component		Priority	Validity (validation results)
1.	Health Centre 1) Basic required rooms - Pharmacy/ Accounting - OPD/ Treatment Room - Pregnant Women's Consultation Room - Delivery Room - Common Space	A	These basic required rooms for providing health care services in each health centre are highly needed to achieve the objectives of the Project. Thus, these basic required rooms in each province are planned to have the common scale and specific use.
	2) Ward	A	The need of ward for the health centre is also very high in order to achieve the objectives of the Project. However, the number of beds shall be planned based on the conditions (beneficial population) of each target site that supported by different types of health centres.
	3) Laboratory	B	This laboratory is quite important for safe keeping and appropriate management of the equipment etc. In order to avoid contact of the patient from the diagnostic reagents with toxic, to avoid mixed -situation with the analysis of waste (blood, urine, feces, or sputum etc.), clinical laboratory has an important role and needs are quite high. However, if there is a provincial or district hospital that is located in close vicinity of the health centre, the provincial or district hospital can be utilized for clinical test and examination. Thus, the need of clinical laboratory will depend on type of the health centre and the location thereof in each province.
2.	Staff House	B	The upgrading of daily living environment for health workers is highly needed in order to recruit necessary health workers for the health centres scattered in remote areas; however, the target sites with the existing staff houses, they shall be utilized.
3.	Deep Well	A	It is essential and indispensable to secure a good water source for the operation of the health centres, it is a very high need; however, the existing sites with existing good quality water sources, they shall be utilized.
4.	PV System	B	The need is very high so as to operate the health centre with provision of equipment which consume electricity such as auto clave, vaccine refrigerator, etc., although most of the target sites are planned with supply of low-voltage power from the distribution line to be undertaken by Lao side.

Facility Component		Priority	Validity (validation results)
5.	Incinerating Space	A	Considering the possibility of spreading a fire and unsanitary conditions caused by burning the garbage around the health centre, incinerating space made of the layers of concrete blocks for prevention of such possibility of spreading a fire is highly needed.
6.	Perimeter Fence	C	The needs on the installation of fence are high from the point security and management of facilities point of view; however, it can be installed by self-support efforts of the Lao side.
7	Sewage and Drainage System	A	It is very important to establish the sewage and drainage system using the means of septic tanks and soak pit from hygienic point of view in order to be function as health facility.

(3) Study of Floor Area

There is no standard for basic floor area requirement for the medical facilities because the standard design criteria for medical facilities have not been provided by MOH. Therefore, the floor area for each room of the health centre and staff house was reviewed and studied with consideration of the composition of the rooms and corresponding floor area shown in the MOH Standard Plan.

In addition, the floor area for each room of the health centre and staff house was also reviewed and studied with consideration of the composition of the rooms and corresponding floor area of the existing health centres built by other donors such as WB, ADB etc. The comparison of the above-mentioned floor area with the existing facilities is summarized in Table 2-3 below:

Table 2-3 Comparative Table of Floor Area

Name of Facilities/ Rooms		This Project	MOH Standard Plan (m^2)	ADB (Reference) (m^2)	WB (Reference) (m^2)	Remarks
1.	Health Centre					
	1) Pharmacy/ Accounting	7.0	7.0	7.2	7.2	
	2) OPD/ Treatment Room	9.6	14.0		-	
	3) Consultation Room	14.9	14.0	14.4	15.1	
	4) Delivery Room	8.8	7.0	14.4		
	5) Laboratory	7.2	7.0	7.2	10.8	
	6) Ward (Type A[*1])	25.2	14.0	14.4	18.0	See "Note"
	7) Common Space	49.4	7.0	42.4	32.9	
	(waiting hall)					
	8) Common Space	6.3	-	-	-	
	(toilet/ shower room)					
Total Floor Area[*2]		128.3	112.0	100.0	84.0	See Note

Name of Facilities/ Rooms		This Project	MOH Standard Plan (m^2)	ADB (Reference) (m^2)	WB (Reference) (m^2)	Remarks
2.	Staff House (2 household)					
	1) Bedroom	21.0	7.8	10.8	31.5	
	2) Living Room	21.0	10.5	10.8		
	3) Kitchen	8.6	5.0	10.8	7.8	
	4) Toilet/ shower room	8.0	3.0	7.2	7.2	
	5) Entrance Hall etc.	12.8	8.7	18	47.3	
Total Floor Area		71.4	70.0	79.2	93.8	

Note: *1 Floor area of the ward for Type B and Type B' Health Centres are 18.0m^2.
*2 Total floor area for Type B and Type B' Health Centres are 113.9m2 and 121.1m^2 respectively.

As for the health centre (Type A, B, B') and staff house, the design improvements on the MOH Standard Plan are as follows:

1) Improvement for Health Centre (Type A)

Improvements on the MOH Standard Plan are as follows:

- Based on the results of discussions with MOH and each province, number of bed in the Health Centre Type A was modified to 5 beds ward (2-beds room and 3-beds room) instead of 4 beds ward in order to separate male and female patients in the ward. As the result, the floor area for new health centre (Type A) will be increased by 11m^2.
- As for the space of the delivery room in particular, the space shown in the MOH Standard Plan (Version 2012) is quite small; thus, the floor area of the delivery room need to be increased to minimum requirement for proper medical practice and in-room delivery from the perspective of providing health care services. As the result, the floor area of the delivery room will be increased by 2.7m^2.
- Preparation Space for preparation of meals and hand washing for patients and staff is added from user-friendly point of view. As a result, floor area will be increased by 3m^2.
- And consequently, the total floor area for planned health centre Type A was increased by 16.6m^2 due to the improvements described above; however, it is considered to be reasonable in carrying out appropriate medical activities. In addition, if the additional floor area of 16.6m^2 is subtracted from the total floor area of 128.6m^2 for the planned health centre, the floor area will be 112m^2 which is the same floor area with the MOH Standard Plan; thus, the proposed plan is quite appropriate.

2) Improvement for Health Centre (Type B)

Although the improvements on the MOH Standard Plan are basically same as the ones for Type A described hereinbefore, an improvement for the ward for TYPE B is as follows:

- Based on the results of discussions with MOH and each province, number of bed in the Health Centre Type B was modified to 3 beds ward (2-beds room and 1-bed room) instead of 2 beds ward in order to separate male and female patients in the ward. As the result, the floor area for new health centre (Type B) will be increased by 7.6m^2.

And consequently, the total floor area for planned health centre Type B was increased by 13.1m^2 due to the improvements described above; however, it is considered to be reasonable in carrying out appropriate medical activities. In addition, if the additional floor area of 13.1m2 is subtracted from the total floor area of 113.9 m^2 for the planned health centre, the floor area will be 110.8m^2 which is less floor area from the MOH Standard Plan; thus, the proposed plan is quite appropriate.

3) Improvement for Health Centre (Type B')

Although the improvements on the MOH Standard Plan are basically same as the ones for Type B described hereinbefore, an addition of the clinical laboratory is made for Type B' as follows:

- Health Centre Type B' is with a provision of a clinical laboratory as an option given to Health Centre Type B in order to perform a microscopic examination for the patients with the symptom of the parasite gut and malaria. As a result, floor area will be increased by 7.2 m^2.

And consequently, the total floor area for planned health centre Type B' was increased by 7.2m^2 from Type B due to the provision of clinical laboratory described above; however, the total floor area of 121.1 m^2 is considered to be reasonable.

4) Improvement for Staff House

Improvements on the MOH Standard Plan are as follows:

- As the layout of the kitchen and toilet shown in the MOH Standard Plan is unfavorable from hygiene point of view, the layout of the kitchen was modified. As a result, the total floor area of the planned staff house will decrease by 1.5m^2.
- With consideration of local custom, a space for wooden stove covered with lean-to roof which can also be utilized as the motorbike stow-away place will be provided by the rear entrance.

And consequently, the total floor area for planned staff house was increased by 1.4m^2 due to the improvements described above; however, it is considered to be reasonable for living under comfortable daily life.

In addition, other supplementary matters in the scale setting i.e. floor areas comparison

shown in the Table 2-3 shall include the following points:

1) Health Centre

As to the ward shown in the MOH Standard Plan , WB Plan and ADB Plan, the number of bed in the ward are required 2- 3 beds. Thus, the ward with 2-3 beds fall under the health centre type of Type B or Type-B'. In addition, floor are of the ward of the planned Type B and Type B' health centre having 3 beds seems to be quite appropriate when compared to the floor area of the ward shown in the said MOH Standard Plan , WB Plan and ADB Plan.

2) Staff House

The staff house shown in WB and ADB plans have large number of floor area compared to the one of the proposed plan, because the staff house shown in WB and ADB plans include storage and corridor space. In the proposed plan, provision of such common space is planned to be minimum in order to reduce the floor area.

2-2-2-3 Architectural Plan

(1) Basic Policy

Architectural plan shall be prepared in accordance with the following basic policies considering the function of each room.

1) Architectural plan shall be prepared respecting the MOH Standard Plan. In addition, the design shall be improved the concept of the MOH Standard Plan using examples from the plans of other donors (ADB and WB), in order to aim at designing best plan for the project goal.

2) Facility design shall be planned in aiming at the policy of "Hospitals and health centres will be developed in the district target area, access to primary health care services with a focus on integration of maternal and child health will improve residents".

3) Facility design shall be properly planned in accordance with a Guideline of Public Health in order to satisfy the basic service functions of the health centre such as consultation, treatment and delivery assistance in the provincial area.

4) Facility design shall be properly planned from user-friendly standpoint as medical facilities for medical staff, patients. Thus, in order to provide a natural ventilation and lighting throughout the year, orientation of the health centre shall be considered so as to reduce the heat-receiving from intense sunlight.

(2) Floor Plan

In preparation of the floor plan, the results of vilifications of the layout plan and floor area of each room as well as required functions described hereinbefore in addition to the verification of the MOH Standard Plan shall be considered. Thus, the floor plan shall be prepared in the consideration of the following:

1) The standardization of space shall be made in order to plan the rationalization of construction and reduction of construction cost, as well as increasing the flexibility of the plan. The planning shall be made with the consideration of the cost-effective method, the economic span and modularized basic dimension of each room based on the MOH Standard Plan .

2) The entrance hall shall be planned openly wide enough to be functioned as waiting lobby equipped with benches for the patients. The reasons are as follows:

   - The basic concept of MOH is a hall shall be open which is shown in the MOH Standard Plan.
   - Status of the existing health centres built by the supports of Lao government and other donors.
   - Sufficient natural ventilation is a very important in order to eliminate as much air stagnation given off from patients in the facility as possible

3) Appropriate balance of the size of facility and the beneficial population of each target site is essential.

4) With consideration of medical facility, the floor plan shall be carefully planned in the way the medical equipment can be used efficiently and appropriately.

5) With consideration of climate conditions of each target site, the floor plan shall be carefully planned so as to provide a comfortable and a safe indoor environment by maximum utilization of natural ventilation and lighting.

(3) Necessary Floor Area and Function of Rooms

Although the standard design criteria of the medical facilities have not been established in MOH, since the MOH Standard Plan is available, the proposed plan of the health centre and staff house for this Project shall be modified and/or improved based on the said MOH Standard Plan in establishing required rooms and corresponding floor area thereof.

In addition, as a result of vilification of the existing health centres most of which were built by the donors such as ADB and WB, the floor area established for the planned health centres for

the project are deemed to be quite appropriate.

1) Basic policy for planning of each room for Health Centre Type A, B and B'

Based on the MOH Standard Plan , the plannd health centres the Project shall be consist of 1) pharmacy and accounting, 2) OPD/treatment room), 3) women's consultation room, 4) delivery room, 5) laboratory, 6) ward and 7) common space such as entrance hall, WC etc., and the floor area of each room shall be planned as minimum for medical activities:

The floor area and function of each planned room of the health centres are as shown in Table 2-4below:

Table 2-4 Floor Area and Function of Each Planned Room (HC)

Name of Room	Floor Area	Function and Outline of the Use	Remarks
a. Pharmacy/ Accounting	7.0 ㎡	Pharmacy and accounting room is planned as one room; thus, a reception counter and lockable cup-board are planned so as to ease a sale of medicine and to secure appropriate control and storage thereof. In addition, a desk and chair are planned giving consideration of smooth operation of daily work.	Built-in reception counter and shelves
b. OPD/ Treatment	9.6 ㎡	It is essential to plan this room separately from pregnant women's consultation room so as to prevent infection of pregnant women from general patient. This room shall also be provided with built-in sink bench as well as a desk and chair in order to perform a general clinic and simple surgical treatment and safe keeping of patient records and records of vaccination.	Built-in sink bench and shelves
c. Pregnant Women's Consultation room	14.9 ㎡	This room is planned for pregnant women's consultation and examination and to be used as MCH clinic (antenatal care, postnatal care, child check-ups, IMCI, family planning, immunization, etc.). Vaccine refrigerator is planned to be placed in this room so as to function as EPI room as well. This room shall be laid out side by side with delivery room as coordination is very important.	Built-in sink bench and shelves
d. Delivery room	8.8 ㎡	This room shall be provided with necessary equipment and utilities (electric power and water supply) so as to perform the birth assistance. It should also be noted that the delivery room shall be planned to secure as much natural lighting as possible while maintaining safeguard against the eyes from the outside.	
e. Laboratory Type A & B'	7.2 ㎡	This room is quite important for safe keeping and appropriate management of the equipment etc. In order to avoid contact of the patient from the diagnostic reagents with toxic, to avoid mixed -situation with the analysis of waste (blood, urine, feces, or sputum etc.), clinical laboratory has an important role and needs are quite high. However, if there is a provincial or district hospital that is located in close vicinity of the health centre, the provincial or district hospital can be utilized for clinical test and examination. Thus, the need of clinical laboratory will depend on type of the health centre and the location thereof in each province.	Built-in sink bench and shelves

Name of Room	Floor Area	Function and Outline of the Use	Remarks
f. Ward	Type A: (25.2 ㎡) Type B, B': (18 ㎡)	The ward is planned as two (2) rooms so that the ward can be used flexibly for men/women or adults/children. Type A is planned with 2 beds room (11 ㎡) and 3 beds room (15 ㎡) while Type B (B') is planned with 2 beds room (11 ㎡) and 1 bed room (7 ㎡).	
g. Public Space (Waiting Hall)	49.4 ㎡	Waiting hall will be utilized as a space for promotion of mother and child health care and prevention of communicable diseases in addition to the use as patients' waiting area (benches to be provided). Furthermore, this space can be used as evacuation space during the disaster. In addition, a corner of this space can be used for washing hand and preparation of meals for the patients and staff alike.	Built-in benches and sink
h. Public Space (Toilet Shower Rm.)	6.3 ㎡	HC shall be provided with toilets for both genders separately in principle while only one shower room is planned giving consideration of frequency of its use. Toilet shall be "Asian Type" with low tank for flushing water and the shower room shall be provided with a faucet.	

Thus, the total floor area for each type of the planned health centre for the Project is 128.3 m² (including waiting hall), 113.9 m² (including waiting hall) and 121.1 m² (including waiting hall) for Type A, Type B and Type B' respectively. And, as for the proposed floor plan for each type of health centre, refer to below:

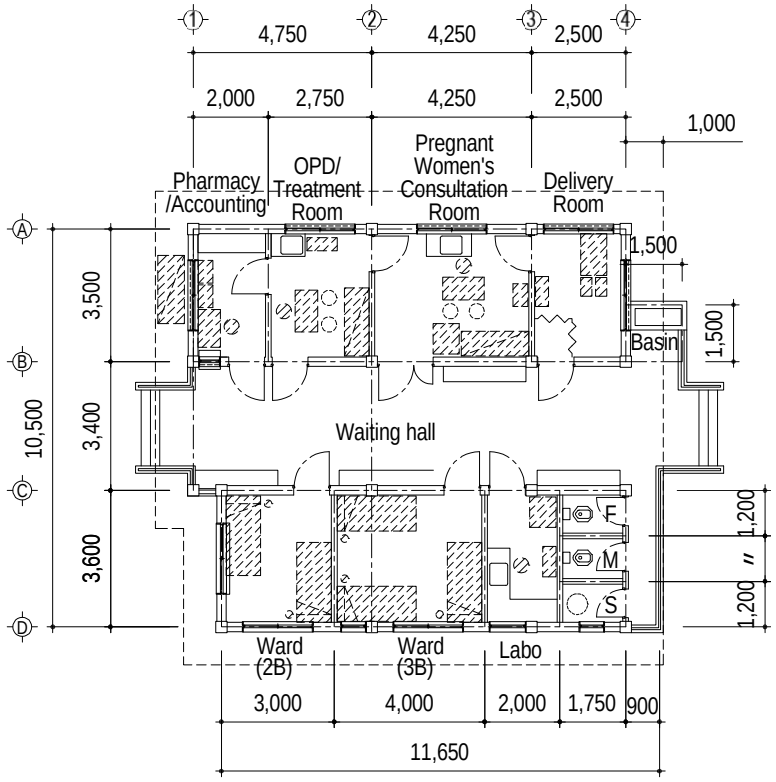


Figure 2-1 Proposed Floor Plan for Type A

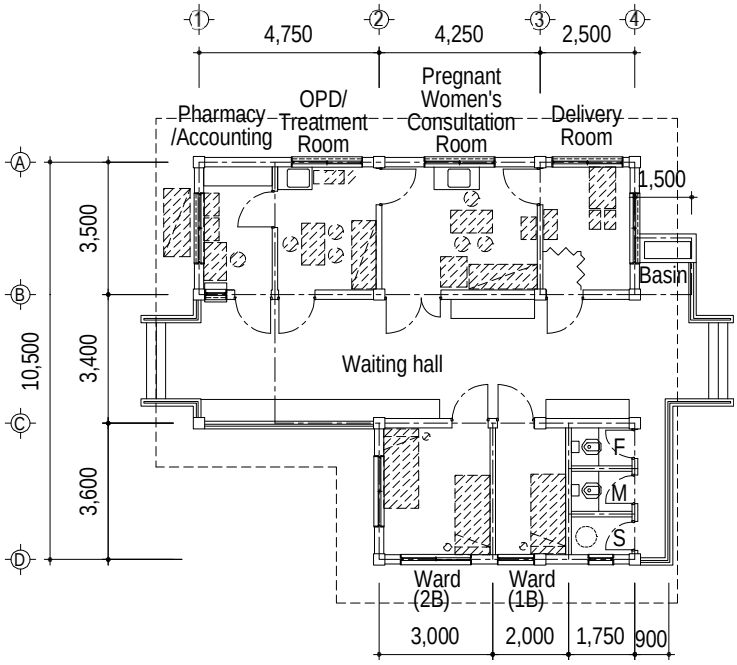


Figure 2-2 Proposed Floor Plan for Type B

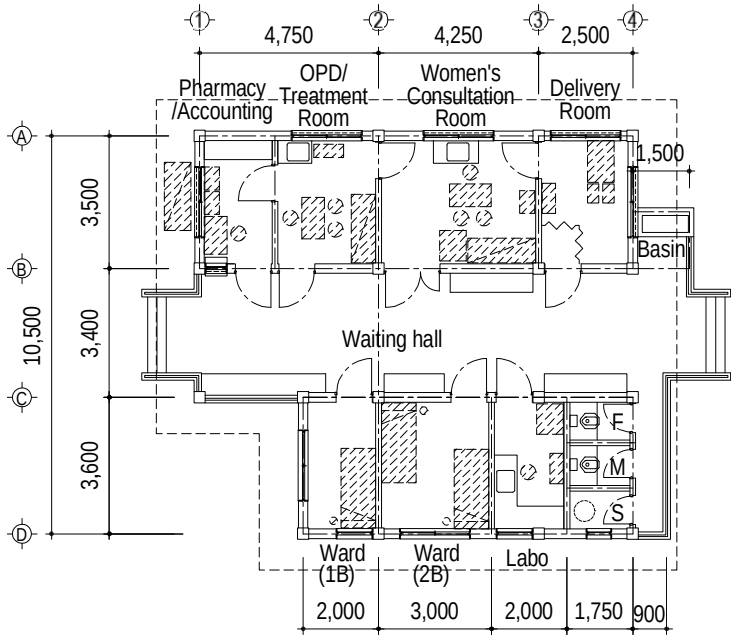


Figure 2-3 Proposed Floor Plan for Type B'

2) The basic policy for planning of each room for Staff House

Based on the MOH Standard Plan, the plannd health centres the Project shall be consist of 1) bedroom, 2) living room, 3) kitchen and 4) toilet and shower room, and the floor area shall be planned as minimum for securing reasonable living comfort.

The staff house shall be planned taking the family constitution of the health centre staff into consideration for the futureas well as respecting their privacy. In addition, in order to provide the better living environment and comfort in the staff house, built-in furniture such as closet, shelves with lock, SUS kitchen sink etc. shall be planned.

The floor area and function of each planned room of the staff houses are as shown in Table 2-5below:

Table 2-5 Floor Area and Function of Each Planned Room (SH)

Room Name	Floor Area	Function	Remarks
a. Bedroom	10.5 ㎡	Room with 2 beds for family - Fixtures as built-in furniture: closet, storage shelves. - Opening windows for ventilation, natural light is to take as much as possible.	Built-in closet
b. Living room	10.5 ㎡	Table set (for counterparts scope) - Fixtures as built-in furniture: wardrobe, storage shelves. - Opening windows for ventilation, natural light is to take as much as possible.	Built-in closet
c. Kitchen	9.7 ㎡	kitchen SUSl sink equipped with shelves (ready-made) - Planning the power supply for the refrigerator - Space be provided in the kitchen for stove (other scope) - proper window in order to get the adequate ventilation In addition, with consideration of local custom of cooking, a space for fire-wood stove with lean-to-roof is planned to be provided by the back entrance	Built-in SUS sink and shelves
d. Toilet/ shower room	3.6 ㎡	- one shower room with a water faucet - one Asia type toilet with a low tank	

Thus, the total floor area for the planned staff house for the Project is 71.4 m^2 including the entrance of the half outside. As for the proposed floor plan for the staff house, refer to Figure 2-4 below:

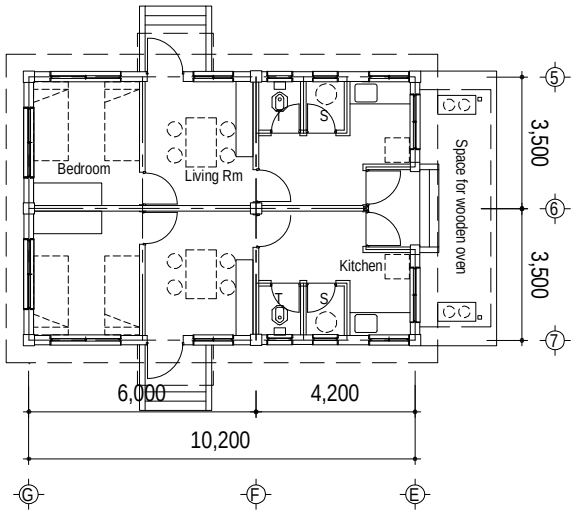


Figure 2-4 Proposed Floor Plan for Staff House

(4) Elevation and Cross-section Plan

The Lao PDR belongs to the temperate zone monsoon zone of high temperature and humidity, and is located in the immediate south side of the tropic of Cancer. Consequently, it is the essential issues for the facility design to secure the natural ventilation and to mitigate severe sunlight. Thus, in planning of section of the building, the following policies shall be considered giving consideration of the local situation:

1) Adequate window openings shall be provided up to the beam except some parts so as to facilitate natural room ventilation and to provide balanced natural lighting, and also to reduce the running cost for the electrical lighting and equipment. And, as for the entrance hall in particular which are widely open and having good ventilation, some sort of hanging walls shall be provided so as to avoid rain flew onto the entrance hall floor.

2) Deep eaves and louvers shall be provided to protect rooms from severe direct sunlight and intense rainfall.

3) The level of the ground floor of the new building having medical equipment to be installed shall be raised at least 500mm above designed ground level in order to prevent water infiltration and radiant heat from the ground.

4) The ceiling shall be provided for all room as well as entrance hall and eaves soffit according to local customs.

5) The distance between the health centre and staff house shall be less than 10m in order to use the land area effectively.

(5) Structural Plan

The structural plan for the Project shall be formulated after a full review of the existing site condition and considering the results of the soil investigation. However, the following shall be considered:

1) Structural design shall be basically conform to the relevant codes, regulations and standard of Lao PDR. In terms of regulation or standard for building, ”The Rule of Construction” has been enacted by Urban Planning Division, Ministry of communication, Transportation, Post and Construction in 1990. This rule was generally prepared for all provinces; however, detailed descriptions are not included. Therefore, in addition to the Lao’s rule, other relevant codes and/or AIJ (architectural Institute of Japan) shall be referred to in order to secure safety and rational in structural design and cost reduction as well.

2) According to the past record, Lao PDR particularly for its southern region did not have a

measurable earthquake. Other loads and imposed loading will be set according to the meteorological condition and site soil conditions. For the new construction the superstructure shall be made of reinforced concrete frame and the walls are to be made of brick which are economical and widely used materials in Lao PDR. Because of the simple plan and equal spans, a simple rigid frame structure with brick wall which is quite common in Laos is adopted.

3) Because of the one story building and a small building having the total floor area of approximately 120m^2, continuous footings to be set in at least 400mm below ground level will be adopted to protect from the differential settlement. The upper structure is the reinforced concrete columns and beams with the simple roof trusses made of local wood.

4) Design load shall be as follows:

a. Wind load	:	The wind load shall be calculated based on the wind speed of 30m/s and either the wind load or seismic load shall be used for design horizontal load.
b. Seismic load	:	The base shear coefficient can be reduced to 50% of the appropriate value (C0=0.1) in the Building Standard Law of Japan which is commonly adopted in Japan's grant Aid projects in South-east Asia.
c. Soil bearing capacity	:	Soil bearing capacity of 30kN/m^2 shall be used for the direct foundation (continuous footings)
d. Live load	:	Design condition of live load shall be set up based on the weight of the furniture, medical equipment, etc. so as not to lessen the structural strength with consideration of safety and economy while 400kN/m^2 and 200kN/m^2 shall be considered for roof/floor and structural elements respectively.

5) In principle, the following materials shall be used:

a. Concrete	:	Design strength (Fc) of 21N/mm^2 (28 days compressive strength of cylinder test piece)
b. Reinforcing bars	:	SD295 for D10, D16 and SD345 for D20. D25
c. Structural steel	:	SS400 with yield strength of 235N/mm^2

(6) Utility Plan

Based on the field surveys of the condition of existing infrastructure available for each target

site, the utility plan shall be designed for the electricity supply, water supply, sewerage and drainage, etc. for each health centre and staff house in accordance with the following basic policies:

1) Basic policy

The basic policies for the preparation of the utility plan are as follows:

- In the utility plan, consideration shall be given to the characteristics of and services to be provided by the health centre. The utility plan as a medical facility shall be coordinated with architectural and equipment planning so that each function in the facilities, such as maternity consultation room, delivery room and laboratory etc., can be operated effectively.
- In the handling of utility equipment, consideration shall be given to the characteristics of local health centres in remote areas. Thus, the utility equipment shall be planned as easy handling system as possible with simple maintenance.
- From the viewpoint of easy procurement of parts and easy maintenance of utility, the utility equipment and materials for the Project shall be the products locally available as much as possible.

2) Internal water supply system

< Water supply system >

Rooms planned to have water supply are as follows:

- All rooms except pharmacy and accounting of the health centre.
- Some rooms of the staff house such as kitchen, toilet and shower room.

3) Drainage and sewerage systems and sanitary plumbing fixtures

The basic policies for drainage and sewerage systems are as follows:

< Sewerage and medical waste drainage >

The basic policies for planning of the sewerage and medical waste drainage system are as follows:

- Since there is no public sewerage system around all the target sites, branch system i.e. 2 lines: one for soil waste and another one for general waste with septic tank and soak pit is planned in principle for this Project.

< Drainage and sewerage systems for Health Centre >

- The sewerage piping system within the building will adopt "the separated drainage piping system" to aid in the separation of sanitary sewage from wastewater.

- The soil waste (sewage) from toilet will be penetrated in the ground by the seepage pit (soak pit) through the septic tank. In addition, the septic tank shall be designed with the maintenance hatch for taking out sludge and/or remained filth periodically.
- The waste water from kitchen and hand washing etc. will be soaked into the ground by the seepage pit (soak pit) directly and the wastewater from clinical laboratory will be soaked into the ground by the purpose-built seepage pit (soak pit) through a wastewater monitoring pit.
- 15 people type septic tank shall be provided.

<Drainage and sewerage systems for Staff House>

- The soil waste (sewage) from toilet will be penetrated in the ground by the seepage pit (soak pit) through the septic tank. In addition, the septic tank shall be designed with the maintenance hatch for taking out sludge and/or remained filth periodically.
- All waste water shall be soaked into the seepage pit (soak pit) through one only drainage line.
- 8 people type septic tank shall be provided.

<Sanitary plumbing fixtures >

Asian type water closets are mainly used in the existing health centre. As requested by MOH, PHO and staff of the existing health centres, water closets shall be planned as Asian type considering Laos lifestyle and hygienic and break-proof standpoint. It should be noted that the cleaning system of the toilet adopt "low tank system" in order to improve how to clean for hygiene control and user-friendly.

< Fire extinguishers (Building Facilities Works) >

The portable type fire extinguisher should be provided for the initial fire-fighting, so that people can be quickly evacuated from the building and fire-fighting action can be promptly taken.

