"Project Formulation Survey" under the Governmental Commission on the Projects for ODA Overseas Economic Cooperation in FY2013

Summary Report

Vietnam
The feasibility Study concerning Improvement of Neonatal Healthcare through Introducing Inspecting Equipment for Neonatal Jaundice

March, 2014

Joint Venture of APEL Co.,Ltd. and Daiwa Institute of Research Ltd.

The content of this report is a summary of the project formulation survey, which was commissioned by the Ministry of Foreign Affairs of Japan in the FY 2013 and is carried out by the consortium of APEL Co.,Ltd. and Daiwa Institute of Research Ltd. It does not represent the official view of the Ministry of Foreign Affairs.

I. Description of the current situation and development needs of the concerned development issues in the surveyed country

In Vietnam, healthcare standards have been largely improved along with rapid economic growth after launching DoiMoi, a political and economic renewal campaign, in 1986. In health sector, several reforms including liberalization of private health insurance service and introduction of public health insurance system have contributed to significant improvement of health indicators. Nevertheless, several challenges have been pointed out. Maternal and child health, particularly child health, is one of such challenges and the Government of Vietnam continues to focus on improving neonatal health as neonatal mortality rate takes most of under-five mortality. The gaps in some health indicators between areas, such as rural and urban, and between ethnic groups are indicated to show the gaps in levels of accessible health service standards. Public health system is the major provider of health service and the referral system in which lower level hospital takes over the management of client to upper level hospital because of insufficient resources has built up. Many clients, however, tend to avoid lower level hospital and consult to higher level hospitals and that cause chronic congestion to higher level hospitals.

Jaundice occurs in most newborn infants. Most jaundice is benign, but in rare cases the potential toxicity of bilirubin might develop kernicterus which leads to central nervous system damage and serious prognostic symptoms. In developed countries including Japan, therefore, neonatal jaundice is one of required subjects to be managed and treated in newborn infants. Measurement of bilirubin levels in blood should be performed for proper assessment and diagnosis of neonatal jaundice. In some developing countries, however, proper assessment and diagnosis of neonatal jaundice are difficult to perform because they are short of clinical chemistry analyzers which usually are very expensive.

APEL Co.Ltd., (hereinafter referred to as “the Proposing SME”), has developed a bilirubin meter (“the Product)” which focuses its function on measuring bilirubin, providing accurate measurement equivalent to expensive chemistry analyzers at cheaper price, for developing countries. The Product has been appreciated in many countries worldwide.

Similarly, it is assumed that proper assessment and diagnosis of neonatal jaundice are not performed at middle-sized or smaller hospitals in Vietnam. Those hospitals seek for assistance of managing clients with neonatal jaundice at higher-level hospitals as they do not have apparatus necessary for adequate diagnosis, which may be one of the causes of overload at higher-level hospitals. The Product might remarkably contribute to improve such situation in Vietnam.

II. Possible applicability of the SME's products and technologies, and prospects for future business development

Competitors in China, Korea and Italy provide products for measuring bilirubin level similar to the Product and the Chinese made, which are competitive in prices, are the most popular in developing countries. The Product, however, is still highly appreciated for its accuracy and stability. The main sections of manufacturing process of the Product are performed in China while the last sections are done in Japan in order to reduce manufacturing cost and to set the price cheaper.

As the labor costs in China has been rising sharply, the Proposing SME has been preparing to set up another manufacturing base in Vietnam to realize its “China + 1” strategy within 5 years. After the establishment of its manufacturing base, the Proposing SME plans to develop Vietnam’s domestic market. Public hospitals will be the initial targets as end users of the Product and the Proposing SME seeks to expand its customer base to include private hospitals and small clinics in the medium and long term.

Public hospitals in Vietnam are required to offer a tender to purchase equipment so that the Proposing SME needs to find a sales representative in Vietnam to provide the Product to them. Private hospitals are not required for competitive tender but a sales representative is also necessary to establish sales network and to develop customer relationships.

