【Online】
Knowledge Co-Creation Program
(Group & Region Focus)

General Information on

OPERATION AND MAINTENANCE OF SEWERAGE SYSTEM (C) and (B)

課題別研修
課題別研修「下水道システム維持管理（C）及び（B）」
JFY 2021
Course No. 201905746J002（C）
Course No. 202006490J001（B）

Online Course Period: From November 1, 2021 to December 10, 2021

This information pertains to one of the JICA Knowledge Co-Creation Programs (Group & Region Focus) of the Japan International Cooperation Agency (JICA) implemented as part of the Official Development Assistance of the Government of Japan based on bilateral agreement between both Governments.

JICA Knowledge Co-Creation Program (KCCP)
The Japanese Cabinet released the Development Cooperation Charter in February 2015, which stated, *"In its development cooperation, Japan has maintained the spirit of jointly creating things that suit partner countries while respecting ownership, intentions and intrinsic characteristics of the country concerned based on a field-oriented approach through dialogue and collaboration. It has also maintained the approach of building reciprocal relationships with developing countries in which both sides learn from each other and grow and develop together."* JICA believes that this 'Knowledge Co-Creation Program' will serve as a foundation of mutual learning process.

I. Concept

Background

Water-related problems are recognized as one of the most pressing issues that threaten human lives. Economic growth and population increase have caused serious water pollution, and urbanization and unplanned development have reduced the soil infiltration and drainage capacity resulting in frequent inundation. To address these issues, domestic/industrial wastewater and stormwater should be controlled properly in systematic and comprehensive manners based on various technologies and know-how.

In its endeavor to reconstruct and modernize the country, Japan has gone through the process of trial and error in developing its sewerage system, which has brought Japan considerable experiences and lessons of sewerage and drainage management with unique and distinctive technologies.

For what?

This program aims to support the organizations in their attempt to develop the sewerage system. Participating organizations are expected to fully utilize the knowledge, skills and a solution plan explored and acquired by their leading staff sent to Japan to participate in this program.

For whom?

This program is designed for those working for local/national government organizations related to the sewerage operation, maintenance, planning, management and stormwater control in developing countries.

How?

(1) Participating organizations are requested to prepare a Country Report to identify facing issues in the sewerage system. The Report will be shared with other participants and experts/lecturers in Japan for further discussion. Participants are expected to recognize clear missions or assignments of what to acquire from the program before their departure to Japan.

(2) A wide variety of lectures and site-visits will be provided with such subjects as wastewater treatment, operation and maintenance of sewage treatment plants and sewer pipes, sludge disposal, planning and designing of facilities, stormwater control etc., including diverse lessons of past experiences, both mistakes and best practices by Osaka City Government in particular. Based on newly acquired knowledge and information in the program, participants are expected to formulate the Action Plan in order to address the issues in their organization.

(3) Participating organizations are required to establish a program by their own initiatives to disseminate techniques and knowledge brought back by participants. It is also

expected that participants are provided with enough support to carry out their Action Plans.

Sustainable Development Goals (SDGs)

The United Nations Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development were adopted by world leaders in September 2015, and call for actions by all countries. As a development cooperation agency, JICA is committed to achieving the SDGs. This program aiming at developing the sewerage system especially contributes to realize the Sustainable Development Goal 6 “Ensure access to water and sanitation for all” by achieving following two targets in this Goal 6:

Target 6.2. By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

Target 6.3. By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

II. Description

1. **Title (Course No.)**
   Operation and Maintenance of Sewerage System (C) (201905746J002)
   Operation and Maintenance of Sewerage System (B) (202006490J001)

2. **Course Period**
   From November 1, 2021 to December 10, 2021

3. **Target Regions or Countries**
   (C) 201905746J002: Azerbaijan, Costa Rica, Egypt, Ethiopia, Marshal Islands, Pakistan
   (B) 202006490J001: Ethiopia, Marshal Islands, Republic of North Macedonia, Pakistan, Tunisia, Viet Nam

4. **Eligible / Target Organization**
   Central or local governments, autonomies, public organizations or their authorized concessionaires related to wastewater treatment, sewage works, and stormwater drainage. (See III-2 “Nominee Qualifications” for details.)