4) Power supply system

The power supply for the new facilities shall be sourced from either the existing or newly installed low voltage power distribution line (1 phase, 2 wires 220V, 50Hz) which shall be provided by Lao side or the PV system planned for the target sites where such low voltage power distribution line is not available which shall be installed under this Project by Japan side so that necessary lightings and power outlets can be provided.

< Items to be installed by Japan side >

- The building facilities shall be equipped with lighting system so as to enable to provide consultation during night time and power outlets so as to enable to operate the equipment to be procured under this Project.
- PV system shall be provided for the target sites without both the low-voltage and medium-voltage line within the site or neighboring area
- PV system with a minimum capacity of 3.15kW and ancillary equipment (change controller, batteries, inverter, connection box, PV panel supporting structure and battery fuse) shall be provided so as not to cause the financial burden of maintenance costs as possible. (9 sites in Attapeu and Sekong provinces: A7, A8, A9, A14, A15, A22, X1, X2 and X3)
- As for the target sites having the existing PV system (7 sites in Attapeu and Sekong provinces: A8, A9, A14, A20 (SOW III), A22, A7 and X3), such existing PV system shall be replaced with new one having a minimum capacity of 3.15kW including ancillary equipment mentioned above with consideration of time-related deterioration thereof and proper operation of the equipment to be procured under this Project.
- Besides the PV system for the building facilities, 0.24kW PV system with ancillary equipment (pump control panel and PV panel supporting structure) for the water pump shall be planned. (8 sites in Attapeau and Sekong provinces: A8, A9, A14, A15, A22, X1, X2 and X3)
- Furthermore, besides the PV system for the building facilities, 0.6kW PV system with ancillary equipment (change controller, batteries, inverter, connection box, PV panel supporting structure and battery fuse) for the vaccine refrigerator shall be planned. (9 sites in Attapeu and Sekong provinces: A7, A8, A9, A14, A15, A22, X1, X2 and X3)

Contents and target sites for the planned PV system are as shown in Table 2-6 below:

Table 2-6 Summary of Planned PV System

System	Item	Site
Building Facilities (New and existing)	3.15kW PV system and ancillary equipment (change controller, batteries, inverter, connection box, PV panel supporting structure and battery fuse)	With existing PV System: A15, X1 and X2、
		Without existing PV System: A7, A8, A9, A14, A22 and X3
Water Pump	0.24kW PV system with ancillary equipment (pump control panel and PV panel supporting structure)	A8, A9, A14, A15, A22, X1, X2 and X3
Vaccine Refrigerator	0.6kW PV system with ancillary equipment (change controller, batteries, inverter, connection box, PV panel supporting structure and battery fuse)	A7, A8, A9, A14, A15, A22, X1, X2 and X3

Assumed power consumption by facilities component and the design capacity of the planned

PV system are as shown in Table 2-7 and Table 2-8 below respectively.

Table 2-7 Summary of Assumed Power Consumption by Each Facility Component

Type	Health Centre			Staff House (Wh/day)	Remarks
	Type A (Wh/day)	B (Wh/day)	B' (Wh/day)		
Site with LV	10,020	9,540	10,020	1,886	
Site with PV	6,671	6,343	6,671	1,747	

Table 2-8 Design Capacity of the Planned PV System

Facility	Power consumption (Wh/day)	Average amount of solar radiation (kWh/day)	System Efficiency (%)	PV Capacity (kW)	Remarks
New Health Centre*1 ＋New Staff House	6,671 1,747	4.90	62	2.78	Difference of power consumption for health centre type is not considered
Existing HC*2 ＋New Staff House	5,567 1,747	4.90	62	1.83	Power consumption for existing HC is assumed to be 1,320Wh/day
Vaccine refrigerator	1,570	4.90	62	0.52	
Water pump	700	4.90	62	0.23	

Note: *1 Power consumption for Type A HC is used for the calculation of design capacity of PV system.
*2 Power consumption for the existing HC is assumed to be 1,320Wh/day

< Items to be installed by Lao Side >

The target site shall be given the necessary low-voltage power to new facilities in order to supply the new low-voltage line from the existing low-voltage/medium-voltage power grids including a pole-mounted transformer, in the case of the medium-voltage grid, by scope of works of Lao side based on M/D that was concluded by both Lao side and Japan side. An electric pole with watt-hour-meter shall be provided by Lao side within 20m from the existing health centre or health centre to be built.

(7) Garbage and Waste Disposal

Medical waste incinerator is not planned in this Project since the disposal of medical waste is currently being operated according to the procedures of the waste treatment control in Provincial Health office. The garbage and waste disposal is planned as the following two types:

1) Garbage disposal

The garbage from the existing facilities is currently burnt within the HC compound. However, for the future, it is important to get accustomed to burn garbage in the burning pit using concrete blocks in order to prevent spreading of a fire in the health centre. Thus, the said burning pit using concrete blocks shall be planned in a corner of HC compound.

The said burning pit shall be made of two layer of concrete block wall reinforced with reinforcing steel bars of approximately 500 x 800 x 400mm (H) and be placed in the yard of each HC. By provision of the burning pit and dispose all garbage in it, the risk of the spread of a fire to the building by burning garbage can be prevented and the situation that are apt to become insanitary.

(Reference Photo of Burning Pit)

2) Medical waste disposal

As for the medical waste which become the source of infection such as injection needles, it shall be planned to be disposed along with the present system, since DHO collects a safety box containing such injection needles from each HC according to the rule that has already enforced and disposed by means of incinerating them at distric and/or provincial level. However, as for the combustible medical waste, it shall be planned to handle same as the garbage disposal.
The said safety boxes are procured by the assistance of NICEF and GAVI with some contribution of the government of Lao PDR then distributed to each HC nationwide through National EPI Programme. Therefore, it is planned that such safety boxes shall not be procured under this Project since it is assumed that its procurement by each HC is not necessary.

The current status of the medical waste management for each province is summalized in Table 2-9 below:

Table 2-9 The Current System for Medical Waste Management

Province	Attapeu	Champasak	Salavan	Sekong
Regulation of medical waste management	Not exists	Exists for SB only	Not exists	Not exists
Type of waste	Only SB is collected. Others are burned or buried at HC	Only SB is collected. Others are burned or buried at HC	Only SB is collected. Others are burned or buried at HC	Only SB is collected. Others are burned or buried at HC
Process of collection	The DHOs collect SB or the HCs bring the SB to DHOs. The PHO collects SB from the DHOs.	The DHOs collect SB or the HCs bring the SB to DHOs. The PHO collects SB from the DHOs.	The DHOs collect SB or the HCs bring the SB to DHOs. The PHO collects SB from the DHOs.	The PHO collects SB from HCs directly or DHOs collect.
Frequency of collection	The PHO collects SB when PHO visits the districts for vaccinations. Ditto the DHOs.	Quarterly. Ditto the DHOs.	The PHO collects SB when PHO visits the districts for vaccinations. Ditto the DHOs.	The PHO collects SB when PHO visits HCs for vaccination quarterly. Ditto the DHOs.
Disposal method	Incinerate by an incinerator. The ash is disposed into a pit beside the incinerator。	Send to the public disposal site in Pakse city	Incinerate by an incinerator. The ash is disposed into pits beside the incinerator。	Incinerate by an incinerator or bury. Ditto the DHOs。

Province	Attapeu	Champasak	Salavan	Sekong
Disposal site	At the PHO's incinerator in Attapeu provincial waste disposal site （Donated by UNICEF）	Temporary, the SBs are kept at the waste site in the provincial hospital before sending to the public waste site.	At the incinerator in the PHO (Donated by Italian Government)	At the incinerators in the provincial hospital or the DHOs
Picture of the disposal sites	 		 	 
Instruction to HCs by PHO	SB: Collect	SB: Collect Others: Burn or bury	SB: Collect	SB: Collect Paper waste: Burn Placentas: Bury

2-2-2-4 Water Supply Plan

(1) Water Supply Plan

Basically, water supply facility for Health Centre and/or Staff House is planned borehole with elevated water tank and submersible pump taking the convenience of staff and patients into consideration since MOH Standard Plan indicates provision of water taps in the rooms.

On the other hand, in case that the existing health centres have not adequate water supplies; the same water supply facility is planned even for the target sites where only the staff house is requested. Where the "adequate" means that groundwater such as borehole or spring water is used. River water or pond water is recognized as "not adequate" as they are not considered to be hygienic.

And, in case that the planned construction site of Health Centre is neighboring to the office of village cluster which has existing borehole already, the elevated water tank and submersible pump are planned to be installed using the existing borehole, if water quantity and quality of the well are confirmed as appropriate for this Project.

If the villages which are planned to construct a Health Centre and/or a Staff House has not enough water quantity, a public tap is installed under the elevated tank taking the use of villagers into consideration.

Lao Standard for the water quality will be applied as priority parameters in principle except "residual chlorine for treated water". However, an electrical conductivity is specified for salinity in the Lao Standard which is seems to be very strict; thus, TDS (Total Dissolved Solid)

of the WHO standard will be applied for verification of the water quality for this Project. Additionally, although color is not a priority parameter, a value specified in the WHO Standard will be applied as a reference.

Water quality standard applied in this project is shown in Table 2-10 below. If some parameters are exceeded the specified values for the newly drilled borehole, such borehole shall be recognized as failed borehole and another borehole will be drilled. However, re-drillings are planned to be up to 2 times (total 3 times drilling). In that case, such an area is recognized as the unsuitable area of groundwater development. If the water quality has some problems, alternative water sources (spring or existing borehole) will be considered.

Table 2-10 Water Quality Standard to be applied for the Project

Parameter		Unit	Standard Value	Remark
1	Thermotolerant coliform	Number/100ml	0	Lao Standard
2	Iron (Fe)	mg/l	Less than 1.0	Lao Standard
3	Manganese (Mn)	mg/l	Less than 0.5	Lao Standard
4	Conductivity	μS/cm	1500	Lao Standard (reference only)
5	Total dissolved solids	mg/l	1000	WHO Standard
6	Total hardness	mg/l	Less than 300	Lao Standard
7	Turbidity	NTU	Less than 10	Lao Standard
8	Color	TCU	15	WHO Standard
9	Taste and odor		Acceptable	Lao Standard
10	pH		6.5 - 8.5	Lao Standard
11	Arsenic (As)	mg/l	Less than 0.05	Lao Standard
12	Fluoride (F)	mg/l	Less than 1.5	Lao Standard
13	Nitrate (NO3)	mg/l	50	Lao Standard
14	Nitrite (NO2)	mg/l	3	Lao Standard

Note: Highlighted standard values will be used for the verification of the water quality for this Project.

According to the Basic Design Study Report of the Japan Grant Aid Project "Groundwater Development Project for Champasak and Salavan Provinces" in 1997, the specific consumption was 20 liters per person per day. However, considered to the enhancement of convenience such as water distribution from elevated water tank, the specific consumption of water supply is set as 35 liters per person per day. And the specific productivity for the patients is set as 10 liters per person per day.

When the staffs and the families are assumed as 10 persons (2 families can be settled in Staff House) and the patients a day in Type B Health Centre are assumed as 20 persons, the water demand of one day is summarized as 550 liters. In the Health Centre Type A, when the patients are assumed as 30 persons, the water demand is summarized as 650 liters. In case that the villagers of 100 persons use this water supply facility, water demands of Type A and Type B are 4,150 liters and 4,050 liters respectively. On the other hand, in case of the target site or

village which the public tap is planned or future expansion is expected, water consumption is estimated as 8,750 liters on the assumption that 50 households with 250 person would use the said public tap.

In addition, water treatment is not considered in this Project because the groundwater or spring water is planned to be used. Therefore, in order to avoid prolonged time of retaining the water in the water tank and to prevent the water quality becomes bad, the water tank capacity will be set for 1/4 day of the demand in case of the target sites having power supply, and for 1/2 day of the demand in case of the target sites with PV systems. Estimated water tank capacity is as shown in Table 2-11 below:

Table 2-11 Water Demand and Planned Tank Capacity

Daily Consumption	Electricity Available				PV System	
	Without Public tap		With Public Tap			
	Type A	Type B	Type A	Type B	Type A	Type B
Consumption by Staff and Family	350	350	350	350	350	350
Consumption by Patients	300	200	300	200	300	200
Consumption by Community	3,500	3,500	8,750	8,750	3,500	3,500
Total Consumption (litre)	4,150	4,050	9,400	9,300	4,150	4,050
Storage Coefficient	0.25	0.25	0.25	0.25	0.50	0.50
Storage Tank Capacity (litre)	1,000	1,000	2,500	2,500	2,500	2,500

(2) Water Source Survey Results

To grasp the capability of the use of existing water source and the securement of groundwater development for borehole drilling, the following water source survey was conducted in the target 67 sites.

< First Field Survey >

In the first field survey (March, 2012), water source survey was conducted in the 67 target sites in order to confirm the necessity of borehole drilling with the following objectives:

- To confirm whether or not there is a usable water source within the target site and/or its surrounding area.
- To specify the location of existing water source of which can be shared with the Health Centre in the land for construction or the surrounding.
- To interview the condition of the existing wells in the target sites from province / district water supply office.
- To test the coliform contents in the using water by simplified coliform test kit.

< Second Field Survey >

Water quality survey was conducted for the every target sites. The water samples are analyzed with regard to 12 parameters which are specified as priority parameters in the water quality standard in Laos and additional parameters of "Total Dissolved Solid" and "Color" which are specified in the WHO Standard.

Resistivity survey was also conducted in some target sites which were identified in the results of 1st field survey.

<Additional Field Survey>

In the results of water quality survey mentioned above, coliform was detected in many of the existing water sources. Therefore, to secure the water source, additional survey was conducted from October 2012. In the additional survey, alternative water sources such as existing wells or springs near the sites were specified. In addition, in the sites which have topographical and geological difficulty of groundwater development, test borehole drillings were conducted.

On the other hand, the necessity of borehole drilling was verified again. And, the existing wells were verified to convert for the water source of HC. As another correspondence, clay and concrete were filled to prevent the coliform invasion around the casing pipe for some sites which will be used as water source for the existing HC and village cluster office as well.

< Additional Resistivity Survey and Trial Borehole Drilling >

The additional resistivity survey was conducted for the sites which could not be done during Second Field Survey and thereafter trial borehole drilling as well as construction of well was carried out at five (5) target sites.

(3) Evaluation of the Possibility of Water Source Securement

The summary of the results of water source survey including water quality test is as shown in Table 2-14 herein after.

The proprierity of water quality to be used for the health centre will be judged based on the parameters specified in Laos however, as for the parameters which effect on health in particular; the guidelines for the drinking water 3rd edition published by WHO will also be referred.

1) Sites utilizing the existing water source (30 sites)

In the result of water source survey, existing water source (urban water supply, community water supply system, existing well and spring water) were confirmed to be available for health centres at 30 target sites. Elevated water tanks and submersible (well) pumps are planned to be installed using the existing water sources for these sites, except the sites which are using urban water supply or community water supply system. However, since coliform was detected in

many of the existing water source, the following measures shall be taken:

< Urban water supply >

Requests to the responsible organization i.e. Water Supply Department of each district to take necessary measures to improve the water quality were made via PHOs.

< Community Water Supply System >

Methods for improvement of water quality were suggested for the responsible water committee. The committees agreed with the suggestion and promised to improve the water quality. In addition provincial water departments agreed to monitor the water quality.

< Existing Well >

Sealing by concrete and clay around the casing has done for some of the existing wells and conducted the monitoring for 2 months after sterilizing with chroline. As a result, coliforms were not detected for all the said existing wells as it seemed that the sealing was quite effective to protect the invasion of coliforms from the surface. Therefore, the existing wells which were detected coliforms can only be used after sealing and sterilizing with chroline. In addition, provincial water departments agreed to monitor the water quality.

< Spring GFW >

Since the reason of detecting coliforms from the spring water is a lack of protection of its source, the Team suggested the method of protecting the water source to the village water committees and the said suggestion was agreed. .

2) Sites securing by new borehole drilling (28 sites)

In the result of water source survey, the sites which new borehole drillings are needed were confirmed for 28 sites. Also, coliform was detected in the existing water source in the village which the target HC belongs to. New borehole drillings are planned to be installed with casings and screens to the bottom of borehole. And sealing with concrete and clay along the shallow part of the boreholes shall be done. Additionally, fence shall be installed around the well. Incidentally, coliforms were not detected at the test boreholes which were constructed during the additional survey mentioned hereinbefore.

Table 2-12 The summary of the Results of Water Source Survey including Water Quality Test

Site No.	Name of HC	pH	EC (µS/cm)	Color (NTU)	Taste and odor	Iron (Fe) (mf/L)	Manganese (Mn) (mg/L)	Fluoride (F) (mg/L)	Arsenic (As) (mg/L)	Total dissolved solids Total hardness (mg/L)	Nitrate (NO3) (mg/L)	Nitrite (NO2) (mg/L)	Thermotolerant coliform	Color (TCU)	TDS (mg/L)	Well
		6.5 - 8.5	1,000	10	acceptable	1	0.5	1.5	0.05	300	50	3	0	15	1000	
A01	Bengphoukham /Lak52	7.12	559	0	OK	0.07	0.04	0	0	100	1.2	0.005	2	1	274	No Needed
A02	Halang Nhai	6.92	421	0	OK	0.06	0.033	0	0	100	1.1	0.007	>100	2	206	Needed
A03	Dak Yieng	7.3	390	0	OK	0.50	0.000	0.56	0	100	1.0	0.020	0	0	45	No Needed
A04	Sompoi	6.5	151	0	OK	0.16	0.004	0	0.003	60	1.8	0.003	15	5	74	Needed
A05	Ban Thae	6.1	1,070	0	OK	0.04	0.033	0.8	0.003	100	1.8	0.01	0	2	524	Needed
A06	Ban Mai	6.82	101	10	OK	0.21	0.1	0.82	0	80	3.6	0.064	>100	32	50	
A07	Namsou	7.71	41	0	OK	0.35	0.012	0.54	0.003	20	1.6	0.009	0	40	20	No Needed
A08	Sapuan	6.12	810	0	OK	0.02	0.029	0.46	0	180	1.6	0.006	0	3	392	Needed
A09	Keng Mhkhua	6.42	1,444	6	OK	0.35	0.272	0.04	0.008	100	1.8	0.006	0	4	708	Needed
A10	Na Seuak	6.75	524	0	OK	0.06	0.049	0.74	0.003	360	1.8	0.021	0	10	145	Needed
A11	Ka Ouan	7.23	704	0	OK	0.07	0.01	0.52	0	60	1.9	0.01	0	4	345	
A12	Honay Keo	6.84	507	0	OK	0.10	0.023	0.76	0	60	1.8	0.016	0	5	248	Needed
A13	Nam Kong	6.85	279	0	OK	0.02	0.037	0.52	0	80	2.1	0.016	>100	2	145	
A14	Beng Vilai	6.88	249	0	OK	0.00	0.007	0.15	0	180	1.5	0.005	0	3	245	No Needed
A15	Pak Bo	6.64	155	68	OK	0.02	3.86	0.74	0	100	6.9	0.1	>100	65	76	Needed
A17	Kum Khan	7.16	454	7	OK	0.23	0.034	0.25	0	20	2.4	0.176	>100	18	222	
A18	Langnao	6.81	198	0	OK	0.02	0.032	0.22	0	140	1.4	0.012	4	2	97	No Needed
A19	Somsanouy	7.12	579	4	OK	0.07	0.042	0.18	0.005	100	1.3	0.004	7	50	284	No Needed
A20	Ban Moon	6.23	90	10	OK	0.07	0.042	0.18	0.05	100	1.3	0.004	>100	2	284	
A22	Phou Home	7.12	146	0	OK	0.01	0.046	0	0.023	100	1.4	0.004	1	2	72	No Needed
C01	Bongsong	6.8	769	1	OK	0.03	0.043	0.48	0.008	60	0.9	0.012	3	3	377	Needed
C02	Saphai	7.3	153.7	3,780	OK	0.58	0.393	0.78	0.006	60	13.7	0.154	>100	550	75	Needed
C03	Km21+h	6.5	23.78	3	OK	0.12	0.003	0.15	0	20	0	0.019	5	4	12	Needed
C04	Vernxai	6.5	567	115	OK	0.45	0.075	0.24	0	100	2.6	0.032	>100	600	278	Needed
C05	Pathoumphone	7	28.1	1	OK	0.18	0.009	0.05	0	20	1.3	0.005	>100	5	43	Needed
C06	Houygeun	6.7	226.3	8	OK	0.21	0.045	0.11	0.003	60	6.5	0.026	5	60	111	No Needed
C07	Vernyang	6.7	689	3	OK	0.15	0.039	0.23	0.004	100	1.6	0.004	4	40	338	
C08	Naphang	6.7	912	0	OK	0.18	0.044	0.32	0	100	1.6	0.046	0	6	447	No Needed
C09	Salow	7.2	705	0	OK	0.18	0.031	0.15	0	100	1.1	0.018	0	4	345	Needed
C10	Banphon	7.2	686	0	OK	0.38	0.006	0.15	0.002	100	1.4	0.016	15	2	336	Needed
C11	Kundchick	7.3	665	0	OK	0.28	0.021	0.24	0	20	1.5	0.016	7	2	326	No Needed
C12	Kaela	7.3	210.1	3	OK	0.21	0	0.06	0	60	3	0.037	5	30	103	Needed
C13	Phounthong	7	818	2	OK	0.21	0.026	0.25	0.005	100	1.7	0.016	4	80	401	No Needed

Site No.	Name of HC	pH	EC (µS/cm)	Color (NTU)	Taste and odor	Iron (Fe) (mf/L)	Manganese (Mn) (mg/L)	Fluoride (F) (mg/L)	Arsenic (As) (mg/L)	Total dissolved solids Total hardness (mg/L)	Nitrate (NO3) (mg/L)	Nitrite (NO2) (mg/L)	Thermotolerant coliform	Color (TCU)	TDS (mg/L)	Well
		6.5 - 8.5	1,000	10	acceptable	1	0.5	1.5	0.05	300	50	3	0	15	1000	
C14	Champasak	7.1	638	0	OK	0.22	0.012	0.12	0.003	60	2	0.009	3	3	312	
C15	Phapho	7.1	114.1	40	OK	0.70	0.042	0.14	0	60	6	0.034	29	40	56	
C16	Phonsikai	6.9	60.4	0	OK	0.18	0.013	0.33	0	60	4.1	0.012	15	3	30	Needed
C17	Nonesavang	7.5	82.3	2	OK	0.14	0.02	0.09	0.002	20	2.9	0.011	4	3	40	No Needed
C18	Selabom	7.2	676	0	OK	0.13	0.106	0.83	0	60	2.9	0.027	5	9	331	Needed
C19	Kuangsy	7.7	136.4	39	OK	0.14	0.018	0.09	0	60	7.5	0.067	50	100	67	
C20	Nam-orm	7	17.97	0	OK	0.32	0.001	0.02	0	20	4.8	0.009	1	5	9	Needed
S01	Naxay	6.5	165.8	0	OK	0.00	0.037	0.56	0	60	13.6	0.12	30	3	81	No Needed
S02	Beng Oudom	6.4	145.5	0	OK	0.01	0.003	0.3	0	60	14.7	0.011	20	2	71	No Needed
S03	Kasa	6.7	587	0	OK	0.01	0.036	0.31	0.002	100	9.2	0.016	15	2	288	Needed
S04	Nadonkhuand	6.8	570	0	OK	0.50	0.002	1.13	0.0014	100	1	0.02	0	0	268	No Needed
S05	Phakkaha	7.1	595	0	OK	0.03	0.025	0.27	0	100	8.6	0.016	70	3	291	Needed
S06	Buongxay	6.8	503	0	OK	0.01	0.015	0.38	0	100	10.8	0.013	5	3	246	No Needed
S07	Dan Nalao	6.9	545	0	OK	0.33	0.028	0.5	0	100	11.1	0.032	60	2	267	Needed
S08	Phonsung	6.9	667	0	OK	0.05	0.024	0.37	0	100	14.3	0.028	2	4	327	No Needed
S09	Lak 90	7.1	429	8	OK	0.04	0.022	0.32	0	100	9.4	0.036	14	2	210	Needed
S10	Nadou Kao	7	1,038	0	OK	0.64	0.042	0.8	0	100	14.9	0.048	12	70	509	No Needed
S11	Khonsay	7	976	19	OK	0.05	0.028	0.49	0	200	11.5	0.056	15	3	478	Needed
S12	Saphat	7.4	833	2	OK	0.04	0.000	0.6	0	38	0.25	0.000	0	1	516	No Needed
S13	Tanpio	7.3	371	0	OK	0.29	0.033	0.57	0	60	9	0.052	8	90	182	No Needed
S14	Thaluang	7.2	89.3	25	OK	0.05	0.06	0.21	0	20	8.4	0.016	7	6	44	No Needed
S15	Kenghuad	6.9	1449	0	OK	0.01	0.029	0.53	0.005	200	11.8	0.126	10	5	710	No Needed
S16	Nong Kae	10.1	462	0	OK	0.03	0.002	0.46	0	60	9.8	0.009	12	7	227	Needed
S17	Dong Nhai	5.6	36.8	3	OK	0.50	0.059	0.1	0.006	20	11.7	0.058	15	96	18	Needed
S18	Vang Peui	5.4	175.8	25	OK	0.04	0.027	0.13	0	60	13.9	0.018	5	4	86	Needed
X01	Dakdin	7.5	25	0	OK	0.01	0.014	0.35	0	20	1.3	0.018	12	1	13	No Needed
X02	Tateu	8.5	21	0	OK	0.00	0.034	0.3	0	2	7.5	0.003	8	1	10	No Needed
X03	Chalea	7.0	62.6	0	OK	0.00	0.000	0.16	0	158	0.30	0.000	0	1	33	No Needed
X04	Paxay	6.2	110.1	11	OK	0.23	0.003	0.01	0	60	0.08	0.029	8	80	54	No Needed
X05	Donechan	6.4	674	0	OK	0.02	0.017	0.25	0.008	100	0.19	0.011	10	60	330	Needed
X06	Phon	6.5	62.6	0	OK	0.00	0.000	0.17	0	54	0.10	0.000	0	1	21	No Needed
X07	Tanum	6.7	470	0	OK	0.50	0.000	0.16	0	100	1	0.02	0	5	25	No Needed
X08	Donsa	6.9	50.4	0	OK	0.03	0.004	0.02	0	20	0.16	0.014	0	3	25	No Needed
X09	Yup	6.6	300	0	OK	0.50	0.007	0.09	0.005	60	1	0.020	0	0	57	No Needed

(4) Securing of Water Source for the Implementation of the Project

In the 28 new drilling sites, if first drilling was failed, second borehole will be drilled with consideration of the failed drilling result after resistivity survey will be conducted again, if it is needed. If the second drilling was failed again, the resistivity survey and drilling will be conducted within the budget. However, fourth borehole will not be drilled.
Thus, if third borehole was failed again, alternative sites will be considered in the covered area of HC, after the discussion between relative organizations in Laos and Japan side.

(5) Drilling Plan

1) Drilling depth

According to the water source survey mentioned above, the results of the previous project and resistivity survey results, the drilling depth, the static water level and the dynamic water level of each site has been estimated. Average drilling depth is estimated as 58.4m plus additional drilling of 10m for setting the casing; thus, total average drilling depth is set as 68m.
Estimated drilling depth and water level in the new drilling sites (28 sites) is shown in Table 2-13 below:

2) Successful rate and the quantities of drilling

Referring to the drilling result of the Japan Grant Aid Project "Groundwater Development Project for Champasak and Salavan Provinces" implemented in 1998 to 2000, the results were classified by topography and geology. And the successful rates of drillings were calculated by the classification. According to the result, though the successful rate in the sedimentary rock area in lowland area was 100% as water quantity, there were several sites which the water quality (salinity and hardness) was exceeded when the water quality standard was applied. Additionally, the same successful rates were applied to Attapeu and Sekong Provinces, if the topography and geology were the same as Champasak and Salavan Provinces. However, since there was no data in the mountainous areas, the successful rates were set by geological difficulty and the result of resistivity survey. When these results were applied to the target sites in this Project, successful rate for each drilling site shall be as shown in Table 2-13 below:
Successful rate for this Project is assumed to be 80% based on the results mentioned above and with consideration of the limitation that borehole shall be drilled within or around each target site; thus, total number of drilling is set at 35 for 28 successful drillings with consideration of estimated number of failed drillings.