III. Verification of adaptability of the SME's products and technologies to the surveyed country (Demonstration and pilot survey)

The Proposing SME and Daiwa Institute of Research Ltd. (hereinafter referred to as "the Joint Study Team") introduced the Products for trial use in 9 hospitals, namely, 2 national hospitals, the Provincial Hospital and 6 District Hospitals in Hoa Binh Province located in northwest Vietnam (hereinafter referred to as "the Target Hospitals"), in order to demonstrate the function and the performance of the Product and to understand their evaluation and needs to the Products.

The Joint Study Team re-visited the Target Hospitals after 1 month's trial use for interview and received high evaluation to the Product on its size and light-weight design, easy operation, quick and accurate measurement and small amount of blood collection that minimize the risk for newborn infants. Many of the Target Hospitals showed great interest in installing the Products.

The National Hospital of Pediatrics pointed out that inspection ability at the Emergency Department and Newborn Intensive Care Unit would be improved if the Products were installed to complement existing analyzers and that the Products would reduce physical strain and minimizes risk of newborns. The Hoa Binh Provincial Hospital similarly valued the Product. The Joint Study Team found that the Product can also be effective for Central and Provincial level hospitals. District-level Hospitals in Hoa Binh Province evaluated the Product as effective because of its function, accuracy, easy operation and the amount of blood collection and showed their expectation that the Product would enable those hospitals to perform necessary measurement of bilirubin. Many of the Target Hospitals agreed that the Product would be most effective when introduced at District Hospitals.

On the other hand, the Joint Study Team found some problems to solve through trial use. Cooperation between the obstetrical department and the neonatal department will be necessary so that the Product can be well utilized at higher-level hospitals. While District Hospitals are supposed to be most adequate for the Product, not only introducing the Product but also education of medical staff on diagnosis and treatment of neonatal jaundice should be provided. Taking account of Vietnamese custom after delivery, education and publicity concerning jaundice for mother and family are necessary. Centrifuges which were provided with the Products were found to be too heavy to carry, so they need to be downsized to be used for home visit. The Proposing SME will reflect on the information obtained through trial use on its future product development.

IV. Expected development impact and effect on business development of the proposing SME(s) in the surveyed country(ies) through proposed ODA projects

The Government of Vietnam strongly committed itself for improving neonatal care with the assistance of donor governments and international aid organizations. The result of trial use shows that the Product will be most effective when furnished at District Hospitals and that will provide early and adequate recognition and treatment by improving accuracy of assessment, which will improve neonatal health. Overload caused by too many patients at higher-level hospitals and differences in healthcare service across regions will also be improved.

Based upon the recognition that neonatal healthcare is one of a fundamental part of healthcare and

improvement of healthcare at local level is indispensable to narrow the gaps in healthcare between regions and ethnicities, the Product is expected to be introduced into the public health system. Human resource development of medical personnel and publicity and education for mothers and families will contribute to higher development impact when collaborating with introducing the Products. ODA projects will be most suitable to facilitate various activities as the above to obtain expected impact.

Future ODA projects will also facilitate to develop customers by the Proposing SME and will make its overseas business plan to move forward.

V. Proposals for formulating ODA projects

The Project Formulation Survey showed that (a) in spite of the Vietnamese Government's effort to improve neonatal health including neonatal jaundice through implementing necessary equipment and diagnosis and treatment guidelines, higher-level hospitals are running short of capacity for examination; clients of neonatal jaundice that are not in serious conditions and can be treated at District Hospital tend to referred to higher-level hospitals, which result in overload to those hospitals and (b) taking account of Vietnamese custom after delivery, observation of jaundice by mother and family is necessary, however, malignant jaundice in newborns is often ignored because of insufficient knowledge.

The Joint Study Team propose three ODA projects; (1) **a Pilot Survey for disseminating SME's technologies** aimed at improving examination and treatment of neonatal jaundice by introducing the Products to larger number of hospitals, (2) **a Technical Cooperation Project** aimed at transferring neonatal management techniques including neonatal jaundice, and (3) **Non-Project Grant Aid for Provision of Japanese SME's Products** by which provide public hospitals in Vietnam with medical equipment related to neonatal healthcare. Among them, **the Pilot Survey for disseminating SME's technologies** should be pursued first because it can be most effective to be performed subsequently to the Survey. **The Technical Cooperation Project** and **Non-Project Grant Aid** should be deliberated in medium-to-long term ODA strategy for Vietnam's healthcare sector.