5. **Capacity (Upper limit of Participants)**
   (C) 201905746J002: 6 participants
   (B) 202006490J001: 6 participants Total: 12 Participants

6. **Language**
   English

7. **Course Objective(s)**
   Knowledge and Technologies on the planning, designing, operation and maintenance of sewerage systems are shared among technical members of the participating organization.

8. **Overall Goal**
   Knowledge and Technologies of Sewerage System are firmly and deeply rooted among leading members of the participating organization.

9. Expected Module Output and Contents:

This program consists of the following components. Details on each component are given below:

(1) Preliminary Phase in a participant's home country (October 5th 2021 to October 18th 2021) *Participating organizations make required preparation for the Program in the respective countries.*	
Expected Module Output	Activities
To formulate and submit Country Report	Preparation for the **Country Report** Country Report is required to include issues and problems that participating organizations are facing. The report will be formulated in the form of Power Point slides. ＊Detailed information is provided in ANNEX II.

(2) Core Phase: On-Demand learning (November 1st, 2021 to December 10th, 2021) *Following subjects are conducted through Lectures and Q&A.*	
	Contents/ Subjects
1) To acquire the rudimentary knowledge of the sewerage system and sewage treatment and explain the gained knowledge	Basic Knowledge on the Sewerage System and Wastewater Treatment
2) To acquire the knowledge needed for the planning and designing of the sewerage system and explain the gained knowledge	Planning and Designing of the Sewerage System ① Sewage Treatment Plant ② Piping ③ Pumping Station
3) To acquire the knowledge needed for the operation and maintenance of the sewerage system and explain the gained knowledge	Operation and Maintenance of the Sewerage System ④ Sewage Treatment Plant ⑤ Piping ⑥ Pumping Station

4) To acquire the knowledge of how industrial effluent control / pretreatment facilities correlate with the sewerage system and explain the gained knowledge	Management of Industrial Effluent
5) To develop tangible measures (an Action Plan) to improve the sewerage system in each country based on the training outcomes and explain the Action Plan	Practice and Discussion An Action Plan shall be prepared to show how the sewerage system will be improved in the participating organization on the basis of the acquired knowledge. The Action Plan should contain dissemination activities of the gained knowledge. Participants are expected to produce such materials as syllabus, PowerPoint slides, textbooks, etc., for the dissemination activities. Your Action Plan will be evaluated by the lecturer and feedback to you.

The participating organizations are required to make a commitment to formulate and implement the dissemination program after the program.

<Structure of the program> (Subject to change)

Before the Program Start	
	Submit your Country Report (by 18th October)
Week 1: Country Report	
	Program Orientation
	Feedback on your Country Report
	On-demand Leaning - Outline of Sewerage works and treatment in Osaka city - Outline of Operation and Maintenance of Sewerage system in Osaka city - Basic concept of biological treatment - Sludge treatment & Beneficial use of sludge
Week 2:	
	On-demand Learning - Design of Sewerage treatment plant - Design of Pumping station (Civil, Mechanical and Electrical field) - How to formulate an Action plan?
	- Formulating an Action Plan
Week 3:	

	On-demand Learning - Planning and Design of Sewer Facilities - Operation and Maintenance of Sewage treatment plant - Operation and Maintenance of Sewer Facilities
	- Formulating an Action Plan
Week 4:	
	On-demand Learning - Water Quality control in Sewage treatment plant - Water Quality Testing - Industrial Wastewater control and Administrative guidance -
	- Formulating an Action Plan
Week 5:	
	Submit your Action Plan
Week 6:	
	Evaluation and Feedback of your Action Plan

III. Eligibility and Procedures

1. Expectations to the Applying Organizations

(1) This program is designed primarily for organizations that intend to address specific issues or problems identified in their operation. Applying organizations are expected to utilize the program for those specific purposes.

(2) This program is enriched with contents and facilitation schemes specially developed in collaboration with relevant prominent organizations in Japan. These special features enable the program to meet specific requirements of applying organizations and effectively facilitate them toward solutions for the issues and problems.

2. Nominee Qualifications

Applying organizations are expected to select nominees who meet the following qualifications.