Table 2-13 Anticipated Successful Rate of Drilling by Site

Site No.	Health Centre	Well	Assumptions			Successful Rate		
			drilling depth (m)	static water level (m)	dynamic water level (m)	water volume (%)	water quality (%)	overall (%)
A-02	Halang Nhai	Need	60	8	12	100	90	90
A-04	Sompoi	Need	55	15	20	100	95	95
A-05	Ban Thae	Need	60	10	15	100	90	90
A-08	Sapuan	Need	60	10	15	100	90	90
A-09	Keng Mhkhua	Need	60	10	15	100	70	70
A-10	Na Seuak	Need	60	10	15	100	70	70
A-12	Honay Keo	Need	50	20	30	70	90	63
A-15	Pak Bo	Need	60	10	15	100	70	70
C-01	Bongsong	Need	50	10	15	100	90	90
C-02	Saphai	Need	50	10	15	100	90	95
C-03	Km21th	Need	55	15	20	100	95	95
C-04	Vernxai	Need	50	10	15	100	90	90
C-05	Pathoumphone	Need	55	15	20	100	95	95
C-09	Salow	Need	50	10	15	100	90	95
C-10	Banphon	Need	60	15	20	100	90	90
C-12	Kaela	Need	55	15	20	100	95	95
C-16	Phonsikai	Need	50	10	15	100	95	95
C-18	Selabom	Need	50	10	15	100	90	95
C-20	Nam-Orm	Need	55	15	20	100	95	95
S-03	Kasa	Need	50	10	15	100	95	95
S-05	Phakkaha	Need	60	10	15	100	90	90
S-07	Dan Nalao	Need	60	10	15	100	90	90
S-09	Lak 90	Need	60	10	15	100	90	90
S-11	Khonsay	Need	60	10	15	100	90	90
S-16	Nong Kae	Need	80	30	40	70	90	63
S-17	Dong Nhai	Need	80	30	40	70	90	63
S-18	Vang Peui	Need	80	30	40	70	90	63
X-05	Donechan	Need	60	10	15	100	90	90
Average			58.4	13.5	19.2	95.7	89.6	85.8

3) Specification of drilling

Drilling diameter should be 6 inches which can be installed 4 inches casing pipe. Shallow part of drilling hole should be drilled 8 inches with installing temporary casing to pass through collapsing soil. Screen pipe should be installed corresponding to the aquifer. The length and depth of screen pipes should be decided by the data of geology and geophysical logging. In this design, the length is estimated 30% of drilling depth. Corresponding to the position of screen pipe, gravel should be installed between the wall of borehole and screen pipe. Other part should be backfilled by the drilled cutting soil.

In order to prevent contaminated water from surface, the shallow part of borehole to approximately 10m should be sealed by clay and concrete. Figure 2-5 shows the borehole structure.

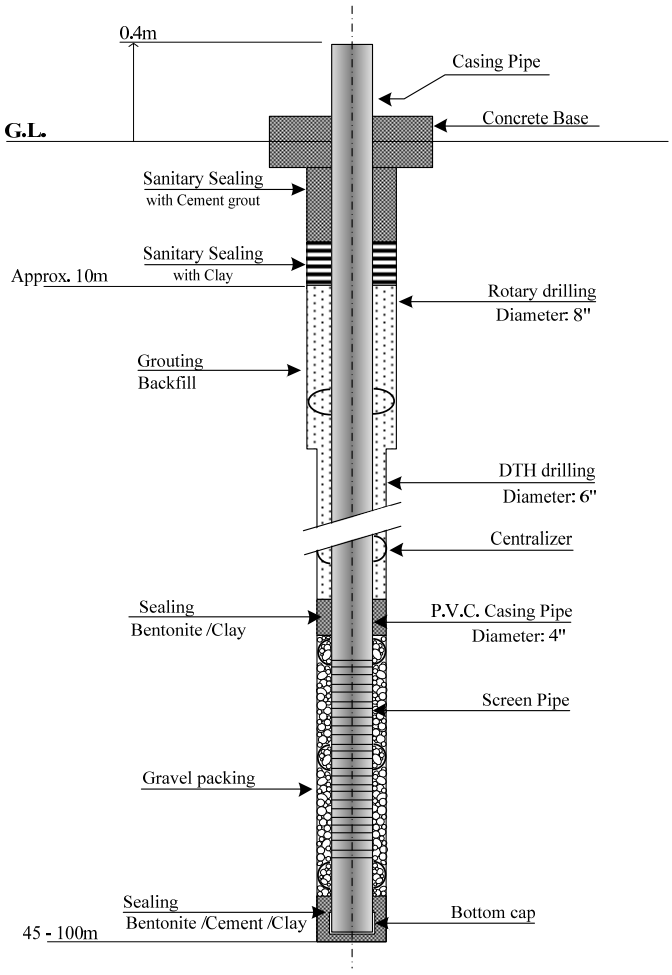


Figure 2-5 Schematic Diagram of Borehole Structure

4) Schedule of borehole drilling

Since the borehole drilling has many uncertainties, the drilling schedule is separated from facilities construction works schedule. Well construction works including borehole drillings shall be implemented prior to the construction of HCs, and the implementation schedule is plotted out to have no effect on the facilities construction works schedule.

Boreholes are classified to successful borehole and failed borehole. The rate of successful borehole in this Project is estimated at 80% of total drilled boreholes as mentioned hereinbefore. Therefore failed boreholes are estimated to be 7 boreholes. According to the results of the drilling of test boreholes, four (4) boreholes per month with one (1) drilling rig can be finished as successful borehole. Therefore, term of drilling for 28 successful boreholes is estimated to

require 4.4 months as shown in Table 2-14 below while the overall schedule of drilling works is estimated to require 5 months including the term of contract, mobilization and demobilization:

Table 2-14 Required Term of Drilling with 2 Drilling Rigs

Type of well	Quantity (boreholes)	Drilling Quantity (boreholes per month)	Drilling Period (month)
Successful borehole	28	8	3.5
Failed borehole	7	8	0.9
Total	35		4.4

(6) Pumping Test

The wells which have been completed the drilling works and set well blocks in Batch 1 will be handed over to the building facilities contractor(s) for Batch 2 and Batch 3. Thereafter, additional facilities for water supply system such as elevated water tank will be constructed. In this time, confirmation of the condition of setting of submersible (well) pump and capacity of the well will be required. Therefore, the confirmation pumping test will be included in the well construction works contract, and the contractor(s) for Batch 1 will conduct the pumping test immediately after the commencement of the facilities construction works. .

(7) Elevated Water Tank and Supporting Structure

The contractor of facilities construction works will construct the supporting structure for the elevated water tank for new well as well as for the sites which are planned to use the existing well shown in the tender documents.

Since the water supply system shall be provided even for HC where the existing well is planned to use, it is also required to install the submersible (well) pump and elevated water tank for such target sites. And, as for the HC where the spring water GFW is planned to use, the water reservoir (receiving tank) shall be constructed. In addition, there are some target sites which are required to install PV system for the water supply system. (Please refer to Table 2-15 hereinafter)

(8) Procurement and Setting of Pump

Procurement and setting of pump shall be included in the facilities construction works contract(s). Thus, although the construction of wells will be completed in Batch 1, the required piping works after discharge pipe of pump and the electrical works including the installation of control panel will also be planned to include in the facility construction works contractor(s) i.e. Batch 2 and Batch 3.

The setting depth of submersible (well) pump is 5 m below the estimated dynamic water level. The pump shall be selected to adapt to the lifting height from the setting depth to the height of elevated tank.

Table 2-15 Summary of Water Source Survey Result

No	Province	District	HC Name	City /Village Water	Improvement for village water		Spring		Well					Tank													Elec.	Remarks
														For General		Fa uc et	For Coliform site		Elevated tower		Water Tank for Spring water				RC Tank	Wate r Pum p		
					Wate r pipe	Water Pump	Sp rin g	Water Protect(f ence 10 × 10 × 2.4m)	New well	Existi ng well	Well depth (m)	Wate r Pum p	Water Protect(fenc e2.5 × 2.5 × 2.4m)	Tank Q'ty	Capa city (m^3)		Tank Q'ty	Capacit y (m^3)	One Tank	Two Tank	Tank Q'ty	Capa city (m^3)	Base	Pump			PV	
A01	Attapeu	Samarkxay	Bengphoukham / Lak52							Exist			1				1	1.0	1									
A02		Samarkxay	Halang Nhai						1		60	1	1	1	1.0				1									
A03		Xaysettha	Dak Yieng							Test		1	1	1	2.5	1			1									
A04		Sanamxay	Sompoi						1		55	1	1	1	1.0				1									
A05		Sanamxay	Ban Thae						1		60	1	1	1	1.0				1									
A07		Sanxay	Namsou				○	1						1	1.0				1		1	1.0	1	1			○	Water pipe line to SH(200m)
A08		Xaysettha	Sapuan						1		60	1	1	1	1.0				1								○	
A09		Xaysettha	Keng Mhkhua						1		60	1	1	1	1.0				1								○	
A10		Phouvong	Na Seuak						1		60	1	1	1	2.5				1									Future use
A12		Phouvong	Honay Keo						1		50	1	1	1	2.5				1									Future use
A14		Sanamxay	Beng Vilai							Exist		1	1	1	2.5	1			1								○	
A15		Sanamxay	Pak Bo						1		60	1	1	1	2.5	1			1								○	
A18		Samarkxay	Langnao							Exist			1				1	1.0	1									Coliform
A19		Samarkxay	Somsanouy							Exist			1				1	1.0	1									Coliform
A22		Phouvong	Phou Home							Exist			1				1	1.0	1								○	
C01	Champasack	Pakse	Bongsong						1		50	1	1	1	1.0				1									
C02		Sanasomboum	Saphai						1		50	1	1	1	1.0				1									
C03		Bachiang	Km21+h						1		55	1	1	1	2.5				1									Future use
C04		Phonthong	Vernxai						1		50	1	1	1	1.0				1									
C05		Pathoumphone	Pathoumphone						1		55	1	1	1	1.0				1									
C06		Champasack	Houygeun							Exist		1	1	1	1.0		1	1.0		1								Well Clean
C08		Khong	Naphang							JICA		1	1	1	2.5	1			1									Water pipe 300m
C09		Sanasomboum	Salow						1		50	1	1	1	1.0				1									
C10		Phonthong	Banphon						1		60	1	1	1	1.0				1									
C11		Phonthong	Kundchick							Exist		1	1	1	1.0		1	1.0		1								Water pipe (20m)
C12		Pathoumphone	Kaela						1		55	1	1	1	1.0				1									
C13		Phonthong	Phounthong							Exist		1	1	1	1.0		1	1.0		1								Water pipe(40m)
C16		Pakse	Phonsikai						1		50	1	1	1	1.0				1									
C17		Pakse	Nonesavang	○																								
C18		Sanasomboum	Selabom						1		50	1	1	1	2.5				1									Future use
C20		Pathoumphone	Nam-orm						1		55	1	1	1	1.0				1									
S01	Salavan	Salavan	Naxay							Exist		1	1	1	1.0	1			1									Casing protection needed
S02		Salavan	Beng Oudom	○	1	1																						Water pipe 500m
S03		Salavan	Kasa						1		50	1	1	1	1.0				1									
S04		Salavan	Nadonkhuand							Test		1	1	1	1.0				1									
S05		Salavan	Phakkaha						1		60	1	1	1	1.0				1									
S06		Salavan	Buongxay							JICA		1	1	1	2.5	1			1									
S07		Lakhonpheng	Dan Nalao						1		60	1	1	1	1.0				1									
S08		Lakhonpheng	Phonsung							Exist		1	1	1	1.0		1	1.0		1								Coliform
S09		Lakhonpheng	Lak 90						1		60	1	1	1	1.0				1									
S10		Lakhonpheng	Nadou Kao							Exist		1	1	1	1.0		1	1.0		1								Coliform
S11		Vapi	Khonsay						1		60	1	1	1	1.0				1									
S12		Vapi	Saphat	○																								
S13		Khongsedon	Tanpio	○																								
S14		Khongsedon	Thaluang							Exist		1	1	1	1.0		1	1.0		1								
S15		Khongsedon	Kenghuad	○	1																							Water pipe 200m
S16		Laongam	Nong Kae						1		80	1	1	1	1.0				1									
S17		Laongam	Dong Nhai						1		80	1	1	1	1.0				1									Future use
S18		Laongam	Vang Peui						1		80	1	1	1	1.0				1									
X01	Sekong	Dakchung	Dakdin				○	1						1	2.5	1			1		1	2.5	1	1	1	1	○	
X02		Dakchung	Tateu				○	1						1	1.0				1		1	1.0	1	1			○	
X03		Kaleum	Chalea				○	1						1	1.0				1		1	1.0	1	1			○	
X04		Kaleum	Paxay				○	1						1	1.0				1		1	1.0	1	1				Water pipe 300m
X05		Lamam	Donechan						1		60	1	1	1	1.0				1									
X06		Lamam	Phon	○																								
X07		Lamam	Tanum							Test		1	1	1	1.0				1									
X08		Tateng	Donsa							Exist		1	1	1	2.5	1			1									
X09		Tateng	Yup							Test		1	1	1	2.5	1			1									

2-2-2-5 Equipment Plan

(1) Type and Quantity of Equipment

Under this project, equipment will be procured in accordance with the standard equipment list that has been prepared by the MOH for the health centres.

(2) Addition and modification of Equipment

1) Microscope and its accessories

Regarding the microscopes and equipment that is required to perform laboratory testing with microscopes, a request was made in the technical notes to the Lao Ministry of Health to submit a target site list in the four target provinces in Southern Laos, reasons for the selection of the target sites and plans for training of laboratory technicians / deployment plans for target sites, etc. by July 2012. However, with the exception of Champasak Province, adequate answers could not be obtained for plans for training of laboratory technicians / deployment plans for target sites, etc. Therefore, in addition to the above content, health centres in remote areas where it is difficult to request provincial hospitals to perform tests were added / reviewed as priority items and selected as target sites.

2) Motorbike

In spite of the fact that each health centre is an outpost for outreach activities, they do not have any mode of transport to reach the neighboring villages. Therefore, plans have been made to provide each health centre with a local spec. motorcycle.

A scooter type off-road spec. motorcycle model that is used by many people locally and is rugged enough to last a long time was selected. This type of motorcycle features a fuel consumption of 20km/ℓ to 35km/ℓ. The motorcycle engine will have a displacement of 100cc or higher, and fuel consumption will most likely be worse since the motorcycles will be ridden on bad roads most of the time.

Furthermore, the average travel distance and number of times the motorcycles will be used per month in each province during outreach activities by the health centres are shown in Table 2-16 below: (As for the detail description of the outreach activities, please refer to Table 1-3 shown in Section 1-1-1-1 (2), Chapter 1)

Table 2-16 Average Travel Distance and Number of Times Motorbike Used per Month

Province Name	Fuel Consumption/Unit	Travel Distance/Unit	Times Used
Attapeu	20ℓ	400km	8 times
Champasak	35ℓ	700km	12 times
Salavan	20ℓ	400km	8 times
Sekong	30ℓ	600km	12 times

3) Drug refrigerators

Health centres need to have drugs on hand but are not able to do so since they do not have drug refrigerators which are required to store drugs at a low temperature. Plans call for the provision of drug refrigerators in order to strengthen the function of health centres to provide drugs to patients.

4) Instrument cabinets

Many compact medical instruments will be procured under this project, and placement of these medical instruments in a haphazard manner will result in them becoming unsanitary, posing a problem for conducting effective medical activities. Accordingly, plans call for the provision of instrument cabinets where all of the compact medical instruments can be stored.

5) Childbirth instrument sets (for birth assistance in home)

Due to the fact that 80% of vaginal births in local communities in Laos are home births, plans call for the provision of one set of childbirth instruments (contained in a backpack) to each of the health centres for use by the staff of the health centres to take with them to the expectant mother's home so that they can provide birth assistance.

6) Outreach backpacks

The staffs at the health centres need a stethoscope, blood-pressure gauge, weight scale and other medical instruments to conduct outreach activities. Plans call for the provision of outreach backpacks that contain these medical instruments which the staff can carry while riding the motorcycle to each village.

7) Lanterns

Due to the frequent power outages in Laos, plans call for the provision of lanterns for use in diagnosis and childbirth when power is interrupted at night.

8) Other items (table, chair, stools)

The existing desks and chairs at the health centres are extremely dilapidated, and represent a significant impediment to diagnosis and patient data record taking work. In addition, the health centres do not have stools, and patients are being diagnosed while standing. Since these items are indispensable for the health centres, plans call for the provision of these items to enhance the functionality of diagnosis and patient data record taking by the health centres.

9) Change from autoclave to dry heat sterilizer

Under this project, plans call for the provision of autoclaves which will be mainly used for

the sterilization of childbirth instrument sets in accordance with the standard equipment prescribed by the MOH. However, due to the fact it has been ascertained in water quality tests that the water at two of the target sites (A09 and S15) contains salt, and the use of water containing salt with autoclaves has an adverse impact on the boiler and may reduce the expected life of the unit, plans have been made to replace the autoclave with a dry heat sterilizer where water is not used for sterilization. Furthermore, the sterilization precision of a dry heat sterilizer compares favorably with an autoclave for use with childbirth instrument sets and other such items.

(3) Specification and Quality of Equipment

The results of the local survey have verified that the equipment list prepared by the MOH for the health centres contains the types of equipment that are required in each of the health centre rooms, and the equipment specifications are suitable for the standard of health care services that are to be provided by the health centres. In addition, it was determined that almost all of the medical equipment contained in the list that is available in the marketplace in Laos is imported, meaning that it is of adequate quality for use by the health centres. Furthermore, it was confirmed that a large portion of the beds, cabinets and other such items that are used at the health centres are produced in Laos, and are normally used at existing health centres, and therefore does not represent a problem of a substantial proportion in terms of quality.

Taking the above factors into consideration, the equipment that is to be procured under this Project shall satisfy the following standards:

- Equipment manufactured in accordance with CE, JIS, FDA and other international standards
- Equipment that is available domestically in Laos that has a track record of usage at health centres in the past
- Equipment that is imported into Laos that has a track record of usage at health centres in the past
- Equipment that has a track record of being adopted in Laos by WHO and other aid agencies

(4) Review of Equipment

With respect to the equipment that has been requested by the counterpart, the judgment was made that procurement of the equipment outlined in this section was appropriate under this project in addition to the nine items as a result of reviewing the standpoints of usage objective, technological level as well as maintenance and management.

The basic policy for equipment plans is described below:

< Existing Health Centres and District Hospitals >

1. Equipment indispensable for basic medical treatment
2. Equipment procured to update existing equipment
3. Equipment procured to supplement quantity of existing equipment
4. Equipment for which usage of existing equipment has been verified at existing similar facilities
5. Equipment for which operation, maintenance and management has definitely been implemented at existing similar facilities
6. Equipment that is being operated at the technological level of health care professionals at existing similar facilities

< Newly established Health Centres >

1. Equipment that is indispensable for basic medical treatment at existing similar facilities
2. Equipment for which usage of existing equipment at existing similar facilities has been verified
3. Equipment for which operation, maintenance and management has definitely been implemented at existing similar facilities
4. Equipment that is being operated at the technological level of health care professionals at existing similar facilities

Review Items

1. Review of usage objective: Required for maternal and child health care service activities.
2. Review of existing equipment: Existing equipment needs to be updated.
3. Equipment procured for technical cooperation project: Equipment that plans call for procurement under a technical cooperation project is excluded.
4. Review of technical level: Matches health centre activities / technical level.
5. Review of maintenance / management expenses: Required costs for operation, maintenance and management can be covered by provincial / district health service bureaus, health centres and communities.

Furthermore, with regard to the vaccine refrigerators which represent a major piece of equipment, almost all of the existing health centres have refrigerators of a newer model year. On the other hand, deployment plans have not been formulated yet for the health centres that are being newly established. According to the EPI Section at the Central MCH Centre, a deployment plan is to be formulated for the entire country of Laos under the National Immunization Program. However, almost all of the actual supply of equipment has been performed by UNICEF, and due to the fact that UNICEF does not have any plans to supply the

Southern portion of Laos with vaccine refrigerators in the future, as a basic rule, vaccine refrigerators will be supplied to the newly established health centres under this project. Furthermore, plans call for the procurement of DC type vaccine refrigerators for the health centres for which the utilization of solar power generation systems has been planned.

As a result of the above review, the lists of equipment that is to be procured under this Project for the target health centres and district hospitals are shown respectively in Table 2-17 and Table 2-18 below:

Table 2-17 Equipment Procured under this Project (HC)

OPD/Treatment Room		HC-21	Sphygmomanometer	Ward	
HC-1	Instrument Trolley	HC-22	Stethoscope for Fetus	HC-41	Bed
HC-2	Weighing Scale for Infant	HC-23	Exam'n Table for Gynecology	HC-42	IV stand
HC-3	Weighing Scale for Adult	HC-24	Desk	Laboratory	
HC-4	Sphygmomanometer	HC-25	Chair	HC-43	Microscope
HC-5	Stethoscope	HC-26	Vaccine Refrigerator (AC)	HC-44	Shallow Tray
HC-6	Tongue Depressor	HC-27	Vaccine Refrigerator (DC)	HC-45	Instrument Cabinet
HC-7	Thermometer	HC-28	Vaccine Bag for Outreach	HC-46	Drug Refrigerator
HC-8	Examination Table	HC-29	Round Chair	HC-47	Laboratory Instrument Set
HC-9	Dirty Plate	Pharmacy/Accounting		HC-48	Rack for Slide
HC-10	Treatment Instrument Set	HC-30	Desk	HC-49	Blood Cell Counter (manual)
HC-11	Instrument Cabinet	HC-31	Chair	HC-50	Box for Slide
HC-12	Kidney Dish	HC-32	Drug Cabinet	HC-51	Pipette
HC-13	Boiling Sterilizer	HC-33	Shelf for Documents	HC-52	Pipette
HC-14	Examination Light	Delivery Room		For Outreach Activities	
HC-15	Hand Light	HC-34	Instrument Trolley	HC-53	Motorcycle
HC-16	Desk	HC-35	Delivery bed	HC-54	Stethoscope
HC-17	Chair	HC-36	Delivery Instrument Set/ HC	HC-55	Thermometer
HC-18	Lantern	HC-37	Autoclave	HC-56	Thermometer
HC-19	Round Chair	HC-38	Dry Heat Sterilizer	HC-57	Back Pack for Outreach
Women's Consultation Room		HC-39	Delivery Light	HC-58	Weighing Scale for Adult
HC-20	Thermometer	HC-40	Delivery Instrument Set/ Home	HC-59	Sphygmomanometer

Table 2-18 Equipment Procured under this Project (DH)

MCH		**Delivery Room**	
DH-1	Examination Table	DH-8	Delivery Table
DH-2	Examination Table for Gynecology	DH-9	Delivery Instrument Set for Hospital
DH-3	Sthethoscope	DH-10	Delivery Light
DH-4	Sphygmomanometer	DH-11	IV stand
DH-5	Vaccine Bag for Outreach	DH-12	Autoclave
DH-6	Thermometer		
DH-7	Vaccine Refridgerator（AC)		

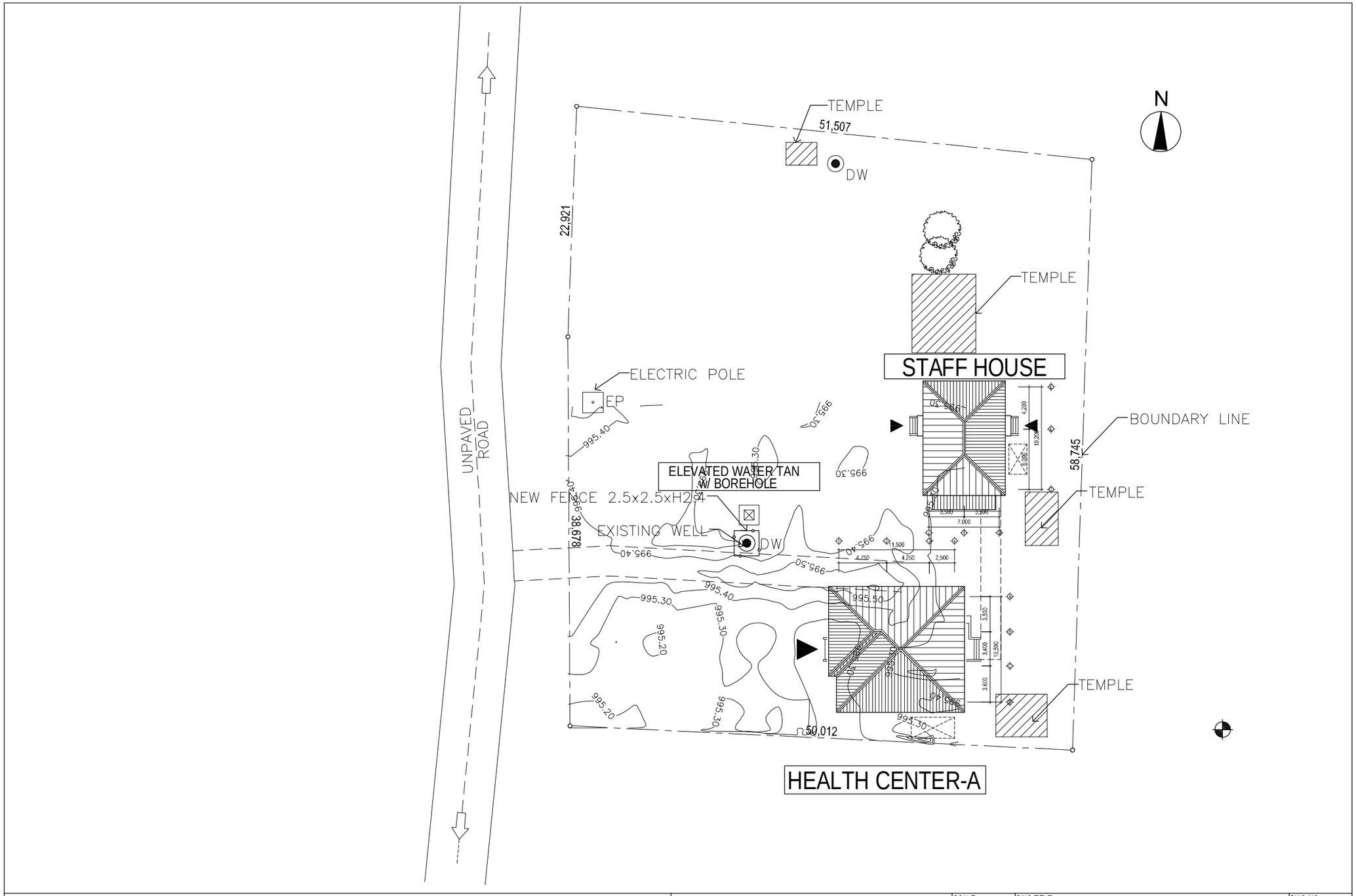
(5) Equipment Transport Plan

Due to the fact that international bids for which the country of origin is not specified will be

submitted for this Project, the equipment which comes from various countries will be amassed in Vientiane which is the capital of Laos. Following checking of the equipment in Vientiane, they will be sorted into lots for each site and transported to the sites by truck.

