

"Project Formulation Survey" under the
Governmental Commission on the Projects for
ODA Overseas Economic Cooperation
in FY2012

Summary Report

People's Republic of Bangladesh

Development for Package of
Medical Waste Treatment System

March, 2013

Joint Venture
between Tesco Co., Ltd. and Yachiyo Engineering Co., Ltd.

This report is a summary of a project formulation survey conducted by the contractor, under the Governmental Commission on the Project for ODA Overseas Economic Cooperation, commissioned by the Ministry of Foreign Affairs of Japan in Fiscal Year 2012. It does not necessarily represent the official views of the Ministry of Foreign Affairs of Japan.

Introduction

According to the estimation by the People's Republic of Bangladesh (hereinafter referred to as "Bangladesh"), medical wastes discharged from Dhala City is estimated 55 tons/day. Most of them are mixed together with municipal solid wastes and disposed with covering soil at the landfill site. In this landfill site, waste pickers come frequently and are at the risk of infectious accidents. Even in the medical institutions, medical waste management lacks the sense "contactless" between the infectious wastes and people.

Tesco Co., Ltd. (hereinafter referred to as "Tesco") found the necessity to establish total management system for medical waste treatment. However, there are not any basic data, such as waste management in medical institutions, the types and amount of discharged wastes.

Therefore, Tesco needed to the investigation for making a plan of the safe and appropriate system for management and treatment, and applies this Survey.

The aim of this Survey is to support Bangladesh by ODA Project, in which appropriate treatment of medical wastes and necessary legal system are established according to the conditions of Bangladesh on the basis of the know-how and experiences of medical waste treatment system of Japan.

In this Survey, the actual situation of waste management in medical institutions, the type and amount of discharged wastes, treatment situation, and others are investigated. Based on the investigation results, the basic policy, which is suitable for Bangladesh and includes the system of safety management, treatment and disposal of infectious wastes and the system of recycling valuables, is proposed. Also preparation of Pilot Project in the model area in Dhaka City is implemented in order to examine this basic policy.

The main results of the Survey are the following 3 points; 1) Most of all medical institutions does not always separate infectious wastes, and manage medical wastes appropriately. 2) There are some risks in the process of medical waste treatment by PRISM. 3) There is a possibility to make a business with treated medical wastes.

Based on these main results, the system of safety management, treatment and disposal of infectious wastes and the system of recycling valuables for Dhaka City were prepared as Basic Policy. This Basic Policy was finalized through the discussion with Ministry of Health and Family Welfare (hereinafter referred to as "MoHFW"), Ministry of Environment and Forest, City Cooperation (hereinafter referred to as "CC") of North Dhaka City, Ministry of Local Government and Rural Development & Cooperatives (hereinafter referred to as "MLGRD&C"), Investment Committee in Prime Minister's Office, Embassy of Japan, JICA Bangladesh Office, and other related agencies.

I. Description of the Current Situation and Development Needs of the Concerned Development Issues in the Surveyed Country

Bangladesh is one of the least developed countries with a land of 144,000 square kilometers and population of 142,319,000 (Bureau of Statistic in Bangladesh, March 2011), one third of which live in the poverty. As the policy related to medical waste management, Bangladesh Government have implemented “Health, Population and Nutrition Sector Development Program 2011-2016” since July 2011. In this Program, medical waste management is shown as one of the important roles for medical institutions. The main law for medical waste management is Medical Waste (Management and Processing) Rules 2008. Based on this Rules, manuals and guidelines were prepared.

In Bangladesh, medical waste management is divided into 2 types; In-house Management and Out-house management. In-house Management is the management which is done in the territory of the medical institutions and Out-house Management is the management including the collection from the medical institutions, transportation, treatment and disposal. The law system for medical waste management is being developed, however, one of the issues for the implementation is lack of appropriate separation, collection, treatment and disposal in each management. Medical institutions under the jurisdiction of MoHFW and MoHFW are responsible for In-house Management. CCs under MLGRD&C and MLGRD&C are responsible for In-house Management.

Japan is one of the main donor countries for Bangladesh, and implemented grass-roots grant aid projects focusing on medical waste management. As the projects related to medical waste management, Japan has supported more than 10 years, such as Master Plan Study and Technical Cooperation Project. Other donors for medical waste management in Bangladesh are Asian Development Bank (hereinafter referred to as “ADB”) and World Health Organization.

The model area of the Pilot Project proposed in this Survey is Sher E Bangla Nagar and its neighboring area. According to the results of hearing survey for medical institutions with questionnaires and site survey, one of the issues for In-house Management is that medical institutions do not always separate the wastes although MoHFW instructs them. Based on the hearing survey results, medical institutions understand their responsibility and have a person in charge of medical waste management, however, they do not always manage properly, such as separation and storage.