(1) Essential Qualifications

1) Current Duties: Administrative officials of Senior technical staff engaged sewage works in the Government who will continue working in the same field

after the course.

2) Experience in the relevant field: have more than 5 years' engagement in the field of 1)
3) Educational Background: University graduates or equivalent.
4) Language: have a competent command of spoken and written English which is equal to TOEFL iBT 90 or more. (This program requires high competence of English ability to analyze and express the issues of their country. Please attach an official certificate for English ability such as TOEFL, TOEIC, etc, if possible.)
5) Technical Requirements for Online Course (Computer)

Technology Proficiency:
-Basic computer skills such as, sending/receiving email with attachments, and using a web browser.
-Online course may be delivered using the following services, Web Conferences (Zoom, Google Meets, Microsoft Teams), Cloud Storage (Google Drive, Gigapod), and YouTube. (Online tutorial and support by JICA will be limited. The ability to be self-directed in learning new technology skills are required.)

Internet Connection:
-High Speed Broadband Connection (at least 2Mbps).

Hardware (Minimum Requirement):
- Regular access to a computer, either from your home or from your office.
- Operating System: Windows or Mac OS (Updated version is preferred).
- Processor: Intel Core 2 Duo or higher; 2GHz or higher
- Memory: 4GB of RAM or higher
- Hard Drive Space: 5GB free disk space
- Browser: Google Chrome is preferred browser. (Edge, Firefox, Safari can be used)
- Others: Webcam Microphone, and Audio output Device (Speaker or Headset)

*In some cases, Smartphone (Android OS or Apple iOS) can be used as substitute of PC.

6) Health: must be in good health to participate in the program.

7) Attendance Requirement: Participation in online program and submission of various assignments is an essential requirement for the completion of the course.

(2) Recommended Qualifications

1) Age: Between 25 to 50 (inclusive) years old.
2) Gender Consideration: JICA promotes gender equality. Women are encouraged to apply for the Program.

3. Required Documents for Application

(1) Application Form: The Application Form is available at **the JICA overseas office (or the Embassy of Japan)**

(2) Photocopy of Passport or Official ID:
Photocopy should include Name, Date of Birth, Nationality, Sex, Passport number and Expire date. (If you do not have a passport, provide a valid identification documents with you name and date of birth)

(3) Inception Report:
To be submitted with the Application form, Applications without the Inception report will not be accepted.

(4) English Score Sheet (photocopy): if the nominees have any official English examination scores, it should be submitted with the application form, (e.g., TOEFL, TOEIC, IELTS)

4. Procedures for Application and Selection

(1) Submission of the Application Documents
Closing date for applications: **Please confirm the local deadline with JICA overseas office (or the Embassy of Japan).**
（All required material must arrive at **JICA Center in Japan** by **September 24th, 2021**）

(2) Selection
Primary screening is conducted at the JICA overseas office (or the embassy of Japan) after receiving official documents from your government. JICA Center will consult with concerned organizations in Japan in the process of final selection. Applying organizations with the best intentions to utilize the opportunity will be highly valued.

The Government of Japan will examine applicants who belong to the military or other military-related organizations and/or who are enlisted in the military, taking into consideration of their duties, positions in the organization and other relevant information in a comprehensive manner to be consistent with the Development Cooperation Charter of Japan.

(3) Notice of Acceptance

The JICA overseas office (or the Embassy of Japan) will notify the results **not later than October 4th, 2021.**

5. Document to be submitted by accepted participants:

Accepted participants are required to submit a Country Report. Please see the ANNEX II.

(1) The report should be sent to JICA Kansai **by October 18th, 2021** by e-mail to Miura.Sadako@jica.go.jp and Kawasaki.Megumi@jica.go.jp

(2) The report must be made by power point slide.

6. Conditions for Participation

Participants of KCCP are required

(1) to strictly observe the course schedule

(2) not to change the program topics

(3) not to record or share the online contents without JICA's permission

(4) to comply with the use conditions of copyrighted works by each copyright holder, when using texts and other materials distributed for KCCP.