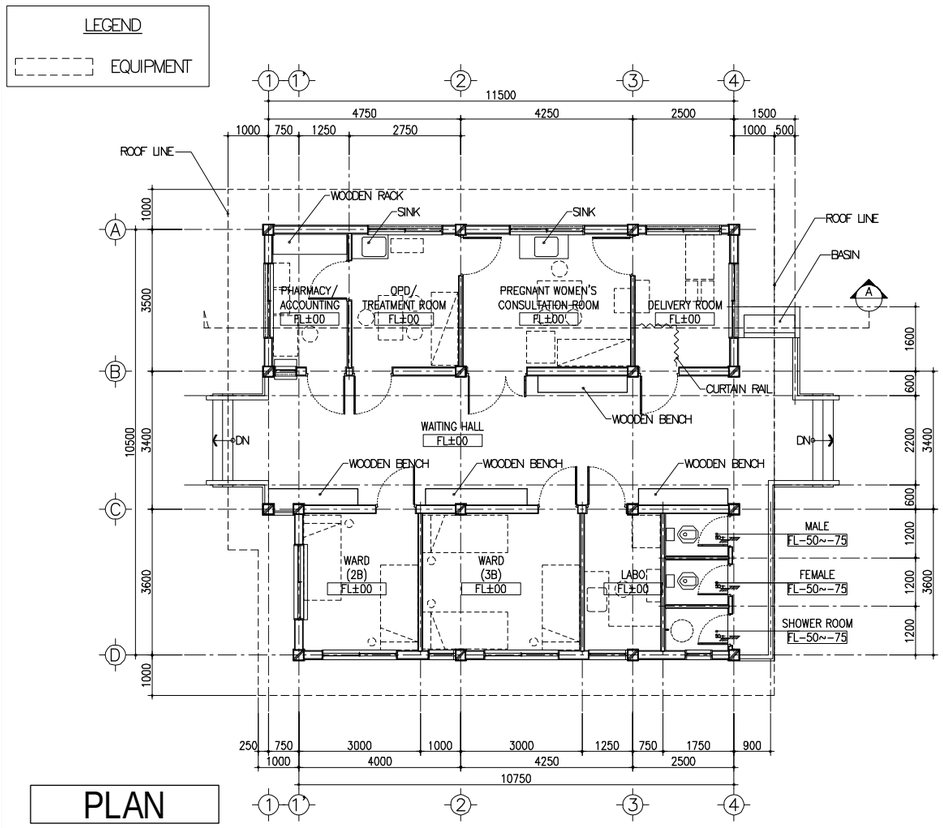
2-2-3 Outline Design Drawings

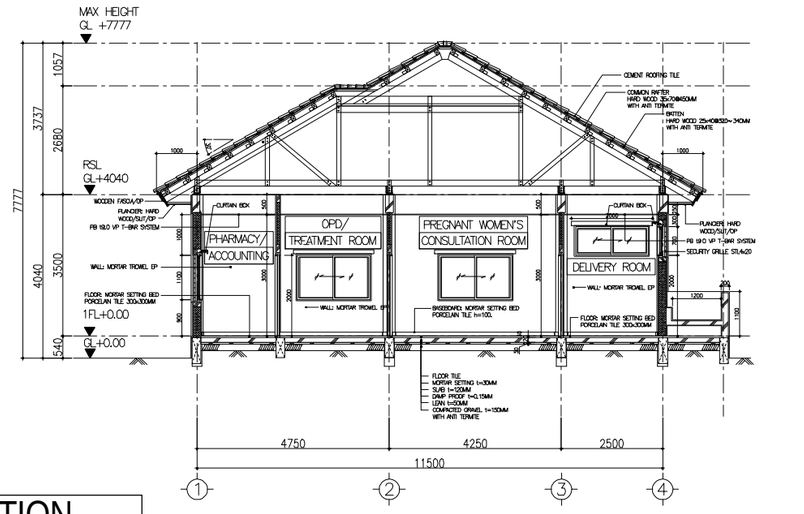
As for the outline design drawings, please refer to Figure 2-6 ~ Figure 2-10 shown hereinafter:



PROJECT TITLE	GENERAL NOTE	SCALE	DWG TITLE	DWG NO
THE PROJECT FOR STRENGTHENING HEALTH SERVICE NETWORK IN SOUTHERN PROVINCES IN LAO P.D.R.		1/400	HEALTH CENTER TYPE-A STAFF HOUSE LAYOUT	A-00-G

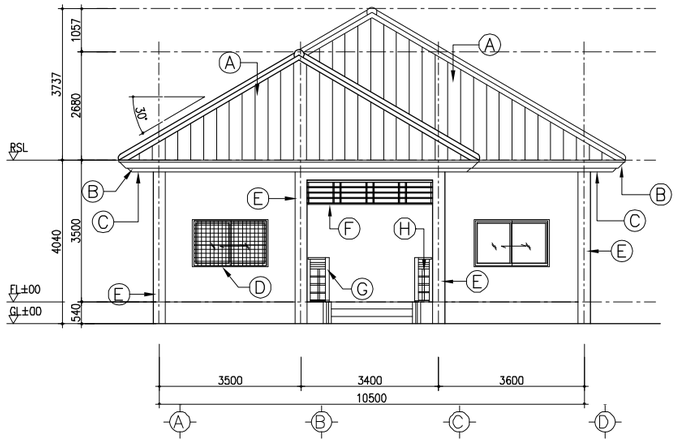
Figure 2-6: A-00-G Site Layout Plan (Sample)

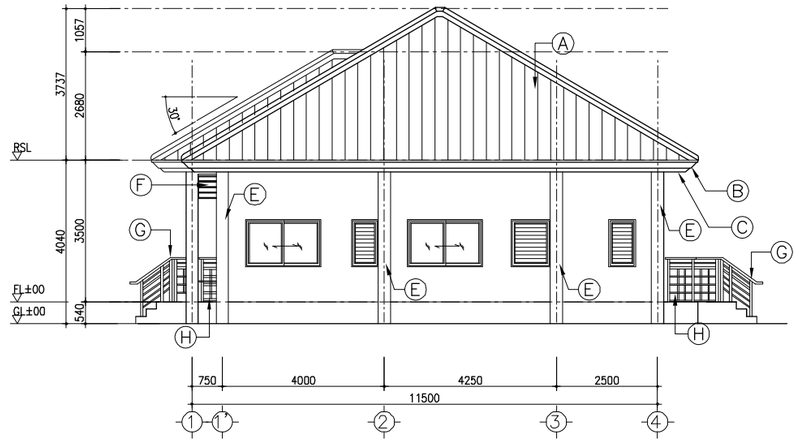




SECTION

NO.	MATERIAL/FINISH
A	CEMENT ROOFING TILE
B	FASCIA: HARD WOOD/OP
C	PLANCIER: HARD WOOD/SLIT/OP
D	SECURITY GRILLE: STEEL/OP
E	MORTAR TROWEL + ACRYLIC EMULSION RESIN PAINT (AEP)
F	HARD WOOD LOUVER/OP (SEE: DT-10)
G	HANDRAIL/OP (SEE: DT-8)
H	HANDRAIL/OP (SEE: DT-12)
I	VENTILATION BLOCK (SEE: DT-2)

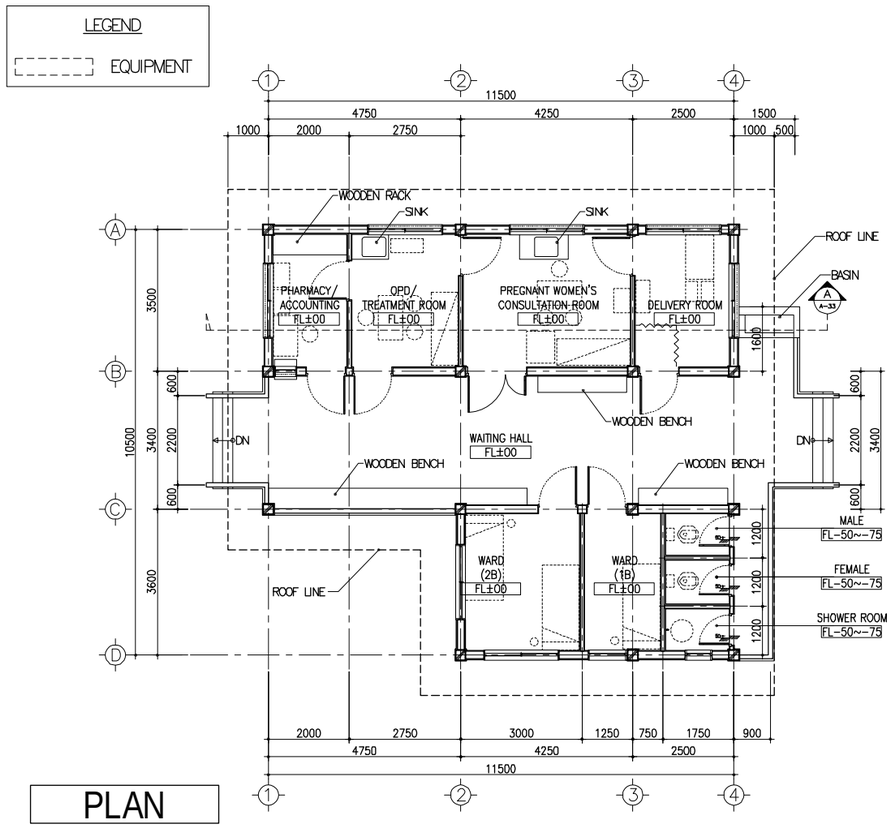


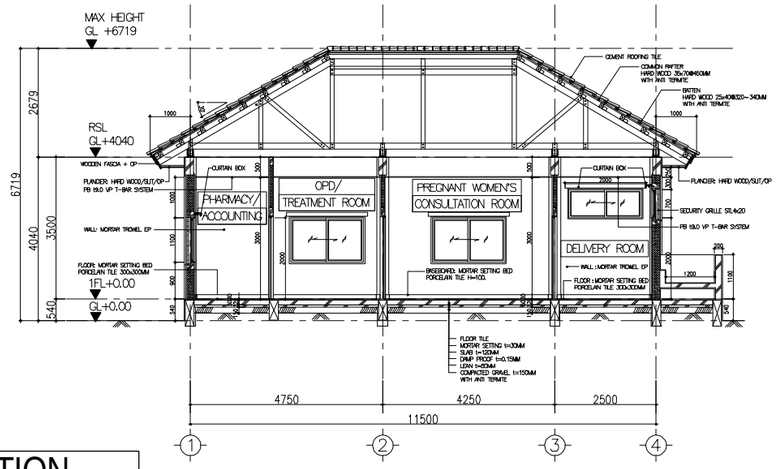


ELEVATION

PROJECT TITLE	GENERAL NOTE	SCALE	DWG TITLE	DWG NO
THE PROJECT FOR STRENGTHENING HEALTH SERVICE NETWORK IN SOUTHERN PROVINCES IN LAO P.D.R.		1/150	HEALTH CENTER TYPE-A PLAN, ELEVATION & SECTION	A-01

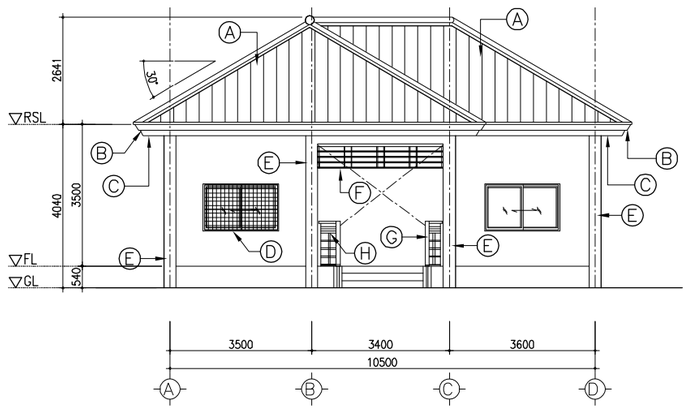
Figure 2-7: A-01 Health Centre Type A

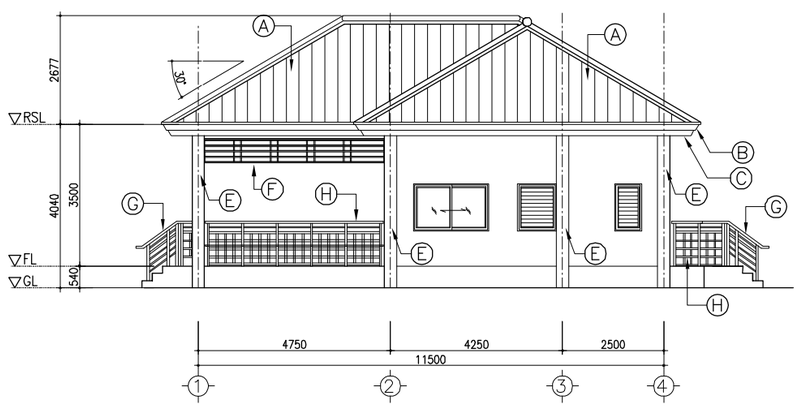




SECTION

NO.	MATERIAL/FINISH
A	CEMENT ROOFING TILE
B	FASCIA: HARD WOOD/OP
C	PLANCIER: HARD WOOD/SLIT/OP
D	SECURITY GRILLE: STEEL/OP
E	MORTAR TROWEL + ACRYLIC EMULSION RESIN PAINT (AEP)
F	HARD WOOD LOUVER/OP (SEE: DT-10)
G	HANDRAIL/OP (SEE: DT-8)
H	HANDRAIL/OP (SEE: DT-12)
I	VENTILATION BLOCK (SEE: DT-2)

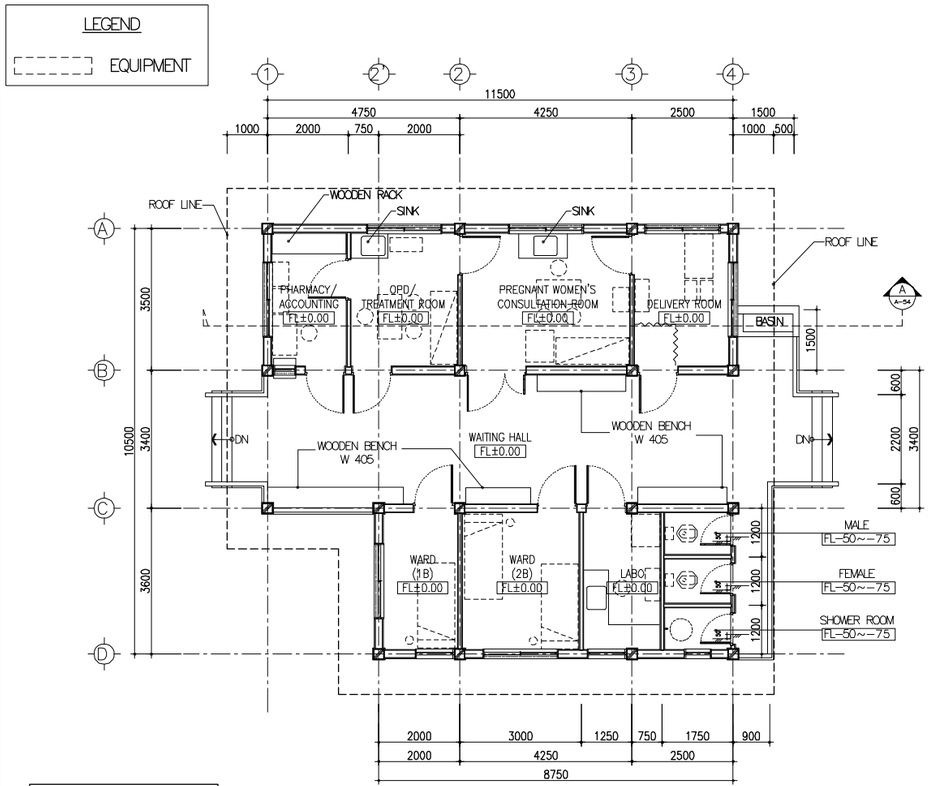


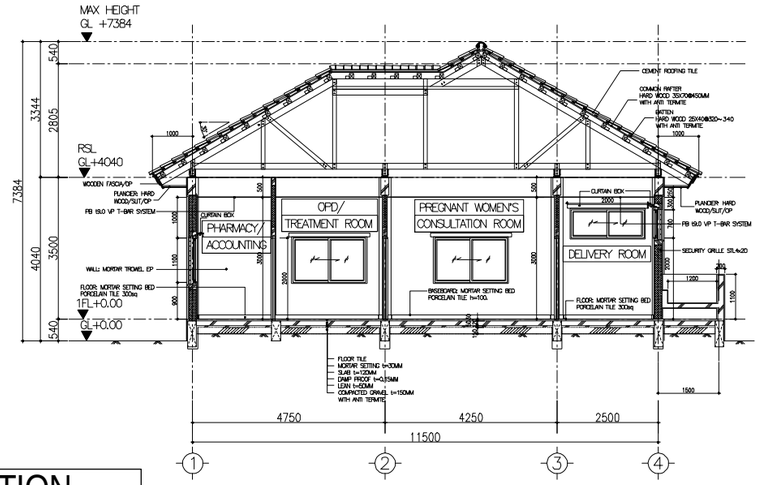


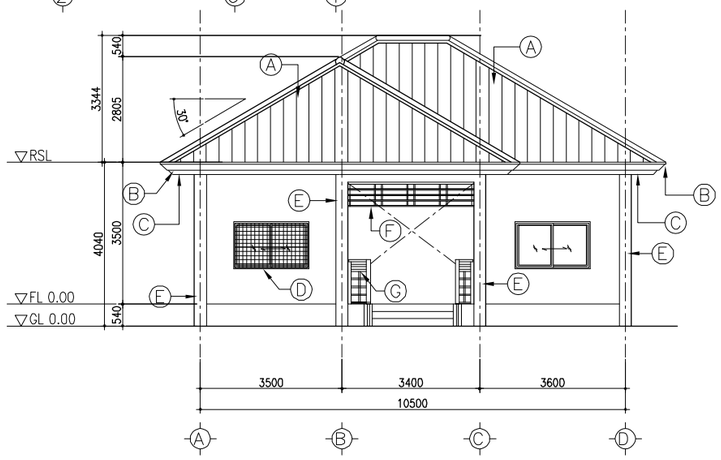
ELEVATION

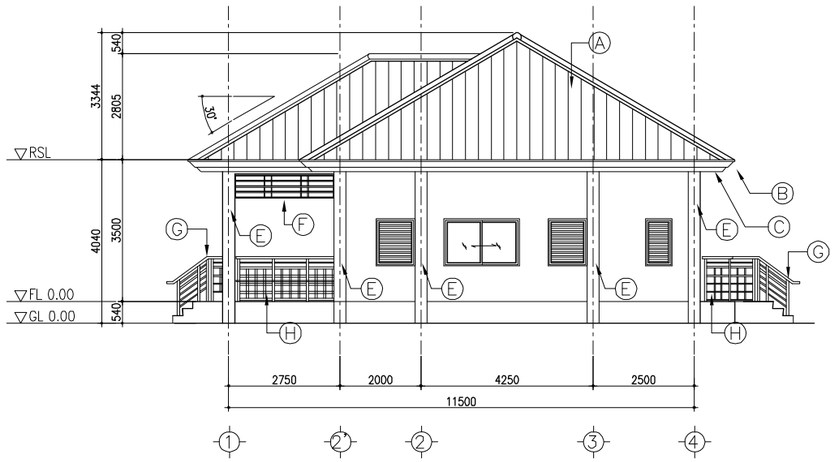
PROJECT TITLE	GENERAL NOTE	SCALE	DWG TITLE	DWG NO
THE PROJECT FOR STRENGTHENING HEALTH SERVICE NETWORK IN SOUTHERN PROVINCES IN LAO P.D.R.		1/150	HEALTH CENTER TYPE-B PLAN, ELEVATION & SECTION	A-02

Figure 2-8: A-02 Health Centre Type B









NO.	MATERIAL/FINISH
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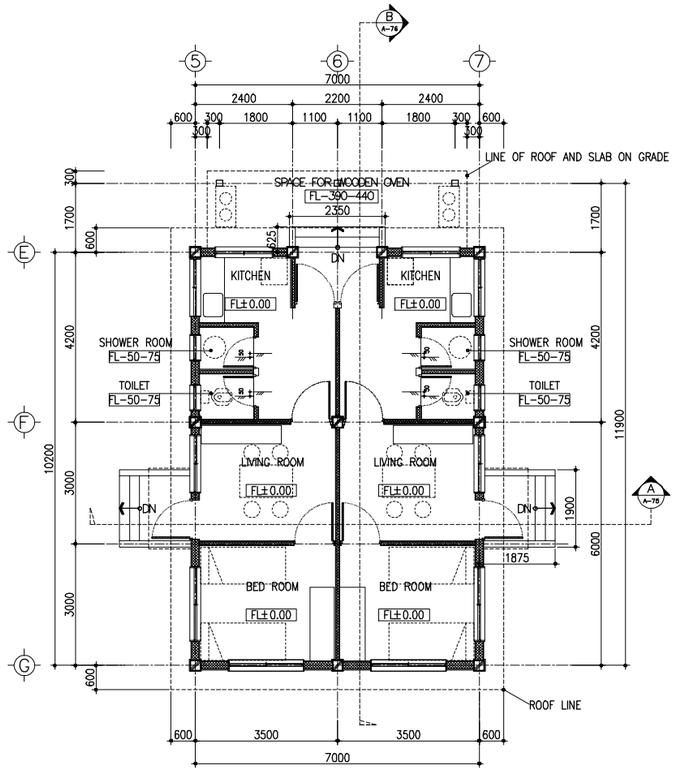
B	FASCIA: HARD WOOD/OP
C	PLANCIER: HARD WOOD/SLIT/OP
D	SECURITY GRILLE: STEEL/OP
E	MORTAR TROWEL + ACRYLIC EMULSION RESIN PAINT (AEP)
F	HARD WOOD LOUVER/OP (SEE: DT-10)
G	HANDRAIL/OP (SEE: DT-8)
H	HANDRAIL/OP (SEE: DT-12)
I	VENTILATION BLOCK (SEE: DT-2)

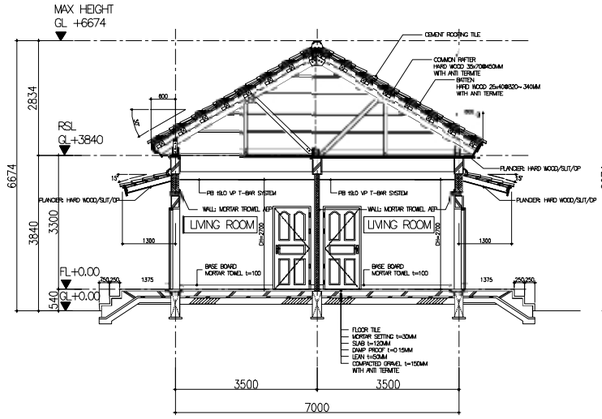
ELEVATION

PROJECT TITLE	GENERAL NOTE	SCALE	DWG TITLE	DWG NO
THE PROJECT FOR STRENGTHENING HEALTH SERVICE NETWORK IN SOUTHERN PROVINCES IN LAO P.D.R.		1/150	HEALTH CENTER TYPE-B' PLAN, ELEVATION & SECTION	A-03

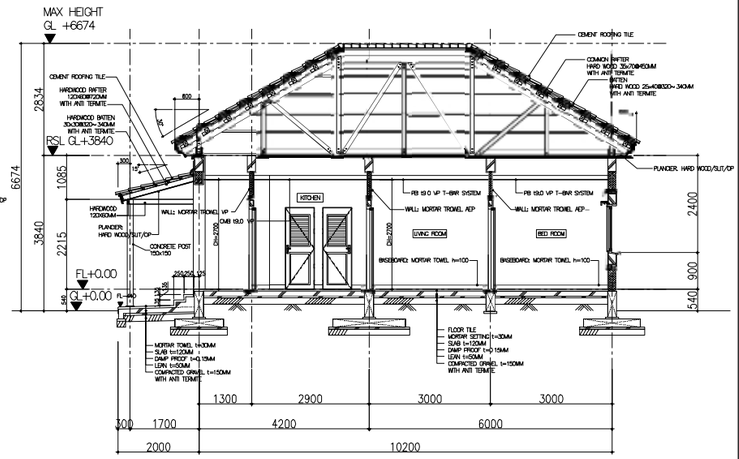
Figure 2-9: A-03 Health Centre Type B'



PLAN



SECTION



NO.	MATERIAL/FINISH
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C	PLANCIER: HARD WOOD/SLIT/OP
D	SECURITY GRILLE: STEEL/OP
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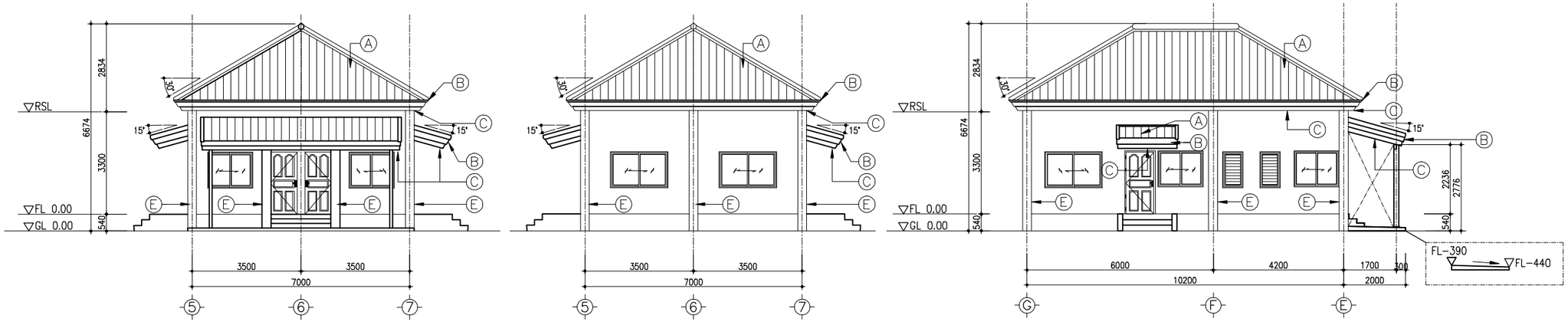
F	HARD WOOD LOUVER/OP (SEE: DT-10)
G	HANDRAIL/OP (SEE: DT-8)
H	HANDRAIL/OP (SEE: DT-12)
I	VENTILATION BLOCK (SEE: DT-2)



ELEVATION

PROJECT TITLE	GENERAL NOTE	SCALE	DWG TITLE	DWG NO
THE PROJECT FOR STRENGTHENING HEALTH SERVICE NETWORK IN SOUTHERN PROVINCES IN LAO P.D.R.		1/150	STAFF HOUSE PLAN, ELEVATION & SECTION	A-04

Figure 2-10: A-04 Staff House

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

(1) Project Implementation through Procurement Management Method

This Project will be implemented through a procurement management method, in which the procurement and supervision of products and services, fund management and construction of facilities will be carried out by a Procurement Agent. The Procurement Agent is a project implementation organization which will implement this Project on behalf of the Government of the Lao PDR and undertake the fund management, various types of procurement, and supervision of project implementation. The Procurement Agent undertaking these works for this Project will be Japan International Cooperation System (JICS), which is the only Procurement Agent of Japan.

This Project will be implemented after conclusion of the Exchange of Notes (E/N) between the two Governments and the Grant Agreement (G/A) between JICA and the Lao Government following the decision made by Cabinet meeting. And thereafter, the Government of the Lao PDR will enter into a Procurement Management Contract with the Japanese Procurement Agent in accordance with the Agreed Minutes (A/M) attached to the E/N.

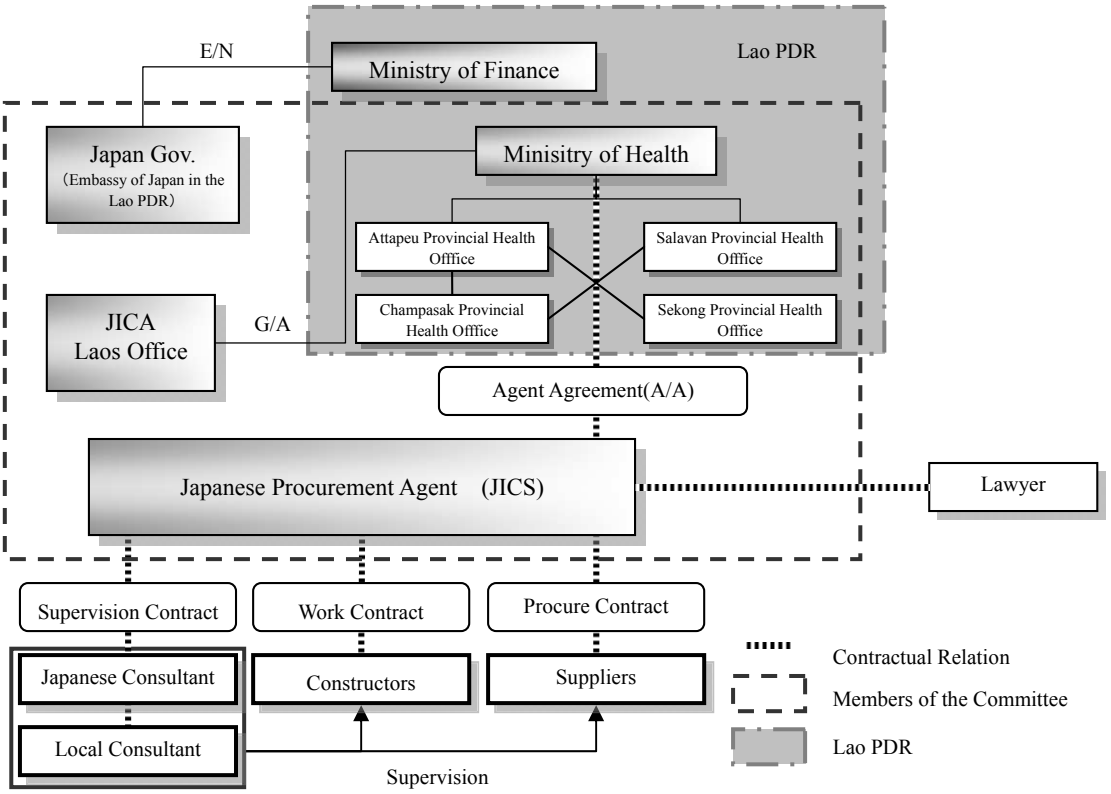


Figure 2-11 Organizational Chart for this Project (draft)

(2) Committee

The Committee will be formed after conclusion of the E/N. The Committee will consist of the Government of Lao PDR, the Japanese Embassy in Laos and JICA, and the Procurement Agent (JICS) that will participate in the Committee as an adviser. The Committee will discuss and coordinate various problems that may arise during the implementation of this Project. And, since many of the projects site are located in remote area, sub-committee shall be established for monitoring of the implementation of the Project, if so required

(3) Procurement Agent

The Procurement Agent is appointed on behalf of the Recipient in order to carry out various affairs as to the procurement services of the facilities, equipment and services including fund management, preparation of tender and contract award for the procetss to be implemented under Japan's GACE.

The Procurement Agent is a fair and square specialized agent to provide services in accordance with terms and conditions specified in the Agreement to be concluded with the Recipient that is recommended by the Government of Japan and agreed in the Agreed Minutes (A/M) to be concluded between governing agencies of both govenments.
The Procurement Agent will handle the fund management and various types of procurement such as lawyer, consultant, contractors and suppliers, and manage the implementation of the Project as a whole.

The planned personnel assignment of the Procurement Agent is as shown in Table 2-19 below:

Table 2-19 Planned Personnel Assignment of the Procurement Agent

Assigned Personnel		Role
Japanese	Project Manager	The Project Manager will manage all the undertakings of the Procurement Agent and will be dispatched to Laos at the time of the tender and the completion/handover of the Project
	Assistance Manager	The Assistant Manager will be stationed in Laos as the responsible person on behalf of the Procurement Agent during the tender work period and during the construction stage.
	Support Staff 1	The personnel will work in Japan to prepare the tender documents for the construction of facilities and the procurement of equipment and materials
	Support Staff 2	The personnel will work in Japan to prepare the tender documents for the construction of wells for Batch 1.
	Support Staff 3	The personnel will work in Japan to manage work related to contracts with contractors and suppliers, payments and fund control.
Local Employees	Clerk	Clerk will be assigned and stationed at Management Office during entire period of this Project to carry out required clerical works.
	Office Boy	Office boy will be assigned and stationed at Management Office during entire period of this Project to carry out required office duties.
	Driver	Driver will be assigned for Assistant Manager.