The future ODA projects, along with the establishment of manufacturing base, will further increase publicity and promote sales of the Product in Vietnam, which will accelerate the Proposing SME's business in Vietnam.

Outline of the proposed ODA projects

	The Pilot Survey for disseminating SME's technologies	The Technical Cooperation Project	Non-Project Grant Aid for Provision of Japanese SME's Products
Objectives	1. Improve diagnosis and treatment of neonatal jaundice. 2. Manage the number of patients at higher-level hospitals and enhance effectiveness of referral system by improving the District Hospitals(as a pilot case). 3. Increse publicity of the Product	1. Improve neonatal healthcare by transferring neonatal management techniques. 2. Manage the number of patients visiting higher-level hospitals to enhance effectiveness of referral system and to narrow the gaps in healthcare between regions and ethnicities by improving the District Hospitals.	Provide public hospitals in Vietnam with medical equipment to improve neonatal healthcare
Sites	Hoa Binh Province	One or two Provinces selected from the sites of "The Project for Strengthening Medical Service in Northern Provinces"	Some Provinces selected from the sites of "The Project for Strengthening Medical Service in Northern Provinces"
Counterparts	1. District Hospiotals (11) 2. CHCs in each District (11) 3. Hoa Binh Provincial Hospital	1. District Hospitals 2. CHCs	Distict Hospitals
Contents	1. Verify the effect of the Product througn trial use. 2. Educate and train medical personnel of District Hospitals and CHCs 3. Educate mothers and families of newborn infants. 4. Trial use of the Products to selected CHCs.	1. Improve the quality of medical personnels of District Hospitals and CHCs by dispatching Japanese professionals and by provide training in Japan. 2. Provide public hospitals in Vietnam with medical equipment related to neonatal healthcare. 3. Educate mothers and families of newborn infants. 4. Publicize to educate general public.	Provide equipment of required for neonatal health in Vietnam such as: - The Product (bilirubin meter) - Phototheraphy - Artificial respirator - Electorocardiographic monitor - Ultrasound

Feasibility Survey concerning Improvement of Neonatal Healthcare through Introducing Inspecting Equipment for Neonatal Jaundice in Vietnam

SMEs and Counterpart Organization

- Name of SME: APEL Co., Ltd.
- Location of SME: Saitama Pref., Japan
- Survey Site・Counterpart Organization: Hoa Binh Province / Ministry of Health and Hoa Binh Provincial Health Bureau

Concerned Development Issues

- In spite of significant improvement in neonatal mortality rate, there remain challenges in the areas of mother-and-child healthcare and neonatal healthcare, one of which is neonatal jaundice
- Lack of inspection equipment necessary for proper diagnosis and treatment of jaundice results in serious illness
- Large hospitals are overloaded; regional disparities in medical treatment level

Products and Technologies of SMEs

- A Total Bilirubin Meter(TBM) designed for developing countries
- Single-purpose equipment focused on examining jaundice; High accuracy; Simple to operate; Reasonable price
- Provide maintenance service in Vietnam
- Most of the products are exported; Highly appreciated in 65 countries

Proposed ODA Projects and Expected Impact

- Pilot Survey: Introduce TBM to more hospitals and provide capability building program for healthcare personnel
- Technical Cooperation: Transfer neonatal management techniques including jaundice with the view to improve neonatal healthcare in rural areas
- Grants (SME Non-project Grants): Provide TBM for medium-sized public hospitals in rural areas such as north-western provinces

Future Business Development of SMEs

- Obtain higher awareness of TBM in MOH and public hospitals; promote introduction of TBM to public Hospitals
- APEL has been preparing to set up its production base in Vietnam with a view to start local production and export from Vietnam