IV. Administrative Arrangements

1. Organizer (JICA Center in Japan)

(1) Center: JICA Kansai Center (JICA Kansai)

(2) Program Officer:

Ms. MIURA Sadako (Miura.Sadako@jica.go.jp)

Ms. KAWASAKI Megumi (Kawasaki.Megumi@jica.go.jp)

2. Implementing Partner

1) Name: Clearwater OSAKA Corporation (CWO)

2) Address: 2-2-5-233, Semba-chuo, Chuo-ku, Osaka 541-0055, Japan

3) URL: https://www.clearwater-osaka.co.jp/

4) Brief Overview:

CWO, an affiliated organization of Public Works Bureau (PWB) of Osaka City Government, was established in 2016 in order to support sewerage system

management in Osaka City. CWO sustains the sewerage system in the city by providing practical operation and maintenance services in a comprehensive manner. It also contributes to sewerage systems outside the city, both domestic and overseas. CWO has been implementing this program since its foundation after taking over the program from Urban Infrastructure Technology Centre Foundation (UITEC), another affiliate of PWB of Osaka City Government.

3. Supporting Organization

1) Name：Public Works Bureau（PWB）, Osaka City Government

2)URL: https://www.city.osaka.lg.jp/contents/wdu020/kensetsu/english/index.html

3) Brief Overview:

The Public Works Bureau (PWB) of Osaka City Government is engaged in the construction, improvement, maintenance management and other activities performed on urban planned roads, general roads, bridges, rivers, canals, parks, sewerage and other public facilities in Osaka City. The Sewerage Division is responsible for planning of constructions, designs and maintenance of sewerage facilities, water quality control, and other such matters.

YouTube of “Knowledge Co-Creation Program” and “Introduction of JICA Center” are viewable from the link below.

Part I: Knowledge Co-Creation Program and Life in Japan	
English ver.	https://www.youtube.com/watch?v=SLurfKugrEw
Spanish ver.	https://www.youtube.com/watch?v=m7I-WIQSDjI
Part II: Introduction of JICA Centers in Japan	
JICA Kansai	https://www.jica.go.jp/kansai/english/office/index.html

V. Other Information

Participants who have successfully completed the program will be awarded a certificate by JICA.

VI. ANNEX Ⅰ:

Operation and Maintenance of Sewerage System (C)

Operation and Maintenance of Sewerage System (B)

(JFY2021)

Inception Report

Applicants are requested to prepare the Inception Report providing information on the following subjects. The Report should be written in double space in English on A4 size paper (21 cm x 30 cm), and **submitted together with the Application Form**.

1. Applicant's information
   - ・Name of Applicant / Country
   - ・Name of Organization
   - ・Address of Organization
   - ・Roles and Responsibilities of Organization
   - ・Applicant's job description and responsibility in the Organization
   - ・Organization Chart
     (Attach an organizational chart of your organization, and circle the section in which you are working.)
   - ・Applicant's job history (since graduating from university)

2. Overview of the Country, Environment and Sewerage service

   (1) General Information

   a) Total population of the country

   b) Estimated population with sewers served

   c) Estimated population with water supply served

   d) Total population and estimated population with sewers of the three (3) largest cities.

	Name of City	Total Population	Estimated Population with Sewers served
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

   (2) Status of the water pollution of rivers, lakes and bays and the pollution sources and additional information such as presence or absence of intake point for drinking water/agriculture/industry etc.
   - a) Sources of pollution
   - b) Situation of rivers (BOD, SS, etc.)
   - c) Situation of lakes (BOD, SS, etc.)
   - d) Situation of bays (BOD, SS, etc.)

(3) Type of Sewage Collection System

□ Combined system (km^2)

□ Separate system (km^2)

(including the case where open channels are used for stormwater runoff drainage)

□ Others

3. Sewage Treatment Plants (STPs)

(1) Total number of STPs in your country and in your city/town/village.