(4) Consultant

The Consultant will be employed by the Procurement Agent using the grant provided to the

Recipient by the Government of Japan in order to assist the Procurement Agent in the process of the tenders and supervison of the works for the Project. In principle, the Consultant shall be the Japanese consulting firm who has carried the Preparatory Survey of the Project following the recommendation of JICA.

The roles of the Consultant are as described below:

< Tender Stage >

- Implementation of site surveys at all the project sites in order to confirm the Project can be started at each project site
- Preparation of the detailed design drawings, specifications and bill of quantities with summary of project cost estimation
- Provision of assistance in the technical aspects of the tender document to be prepared by the Procurement Agent
- Provision of assistance in the technical aspects of the tender, tender evaluation and contract negotiations to be carried out by the Procurement Agent

< Construction Supervision Stage >

- Visit sites to inspect the quality of work as stated in the tender document, compliance with the work schedule and safety control, and submission of monthly reports on those items to the Procurement Agent
- Inspection of the progress of the work and work completed whenever the contractor requests payment, and reporting of the results to the Procurement Agent
- Implementation of the final inspection and reporting of the results to the Procurement Agent
- Implementation of a warranty inspection one year after project completion and report to the Procurement Agent

The Japanese Consultant will be the prime-consultant of the Procurement Agent and will utilize a local consultant firm as sub-consultant in order to provide supervisory services for all construction works of the Project.

The construction supervision system will be established by setting up construction supervision office in Pakse in Champasak Province to manage the supervision work in all project sites of four (4) provinces. The supervision at each site will be done by setting up a construction supervision base in accordance with the requirement for each contract lot.

The proposed structure for the provision of the supervisory services by the Consultant is as shown in Figure 2-12 below and the planned personnel assignment of the Consultant is as shown in Table 2-20 below:

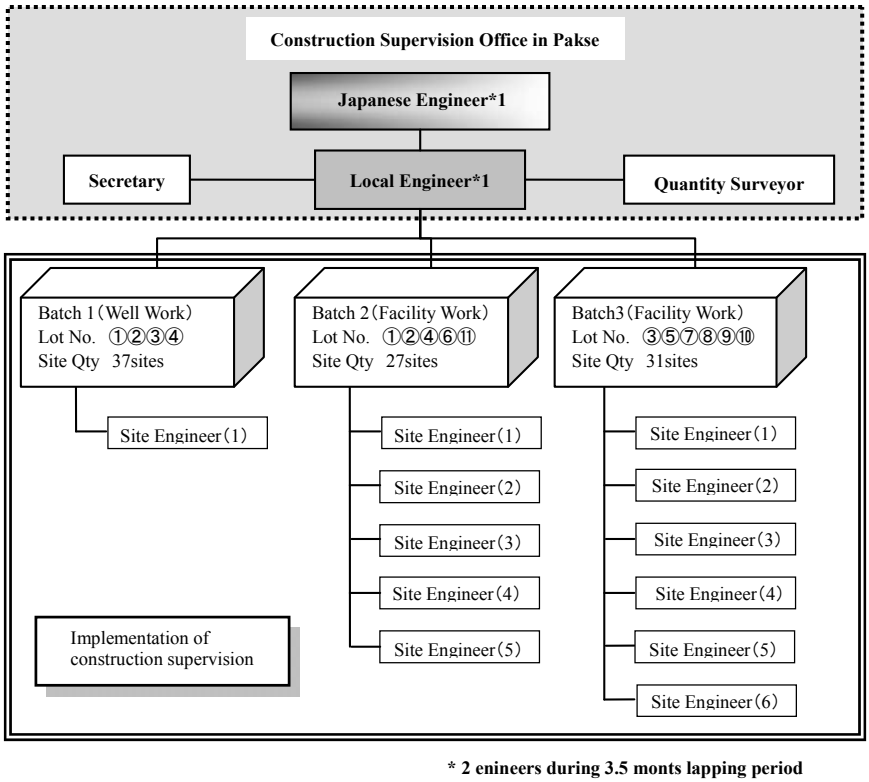


Figure 2-12 Proposed Structure for Consultant's Supervisory Services

Table 2-20 Planned Personnel Assignment of the Consultant

Assigned Personnel		Role
Japanese Consultant	Japanese Engineer 1 (In charge of Tender)	Control and management of all the duties of the Consultant and handling of tender works.
	Japanese Engineer 2 (In charge of Tender)	To be stationed in Japan to assist Japanese Engineer 1 and handle questionnaires.
	Japanese Engineer3 (In charge of Supervision)	To be stationed at Head Quarter as consultant's representative from the start of construction works to the completion of the works for batch 2; and to carry out completion inspection and warranty inspection after one year.
	Japanese Engineer 4 (In charge of Supervision)	To be stationed at Head Quarter as consultant's representative from the start of construction works to the completion of the works for batch 3; and to carry out completion inspection and warranty inspection after one year.
	Japanese Engineer 5 (In charge of Supervision)	To control and manage tender works for Batch 1 (well construction works for contract lot No.1) and visit and supervise the sites for Batch 1 in terms of quality, schedule and safety; and to carryout completion inspection.
	Japanese Engineer 5' (In charge of Supervision)	To control and manage tender works for Batch 1 (well construction works for Contract lot No.2) and visit and supervise the sites for Batch 1 in terms of quality, schedule and safety; and to carryout completion inspection.
	Japanese Engineer 6 (In charge of Supervision)	To assist Engineer 1 in handling of questionnaires in M&E works and to supervise its works during supervision period.
	Japanese Engineer 7 (In charge of Equipment)	To control and manage tender works for equipment procurement for Batch 2; and to carry out completion inspection and warranty inspection after one year.
	Japanese Engineer 8 (In charge of Equipment)	To control and manage tender works for equipment procurement for Batch 3; and to carry out completion inspection and warranty inspection after one year.

Assigned Personnel		Role
	Japanese Engineer 9 (In charge of Estimate)	To be stationed in Japan to assist Japanese Engineer 1 and to review BOQ of the tender.
Local Consultant	Chief Engineer (Head Quarter)	To assist Japanese Engineer 1 during the tender period as well as Japanese Engineers 3 and 4 during warranty inspections; and to be stationed at Head Quarter during the period of construction work supervision, in charge of the site engineers.
	Assistant Chief Engineer (Head Quarter)	To be stationed at Head Quarter during the period of construction work supervision, in charge of the site engineers.
	Site Engineer (Batch 1, Lot 1 ~ 4)	To visit and supervise the sites for Batch 1n terms of quality, schedule and safety.
	Site Engineer (Batch 2, Lot 1 ~ 5)	To visit and supervise the sites for Batch 2 n terms of quality, schedule and safety.
	Site Engineer (Batch 3, Lot 6 ~ 11)	To visit and supervise the sites for Batch 3 in terms of quality, schedule and safety.
	Quantity Surveyor1 (Head Quarter)	To assist Japanese Engineer 1 during the tender period, undertaking the preparation of tender documents, tender evaluation, and price and contract negotiations. Also to be stationed at Head Quarter during the period of construction work supervision to check the work done for each contract lot.
	Driver (Batch 1)	Driver will be assigned for Japanese Engineer 5.
	Driver (Batch 2)	Driver will be assigned for Japanese Engineer 3.
	Driver (Batch 3)	Driver will be assigned for Japanese Engineer 4.
	Clerk	Clerk will be assigned and stationed at Head Quarter during entire period of this Project to carry out required clerical works.
	Office Boy	Office boy will be assigned and stationed at Head Quarter during entire period of this Project to carry out required office duties.

Number of boreholes for the Project is planned to be 35 in totals i.e. 28 successful wells and anticipated 7 failed wells. According to the record of the test borehole implemented during the additional survey from October 2012, it took a month to drill four (4) successful boreholes with one drilling rig. So, it is assumed that more than seven (7) months will take to complete drilling of 28 successful boreholes in case it is implemented as one only contract lot which will hinder the smooth commencement of the facilities construction works for Batch 2 and Batch 3. Thus, the well construction works are planned to be implemented by two (2) contract lots and it is planned to supervise the said well construction works by two (2) Japanese engineers to manage pumping test for each well to be constructed.

(5) Contractor (building facilities and well)

The Contractor for the facilities construction and well construction shall be selected from the contractors in Laos through competitive tenders to be handled by the Procurement Agent and thereafter the construction works shall be carries out in accordance with the Contract Documents.

(6) Plaque Supplier

The Supplier for the plaque shall be selected from the specialized suppliers of signages, billboards etc. in Laos or from neigbouring countries through competitive tenders to be handled

by the Procurement Agent and thereafter the plaques shall be procured in accordance with the Contract Documents.

(7) Equipment/ and Furniture Supplier

The Supplier for the equipment and furniture shall be selected from the suppliers in Laos through competitive tenders to be handled by the Procurement Agent and thereafter the equipment and furniture shall be procured in accordance with the Contract Documents.

(8) Lawyer

A legal advisor from law firm may be appointed in order to check the details of various contracts and agreements and to handle possible actions and disputes. The lawyer acting as a legal advisor for the Project shall be selected from law firms in Laos that have experiences in handling the similar projects implemented by other donors.

2-2-4-2 Considerations for Construction and Procurement

(1) Adjustment of Components for the Project

At the implementation stage, it may be necessary to reduce the number of health centre and/or components to be constructed and/or installed due to fluctuation of the currency rate or a sharp price rise of construction materials. In this Project, the health centres and other components are divided into SOW-I and SOW-II according to the priority ranking of the facilities to be provided under this Project. Thus, health centres and/or other components with lower priority for Batch 3 may have to be excluded from the Project in order to adjust the project cost, if it becomes necessary.

(2) Tender and Contract award

A series of procedures to be taken from the time of tender notice to the time of awarding the contract by the Procurement Agent shall be in accordance with the ones commonly accepted and practiced in the Lao PDR.

In addition, it is essential that the Procurement Agent to support MOH appropriately since this Project is a first one to be implemented as GACE for the health sector in the Lao PDR.

(3) Principal Qualifications for Tender

It is planned to set the conditions that only local companies registered with Department of Housing and Urban Planning (DOHUP), Ministry of Public Works and Transport (MOPWT) can participate in the tenders for this Project so as to select sound and reliable local contractors. And, with regard to the well construction contractors and equipment suppliers, it is planned to set a similar conditions.

1) Contractor should be registered with Department of Housing and Urban Planning (DOHUP) of Ministry of Public Works and Transport (MOPWT) (for building facilities construction works only)

2) Tender amount should be less than half of average annual contract amounts for past five (5) years (for building facilities construction works only)

3) Corporation or individual person having experience(s) in facilities construction/well construction and equipment procurement of the public works of the Lao PDR or under the international cooperation projects of Japan

4) Corporation or individual person who can submit bank security specified in the tender documents

5) Corporation or individual person having engineers, construction equipment and track records specified in the tender documents

6) Domestic company established following the Organization Acts (company law) of Lao PDR

(4) Payment Method

Because a method to pay every month to the contractor by submitting a summary of construction volume for each work item executed for a corresponding month is widely adopted in Laos, the payment to the contractor(s) procured for this Project shall also be made by means of monthly progress payment.

Prime Consultant will assess the summary of construction volume for each work item executed for the month for each contract lot submitted by the contractor(s) and report its assessment result to the Procurement Agent, and having received approval, the payment to the contractor(s) will be made. And the final payment will be made after completing all remedial works pointed out during the final inspection conducted by the Consultant.

(5) Measures for Asbestos

Building materials which contains asbestos shall not be used for building facilities to be constructed under this Project. And, in order to do so, the Prime Consultant will let the contractor(s) to instruct the suppliers not to supply asbestos contained materials beforehand and it will be confirmed before use on site.

2-2-4-3 Scope of Works

For the implementation of the Project, the Government of Japan and the Recipient shall be

responsible for the procurement of the Project components as shown in Table 2-21 below:

Table 2-21 Major Undertakings to be borne by Each Government

Item	To be covered by Grant Aid	To be covered by Recipient Side
Facilities	・HC including septic tank ・SH including septic tank ・Water supply system including construction of wells ・PV system	・Securing sites ・Site clearance including cutting of trees and uprooting ・Power and water connection ・Other ancillary facilities (fence, etc.)
Equipment	・Procurement for 67 HCs ・Procurement for 9 DHs	・Equipment, furniture etc. which will not be covered by Grant Aid

2-2-4-4 Construction and Procurement Supervision

In this Project, the facilities construction works for many target sites have to be completed simultaneously within the limited time period. And therefore, it is quite important to provide appropriate construction and procurement supervision through minute reports and discussions with the Procurement Agent (JICS) and the Executing and Implementing Agencies i.e. Department of Health Care, MOH and PHOs as well as giving timely and appropriate instructions and guidance to the contractors.

Japanese consultants having experiences of on-site construction management will be placed in Lao PDR as resident engineers will supervise the construction works and carry out schedule and quality control for the Project with local chief engineer and site engineers. In addition, the Japanese consultants will collect all relevant monitoring information, prepare various reports and submit the progress report regularly to the Procurement Agent (JICS), as well as Department of Health Care of MOH and PHOs in four (4) southern provinces, if so required.

2-2-4-5 Quality Control Plan

Quality control will be carried out in accordance with the Tender Documents and the Consultant's construction supervision plan; such as reviewing and/or approval of the work plans, shop drawings, mock-ups and samples of materials as well as conducting various on-site and off-site laboratory tests and inspections including periodical site inspection at each work site. The main items of quality control for the structural work are as shown in Table 2-22 below:

Table 2-22 Main Items of Quality Control for the Structural Work (draft)

Work Item and Quality Control Item		Inspection Method	Frequency
Well construction	Confirmation of depth	Measurement	Upon completion
Earth work	Bottom of excavation	Visual inspection	Upon completion
Re-bar work and formwork	Materials	Collation and confirmation of mill-certificate	Every lot Every size
	Re-bar arrangement	Inspection on site	Prior to casting concrete
	Formwork	Inspection on site	Prior to casting concrete

Work Item and Quality Control Item		Inspection Method	Frequency
Concrete work	Materials	Cement: Quality Aggregate: Distribution of size	At the time of deciding mix proportion
	Trial mix	Compressive lest of test cube	Once per every lot
	Casting	Compressive lest of test cube	5 times per site per every lot
Carpentry work	Materials	Materials test such as bolts	Prior to assembling

2-2-4-6 Procurement Plan

All the equipment and materials required for this Project can basically be procured within the country of Laos, though some construction materials such as cement roofing tiles will be originally from neighboring countries such as Thailand.

And, as for the medical equipment, they are always in circulation in Laos although they are imported; thus, medical equipment required for this Project can also be procured within the country of Laos.

The countries of procurement and the countries of origin of the building materials and equipment and medical equipment and furniture are as shown in Table 2-23 and Table 2-24 below respectively:

Table 2-23 Countries of Procurement of Building Materials and Equipment

Materials and Equipment	Source of Procurement			Remarks
	Laos	Japan	Others	
Portland cement	○			Local and Imports from Thailand
Aggregate for concrete	○			
Reinforcing bars	○			Local and Imports from Thailand
Structural steel	○			Local and Imports from Thailand
Formwork materials	○			
Perforated blocks	○			
Bricks	○			
Cement roof	○			Imports from Thailand
Timber	○			
Joinery fittings/ hardware	○			Imports from Thailand
Wooden doors	○			
Aluminum windows	○			Imports from Thailand
Paints etc.	○			Imports from Thailand
Furniture	○			
Distribution panels etc.	○			Imports from Thailand
Wires and cables	○			Imports from Thailand
Conduit pipes	○			Imports from Thailand
Light fittings	○			Imports from Thailand
Pipes and accessories	○			Imports from Thailand
Valves and pipe fittings	○			Imports from Thailand
Photovoltaic (PV) system	○			Imports from Thailand or Germany
Submersible pumps	○			Imports from Thailand
Ratio (%)	100%	0%	0%	

Table 2-24 Countries of Procurement of Medical

Materials and Equipment	Source of Procurement			Remarks
	Laos	Japan	Others	
Autoclave	○			
Dry Heat Sterilizer	○			
Boiling Sterilizer	○			
Vaccine Refrigerator (AC)	○			
Vaccine Refrigerator (DC)	○			
Drug Refrigerator	○			
Examination Light	○			
Delivery Light	○			
Microscope	○			
Laboratory Instrument Set	○			
Stethoscope for Fetus	○			
Sphygmomanometer	○			
Stethoscope	○			
Tongue Depressor	○			
Thermometer	○			
Weighing Scale for Infant	○			
Weighing Scale for Adult	○			
Treatment Instrument Set	○			
Delivery Instrument Set/ HC	○			
Delivery Instrument Set/ Home	○			
Dirty Plate	○			
Kidney Dish	○			
Shallow Tray	○			
Pipette	○			
Examination Table	○			
Delivery bed	○			
Exam'n Table for Gynecology	○			
Bed	○			
Instrument Trolley	○			
Instrument Cabinet	○			
Drug Cabinet	○			
Shelf for Documents	○			
IV stand	○			
Rack for Slide	○			
Box for Slide	○			
Blood Cell Counter (manual)	○			
Hand Light	○			
Desk	○			
Chair	○			
Round Chair	○			
Vaccine Bag for Outreach	○			
Back Pack for Outreach	○			
Lantern	○			
Motorcycle	○			
Ratio (%)	100%	0%	0%	

2-2-4-7 Initial Operation Guidance

Because there is no equipment requires provision of the initial operation guidance by the expert, the initial operation guidance will not be planned for the equipment to be procured under this Project.

2-2-4-8 Soft-component Works

The residents' awareness-raising for health, the reduction of the financial barrier and improvement of accessibility can be considered as factors to promote the use of the health facilities by residents. As the support measures to facilitate the use of the health centres, the following three (3) points are assumed to be considered. However, since these points are already covered by JICA Technical Cooperation Projects and within the operational structure being established by the Recipient, it is judged that the implementation of the soft-component works especially health planning is not necessary for this Project.

(1) Health promotion in the Community

The project has been implementing the activities such as information sharing about MNCH services with the provincial/district health offices and mass organizations including the Lao Women's Union and the Lao Youth Organization and regular health education activities/events in order to enhance mobilization of community people for the MNCH services in collaboration with various organizations. For example, many pregnant women of the target villages came to the health facilities to receive antenatal care after the project held a health promotion day.

(2) Improvement of Monetary Access of Residents

Charge-free of the maternal and child health care services and Health Equity Fund for the needy are already being implemented by WB, ADB and so on.

(3) Improvement of Access

Outreach activities in the remote areas can be enriched by provision of a motorbike.

2-2-4-9 Implementation Schedule

(1) Division of Batches and Contract lots

1) Division of batches

This Project consists of construction of HC an SH and in 58 target sites and wells in 28 target sites which are spread over an extensively wide area in four (4) Southern Provinces i.e. 15 sites in Attapeu, 16 sites in Champasak, 18 sites in Salavan and 9 sites in Sekong.

Prime Consultant system will be adopted as the supervisory system for the implementation of

this Project. The construction consultant base office (the headquarters) for the administration of the construction works for the Project will be established in Pakse, Champasak Province and the construction works for the 58 target sites spread over four (4) provinces will be supervised from sub-base office to be established for each lot.

Since the construction of HC and SH shall be implemented for the target site where the appropriate water source with required quality and quantity had been secured, it is appropriate to start well construction works as Batch 1 prior to the facilities construction works.

And, as for the building facilities, it is quite appropriate to plan the building facilities to be implemented by two (2) batches. Because, with consideration of processing of all required procedures such as conclusion of A/A and Consultant Service Agreement as well as tender periods and preceding well construction works (Batch 1), commencement of Batch 2 building facilities construction works will be in the rainy season; thus, commencement of the construction works for the target sites having difficulty to access during the rainy season will not be possible. And consequently, Batch 2 will include 27 target sites which are deemed to be having less difficulty for the access even in the rainy season while Batch 3 includes 31 target sites including 19 sites which have to cross the river.

Furthermore, in view of available budget allocation for the implementation of the Project by the Procurement Agent, it is quite appropriate to divide building facilities construction works into two (2) batches. Because, only local contractors will participate in the tender for the project under GACE in general and quite often tender price exceeds the reference price in a great sum; thus, it is anticipated the same will happen for this Project as well.

With giving consideration of the above, it is planned to implement and supervise this Project by three (3) batches i.e. Batch 1 for well construction works and Batch 2 and Batch 3 for building facilities construction works.

2) Division of contract lots

In supervision of the construction works (construction management), it is necessary to consider the facts that the target sites for the Project are spread over an extensively wide area with 58 locations in four (4) southern provinces and the geographical situation such as some target sites have to be accessed by crossing the river. And it is clear that it will take quite long travel time from the consultant base office to each target site; thus, it is inevitable to consider such situation in the planning appropriate division of lots.

And, as for the local construction companies, since the grade of the construction companies would guarantee the secure implementation of the construction works as schedule, it is assumed that the contracts would be awarded to medium to large size of the construction companies.

Among the construction companies registered with DOHUP of MOPWT, it was confirmed during 1st and 2nd Preparatory Surveys that approx. ten (10) construction companies are capable of carrying out the construction works within a construction period and with required quality specified for this Project after reviewing their track records and experiences, financial capability, number of staff and their skill level and possession of construction equipment.

Contract lots for each batch for the implementation of the Project had been planned with consideration of the aforesaid results of 1st and 2nd Preparatory Surveys. Thus, it is planned to implement the Project with four (4) contract lots for well construction works (Batch 1) at 28 target sites, five (5) contract lots for building facilities construction works (Batch 2) at 27 target sites and six (6) contract lots for building facilities construction works (Batch 3) at 31 target sites, with consideration of appropriate work volume which can be managed by the local contractors. .

On the other hand, procurement of the plaque will be divided into two (2) lots along with the batches i.e. Batch 2 and Batch 3 for the building facilities construction works. And the procurement of the equipment will also be divided into two (2) batches along with the batches i.e. Batch 2 and Batch 3 for the building facilities construction works with each batch having separate lot for medical equipment including vaccine refrigerators and motorbike; thus, there will be 4 lots in total. The summary of contract lots and breakdown thereof for each work item and each batch are as shown in Table 2-25 ~ Table 28 below:

Table 2-25 Number of Contract Lots

Work Item	Batch 1	Batch 2	Batch 3	Total
Well Construction	2	-	-	2
Building Construction	-	5	6	11
Equipment Procurement	-	2	2	4
Plaque Procurement	-	1	1	2
TOTAL	2	8	9	19

As for the well construction works and building construction works, the target sites for each batch and each contract lot and breakdown thereof are summarized in Table 2-26 ~ Table 2-28 here in below:

Table 2-26 Contract Lots for Well Construction Works (Batch 1)

Lot No.	Province	Site No.	Target Site	District	Remarks	Facility Batch
No.1	Champasak	**C-01**	Ban song	Pakse	Depth below 60m	2
		C-02	Saphai	Sanasomboum	Depth below 60m	2
		C-03	Km 21th	Bachiang	Depth below 60m	3
		C-04	Vernsay	Phonthong	Depth below 60m	3
		C-05	Pathumphon	Pathoumphone	Depth below 60m	2
		C-09	Salow	Sanasomboum	Depth below 60m**	3
		C-10	Banphon	Phonthong	Depth below 60m	2
		C-12	Kalae	Pathoumphone	Depth below 60m	2
		C-16	Phonsikai	Pakse	Depth below 60m	2
		C-18	Selabom	Sanasomboum	Depth below 60m**	3
		C-20	Nam-orm	Pathoumphone	Depth below 60m**	3
	Salavan	**S-03**	Kasa Ngai	Salavan	Depth below 60m	2
		S-05	Phakkha	Salavan		3
		S-07	Dan Nalao	Lakhonpheng	Depth below 60m	3
	No.1- total	**14**				
No.2	Attapeu	**A-02**	Halang Nhai	Samarkxay	Depth below 60m	2
		A-04	Sompoi	Sanamxay	Depth below 60m**	3
		A-05	Ban Thae	Sanamxay	Depth below 60m	3
		A-08	Sapuan	Xaysettha	Depth below 60m**	3
		A-09	Keng Mhkhua	Xaysettha	Depth below 60m**	2
		A-10	Na Seuak	Phouvong	Depth below 60m	2
		A-12	Honay Keo	Phouvong	Depth below 60m**	3
		A-15	Pak Bo	Sanamxay	Depth below 60m**	3
	Salavan	**S-09**	Lak 90	Lakhonpheng	Depth below 60m	3
		S-11	Khonsay	Vapi	Depth below 60m	3
		S-16	Nong Kae	Laongam	Depth more than 70m	2
		S-17	Dong Nhai	Laongam	Depth more than 70m	2
		S-18	Vang Peui	Laongam	Depth more than 70m	2
	Sekong	**X-05**	Donechan	Lamam	Depth below 60m	3
	No.2- total	**14**				
TOTAL		**28**				

Remarks: Target sites marked with ** indicates difficult to access.