Issues for Out-house Management are that medical institutions do not always separate the waste, collection from medical institutions is not periodically, and inappropriate treatment, such as burning outside, is done in the territory of medical institutions, etc.

In this Survey, the amounts of discharged wastes from a part of medical institutions in the model area were measured. Based on this measurement, the total amount of discharged waste in the model area is estimated as 7,109.6 kg/day. This value is for reference purpose only because it has many uncertainties.

II. Possible Applicability of the SME's Products and Technologies, and Prospects for Future Business Development

II-1 Advantage of SME and SME's Products and Technologies

It is necessary for Bangladesh, where the present system for medical waste management is not functioned fully, to establish a new consistent system for medical waste management from generation to disposal. This new system includes recycling of medical plastic wastes as one of the supplements for vulnerability of petroleum resources.

(1) Making Plastic Chips from Medical Plastic Wastes

Good quality plastics are used for some items in medical operation. After use of these plastics, they can be the materials for recycling if the infectious possibility is removed. In Japan, this recycling is impossible because of the legal limitation, however, the recycling technology of municipal solid wastes is developed. Applying this technology and experiences, such as process management for safety separation and machinery for making plastic chips, recycling business for medical plastic wastes is examined.

(2) Construction of Incinerator (future plan)

Although incinerators are required for safety treatment of medical wastes, only sterilization equipment is applied for removal of infectious possibility for the time being. Incinerators will be constructed after the conditions are settled.

II-2 Position of Overseas Business in SME's Business Plan

Tesco will make a treatment system for safety recycling of medical wastes into business, and aim to disseminate this business in other countries.

II-3 Contribution by SME's Overseas Business

It will contribute to revitalization of economy in Tokai Area in Japan to utilize the technologies and experiences of this area into our recycling business, such as plastic recycling business and large-scale sterilization equipment which are unique technologies and experiences of this area.

II-4 Mechanism of Proposed Business

In the proposed system, MoHFW will be the responsible agency for both In-house and Out-house managements. Also Tesco proposes the Basic Policy including legal package for simplifying the separation category of medical waste, dissemination and instruction package for strengthening management system, package for facility construction, etc.

In order to realize the proposed system, Pilot Project will be implemented in the selected model area. This Pilot Project will include collection and transportation, facility construction and operation and maintenance, recycling business in order to verify the proposed system.

Together with the Pilot Project, another Technical Cooperation Project (hereinafter referred to as "Coordinated Technical Cooperation Project") is proposed for strengthening instruction for medical

institutions in the model area.

II-5 Proposed Business Implementation Structure and Detailed Schedule for Dissemination

The implementation period of Pilot Project is 3 years; 1 year for facility construction and 2 years for instruction for medical institutions. However, it will be extended until the proposed system is legalized.

II-6 Countermeasure against Risks and Results of Countermeasures against Estimated Risk

Risks related to legalization will be reduced by the cooperation with Counterpart (hereinafter referred to as "C/P"). And risks related to the traffic conditions will be reduced by the effective collection and transportation plan.

III. Expanded Development Impact and Effect on Business Development of the Proposing SME' s in the Surveyed Country through Proposed ODA Projects

III-1 Consistency between Concerned Development Issues and Proposed Products and Technologies

Bangladesh has mainly 2 issues for medical waste management. One is to implement safe and appropriate management of medical wastes, and to prevent infection accidents for related workers, general public and environment. Another is to utilize medical wastes as materials effectively. In order to solve these issues, it is proposed to legalize the effectively functioned management and treatment system, to establish the safe treatment method, and to implement the recycling as the new system.

Japan has the basic technology for safe treatment, and experiences to recycle municipal solid wastes. The new system will be established with these technologies and experiences.

Chukyo Area of Japan has the company to manufacture the large-scale sterilization equipment for medical wastes, and the company to manufacture the food container from waste plastics, each of which is the only one company all over Japan. The issues in Bangladesh will be solved by collecting technical cooperation of companies for the fundamental part for medical waste treatment process, experiences of waste recycling business, willingness and intelligence for the new business, and realizing the safe and appropriate treatment and recycling business.

III-2 Effectiveness of ODA Project for SME' s Business

It is estimated that there are more than 1,200 medical institutions in Dhaka City. At present, the wastes from 320 institutions are collected. Wastes from most of all medical institutions are mixed together with municipal wastes and directly disposed into the landfill site without sterilization. Even collected medical wastes are not always treated appropriately. Some of the wastes, which are not fully treated, are sold in the recycling market.