Table 2-27 Contract Lots for Building Construction Works (Batch 2)

Province	Top: Contract Lot No. Middle: No. of Component Bottom: No. of Target Site	Site No.	Target Site	District	Components	
					HC	SH
Champasak	① 6 4	**C-05**	Pathumphon	Pathumphon	○	―
		C-06	Houy Ngern	Champasak	○	○
		C-08	Nafang Bankeang	Khong	○	―
		C-12	Kalae	Pathumphon	○	○
	①- total	4			4	2
	② 7 7	**C-01**	Ban song	Pakse	○	―
		C-02	Saphai	Sanasomboun	○	―
		C-10	Banphon	Phonthong	○	―
		C-11	Koudchick	Phonthong	○	―
		C-13	Phonthong	Phonthong	○	―
		C-16	Phonsikai	Pakse	○	―
		C-17	Noonsavang	Pakse	○	―
	②- total	7	7		7	0

Province	Top: Contract Lot No. Middle: No. of Component Bottom: No. of Target Site	Site No.	Target Site	District	Components	
					HC	SH
Salavan	④ 7 5	**S-14**	Thaluang	Khongsedon	○	―
		S-15	Kenghuad	Khongsedon	○	―
		S-16	Nong Kae	laongam	○	―
		S-17	Dong Nhai	laongam	○	○
		S-18	Vang Peui	laongam	○	○
	④- total	5	5		5	2
	⑥ 6 5	**S-01**	Naxay	Salavan	○	―
		S-02	Beng Oudom	Salavan	○	―
		S-03	Kasa Ngai	Salavan	○	―
		S-04	Nadonkhuang	Salavan	○	○
		S-06	Buengxay	Salavan	○	―
	⑥- total	5	6		5	1
Attapeu	⑪ 6(+1) 6	**A-02**	Hlang Nhai	Samarkxay	○	―
		A-09	Keng Mhkhua	Xaysettha	―	○
		A-10	Na Seuak	Phouvong	○	―
		A-18	Langao	Samarkxay	―	○
		A-19	Somsanouy	Samarkxay	*roof	○
		A-22	Phouhome	Phouvong	―	○
	⑪- total	6	6(+1)		2(+1)	4

Note: HC Health Centre SH: Staff House

Table 2-28 Contract Lots for Building Construction Works (Batch 3)

Province	Top: Contract Lot No. Middle: No. of Component Bottom: No. of Target Site	Site No.	Target Site	District	Components	
					HC	SH
Champasak	③ 6 5	**C-03**	Km21th	Bachieng	○	―
		C-04	Vernsay	Phonthong	○	○
		C-09	Salow	Sanasomboun	○	―
		C-18	Selabom	Sanasomboun	○	―
		C-20	Nam-orm	Pathumphon	○	―
	③- total	5	6		5	1
Salavan	⑤ 8 8	**S-05**	Phakkaha	Salavan	○	―
		S-07	Dan Nalao	Lakhonpheng	○	―
		S-08	Phonsung	Lakhonpheng	○	―
		S-09	Lak 90	Lakhonpheng	○	―
		S-10	Nadou Kao	Lakhonpheng	○	―
		S-11	Khonsay	Vapi	○	―
		S-12	Saphat	Vapi	○	―
		S-13	Tanpio	Khongsedon	○	―
	⑤- total	8	8		8	0
Sekong	⑦ 6 4	**X-01**	Dakdin	Dakchung	―	○
		X-02	Tateu	Dakchung	―	○
		X-05	Donechan	Lamam	○	○
		X-06	Phon	Lamam	○	○
	⑦-total	4	6		2	4
	⑧ 8 5	**X-03**	Chalea	Kaleum	―	○
		X-04	Pakxay	Kaleum	○	○
		X-07	Tanum	Lamam	○	○
		X-08	Nongkan	Tateng	○	―
		X-09	Yup	Tateng	○	○
	⑧-total	5	8		4	4

Province	Top: Contract Lot No. Middle: No. of Component Bottom: No. of Target Site	Site No.	Target Site	District	Components	
					HC	SH
Attapeu	⑨ 4 4	**A-04**	Sompoi	Sanamxay	○	―
		A-05	Ban Thae	Sanamxay	○	―
		A-14	Beng Vilai	Sanamxay	―	○
		A-15	Pak Bo	Sanamxay	―	○
	⑨- total	4	4		2	2
	⑩ 5 5	**A-01**	Bengphoukham/Lak52	Samarkxay	―	○
		A-03	Dak Yieng	Xaysettha	○	―
		A-07	Namsou	Sanxay	―	○
		A-08	Sapuan	Xaysettha	―	○
		A-12	Honay Keo	Phouvong	―	○
	⑩- total	5	5		1	4

Note: HC Health Centre SH: Staff House

As for the procurement of the equipment, the target sites for each contract lot are exactly same as the ones planned for the building construction works in principle i.e. one only contract lot for Batch 2 and Batch 3 respectively. However, 9 district hospitals and 9 additional health centres are included in Batch 2 and Batch 3 respectively as shown in Table 2-29 and Table 2-30 herein below:

Table 2-29 Contract Lots for Procurement of Equipment (Batch 2)

Facility	Province	Site No.	Target Site	District	Lot 1 Motorbike	Lot 2 Other Equipment
Health Centre (HC)	Attapeu	**A-02**	Hlang Nhai	Samarkxay	○	○
		A-09	Keng Mhkhua	Xaysettha	○	○
		A-10	Na Seuak	Phouvong	○	○
		A-18	Langao	Samarkxay		○
		A-19	Somsanouy	Samarkxay		○
		A-22	Phouhome	Phouvong	○	○
	Sub-total (1)				**4**	**6**
	Champasak	**C-01**	Ban song	Pakse	○	○
		C-02	Saphai	Sanasomboun	○	○
		C-05	Pathumphon	Pathumphon	○	○
		C-06	Houy Ngern	Champasak	○	○
		C-08	Nafang Bankeang	Khong	○	○
		C-10	Banphon	Phonthong	○	○
		C-11	Koudchick	Phonthong	○	○
		C-12	Kalae	Pathumphon	○	○
		C-13	Phonthong	Phonthong	○	○
		C-16	Phonsikai	Pakse	○	○
		C-17	Noonsavang	Pakse	○	○
	Sub-total (2)				**11**	**11**
	Salavan	**S-01**	Naxay	Salavan		○
		S-02	Beng Oudom	Salavan	○	○
		S-03	Kasa Ngai	Salavan		○
		S-04	Nadonkhuang	Salavan	○	○
		S-06	Buengxay	Salavan		○
		S-14	Thaluang	Khongsedon		○
		S-15	Kenghuad	Khongsedon		○

Facility	Province	Site No.	Target Site	District	Lot 1 Motorbike	Lot 2 Other Equipment
Health Centre (HC)	Salavan	**S-16**	Nong Kae	laongam	○	○
		S-17	Dong Nhai	laongam	○	○
		S-18	Vang Peui	laongam	○	○
	Sub-total (3)				**5**	**10**
Total for HC		**27**			**20**	**27**
District Hospital (DH)	Champasak	**D-01**	Phonthong	Phonthong		○
	Sekong	**D-02**	Kaleum	Kaleum		○
		D-03	Dakchung	Dakchung		○
	Salavan	**D-04**	Ta-Oy	Ta-Oy		○
		D-05	Toumlan	Toumlan		○
		D-06	Vapi	Vapi		○
		D-07	Laongam	Laongam		○
		D-08	Samoui	Samoui		○
	Attapeu	**D-09**	Xaysettha	Xaysettha		○
Total for DH		**9**				**9**

Table 2-30 Contract Lots for Procurement of Equipment (Batch 3)

Facility	Province	Site No.	Target Site	District	Lot 1 Motorbike	Lot 2 Other Equipment
Health Centre (HC)	Attapeu	**A-01**	Bengphoukham/Lak52	Samarkxay	○	○
		A-03	Dak Yieng	Xaysettha	○	○
		A-04	Sompoi	Sanamxay	○	○
		A-05	Ban Thae	Sanamxay		○
		A-06	Ban Mai	Sanamxay	○	○
		A-07	Namsou	Sanxay		○
		A-08	Sapuan	Xaysettha	○	○
		A-11	Ka Ouan	Phouvong	○	○
		A-12	Honay Keo	Phouvong	○	○
		A-13	Nam Kong	Phouvong		○
		A-14	Beng Vilai	Sanamxay		○
		A-15	Pak Bo	Sanamxay	○	○
		A-17	Kum Khan	Samarkxay	○	○
		A-20	Ban Moon	Sanxay	○	○
	Sub-total (1)				**10**	**14**
	Champasak	**C-03**	Km21th	Bachieng	○	○
		C-04	Vernsay	Phonthong	○	○
		C-07	Vernyang	Mounlapamok	○	○
		C-09	Salow	Sanasomboun	○	○
		C-14	Champasak	Champasak	○	○
		C-15	Phapho	Pathumphon	○	○
		C-18	Selabom	Sanasomboun	○	○
		C-19	Kuangxi	Bachieng		○
		C-20	Nam-orm	Pathumphon	○	○
	Sub-total (2)				**8**	**9**
	Salavan	**S-05**	Phakkaha	Salavan		○
		S-07	Dan Nalao	Lakhonpheng	○	○
		S-08	Phonsung	Lakhonpheng	○	○

Facility	Province	Site No.	Target Site	District	Lot 1 Motorbike	Lot 2 Other Equipment
Health Centre (HC)	Salavan	**S-09**	Lak 90	Lakhonpheng	○	○
		S-10	Nadou Kao	Lakhonpheng	○	○
		S-11	Khonsay	Vapi	○	○
		S-12	Saphat	Vapi	○	○
		S-13	Tanpio	Khongsedon	○	○
	Sub-total (3)				**7**	**8**
	Sekong	**X-01**	Dakdin	Dakchung	○	○
		X-02	Tateu	Dakchung	○	○
		X-03	Chalea	Kaleum	○	○
		X-04	Pakxay	Kaleum	○	○
		X-05	Donechan	Lamam	○	○
		X-06	Phon	Lamam		○
		X-07	Tanum	Lamam	○	○
		X-08	Nongkan	Tateng	○	○
		X-09	Yup	Tateng	○	○
	Sub-total (4)				**8**	**9**
Total for HC		**40**			**33**	**40**

As for the procurement of the plaque, the target sites for each contract lot are exactly same as the ones planned for the building construction works (see Table 2-27 and Table 2-28) i.e. one only contract lot for Batch 2 and Batch 3 respectively.

(2) Project Implementation Schedule

After concluding the Procurement Management Contract and the Consultant Contract, preparation of tender documents for selection of contractors will be preceded. Each contract lots for various components will be awarded to the successful contractor through tender, tender evaluation, contract negotiation and approval by related authorities. It is dedticipated that these formalities will require a period of 3.5 months for Batch 1 and 5.0 months for Batch 2 and 3 respectively.

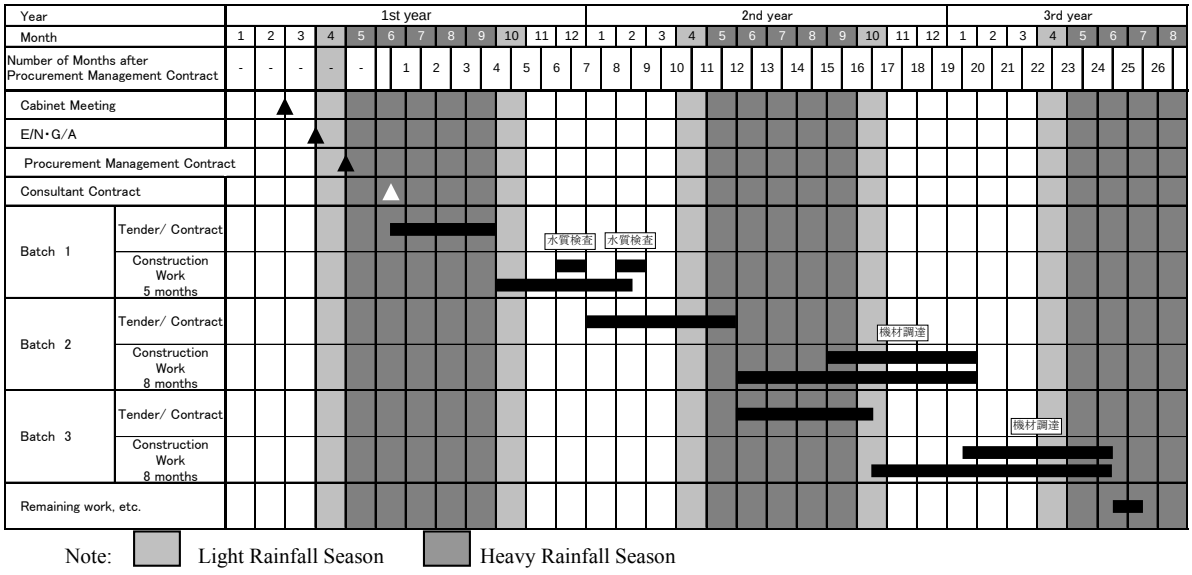
As mentioned hereinbefore, construction of building facilities for the Project will be implemented by two (2) groups i.e. Batch 2 and Batch 3 and the facilities construction works at target sites of which are able to access during rainy season will be implemented first as Batch 2. The construction period for the building facilities is assumed to be 8 months in total; 1 month for preparation works, 6 months for facilities construction and 1 month for inspection and remedial works. On the other hand, the procurement period of the equipment is assumed to be 4.5 months in total; 3 months for manufacturing and procuring including transportation and 1.5 months for inspection and acceptance.

Since the construction works for the Project are planned to be implemented by three (3) batches starting from Batch 1 for well construction works and followed by Batch 2 and Batch 3 for facilities construction works with overlapping period of 3.5 months. Thus, the entire

project implementation period from the conclusion of the Procurement Management Contract to the completion of the project and the closing of the offices (not including the warranty period) is estimated to be 25 months.

And, since the cabinet approval for the Project had been granted in February 2013 and E/N and G/A had also been concluded in March 2013 as scheduled; proposed implementation schedule thereafter is as shown in Table 2-31 below:

Table 2-31 Implementation Schedule (draft)



2-3 Outline of Scope of Work to be undertaken by the Lao Side

In the implementation of Japan's GACE in the Lao PDR, the scope of works to be undertaken by the Lao PDR is as described below:

(1) Securing of the necessary land at each target site and the right to construct the facilities;

(2) Securing of UXO-free certificate for each target site;

(3) Execution of site clearance of each target site including demolishing and clearing of the existing facilities and obstacles, if any, as well as cutting down the trees and uprooting thereof before implementation of the Project;

(4) Connection of electric power (low voltage) before the commencement of the facilities construction works for the specified target sites (A-05, C-01, C-03, C-08, C-09, C-10, C-17, S-02, S-07, S-12, S-16, S-18, X-04, X-05, X-07 and X-09).

(5) Connection of electric power (low voltage) including installation of transformer (medium voltage to low voltage) before the commencement of the facilities construction works for the specified target sites (A-02, C-06, C-20, S-03 and S-04).

(6) Provision of furniture and household equipment for staff houses to be constructed under the Project upon completion;
(7) Obtaining of all permits and approvals which are deemed necessary for the implementation of the Project;
(8) Bearing of the payment commissions to the bank in Japan for banking services based upon the Bank Agreement (B/A);
(9) Implementation of necessary measures to ensure the prompt import and customs clearance of equipment and materials to be used for the Project;
(10) Exemption of all companies, organizations and individuals from any customs duties, internal taxes and levies with respect to the supplies, products and services provided under the contracts of the Project, i.e. the procurement management service contract and contracts with the Procurement Agent;
(11) Exemption of the corporations or individuals to be engaged in the implementation of the Project from customs duties, internal taxes and any other duties imposed within Laos; and,
(12) Assuming of responsibility for covering all the necessary costs and expenses for the implementation of the Project that are not covered by Japan's GACE in order to assure an appropriate and effective operation and maintenance of the facilities and equipment to be provided under the Project.

2-4 Project Operation and Maintenance Plan

2-4-1 Placement of Personnel for Health Centres

2-4-1-1 Addition of Personnel

Currently in Lao PDR, 2 to 4 health workers (mainly nurses) are placed at most of the existing health centres. On the other hand, most of the newly planned health centres which will be built by the Project have not secured necessary staff yet to date. However, there are a few newly planned health centres which already secure the staff who work in other health facilities as volunteers. Thus, the recruitment of additional personnel is necessary since the number of staff to be placed at each target site of the Project is not sufficient at present.

According to the Agreement of the Minister of Ministry of Health on the Organization and Activations of Health Centres 2006, the staff allocation for health centre is defined as 4-5 staff and 2-3 staff for Type A for and Type B respectively. Assuming that 4 primary nurses receiving a monthly salary of 538,760 Kip each for health centre Type A and 2 each for Type B are to be placed at all target sites of the Project upon its completion, at least 58 additional staff in total will be required for 4 provinces. And accordingly, the additional personnel expenses

will be estimated as much as 375 million Kip as shown in Table 2-32 below:

Table 2-32 Estimated additional personnel expenses

Unit: Lao Kip (LAK)

Province	Minimum number of required staff	Minimum additional annual personnel expenses
Attapeu	4	25,860,480
Champasak	27	174,558,240
Salavan	13	84,046,560
Sekong	14	90,511,680
TOTAL	58	374,976,960

2-4-2 Operation and Maintenance of the Health Centre

2-4-2-1 Operation of the Health Centre

(1) Procedure of Budget Request and Allocation

The procedure of request and allocation of the budget for salaries of the staff in health centres is different from the procedure for the operating cost in health centres.

The district health offices request for the quota of health centres and the district hospital in their districts to their provincial health offices. The provincial health offices gather requests from each district health office and request for the provincial quota to the department of personnel and organization in the Ministry of Health. Ministry of Health gathers the requests from the provinces and applies for the quota of the public health sector to the Ministry of Home Affairs every May. The request approved by the Ministry of Home Affairs is transferred to Ministry of Financial to allocate the budget for salaries. Ministry of Finance must allocate the budget according to the approval. (by the hearing at the Dept. of personnel and organization in Ministry of Health) The salary is paid to staff of health centre through the district health offices by the government. (by the hearing at the district health offices)

The district health offices request the administrative budget including the operating cost for health centres, and then, the provincial health offices request for the total provincial budget to Ministry of Health. Ministry of Health gathers the request from the provinces and then submits the request for the budget to Ministry of Planning and Investment. The amount of the budget is decided by the agreement among the Ministry of Planning and Investment, Ministry of Finance and the Lao PDR government. The approved amount of the budget is informed provincial governments from the Ministry of Finance and then provincial governors allocate the budget to each provincial sector and district government. The district governments allocate the budget to each sector and then the district health offices allocate the budget to each health centre as their operating cost. (by the hearing at Ministry of Health and provincial health offices)

(2) Revenue and Expenditure of District Health Office

The district health office is responsible to manage the financial matters of health centres and district hospitals which are the health facilities targeted by the project. An example of the financial record of district health office (Sanasomboun district in Champasak province) is shown below.

Revenue and expenditure of 6 health centres and a district hospital under the Sanasomboun district health office. (by the hearing at Sanasomboun district health office)

Table 2-33 Revenue in Year 2011

Unit: Lao Kip (LAK)

Financial resources	Amount (6 HCs in total)	Amount (DHO and DH)
Government	146,493,882	174,842,600
Drug Revolving Fund (DRF)	22,951,930	16,685,025
Donor	25,175,000	16,620,000
Total	194,620,872	208,147,625

Table 2-34 Expenditure in Year 2011

Unit: Lao Kip (LAK)

Items	Amount (6 HCs in total)	Amount (DHO and DH)
Salary	146,493,882	174,742,600
Procurement of medicines	17,213,947	10,947,042
Meeting	1,258,750	831,000
Administrative cost (including expenses for electricity and water)	3,776,250	2,493,000
Outreach service	20,140,000	13,296,000
Total	188,882,829	202,309,642

2-4-2-2 Maintenance Plan for the Facilities and Equipment

(1) Building Facilities

Although the building facilities to be built under this Project shall be built with locally procured materials with ease of maintenance in principle, it is quite important that POH and DHO staff as well as personnel to be placed to each health centre and residents in the community covered by such health centre should be aware of needs of periodical maintenance and endeavor to maintain the facilities appropriately at all the time.

Therefore, as for the building facilities to be provided by the Project, daily maintenance such as cleaning and very minor repairs shall be executed by the staff at each health centre while minor repairs such as repairing and painting of wall and/or roof etc. and major repairs such as re-roofing and extensive paint work etc. shall be executed by Community Health Committee

and governing PHO and/or DHO respectively.

(2) Equipment

Regarding maintenance and management of the equipment, plans call for daily inspection and cleaning to be performed by the staff of the Ministry of Health, small scale simple repairs to be performed by the community health councils, and the replenishment of consumables and spare parts to be performed by the District Health Service Bureaus (Provincial Health Service Bureaus) respectively.

Furthermore, a flow chart for the repair of equipment in Laos is shown in Figure 2-13 below:

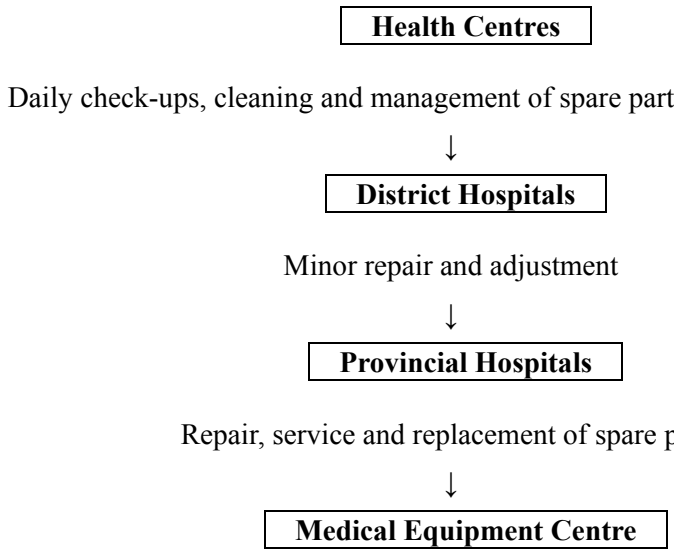


Figure 2-13 Flow Chart for Equipment Repair in Laos

It has been verified that autoclaves are being used at the health centres in the Southern portion of Laos, and these items have been included in the MOH standard equipment list. Since autoclave to be mainly used for sterilizing delivery instruments is small and simple and boiling sterilizer is also with simple structure, they can be repaired at the provincial hospitals. Workshop at each provincial hospital (PH) is placed with at least one maintenance engineer and such engineer visit DHs regularly i.e. once every three (3) months for the maintenance of the equipment. However, in case the said equipment cannot be repaired at PH, ultimately the repairs can be performed at the Medical Equipment Centre (MEC) which is a one of the division of the Medical Supplies Procurement Centre (MSPC) assigned with 9 staff under the umbrella of Department of Foods and Drugs of MOH in Vientiane, the capital city of Lao PDR.

Furthermore, when equipment needs to be transported to the MEC in Vientiane, it will be

transported by truck (it takes approx. 10 hours from Champasak to Vientiane). The time required for repairs varies depending upon the extent of the breakdown, but should normally be approximately one week. The motorcycles can be repaired at a motorcycle shop in a neighboring village, at the district level or at the provincial level, though this will depend on the location of the health centre. It has been confirmed during the survey that there are motorcycle shops (or repair shops) in district capitals and relatively large villages.

(3) Well and Water Supply Facilities

Management of deep wells to be provided by the Project including any required repairs shall be executed by governing PHO and/or DHO.

On the other hand, as for the water supply facilities to be provided by the Project, daily check-ups and cleaning around deep well shall be executed by the staff at each health centre while minor repairs including cleaning of water tank (inside) and major repairs such as repairing of pump and pipes, changing ball tap, etc. shall be executed by Community Health Committee and governing PHO and/or DHO respectively.

(4) Electrical Facilities

As for electrical facilities to be provided by the Project, daily check-ups and maintenance such as cleaning of light fittings, changing light bulb, etc. shall be executed by the staff at each health centre while minor repairs such as changing fuse etc. and major repairs such as repairing of panel board, damaged wire etc. shall be executed by Community Health Committee and governing PHO and/or DHO respectively.

(5) Drainage and Sewage Facilities

As for drainage and sewage facilities to be provided by the Project, daily maintenance such as sanitary fittings, drainage pit etc. shall be executed by the staff at each health centre while minor repairs including removing of scum inside septic tank etc. and major repairs such as removing scum inside pipe and repairing of pipes etc. shall be executed by Community Health Committee and governing PHO and/or DHO respectively.

(6) PV System

As for the periodical inspection including any required repairs for PV system to be provided by the Project, it is recommended to be executed by the specialized contractor who installed the said system under this Project by concluding service agreement.

Division of responsibility for the maintenance of health centre summarized with consideration of aforementioned plans each component is as shown in Table 2-35 below:

Table 2-35 Division of Responsibility for Maintenance (draft)

Maintenance Item			Responsible Person/ Agent
1.	Facilities in general	(1) Daily Maintenance	
		・Cleaning	HC Staff
		・Minor repairs	HC Staff
		・Daily maintenance of motorcycle	HC Staff
		(2) Management of Repairs	
		・Minor: Repairing of walls, roof etc.	Community Health Committee
		・Major: Re-roofing etc.	DHO/ PHO
		(3) Purchasing of equipment, consumables etc.	DHO/ PHO
2.	Water Supply System	(1) Daily Maintenance	
		・Cleaning around well	HC Staff
		・Replacement of packing (faucet)	HC Staff
		(2) Management of Repairs	
		・Minor: Cleaning of water tank (inside)	Community Health Committee
		・Major: Pump, piping, ball tap	DHO/ PHO
		(3) Payment for water consumption	Community Health Committee
3.	Power Supply System	(1) Daily Maintenance	
		・Changing light bulbs, tube	HC Staff
		・Cleaning of lighting fixtures	HC Staff
		(2) Management of Repairs	
		・Minor: Changing fuses	Community Health Committee
		・Major: panels, broken wires etc.	DHO/ PHO
		(3) Payment for power consumption	DHO/ PHO
4.	Sewage and Drainage System	(1) Daily Maintenance	
		・Cleaning of sanitary fixture, manhole	HC Staff
		(2) Management of Repairs	
		・Minor: Removing of scum (septic tank)	Community Health Committee
		・Major: Removing of scum (inside pipe)	DHO/ PHO
		(3) Collection of fees	N/A
5.	Photovoltaic (PV) System	(1) Daily Maintenance	
		・Monitoring of power generation	HC Staff
		・Cleaning of PV modules as necessary	HC Staff
		(2) Periodical inspection and repair	
		・Overall system	Contractor (Service Agreement)
6.	Medical Equipment	(1) Daily Maintenance	
		・Daily inspection	HC Staff
		・Daily cleaning	HC Staff
		(2) Management of repairs	
		・Minor and simple repairs	Community Health Committee
		・Replacement of consumables	DHO/ PHO
		・Replacement of spare parts	DHO/ PHO
		・Repairing of motorcycles	DHO/ PHO
		(3) Collection of fees	N/A
7.	Medical Waste	Distribution and collection of Safety Box	DHO/ PHO
8.	Staff Salary including allowance etc.		DHO/ PHO

(7) Medical Waste Management

In all southern provinces, the safety boxes for disposing contaminated sharp objects and

syringes in all health centres and district hospitals are collected by the provincial health offices through the district health offices. The collected safety boxes are eventually incinerated at the provincial health offices, provincial hospitals or public waste disposal sites. The district health offices collect the safety boxes quarterly in a mass when they have opportunities to visit health facilities for vaccinations or other activities. Thus, since the waste management system in each province is currently working as shown on Table 2-9, the generated medical wastes at the project sites also should be managed in accordance with this procedure.

(8) Garbage Disposal

Other non-contaminated wastes such as paper wastes, garbage etc. are to be incinerated at a simple incinerating space to be provided under this Project at each health centre. In addition, importance of the cleaning of the said incinerating space will be explained during the explanation of the management and maintenance of the facilities and equipment built and/or installed under this Project.

2-4-3 Supply Chain

The drugs and medical supplies to be consumed at the health centres are purchased by the profit from the Drug Revolving Fund (DRF) basically. The district health offices procure the drugs and supplies locally on behalf of health facilities, under the supervision by the district health committees.

Medical Products Supply Centre (MPSC) in the Department of Food and Drug in the Ministry of Health is responsible to supervise and guide for the medical supply chain in Lao PDR. The supplies donated by the partners are distributed from the National Warehouse to the Regional Warehouses.

In Lao PDR, there are four regional warehouses located in Champasak, Oudomxay, Luangprabang and Savannakhet. In Champasak province, the supplies are distributed from the Champasak regional warehouse to health facilities directly. In other 3 provinces, the supplies are distributed from the regional warehouse to each provincial warehouse, and then, provincial portions are distributed to health facilities directly or through district warehouses. The vaccines are distributed to the health facilities through the cold chain of the National EPI Programme.

In order to secure the supply chain for the project sites especially new health centres, MPSC and the National EPI Programmes should be aware well of the construction plan of the project on ahead.

2-5 Coordination with Communities

The Community Health Committee (CHC) is responsible to manage the health centres in the horizontal sector, and it is organized by a village or a group of villages (Kum-ban). The CHCs are composed of local authorities, village health volunteers, members of mass organizations such the Lao Women's Union and the Lao Youth organization, police and heads of health centres. The most important roles of CHC are to support communications between health centres and communities, mobilization of residents, health promotion and public health activities in communities. CHCs help health centres to clean up and build a fence enclosing the facility as well. They voluntarily support to repair damaged parts of the facility if it is uncomplicated, when the health centres cannot be taken the maintenance service from the district health offices.

In order to promote the utilization of the project sites (health facilities and staff houses) by the mobilization and health promotion for residents, the provincial and district health offices should inform CHCs of the plan of the project and request for their cooperation.

2-6 Project Cost Estimation

2-6-1 Initial Cost Estimation of the Project

2-6-1-1 Total Cost to be borne by the Japan Side

If the Project is implemented under the Japanese Grant Aid for Community Empowerment Scheme, the total costs to be borne by the Lao side is estimated to be around 16.7 Million Japanese Yen, a summary of which is as shown in Table 2-36 below:

Table 2-36 Total Cost to be borne by the Lao Side

Particulars of Expenses	Amount (Thousand Lao Kip)	Amount (Thousand Yen)
Site clearance incl. cutting trees and uprooting	261,361.71	2,561
City water supply connection	4,605.00	45
Community water supply connection	1,535.00	15
Power connection (Low Voltage)	52,500.00	515
Power connection (Medium Voltage)	641,814.00	6,290
Extension of power distribution lines	114,730.00	1,124
Provision of furniture etc. for Staff House	559,494.20	5,483
Others incl. bank commission	75,510.20	740
TOTAL	**1,711,550.11**	**16,773**

Since the total cost to be borne by the Lao side shown in the table above is approx. 2.13% of the total annual budget of four (4) PHOs for 2009/10 fiscal year i.e. 80,496,658 Thousand Lao Kip, it is possible for Lao PDR side to contribute the said cost.

2-6-1-2 Conditions for Cost Estimation

(1) Time of Estimation : June 2012

(2) Exchange Rate : LAK 1.00 = JPY 0.0096、USD 1.00 = JPY 78.42

(3) Implementation Period : As shown in Table 2-31 Implementation Schedule (draft)

(4) Others : Cost estimation shall be conducted based on the principles of the Government of Japan's Grant Aid for Community Empowerment

2-6-2 Operation and Maintenance Cost

2-6-2-1 Placement of Personnel

As described in foregoing "Section 2-4-1 Placement of Personnel for Health Centres", additional staff salaries required for the operation of health centres to be built under this Project are estimated to be around 375 Million Kip (LAK).

2-6-2-2 Operation cost for Facilities and Equipment

Operation items and corresponding costs thereof for the facilities and equipment to be built, installed and/or procured under this Project are described here-in-after:

(1) Operation costs for Facilities

Estimated annual operation costs required for the operation of the facilities to be built and installed under this Project are as shown in Table 2-37 below:

Table 2-37 Estimated Annual Operation Costs

Unit: Thousand Lao Kip (LAK)

Particulars of Expenses	Qty	Unit Price	Amount	Remarks
Salaries for the additional staff required	58	6,465.12	374,976.96	Salary for Primary Nurse
- Allowance for the outreach activities	58	1,616.28	93,744.24	Allowed 25% of salaries
Electricity Charge for HC Type A*1	38	1,243.48	47,252.32	10.02kWh/day
Electricity Charge for HC Type B*2	6	1,183.91	7,103.48	9.54 kWh/day
Electricity Charge for HC Type B'*3	1	1,243.48	1,244.48	10.02 kWh/day
Electricity Charge for Staff House*4	25	234.05	5,851.32	1.886 kWh/day
Water Rate for City Water Supply*5	2	2,090.36	4,180.71	4.15m^3/day
Water Rate for Community Water Supply*5	4	2,090.36	8,361.42	4.15m^3/day
Fuel for Motor Cycle*6	53	2,716.8	143,990.40	20ℓ/unit/month
Chroline tablets for sterilizing coliform	10	7,300.00	73,000.00	1.0m^3/day
		TOTAL	**759,704.33**	

Since the total additional salaries and operation cost for the facilities including the fuel for motor cycle are 468,721.20 Thousand Lao Kip and 290,983.13 Thousand Lao Kip respectively

as shown in the table above which are approx. 2.00% of the total budget for salaries of four (4) PHOs for 2009/10 fiscal year i.e. 290,983.13 Thousand Lao Kip and approx. 2.93% of the total annual operation and maintenance budget of four (4) PHOs for 2009/10 fiscal year i.e. 9,917,157 Thousand Lao Kip respectively, it is judged that Lao PDR side can operate and manage the facilities and equipment to be built and/or installed under this Project.

(2) Operation costs for Equipment

Although monthly running distance of motorbike and its frequency of use for out-reach activities of each health centre are described in 1-1-1-1 (2) here-in-before, total costs of annual fuel consumptions are estimated to be around 143,900.40 Thousand Kip (LAK) as shown in the Table 2-37 above.

On the other hand, utilities costs for the equipment to be procured under this Project which consumes electricity such as autoclave, dry heat steriliser, etc. are also included in the Table 2-37 above as operation cost for the facilities.

2-6-2-3 Maintenance Cost for Facilities and Equipment

Maintenance items and corresponding costs thereof for the facilities and equipment to be built, installed and/or procured under this Project are described here-in-after:

(1) Maintenance cost for facilities

Maintenance items and corresponding costs thereof for the facilities to be built and installed under this Project are as shown in Table 2-38 below:

Table 2-38 Estimated Annual Maintenance Costs for Facilities

Unit: Thousand Lao Kip (LAK)

Particulars of Expenses	Qty	Unit Price	Frequency	Amount
Health Centre/ Staff House				
- External painting	70	512.00	Every 10 years	35,840.00
- Internal painting incl. doors, built-in furniture	70	2,048.00	Every 5 years	143,360.00
- Painting and repairs of doors/ windows	70	512.00	Every 5 years	35,840.00
- Repairs of roof and cleaning of gutters	70	80.00	Every 5 years	5,600.00
- Removal of scum out of septic tank	70	250.00	Every two years	17,500.00
- Cleaning of manholes	70	400.00	Every 5 years	28,000.00
- Changing light bulbs/ tubes	70	160.00	Every 2 year	11,200.00
Photovoltaic (PV) System				
- Periodical maintenance and repairs	9	8,400.00	Every year	75,600.00
- Renewal of batteries	9	6,960.00	Every 5 years	62,640.00
Deep Well				
- Periodical maintenance and repairs	52	235.00	Every year	12,220.00
- Renewal of water pump	50	1,330.00	Every 10 years	66,500.00
			TOTAL	**494,300.00**

Since the total annual maintenance cost is estimated at 494,300.00 Thousand Lao Kip as shown in the table above which is approx. 4.98% of the total annual operation and maintenance budget of four (4) PHOs for 2009/10 fiscal year i.e. 9,917,157 Thousand Lao Kip, it is judged that Lao PDR side can implement sufficient maintenance of the facilities to be built and installed under this Project.

(2) Maintenance cost for equipment

Maintenance items and corresponding costs thereof for the equipment to be procured under this Project are as shown in Table 2-39 below:

Table 2-39 Estimated Annual Maintenance Costs for Equipment

Unit: Thousand Lao Kip (LAK)

Particulars of Expenses	Qty	Unit Price	Frequency	Amount
Autoclave				
- Replacement of packing	58	26.65	Every 2 years	772.85
Boiling Sterilizer				
- Replacement of pipe heater	65	123.00	Every 2 years	3,997.50
Motorcycle				
- Tire change	53	24.60	Once a year	1,303.80
- Oil change	53	82.00	Once a year	4,346.00
- Replacement of brake cable	53	20.50	Every 3 years	362.16
- Replacement of V-belt for power transmission device	53	51.25	Every 10,000km	905.41
- Replacement of air cleaner element for power transmission device	53	10.25	Every 20,000km	90.54
- Replacement of oil filter for engine	53	51.25	Every 15,000km	679.06
- Replacement of air cleaner element for engine	53	10.25	Every 20,000km	90.54
			TOTAL	**12,547.86**

Since the total annual maintenance cost is estimated at 12,547.86 Thousand Lao Kip as shown in the table above which is approx. 0.13% of the total annual operation and maintenance budget of four (4) PHOs for 2009/10 fiscal year i.e. 9,917,157 Thousand Lao Kip, it is judged that Lao PDR side can bear the said cost.

2-6-2-4 Provision of Budget for Operation and Maintenance Costs

As for securing of the necessary budget for the operation and maintenance costs described here-in-before, provision of the budget was confirmed by each PHO during the joint meeting and individual meeting thereafter held among MOH, PHOs and the Team during 2nd Preparatory Survey.

2-7 Considerations for the Implementation of the Project

2-7-1 Coordination with JICA Technical Cooperation Projects

Project goal of the on-going JICA Technical Cooperation Project "The Project for Strengthening Integrated Maternal, Neonatal and Child Health Services (2010-2015)" aims to improve the coverage of the maternal, neonatal and child health (MNCH) services in four (4) southern provinces. And outputs thereof are expected to be 1) appropriate management of the maternal, neonatal and child health (MNCH) services by PHOs and DHOs, 2) improvement of knowledge and technic in the maternal, neonatal and child health (MNCH) services by the health service provider and 3) strengthening of enlightenment of the villagers for the maternal, neonatal and child health (MNCH) services all of which are closely related to this Project. Thus, it is quite important to coordinate with the said JICA technical cooperation project and the request to the same are described as follows:

(1) To confirm and follow up with MOH, PHOs and DHOs as to the allocation of health workers to the health centres to be built under this Project and as to the required operation and maintenance costs as well as establishment of supply chain and collaboration with community health committee.

(2) To implement publicity by giving out a message saying that "new health centres will be opened soon" in the course of strengthening of enlightment of public awareness, in order to promote the use of the new health centres to be built under this Project.

2-7-2 Suggestions for Construction and Maintenance of Well

There were many existing wells which detected coliform as a result of water quality tests and it was suspected that inappropriate well structure such as the method of sealing off contaminated ground water was the main cause of contamination with the coliform.

Coliform contaminating route survey of some of the existing wells was conducted in the additional field survey and it was confirmed that the casing was installed only for upper part of the borehole i.e. approx. 8m for most of them. It was also confirmed that no measures for sealing off the contaminated water from ground surface.

Therefore, casing should be installed to the bottom of boreholes to be constructed under this Project and screen and bottom cap for the said casing should also be provided. In addition, gravel should be filled around entire length of casing and clay and mortar grout or concrete should be filled around the upper part of the casing in order to avoid entering contaminated water into the well from the ground surface. Thus, in order to make sure do so, it is essential that the well construction works should be supervised appropriately by the consultant i.e. Japanese experts.

On the other hand, as for the maintenance of the well, there will still be a chance of contaminating well water after constructing an appropriate well if domestic animals can enter into around the well. Therefore, it is necessary to install a fence around the well in order to keep hygienic its surrounding area and it is desirous to enlighten the public its importance in terms of the maintenance of the well.

CHAPTER 3
PROJECT EVALUATION

Chapter 3 Project Evaluation

3-1 Recommendations

3-1-1 Pre-conditions for the Implementation of the Project

Pre-conditions for the implementation of the Project are as follows:

- MOH and PHOs shall not oppose the implementation of the Project. .
- Policies for the strengthening of the health service network in the National Health Sector Development Plan shall not change drastically.
- UXO free certificate for the target sites shall be issued.
- Source of the water supply for the target sites where the facilities (HC and SH) to be built under this Project shall be secured.

3-1-2 External Conditions for Achieving Overall Plan of the Project

Commitment to the Project from the responsible agency and implementing agencies as well as DHOs that will actually be in charge of operation and maintenance of the health facilities is necessary for the successful completion of the Project as a whole. In addition, provision of the health services and supports for the operation and maintenance of the health facilities to be built under this Project by HC staff as well as involvement of the community health committee are indispensable in order to attain the community assistance such as promotions for utilization of HCs.

On the other hand, the cooperation with the Facility Management Division of MOH and Medical Product Supply Centre (MPSC) under the Department of Medicine and Food of MOH is necessary during the tender and implementation stage of the Project. In addition, the cooperation with National Centre for Environmental Health and Water Supply (NCEHW) is also required for the tender and implementation stage of the well construction works.
The concerned organizations and their roles are as shown in Table 3-1 below:

Table 3-1 Concerned Organization and its Role

Role	Organization	Remarks
Responsible Agency	Health Care Division, MOH	
Implementing Agency	Health Care Division, MOH	
	Attapeu Provincial Health Office	
	Champasak Provincial Health Office	
	Salavan Provincial Health Office	
	Sekong Provincial Health Office	

Role	Organization	Remarks
Operation and Maintenance of Equipment and Facilities (District Hospitals and HCs)	Provincial Health Office at 4 southern provinces (incl. Nam Sa-at) and Provincial Hospital	
	District Health Office at 4 southern provinces (incl. Nam Sa-at) and Provincial Hospital	
	Community Health Committee	
Provision of Health Services	Staff of all target HCs	
Tender/Construction of Buildings	Facility Management Division, MOH	
Tender/Procurement of Equipment	Medical Product Supply Centre (MPSC), Medicine and Food Division, MOH	
Others	National Centre for Environmental Health and Water Supply (NCEHW)	

3-1-3 External Conditions

(1) Achievement of Project Objectives

For the achievement of project objectives "Health Centre (HC) and District Hospital (DH) will be established and/or improved within the target areas of the Project; thus access to primary health care for integrated maternal and child health care services for the residents in particular will be improved accordingly", the necessary external conditions are as follows:

- Target sites shall not be damaged by natural disaster (earthquake, flood by heavy rainfall, typhoon, etc.).
- Health workers necessary for the target HCs shall be deployed.
- Operation and maintenance budget necessary for the target HCs shall be secured.
- Consumables such as medicine and vaccine necessary for the target HCs shall be supplied.
- Cooperation from the community and community health committee related to the target HCs shall be obtained.

(2) Achievement of Project Goal

For the achievement of project goal "The utilization rate of the integrated maternal and child health care services in the target four (4) provinces will be increased which is essential for the achievement of MDGs 4 and 5", the necessary external conditions are as follows:

- Implementation of Maternal, Neonatal and Child Health (MNCH) Plan shall be continued.
- Cooperation from the community related to the target HCs shall be continued.

3-2 Project Evaluation

3-2-1 Validity

This Project is validated to be suitable for Japanese Grant Aid based on the following reasons:

(1) The government of Lao PDR aims to graduate from the Least Developed Country (LDC) and to achieve the Millennium Development Goals (MDGs) by 2015. Improvement of quality of health care at provincial level by the implementation of the Project will contribute toward improving the standard of living and poverty reduction at provincial level.

(2) Health facilities construction/renovation by the implementation of this Project in southern provinces accords with one of the direction of 7th National Health Sector Development Plan (NHSDP) "Strengthening of the health system for improvement of mother and child health especially the expansion of health care service network down to all rural and out of reach mountainous areas".

(3) Maternal, Neonatal and Child Health (MNCH) indicators remains at very low level. Improvement of access to health services at provincial level and expansion of MNCH services are issues to be addressed immediately in order to achieve MDG-4 "Reducing of under Five Mortality Rate" and MDG-5 "Improvement of Maternal Health". HCs to be constructed and/or improved by the implementation of this Project are the centre of MNCH services in the community. Access and quality of MNCH will be improved by means of the increase in the number of newly constructed HCs, re-construction of the existing HCs and procurement of equipment in consideration of MNCH services provision and the reinforcement of MNCH clinic at district hospital which supports HCs.

(4) There is a regional difference in health conditions of resident between urban and rural area. Health indicators of southern region are worse than the average of Lao PDR as a whole and the utilization rate of MNCH services is especially low. There are many mountainous areas and the area difficult to access due to inadequate road for which the health service coverage is not sufficient. Under these circumstances, validation of covering the southern region by the implementation of this Project is quite high.

(5) Japanese government is focusing on the provision of the improved health care services as one of the top priority issues on the "Aid program for the Lao PDR" toward the achievement of MDG-4 and 5. Improved health care services consist of improvement of MNCH services, human resources development, institutionalization and capacity development for health care in community. Therefore, this Project accords with an aid policy of Japan.

(6) "The Project for Strengthening Integrated Maternal, Neonatal and Child Health Services" by JICA is to support "Strategy and Planning Framework for the Integrated Package of Maternal, Neonatal and Child Health Services 2009-2015" by Lao PDR comprehensively with soft and hard components. The synergy by this Project as hard component and Technical Assistance as soft component is expected.

(7) Deployment of health worker is one of the issues of MNCH services and MOH is implementing "Skilled Birth Attendant Development Plan" supported by UNFPA and formulating the strategy for low retention rate of health workers. Also "Health Equity Fund" and "Free treatment fee for pregnant woman and infant under 5 years old" are implemented with assistance by development partner such as ADB and WB to address the financial burden for health services. Regarding the promotion of utilization of health services, "The Project for Strengthening Integrated Maternal, Neonatal and Child Health Services" and health promotion by UNFPA are being implemented. However, only this Project is planned for the improvement of health facilities such as HCs in a large scale in the southern region at this moment and takes an important role in strengthening of the health service network.

3-2-2 Effectiveness

The following effects are expected from the implementation of the Project.

3-2-2-1 Quantitative Effects

Expected quantitative effects are as follows:

(1) Covered Population and Beneficiary

Current health services provided by the existing DHs and HCs cover 74.2% of population in four (4) southern provinces. The population newly covered by 15 new HCs to be built under this Project will be about 65,000 and the coverage ratio will rise to 79.3% which is an increase of approx. 5%. Number of population who will benefit from the target HCs and DHs is 341,067 in total which represents 26.9% of the total population in four (4) southern provinces, which is calculated based on the conditions that HC covers all resident in the area and DH only covers infant under 5 years old and women between 15-49 years old. The details thereof are as shown in Table 3-2 below:

Table 3-2 Population covered by all DHs and HCs and benefits from the Project

Particulars	Lao PDR	Southern 4 Provinces	Attapeu	Champasak	Salavan	Sekong
Population	6,259,857	1,266,683	128,615	671,532	366,338	100,198
Population covered by Existing DH and HC		939,770	109,744	498,677	261,834	69,515
Ratio (%)		**74.2**	**85.3**	**74.3**	**71.5**	**69.4**
Number of New HC		15	2	7	3	3
Population covered by New HC		65,159	3,036	33,231	24,058	4,834
Population covered after the project		1,004,929	112,780	531,908	285,892	74,349
Ratio (%)		**79.3**	**87.7**	**79.2**	**78.0**	**74.2**
Population benefits from the Project		341,067	59,046	135,441	116,675	29,906
Ratio (%)	**5.4**	**26.9**	**45.9**	**20.2**	**31.8**	**29.8**

Source: National Health Statistics Report FY2009~2010, MOH (Population)
Basic and Preparatory Survey I (Population benefits from target DH and HC)

(2) Health Services Utilization Rate

Estimated health services utilization rate after the completion of the Project is as shown in Table 3-3 below, assumptions of which are made based on the effects of the similar projects implemented by other donors. The record of effects 1 year after the completion of the similar project are 1) Number of ANC1 increased by 1.7 times at HC and 1.3 times at DH, 2) the number of measles immunization recipients increased by 1.3 times at HC and 1.1 times at DH and 3) the number of outpatients increased by 1.4 times at HC and 1.1 times at DH.

Table 3-3 Estimated Health Services Utilization Rate after Project Completion (2015)

Indicators		Lao PDR	4 Southern Provinces	Attapeu	Champasak	Salavan	Sekong
ANC1 Rate (National Target: 69%)	2010 (Actual)	71.0	60.1	47.3	66.2	56.7	55.1
	2015 (Estimated)	74.7	74.6	64.0	78.8	73.6	69.3
Measles Immunization Rate (National Target: 90%)	2010 (Actual)	64.4	65.0	66.6	61.4	69.2	66.2
	2015 (Estimated)	66.6	73.6	77.5	68.1	80.5	75.2
Outpatients per 1,000 population (National Target: N/A)	2010 (Actual)	0.38	0.30	0.28	0.26	0.29	0.59
	2015 (Estimated)	0.39	0.35	0.34	0.29	0.35	0.69

(3) Effects from the Construction of Staff House

The rate of HC deployed with necessary number of staff out of 67 target HC is as shown in Table 3-4 below, assumptions of which are made based on the hypothesis that the minimum number of staff will be secured on account of the construction of staff house (4 staff for HC Type A, 2 staffs for HC Type B). The rate is expected to increase notably e.g. from 50% to 75% in Attapeu and from 22.2% to 100% in Sekong.

Table 3-4 Rate of HC deployed with Necessary Number of Staff

Particulars	Attapeu	Champasak	Salavan	Sekong
Current Rate (%)	50.0	45.0	33.3	22.2
Rate after Project Completion (%)	75.0	55.0	50.0	100.0

(4) Quantitative Output Indicators

Targets of each output indicator are set as shown in Table 3-5 below, assumptions of which are made based on the quantitative effects mentioned above, health services utilization rate in particular.

Table 3-5 Target of Quantitative Output

Indicators	Actual	Target (2018)
Population rate covered by DHs and HCs in four (4) southern provinces (incl. those not targeted by the project)	74.2% (2010)	79.3%
ANC1 rate in the southern 4 provinces	60.1% (2010)	86.2%
Measles immunization Rate in four (4) southern provinces	64.8% (2010)	85.1%
Number of outpatient of DHs and HCs in four (4) southern provinces	376,978	536,535
Number of staff at the target HCs	172	230

Targets of each output indicator shown in Table 3-5 above are computed based on the record of effects of similar project mentioned hereinbefore (~2015) and reasonable growth rate of 5% (2016~2018).

3-2-2-2 Qualitative Effects

- Construction of SH helps: emergency medical examination and treatment beyond office hours at HC can be available for the resident.
- Photovoltaic (PV) system helps: improvement of the quality of nighttime medical examination and delivery, keep quality of vaccine in good condition by means of continuous running of the vaccine refrigerator, and improvement of the quality of medical examination by means of use of the equipment which consumes the electricity.
- Water supply system helps: realization of the hygienic environment suitable for provision of the health services, improvement of the safety in health care services, and to enable to installing flush toilet to give instructions for hand washing to the patients which will lead to hygiene control among the community by HC.

Table 3-6 Project Outcome

Current Situation and issues	Counter Measure by the Project (Project Component)	Project Outcome
There are areas/residents out of health facility's coverage and difficult to access to health services.	Construction of 14 new HC in the southern 4 provinces.	New 14 HC will cover about 65,000 residents in the southern 4 provinces and coverage ratio increases from 74% to 79%.

Current Situation and issues	Counter Measure by the Project (Project Component)	Project Outcome
Health service utilization rate is low partially due to aging health facility	Reconstruction of 30 existing HC in the southern 4 provinces.	Safe, hygienic and comfortable office environment will be secured.
Primary health care services, especially integrated maternal health services by HC is not properly provided due to lack of or aging medical equipment.	Installation of necessary equipment for target health facilities.	Primary health care services and integrated maternal health services will be provided and its service level will be improved.
There are health facilities difficult to maintain hygienic office environment and provide a treatment due to lack of clean water.	Water supply such as a well for the health facilities difficult to secure water.	Quick and efficient medical examination and treatment will be possible on account of hygienic office environment and availability of clean water.
There are health facilities difficult to provide treatment at night and integrated maternal health service, especially immunization, due to lack of electricity.	Installation of photovoltaic solar power generation system for the facilities difficult to connect to power line.	Integrated maternal health services, Emergent medical examination and treatment at night will be provided. Health services will be improved by electric medical equipment.
There are health facilities difficult to provide an outreach services due to lack of transportation.	Supply of motorcycle for transportation.	Outreach service will be provided. Emergent delivery at home will be possible.
Deployment of staff at rural area is difficult due to its unpopularity.	Construction of Staff House with infrastructure.	Staff House will be incentive for staff to be deployed. Nighttime or emergent medical examination will be possible since Staff House will be attached to HC.
Maternal health services utilization rate is low. There are health facilities with room component not applicable for delivery, antenatal and postnatal care.	Construction/Reconstruction of examination room for maternal health and delivery room.	Comfortable Integrated maternal health services will be provided with patient's privacy
Without RDT, examination cannot be done since there is no examination facility. Diagnosis for diarrhea cannot be made	Set up examination room equipped with microscope.	Cure rate will be increased by proper medication based on the examination for malaria and intestinal parasite
Regulated MCH services at DH cannot be provided due to insufficient medical equipment.	Installation of medical equipment at MCH clinic of DH.	BemONC can be provided. Referral from HC can be accepted.

3-2-3 Issues and Recommendations

In order to utilize HCs and MCH clinics of DHs improved and/or built by this Project continuously and effectively, the following issues should be reviewed and accommodated by Lao side

- Adequate health staff should be allocated at the health facilities improved and/or by this Project. Especially, laboratory technicians should certainly be allocated for HCs which

the laboratory with microscopes is provided.

- The necessary operating and maintenance cost should be secured for HCs to be improved and/or built by this Project
- The supply chain for essential drugs and medical commodities and the cold chain for vaccines should be established for the new HCs to be built by this Project.
- Strong commitment for facility management and the promotion for utilization of HCs to residents should be requested to community health committees which are covered by HCs improved and/or built by this Project.

3-2-4 Collaboration with Technical Cooperation and Other Donors

The JICA technical cooperation project in progress, "the Project for strengthening integrated maternal, neonatal and child health services in 2011-2015" aims to improve the coverage of the maternal, neonatal and child health (MNCH) services in four southern provinces. The cooperation with the said technical cooperation project is very important because all outputs thereof are closely related to this Project, which are 1) the MNCH services are appropriately managed by PHOs and DHOs, 2) knowledge and skills of health service providers for the MNCH service delivery are improved, and 3) mobilization of the community people for the MNCH services are enhanced in collaboration with various organizations.

There are major aid partners such as WHO, UNFPA, UNICEF, Global Fund, WB, ADB and Luxemburg to support the health sector in Lao PDR variously. It is confirmed that this Project is not duplicated with these partners' programs. In order to implement this Project to be more effectively, the cooperation with other aid partners is quite effective. Cooperation with WB which supports the promotion of utilization of health services for poor mothers and children and the improvement of service quality in the southern region (4 southern provinces + Savahnakeht), UNFPA which supports the SBA development plan, and UNICEF which supports EPI is quite important.

APPENDICES

APPENDICES

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A1 Member list of the Survey Team

1) Field Survey I (February 26 to March 21, 2012)

Name	Role	Institution
Mr. Mitsuru Suemori	Team Leader	Senior Advisor, Japan International Cooperation Agency (JICA)
Ms. Miho Kyouguchi	Planning Management	Health Division 3, Health Group 2, Human Development Department, Japan International Cooperation Agency (JICA)
Ms. Rika Matsumoto	Procurement Management	Second Construction Management Division, First Management Department, Japan International Cooperation System(JICS)
Mr. Mituso Ochi	Chief Consultant/ Architectural Planner	Oriental Consultants Co., Ltd.
Mr. Takatsugu Shimada	Facility Planner	Oriental Consultants Co., Ltd.
Ms. Akiko Takamiya	Health Planner	C.D.C. International Corporation
Mr. Takashi Ogawa	Equipment Planner/ Cost Estimator	Fujita Planning Co.,Ltd.
Mr. Shinichi Iseki	Hidrogeologist/ Water Supply System Planner	OYO International Corporation
Ms. Naoko Miyatake	Coordinator/ Assistant to Facility Planner	Oriental Consultants Co., Ltd.

2) Field Survey II (May 20 to June 16, 2012)

Name	Role	Institution
Mr. Mitsuru Suemori	Team Leader	Senior Advisor, Japan International Cooperation Agency (JICA)
Ms. Yui Takayama	Planning Management 1	Health Division 3, Health Group 2, Human Development Department, Japan International Cooperation Agency (JICA)
Ms. Miho Kyouguchi	Planning Management 2	Health Division 3, Health Group 2, Human Development Department, Japan International Cooperation Agency (JICA)
Mr. Mituso Ochi	Chief Consultant/ Architectural Planner	Oriental Consultants Co., Ltd.
Mr. Takatsugu Shimada	Facility Planner	Oriental Consultants Co., Ltd.
Mr. Takayuki Yonemaru	Procurement Planning / Cost Estimation	Oriental Consultants Co., Ltd.
Ms. Akiko Takamiya	Health Planner	C.D.C. International Corporation
Mr. Takashi Ogawa	Equipment Planner/ Cost Estimator	Fujita Planning Co.,Ltd.
Mr. Shinichi Iseki	Hidrogeologist/ Water Supply System Planner	OYO International Corporation
Ms. Naoko Miyatake	Coordinator/ Assistant to Facility Planner	Oriental Consultants Co., Ltd.

3) Additional Field Survey II (October 21 to December 9, 2012)

Name	Role	Institution
Mr. Shinichi Iseki	Hidrogeologist/ Water Supply System Planner	OYO International Corporation

4) Field Survey III (December 2 to December 13, 2012)

Name	Role	Institution
Mr. Mitsuru Suemori	Team Leader	Senior Advisor, Japan International Cooperation Agency (JICA)
Ms. Yui Takayama	Planning Management	Health Division 3, Health Group 2, Human Development Department, Japan International Cooperation Agency (JICA)
Ms. Rika Matsumoto	Procurement Management	Second Construction Management Division, First Management Department, Japan International Cooperation System(JICS)
Mr. Mituso Ochi	Chief Consultant/ Architectural Planner	Oriental Consultants Co., Ltd.
Mr. Takatsugu Shimada	Facility Planner	Oriental Consultants Co., Ltd.
Mr. Takayuki Yonemaru	Procurement Planning / Cost Estimation	Oriental Consultants Co., Ltd.

5) Field Survey IV (April 21 to April 27, 2013)

Name	Role	Institution
Mr. Mituso Ochi	Chief Consultant/ Architectural Planner	Oriental Consultants Co., Ltd.
Mr. Takatsugu Shimada	Facility Planner	Oriental Consultants Co., Ltd.
Mr. Takayuki Yonemaru	Procurement Planning / Cost Estimation	Oriental Consultants Co., Ltd.