By realization of the proposed system, risk for a lot of people in Bangladesh who do not know the actual situation of medical wastes will be reduced, environmental pollution will be decreased, and

safe and secure life will be developed.

Moreover, it is possible by recycling medical wastes to supply chips and to manufacture products with the high quality plastic. In Bangladesh, which has scarce resources, recycling medical wastes can be the material supply business, and this business is expected to connect to development of the new industry and job creation. Success of recycling business of medical wastes can be disseminated into other areas in Bangladesh and other countries. There is a possibility to implement recycling business in 5CCs in Bangladesh, such as Chittagong, Khulna and Rajshahi because they have plans to introduce medical waste treatment facility (autoclave). Waste plastic processing industry is just a home industry at present, however, it will be developed into the real industry in the future if the recycling business of medical wastes will be the main business.

IV Proposals for Formulating ODA Projects

IV-1 Outline of ODA Project and Applicable ODA Scheme

The model area of the Pilot Project proposed in this Survey is Sher E Bangla Nagar and its neighboring area. The planned site for treatment facility is Amin Bazar Landfill or its neighboring area at the suburb of North Dhaka City. The target facility of the Pilot Project is 63 medical institutions in the model area.

In the Pilot Project, the applicable ODA schemes can be estimated as the grant aid for facility construction, technical cooperation for instruction for medical institutions, non-project grant aid for procurement of SME's products, overseas volunteering program with private sector, and so on.

Service fee collected from medical institutions and profits from selling recycling products will be used for operation and maintenance costs for treatment facility and recycling. According to the estimation of the business cost, the Pilot Project can be sufficiently profitable.

IV-2 Detailed Cooperation Contents and Development Effectiveness

The Pilot Project aims to prevent environmental pollution by medical wastes and to decrease the infectious diseases among related workers, waste pickers and general public.

Inputs by Japanese side are dispatch of short and long-term experts, technology transfer, C/P training in Japan, facility for sterilization and recycling, vehicles for collection and transportation and so on.

Inputs by Bangladesh side are assignment of C/P members, project office, equipment provision, facility for the project activity and operation, and so on.

The main C/P is MoHFW (especially Directorate General of Health Services (hereinafter referred to as "DGHS")).

Tesco will dispatch the Project Manager, operate and maintain the treatment facility and implement recycling business as the sub-contracting work from MoHFW. The time period of Pilot Project is planned as 3 years. In the future, it is expected to legalize the appropriate treatment system of medical wastes for all over Dhaka City and to disseminate into all over Bangladesh

IV-3 Possibility of Cooperation with Other ODA Projects

Together with the Pilot Project, human resource development plan for appropriate In-house management is proposed as Coordinated Technical Cooperation Project. The main C/P is DGHS and the project period is 3 years. The overall goal of this project is to be a model for other cities in Bangladesh. In this Project, the main target agency is medical institutions in the model area, and staffs in the medical institutions, workers associated and visitors and so on.

One of the activities is to make a license system of the responsible officer in each medical institution in order to strengthening the management system in each medical institution and to disseminate the appropriate treatment of medical wastes. It is proposed to make a rule for arrangement of the licensed persons, to implement internal trainings and instructions by the licensed persons, and to implement training of trainers who instructs medical institutions.

IV-4 Other Related Information

During this survey, Tesco examined the capacity of Dhaka CC to be C/P of the Pilot Project and found the lack of human resources of Dhaka CC. Therefore, MoHFW will discuss with MLGRD&C on that MoHFW will be the responsible agency for both In-house and Out-house managements.

And one Japanese maker for medical equipment decided to cooperate and to provide 4,200 clinical electronic thermometers, which will be replacement of the present mercury thermometers. It is contributed to decrease the hard-to-manage material to dispose.

Basic Policy for medical waste management, treatment and recycling system was prepared.

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SMEs and Counterpart Organization

- Name of SME: TESCO CO., LTD, Yachiyo Engineering CO., LTD
- Location of SME: 34 Shinano-machi, Shinjuku, Tokyo
- Survey Site • Counterpart Organization: Dhaka City, Bangladesh, Ministry of Health & Family Welfare

Concerned Development Issues

- Medical Waste is not managed appropriately
- Medical Waste is not handled safely
- Medical Waste will be recycled

Products and Technologies of SMEs

- Establishment the system for treatment of Medical Waste appropriately and safely
- Recycling and business of Medical Waste
- Design as expecting form

Proposed ODA Projects and Expected Impact

- Protect Bangladeshi from infection accidents
- Disappear environmental pollution cause of Medical Waste
- Recycle Medical Waste safely

Future Business Development of SMEs

- Carry out the recycling business of Medical Waste that cannot be undertaken in Japan