A2 Survey Schedule

1) Field Survey I (February 26 to March 21, 2012)

	Date		Official Members (JICA/JICS)	Chief Consultant/ Architectural Planner	Facility Planner	Equipment Planner/ Cost Estimator	Health Planner	Hidrogeologist/ Water Supply System Planner	Coordinator/ Assistant to Facility Planner
				OCHI Mitsuo	SHIMADA Takatsugu	OGAWA Takashi	TAKAMIYA Akiko	ISEKI Shinichi	MIYATAKE Naoko
1	26-Feb	SUN		Move by Plane: Leave Tokyo (Narita) at 11:45 ⇒ Arrive Bangkok at16:45 Leave Bangkok at 19:55 ⇒ Arrive Vientiane at 21:05					Same as Chief Consultant
2	27-Feb	MON		Courtesy Call to and Meeting with JICA Vientiane Office, CDSWC Technical Assistance Team and MOH (incl. Center for Environmental Health and Rural Water Supply for Hydrogeologist)					ditto
3	28-Feb	TUE		Courtesy Call to and Hearing from ADB and WB Site Visit (HC constructed by ADB)			Hearing from MOH	Hearing from Water Authority	ditto
4	29-Feb	WED		Move by Plane: Lv. Vientiane at 7:45 ⇒ Ar. Pakse at 9:00 for Meeting with PHO in Champasak Province (incl. site survey after confirming location)					Same as Facility Planner
				Move by Car from Pakse to Salavan for Meeting with PHO in Salavan Province (incl. site survey after confirming location)					ditto
5	1-Mar	THU		Move by Car from Salavan to Sekon for Meeting with PHO in Sekon Province (incl. site survey after confirming location)					ditto
6	2-Mar	FRI		Move by Car from Sekon to Attapeu for Meeting with PHO in Attapeu Province (incl. site survey after confirming location)					ditto
7	3-Mar	SAT		Move by Car from Attapeu to Pakse Preparation of Draft Selection Criteria for Target Sites	Site Survey in Attapeu Province (Team A)		Same as Chief Consultant	Site Survey in Attapeu Province (Team B)	
8	4-Mar	SUN	Move by Plane: Tokyo (Haneda) ⇒ Bangkok ⇒ Vientiane	Move by Plane: Lv. Pakse at 11:45 ⇒ Ar. Vientiane at 13:00	Site Survey in Attapeu Province (Team A)		ditto	Site Survey in Attapeu Province (Team B)	
9	5-Mar	MON	Report by Consultant Team Meeting with JICA Vientiane Office		Site Survey in Attapeu Province (Team A)		ditto	Site Survey in Attapeu Province (Team B)	
10	6-Mar	TUE	Meeting with Embassy and MOH (Discussion of Selection Criteria)		Site Survey in Attapeu Province Move by Car: Attapeu ⇒ Sekon		ditto	Move by Car: Attapeu ⇒ Sekon Site Survey in Sekon Province	
11	7-Mar	WED	Move by Plane: Lv. Vientiane at 7:45 ⇒ Ar. Pakse at 9:00 for Visit to PHO and HC in Champasak Province		Site Survey in Sekon Province Move by Car: Sekon ⇒ Salavan		ditto	Site Survey in Sekon Province (Team B)	
			Move by Car from Pakse to Salavan for Visit to PHO and HC in Salavan Province				ditto		
			Move by Car from Salavan to Sekon				ditto		
12	8-Mar	THU	Visit PHO and HC in Sekon Province		Site Survey in Salavan Province (Team A)		ditto	Site Survey in Sekon Province (Team B)	
			Move by Car from Sekon to Attapeu for Visit to PHO in Attapeu Province				ditto		
			Move by Car: Attapeu ⇒ Pakse				ditto		
13	9-Mar	FRI	Site Survey in Champasak Province Internal Meeting/ Review of Draft Selection Criteria for Target Sites		Site Survey in Salavan Province (Team A)		ditto	Move by Car: Sekon ⇒ Salavan for Site Survey in Salavan Province (Team B)	
14	10-Mar	SAT	Move by Plane: Lv. Pakse at 11:45 ⇒ Ar. Vientiane Review of Field Survey Results/ Internal Meeting		Site Survey in Salavan Province (Team A)		ditto	Site Survey in Salavan Province (Team B)	
15	11-Mar	SUN	Internal Meeting/ Preparation of Final Version of Selection Criteria for Target Sites		Site Survey in Salavan Province (Team A)		ditto	Site Survey in Salavan Province (Team B) Move by Car: Salavan ⇒ Pakse	
16	12-Mar	MON	Internal Meeting/ Review of Final Version of Selection Criteria for Target Sites Preparation of Draft Minutes of Discussion (M/D)		Move by Car: Salavan ⇒ Pakse for Site Survey in Champasack Province (Team A)		ditto	Site Survey in Champasack Province (Team B)	
17	13-Mar	TUE	Signing of M/D Report to Embassy of Japan and JICA Vientiane Office Internal Meeting		Site Survey in Champasack Province (Team A)		ditto	Site Survey in Champasack Province (Team B)	
	14-Mar	WED	Move by Plane (Leader): Vientiane ⇒ Bangkok	Visiting to Bureau of Statistics, EDL	Site Survey in Champasack Province (Team A)		ditto	Site Survey in Champasack Province (Team B)	
19	15-Mar	THU	⇒ Arrive Tokyo (Haneda)	Move by Plane: Lv. Vientiane at 7:45 ⇒ Ar. Pakse at 9:00	Site Survey in Champasack Province (Team A)		Collection of Additional Data and Information giving consideration of agreed Selection Criteria	Site Survey in Champasack Province (Team B)	
				Move by Car from Pakse to Attapeu		Move by Plane: Lv. Pakse at 16:05 ⇒ Ar. Vientiane at 17:20		Same as Chief Consultant	Same as FEquipment Planner/ Cost Estimator
20	16-Mar	FRI		Site Survey in Attapeu Province		Greeting before leave to JICA Move by Plane: Leave Vientiane at 13:50 ⇒ Arrive Bangkok at 14:55 Leave Bangkok at 22:35 ⇒		ditto	ditto
21	17-Mar	SAT		Site Survey in Attapeu Province		⇒ Arrive Tokyo (Narita) at 06:15		ditto	ditto
22	18-Mar	SUN		Move by Car from Attapeu to Pakse				ditto	
				Move by Plane: Lv. Pakse at 16:05 ⇒ Ar. Vientiane at 17:20				ditto	
23	19-Mar	MON		Visiting to MOH, Mnistry of Energy and Mining				ditto	
24	20-Mar	TUE		Greeting before leave to JICA Move by Plane: Leave Vientiane at 21:50 ⇒ Arrive Bangkok at 22:55				ditto	
25	21-Mar	WED		⇒ Arrive Tokyo (Narita) at 07:30				ditto	

2) Field Survey II (May 20 to June 16, 2012)

Date			Official Members (JICA)	Chief Consultant/ Architectural Planner	Facility Planner	Procurement Planning / Cost Estimation	Equipment Planner/ Cost Estimator	Health Planner	Hidrogeologist/ Water Supply System Planner	Coordinator/ Assistant to Facility Planner
20-May	Sun	1			Move by Plane Lv. Narita (Tokyo) at 12:00 ⇒ Ar. Bangkok at 16:30 Lv. Bangkok at 19:50 ⇒Ar. Vientiane at 21:00				Same as Facility Planner	
21-May	Mon	2			Courtesy Call to and Meeting with JICA Vientiane Office, MOH Meeting with Local Contractor for Research Unit Price and Request of Quotation				Same as Facility Planner	
22-May	Tue	3			Meeting with Local Contractor for Research Unit Price and Request of Quotation				Meeting wit HCEHWS Arrangement of Equipment for Electrical Prospecting	
23-May	Wed	4		Move by Plane Lv. Narita (Tokyo) at 12:00 ⇒ Ar. Bangkok at 16:30 Lv. Bangkok at 19:50 ⇒Ar. Vientiane at 21:00	Move by Plane & Car Lv. Vientiane at 07:40⇒ Ar. Pakse at 8:55 11:00 Meeting with PHO in Salavan Province Additional Site Survey in Salavan Province		Move by Plane Lv. Narita (Tokyo) at 12:00 ⇒ Ar. Bangkok at 16:30 Lv. Bangkok at 19:50 ⇒Ar. Vientiane at 21:00	Move by Plane Lv. Kansai (Osaka) at 11:45 ⇒ Ar. Bangkok at 15:35 Lv. Bangkok at 19:50 ⇒Ar. Vientiane at 21:00	Same as Facility Planner	Same as Chief Consultant
24-May	Thu	5		Meeting with JICA and MOH Discussion and Explamation Explanation about Facility Plan and Equipment List	Additional Site Survey in Salavan Province Survey Local Conditions on Procurement and Construction in Salavan Province		Same as Chief Consultant		Same as Facility Planner	Same as Chief Consultant
25-May	Fri	6		Discussion with MOH about Facility Plan (HC、SH)	Move by Car:Salavan⇒Sekong 09:30 Meeting with PHO in Sekong Province Additional Site Survey in Sekong Province		Meeting with MOH on Equipment for HC and DH	Meeting with MOH on Questionnaire and Outline of HC	Same as Facility Planner	Same as Chief Consultant
26-May	Sat	7		Hearing with Local Consultants for Construction	Additional Site Survey in Sekong Province Survey Local Conditions on Procurement and Construction in Sekong Province Move by Car:Sekong⇒Attapeu		Survey Local Conditions on Procurement and Price Unit	Analysis of Health Indicators, Collection of Data	Same as Facility Planner	Same as Chief Consultant
27-May	Sun	8		Review of Field Survey Results/ Internal Meeting	Review of Field Survey Results/ Internal Meeting		Review of Field Survey Results/ Internal Meeting		Same as Facility Planner	Same as Chief Consultant
28-May	Mon	9	Move by Plane:12:35 Jakarta⇒Bangkok ⇒Vientiane 20:05	Hearing with Local Consultants for Construction	08:30 Meeting with PHO in Attapeu Province Additional Site Survey in Attapeu Province		Move by Plane Lv. Vientiane at 06:30⇒Ar. Pakse at 07:45 Move by Car:Pakse⇒Attapeu Hearing with PHO & DHO in Attapeu Province		Same as Facility Planner	Same as Chief Consultant
29-May	Tue	10	Move by Plane:00:20 Haneda (Tokyo)⇒ Bangkok ⇒Vientiane10:45 14:00 Report to JICA Vientiane Office 16:00 Report to Embassy of Japan	Review of the Draft Facility Plan	Survey Local Conditions on Procurement and Construction in Attapeu Province Move by Car:Attapeu⇒Pakse		Hearing with PHO & DHO in Attapeu Province		Same as Facility Planner	Same as Chief Consultant
30-May	Wed	11	09:00 Meeting with MOH 14:00 Internal Meeting		08:30 Meeting with PHO in Champasack Province (incl. site survey)		Move by Car:Attapeu⇒Sekong Hearing with PHO & DHO in Sekong Province Move by Car:Sekong⇒Pakse		Same as Facility Planner	Same as Chief Consultant
31-May	Thu	12	Move by Plane & Car:06:30 Vientiane⇒Pakse 10:00 Meeting with PHOs in 4 Province (Champasack PHO) 13:30 Meeting with PHO in Attapeu Province 15:15 Meeting with PHO in Salavan Province		Same as Chief Consultant	Collection of Additional Data and Information (Pakse)	10:00 Meeting with PHOs in 4 Province (Champasack PHO) Hearing with PHO & DHO in Champasack Province		Same as Facility Planner	Same as Chief Consultant
1-Jun	Fri	13	10:00 Meeting with PHO in Sekong Province 13:30 Meeting with PHO in Champasack Province		Additional Site Survey in Champasack Province Collection of Additional Data and Information (Pakse)		Same as Chief Consultant Move by Car:Pakse⇒Attapeu	Hearing with PHO & DHO in Champasack Province	Same as Facility Planner	Same as Chief Consultant
2-Jun	Sat	14	Move by Plane:Lv. Pakse at 16:05⇒Ar. Vientiane at 17:30		Collection of Additional Data and Information (Pakse) Review of Field Survey Results/ Internal Meeting		Hearing with PHO & DHO in Attapeu Province		Arrangements for local workers	Same as Facility Planner
3-Jun	Sun	15	Internal Meeting Draft Minutes (M/M)		Move by Plane:Lv. Pakse at 11:45⇒Ar. Vientiane at 13:00 Review of Field Survey Results/ Internal Meeting		Hearing with PHO & DHO in Attapeu Province Review of Field Survey Results/ Internal Meeting		Move by Car: Pakse⇒Sekong	Same as Facility Planner
4-Jun	Mon	16	09:00 Internal Meeting(JICA) 10:00 Meeting with MOH in order to finalize M/M(MOH) 14:00 Finalaize M/M		Hearing with Other Donors and GOL about the Projects and Site Visit		Hearing with PHO & DHO in Attapeu Province Move by Car:Attapeu⇒Sekong⇒Pakse		Electrical Prospecting in Sekong Province	Same as Chief Consultant
5-Jun	Tue	17	10:00 Signing of M/M 14:00 Report to Embassy of Japan 15:00 Report to JICA Vientiane Office Move by Plane:Lv. Vientiane at 21:45⇒ Bangkok⇒	14:00 Report to Embassy of Japan 15:00 Report to JICA Vientiane Office	Hearing with Local Consultants		Move by Plane:Lv. Pakse at 11:45⇒Ar. Vientiane at 13:00 Survey Local Conditions on Procurement and Price Unit	Analysis of Health Indicators, Collection of Data	Electrical Prospecting in Sekong Province	Same as Chief Consultant
6-Jun	Wed	18	⇒Narita (Tokyo)	Hearing with EDL & Meteorological Agency	Review of the Draft Facility Plan	Same as Chief Consultant	Discussion with MOH on Equipment for HC and DH	Discussion wit JICA (CDSWC)	Move by Car:Sekong⇒ Attapeu Electrical Prospecting in Attapeu Province	Same as Chief Consultant
7-Jun	Thu	19		Preparation of Draft Facility Plan(HC・SH) (incl. Technical Note)		Collecting with Data, Information and Materials	Discussion with MOH on Equipment for HC and DH	Discussion with MOH on Operation and Maintenancs for HC	Electrical Prospecting in Attapeu Province	Same as Chief Consultant
8-Jun	Fri	20		Discussion with MOH in order to Finalize Draft Facility Plan(HC・SH) (incl. Technical Note)		Collecting with Data, Information and Materials	Discussion with MOH on Equipment for HC and DH (Signing Technical Note)	Discussion with MOH on Operation and Maintenancs for HC	Electrical Prospecting in Attapeu Province Move by Car:Attapeu⇒ Sekong	Same as Chief Consultant
9-Jun	Sat	21		Revise of Draft Facility Plan(HC・SH) (incl. Technical Note)		Collecting with Data, Information and Materials	Survey Local Conditions on Procurement and Price Unit	Review of Field Survey Results/ Internal Meeting	Electrical Prospecting in Sekong Province	Same as Chief Consultant
10-Jun	Sun	22		Review of Field Survey Results/ Internal Meeting					Electrical Prospecting in Sekong Province	Same as Chief Consultant
11-Jun	Mon	23		Preparation of Final Version of Draft Facility Plan(HC・SH) (incl. final version of Technical Note)		Collecting with Unit Price Survey Sheet, Hearing with Local Contractor	Survey Local Conditions on Procurement and Price Unit	Hearing with Other Donors on Assistance of MOH	Move by Car:Sekong⇒ Salavan Electrical Prospecting in Salavan Province	Same as Procurement Planning / Cost Estimation
12-Jun	Tue	24		Discussion with MOH on Final Version of Draft Facility Plan(HC・SH) (Signing of Technical Note)		Collecting with Unit Price Survey Sheet, Hearing with Local Contractor	Survey Local Conditions on Procurement and Price Unit	Discussion with MOH on Promotion for HC	Electrical Prospecting in Salavan Province	Same as Procurement Planning / Cost Estimation
13-Jun	Wed	25		Collecting with Unit Price Survey Sheet, Hearing with Contractor 15:00 Report to JICA Vientiane Office 17:00 Report to Embassy of Japan			15:00 Report to JICA Vientiane Office 17:00 Report to Embassy of Japan	15:00 Report to JICA Vientiane Office 17:00 Report to Embassy of Japan	Electrical Prospecting in Salavan Province	Same as Health Planner
14-Jun	Thu	26		Collecting with Unit Price Survey Sheet, Hearing with Local Contractor			Review of Field Survey Results		Data Collection in Salavan & Sekong Province Move by Car Salavan⇒ Sekong⇒Pakse	Same as Health Planner
				Move by Plane Lv. Vientiane at 13:50 ⇒Ar. Bangkok at 14:55	Move by Plane Lv. Vientiane at 13:50 ⇒Ar. Bangkok at 14:55 Lv. Bangkok at 22:10⇒	Same as Chief Consultant	Move by Plane Lv. Vientiane at 13:50 ⇒Ar. Bangkok at 14:55 Lv. Bangkok at 22:10⇒	Move by Plane Lv. Vientiane at 13:50 ⇒Ar. Bangkok at 14:55 Lv. Bangkok at 23:30⇒		Same as Facility Planner
15-Jun	Fri	27		Survey Local Conditions on Procurement of Construction Materials	Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20	Same as Chief Consultant	Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20	Move by Plane: ⇒Ar. Kansai (Osaka) at 07:00	Move by Plane:Lv. Pakse at 1:45 ⇒Ar. Vientiane at 13:00	Same as Facility Planner
16-Jun	Sat	28		Survey Local Conditions on Procurement of PV System Move by Plane: Lv. Bangkok at 22:10⇒		Same as Chief Consultant			Move by Plane:13:50Vientiane⇒ 14:55 Bangkok22:35⇒	
17-Jun	Sun	29		Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20		Same as Chief Consultant			Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20	

3) Additional Field Survey II (October 21 to December 9, 2012)

Date		Schedule			
		Mr. Iseki	Stay	Mr. Sakato	Stay
2012/10/28	Sun	Moving to Pakxe			Pakxe
2012/10/29	Mon	Champasack Province, Coliform Test	Pakxe		Pakse
2012/10/30	Tue	Preparation for Resistivity Survey and Geophysical Logging	Pakxe		Pakxe
2012/10/31	Wed		Pakxe		Pakxe
2012/11/1	Thr	Coliform Test in Champasack	Pakxe		Pakxe
2012/11/2	Fri	Coliform Test in Salavan Province	Salavan	Test Borehole Drilling (S04)	Salavan
2012/11/3	Sat	Sekong Provincs, Coliform Test	Attapeu	Test Borehole Drilling (S04)	Salavan
2012/11/4	Sun	Attapeu Province, Coliform Test	Attapeu	Test Borehole Drilling (S04)	Salavan
2012/11/5	Mon	Attapeu -> Pakxe -> Attapeu (Water Sample)	Atapeu	Test Borehole Drilling (S04)	Salavan
2012/11/6	Tue	Resistivity Survey (A03)	Attapeu	Test Borehole Drilling (S04)	Salavan
2012/11/7	Wed	Moving (Attapeu to Dakchung))	Dakchung	Test Borehole Drilling (S04)	Salavan
2012/11/8	Thr	Resistivity Survey (X01)	Dakchung	Test Borehole Drilling (S04)	Salavan
2012/11/9	Fri	Resistivity Survey (X01), Spring Survey (X01)	Dakchung	Moving (Salavan to Attapeu)	Attapeu
2012/11/10	Sat	Resistivity Survey (X02)	Dakchung	Test Borehole Drilling (A03)	Attapeu
2012/11/11	Sun	Resistivity Survey (X02), Spring Survey (X02)	Dakchung	Test Borehole Drilling (A03)	Attapeu
2012/11/12	Mon	Moving (Dakchung to Attapeu)	Attapeu	Test Borehole Drilling (A03)	Attapeu
2012/11/13	Tue	Contamination Route Survey(A18), Spring Survey(A03), Alternative Source Survey(A03)	Attapeu	Test Borehole Drilling (A03)	Attapeu
2012/11/14	Wed	Contamination Route Survey(A19), Spring Survey, Alternative Source Survey(A19)	Attapeu	Test Borehole Drilling (A03)	Attapeu
2012/11/15	Thr	Contamination Route Survey(A22), Spring Survey, Alternative Source Survey(A12)	Attapeu	Test Borehole Drilling (A03)	Attapeu
2012/11/16	Fri	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (A03)	Attapeu
2012/11/17	Sat	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (A03)	Attapeu
2012/11/18	Sun	Contamination Route Survey, Spring Survey, Alternative Source Survey		Moving (Attapeu to Sekong)	Sekong
2012/11/19	Mon	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X09)	Sekong
2012/11/20	Tue	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X09)	Sekong
2012/11/21	Wed	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X09)	Sekong
2012/11/22	Thr	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X09)	Sekong
2012/11/23	Fri	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X09)	Sekong
2012/11/24	Sat	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X09)	Sekong
2012/11/25	Sun	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X09)	Sekong
2012/11/26	Mon	Contamination Route Survey, Spring Survey, Alternative Source Survey		Moving (Sekong to Dakchung)	Dakchung
2012/11/27	Tue	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X02)	Dakchung
2012/11/28	Wed	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X02)	Dakchung
2012/11/29	Thr	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X02)	Dakchung
2012/11/30	Fri	Contamination Route Survey, Spring Survey, Alternative Source Survey		Test Borehole Drilling (X02)	Dakchung
2012/12/1	Sat	Moving to Vientiane		Test Borehole Drilling (X02)	Dakchung
2012/12/2	Sun	Reporting		Test Borehole Drilling (X02)	Dakchung
2012/12/3	Mon	Reporting		Test Borehole Drilling (X02)	Dakchung
2012/12/4	Tue	Discussion with MoH		Test Borehole Drilling (X02)	Dakchung
2012/12/5	Wed	Moving to Pakxe, Discussion with Provinces		Test Borehole Drilling (X02)	Dakchung
2012/12/6	Thr	Moving to Vientiane		Moving (Dakchung to Pakxe)	
2012/12/7	Fri	Discussion with MoH			
2012/12/8	Sat	Moving to Bangkok			
2012/12/9	Sun	Moving to Japan			

4) Field Survey III (December 2 to December 13, 2012)

Date		day	Official Members (JICA & JICS)	Chief Consultant/ Architectural Planner	Facility Planner	Procurement Planning / Cost Estimation	Hidrogeologist/ Water Supply System Planner
2-Dec-12	Sun	1		Move by Plane Lv. Narita (Tokyo) at 12:00 ⇒ Ar. Bangkok at 16:30 Lv. Bangkok at 19:50 ⇒Ar. Vientiane at 21:00			Review of Field Survey Results
3-Dec-12	Mon	2	Move by Plane:00:20 Haneda (Tokyo) ⇒Bangkok ⇒Vientiane10:45	Internal Meeting		Internal Meeting	Same as Chief Consultant
4-Dec-12	Tue	3	Internal Meeting			Internal Meeting Visit to Local Consultants & Contractor	Same as Chief Consultant
5-Dec-12	Wed	4	Report to JICA Vientiane Office & Embassy of Japan Meeting with MOH				Same as Chief Consultant
6-Dec-12	Thu	5	Move by Plane & Car:11:15 Vientiane⇒Pakse12:30 Meeting with PHOs in 4 Province (Champasack PHO), Meeting with PHO in each Province			Internal Meeting Visit to Local Consultants & Contractor	Same as Chief Consultant
7-Dec-12	Fri	6	Meeting with PHO in each Province			Internal Meeting Visit to Local Consultants & Contractor	Same as Chief Consultant
8-Dec-12	Sat	7	Meeting with PHO in each Province Move by Plane:Lv. Pakse at 16:20⇒Ar. Vientiane at 17:35			Internal Meeting Visit to Local Consultants & Contractor	Same as Chief Consultant
9-Dec-12	Sun	8	Internal Meeting Draft Minutes (M/M)	Review of Field Survey Results/ Internal Meeting Draft Minutes (M/M)			Review of Field Survey Results/ Internal Meeting
				Evaluation about TOR			Move by Plane Lv. Vientiane ⇒Ar. Bangkok ⇒
10-Dec-12	Mon	9	Meeting with MOH			Negotiation & Discussion with Local Consultants	Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20
11-Dec-12	Tue	10	Signing of M/M, Report to Embassy of Japan & JICA Vientiane Office				
			14:00 Report to Embassy of Japan 15:00 Report to JICA Vientiane Office Move by Plane:Lv. Vientiane at 21:45	Collecting with Unit Price Survey Sheet, Hearing with Contractor			
12-Dec-12	Wed	11	⇒Narita (Tokyo)	Discussion with Contractor			
				Move by Plane Lv. Vientiane at 22:35 ⇒Ar. Bangkok at 23:55 Lv. Bangkok at 22:10⇒			
13-Dec-12	Thu	12		Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20			

5) Field Survey IV (April 21 to April 27, 2013)

Date		day	Chief Consultant/ Architectural Planner	Facility Planner	Procurement Planning / Cost Estimation
21-Apr	Sun	1	Move by Plane Lv. Narita (Tokyo) at 12:00 ⇒ Ar. Bangkok at 16:30 Lv. Bangkok at 19:50 ⇒Ar. Vientiane at 21:00		
22-Apr	Mon	2	Courtesy Call to and Meeting with JICA Vientiane Office, MOH(Dept. of Healeth care and Dept. of Planning & Finance)		
23-Apr	Tue	3	Discussion and Explamation with MOH (Dept. of Health care) about Tender Documents		
24-Apr	Wed	4	Discussion and Explamation with MOH (Dept. of Planning & Finance) about Tender Documents		
25-Apr	Thu	5	Discussion and Explamation with MOH (Dept. of Health care) about Tender Documents (Signing of Technical Note)	Move by Plane Lv. Vientiane at 13:50 ⇒Ar. Bangkok at 14:55 Lv. Bangkok at 22:10⇒	Discussion and Explamation with MOH (Dept. of Health care) about Tender Documents (Signing of Technical Note)
26-Apr	Fri	6	Report to JICA Vientiane Office and Embassy of Japan Move by Plane Lv. Vientiane at 13:50 ⇒Ar. Bangkok at 14:55 Lv. Bangkok at 22:10⇒	Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20	Report to JICA Vientiane Office and Embassy of Japan Move by Plane Lv. Vientiane at 13:50 ⇒Ar. Bangkok at 14:55 Lv. Bangkok at 22:10⇒
27-Apr	Sat	7	Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20		Move by Plane: ⇒Ar. Narita (Tokyo) at 06:20

A3 List of Parties Concerned in the Recipient Country

1) Ministry of Health: MOH

Dr. Champhomma Vongsamphanh	Deputy Director General, Health Care Department
Dr. Thongsavanh Sengkongdala	Technical Staff, Regional Hospital Division, Department of Health Care
Dr. Bounfeng Phoummalaysith	Deputy Director General, MOH Cabinet
Dr. Phouthone Vangkonevilay	Deputy Director General, Department of Organization and Personnel
Dr. Phicith Phoutsavath	Director of Hospital, Management Division, Department of Health Care
Dr. Chandavone Phoxay	Director of Health System Strengthen Project, Department of Health Care
Dr. Sommana Rattana	Deputy Head of Central-Provincial Hospital Division
Mr. Bounsathien Phimmasenh	Procurement Unit Manager, Department of Planning and Finance
Dr. Somchan Xaysida	Head Division of Education and Training, Dept. of Personnel
Mrs. Sengmany Khambounheuang	Deputy Head Division of Education and Training
Dr. Anonh Xeuatvongsa	Director of National Immunization Programme (EPI section)
Dr. Manisone	Head of Procurement
Dr. Bounnack Saysanasongham	Deputy Director General, Department of Health Care
Dr. Bouasy Hongvanthong	Director, National Malaria Control Programme
Mr. Phontnalong Vilay	Technical Staff, National Malaria Control Programme
Mr. Phoxay Sayalat	Head of Finance Division
Dr. Viengmany Bounkham	Technical Staff, Head of Finance Division
Dr. Manivanh	Technical Officer, Department of Health Care
Mr. Somchit	Head of Department, MOH Cabinet
Mr. Phasoumphan	Technical Officer, Department of Planning
Mr. Anoulack	Deputy Chief of Division, Department of Finance
Mr. Singhana	Technical Officer, Department of Planning

2) Champasak Provincial Health Office: CP-PHO

Dr. Khampho Chareunvoag	Director
Dr. Somkiat Vorarath	Deputy Director
Mr. Sonphanh Phounsavath	Deputy Director
Dr. Orathai Satrakoun (Ms.)	Chief of MCH
Dr. Phonxay Khounmala	Curative Office
Dr. Senghanh Keoophondeth	Deputy Chief of Administration
Dr. Phengvan Baisack	Deputy Chief of Health Promotion
Mr. Henon Moski	Public Health Care Division
Dr. Vannasay Sattakounh	-

3) Selavan Provincial Health Office: SL-PHO

Dr. Kaseunsouu Vongsouthy	Deputy Director
Dr. Bouaeay Senkeomyco	Deputy Director
Mr. Sommay Keomany	Deputy Director
Mr. Somphan Sikin	Deputy Chief of Planning and Finance
Dr. Somkhit Thongkhamsouk	Deputy Chief of Administration
Mr. Saosely Boualany	Manager
Mr. Goanphamh Silavy	-
Dr. Somkhith Boualavong (Ms.)	Chief of MCH
Dr. Thongkham Kouengmany	Deputy Chief of MCH

4) Sekong Provincial Health Office: SK-PHO

Dr. Bounphone Phoxayavong	Deputy Director
Dr. Sompong Duanghorm	Chief of Health Care Service
Dr. Boulay Kiatchen	Chief of Administrator
Dr. Nisong Keosouvan	Deputy Chief of Administration

5) Attapeu Provincial Health Office: AT-PHO

Dr. Chanthavong Xayasena	Deputy Director
Dr. Vilasak Navonasa	Administrative Office
Mr. Sisavanh Keohoung Houang	Water and Sanitary
Mr. Phosy Thongddy	Deputy Chief of Planning Division
Ms. Vidany Kimala	-

6) Embassy of Japan in the Lao PDR

Mr. Masato Iso	Minister
Mr. Masahiko Mitsumoto	First Scretary
Ms. Akiko Tomita	Second Scretary
Mr. Toshiharu Mochizuki	Second Scretary
Mr. Masaru Nakayama	Second Scretary
Mr. Yoshinori Asada	Researcher/ Adviser in Economic and Social Develompent

7) JICA Laos Office

Mr. Masato Togagwa	Chief Representative
Mr. Kouichi Takei	Chief Representative
Mr. Yoshiharu Yoneyama	Senior Representative
Ms. Yuki Yoshimura	Representative
Mr. Kazuyuki Kakuda	Representative
Vangxay Phonlameuang	National Staff

8) National Center for Environmental Health and Water Supply: NCEHW

Mr. Kongkham Miboun	Deputy Director
Mr. Sengphet Keomany	Water Engineer, Water Supply Department

Mr. Khamphouthay Sithilath	Water Engineer, Groundwater Department

9) Provincial Water Supply Office: PWSO

Mr. Kaysone	Director, Champasak Province
Mr. Thong Kham	Director, Salavan Province
Ms. Atsaphone	Director, Sekong Province
Mr. Sisavane	Director, Attapeu Province

10) The Project for Strengthening Integrated Maternal, Neonatal and Child Health Services

Dr. Hironori Okabayashi	Chief Advisor
Dr. Shogo Kubota	Community Health/ MNCH
Ms. Megumi Fujita	Project Coordinator/ Health Education

11) Capacity Development for Sector Wide Coordination in Health Phase II: CDSWC

Dr. Azusa Iwamoto	Chief Advisor

12) Ministry of Energy and Mines: MOEM

Mr. Nobuo Hashimoto	Adviser
Mr. Anousak Phongsavanth	Deputy Director General

13) Ministry of Public Works and Transport: MOPWT

Mr. Sengdara Douangmyxay	Deputy Head of Urban Planning Division

14) Ministry of Natural Resources and Environment: MONRE

Ms. Souvanny Phonuvilay	Deputy Director General, Department of Meteorology and Hydrology

15) Electricite Du Laos: EDL

Mr. Gnanhkham Douanysavanh	PM for REP II, Department of Transmission Line
Mr. Phao Kongmany	Deputy Manager, System Planning Office, Technical Department

16) Medical Products Supply Center: MPSC

Mr. Thanom Insal	Director

17) The World Bank: WB

Mr. Phetdara Chanthala	Health Specialist

18) Asian Development Bank: ADB

Ms. Barbara Lochmann	Sr. Social Sector Specialist
Ms. Phoxay Xayyavong	Project Officer

19) UNICEF

Dr. Uma Palaniappan	Nutrition Specialist

20) United Nations Population Fund: UNFPA

Mrs. Della Sherratt	International Coordinator

21) Médecins Du Monde: MdM

Ms. Isabelle Decout	General Coordinator