(2) Breakdown of the treatment type (Please show the ratio of Lagoon, Aerated Lagoon, Oxidation ditch, Trickling Filter, Activated sludge, others, etc)

(3) Describe three (3) largest STPs in your country with following information.

a) Name and location of the STP (Please attach the maps)

b) Volume of wastewater

i) Daily wastewater flow (m^3/d)

ii) Ratio of domestic and industrial flow

c) Treatment Process

i) Treatment type (Please attach the flow diagram of sewage treatment)

ii) Designed capacity and its design criteria/standard such as HRT, BOD load.

iii) Current status (Evaluation such as overloaded or underutilized)

d) Destination of final effluent (Name of river/lake/sea, soakage, other)

e) Influent and Effluent Water Quality (BOD, COD, SS, T-N, T-P, Faecal coliform etc.)

f) In case treated water is reclaimed or reused, describe the details as well as purposes.

(4) Regulation of Effluent Water Quality

pH, BOD, S-BOD,COD, SS, T-N, T-P, Fecal coliform, Heavy Metal etc.

(5) Water Quality Testing

a) Number of Water Quality Laboratory and its scale

b) Test parameters

pH, BOD, S-BOD,COD, SS, T-N, T-P, Fecal coliform, Heavy Metal etc.

4. Stormwater Drainage

(1) Climate in your city/town/village and rainfall.

a) Average annual rainfall ( ) mm/year

b) Average frequency of rainfall ( ) times/year

c) Maximum hourly rainfall ( ) mm/hour (in year of)

d) Maximum 10-minute rainfall ( ) mm/10 min. (in year of)

(2) Frequent flooding region/area and frequency of inundation (Please attach the maps)

(3) Drainage area where stormwater runoff is collected and discharged to stormwater sewers and channels.

(4) Total length of sewers

less than 600 mm dia. ( ) km

600-1,500 mm dia. ( ) km

larger than 1,500 mm dia. ( ) km

(5) Number of pumping station

(6) Main countermeasures for flood prevention in your country

5. Sludge treatment and disposal

(1) Sludge Treatment Process including final disposal

(2) In case sludge is reused, describe the details as well as purposes.

6. Organizational Viability

SWOT analysis of your organization

S (Internal Strength) of your organization	**O** (External Opportunity) of your organization
W (Internal Weakness) of your organization	**T** (External Threat) of your organization

VI. ANNEX Ⅱ:

Operation and Maintenance of Sewerage System (C)
Operation and Maintenance of Sewerage System (B)

Format for Country Report (PowerPoint Slides)

Accepted participants are requested to make eight (8) pages at maximum of their country report by PowerPoint by covering following topics and to send it to JICA **by October 18th, 2021.**

Page	Topics	Examples of Contents
1	Cover page	➢ Participant's Name ➢ Date ➢ Program Name ➢ Country/Region
2	General Information on a Participant's Country/Region	➢ Geographical Positioning ➢ Population ➢ Economic Statistics, etc.
3	Organization Chart & a Participant's Duty	➢ Organization Chart ➢ Job Description and Responsibility in the Organization
4-7	1) Present Status of Sewage (Sanitation) and Drainage Facilities. 2) Issues and Problems a Participant Is Faced With	➢ Water Quality Preservation Policy and/or Strategy ➢ Financial System regarding Sewage Works/Drainage Facility (Construction Cost, Maintenance Cost, Tariff System, Subsidy from Central or Local Government, etc.) ➢ Present Status of Industrial Wastewater, Type of Industry, Regulation, Industrial Wastewater Treatment, etc.
8	What a Participant Wishes To Learn	Brief Description of What To Expect from Japanese Technologies in Sewerage/Sanitation Fields. (Please present three (3) topics and state their reasons.)

(Showing photos indicating the present situation in the presentation makes it easier for the audience to understand the situation and problems participants' are faced with.)

For Your Reference

JICA and Capacity Development

Technical cooperation is people-to-people cooperation that supports partner countries in enhancing their comprehensive capacities to address development challenges by their own efforts. Instead of applying Japanese technology per se to partner countries, JICA's technical cooperation provides solutions that best fit their needs by working with people living there. In the process, consideration is given to factors such as their regional characteristics, historical background, and languages. JICA does not limit its technical cooperation to human resources development; it offers multi-tiered assistance that also involves organizational strengthening, policy formulation, and institution building.

Implementation methods of JICA's technical cooperation can be divided into two approaches. One is overseas cooperation by dispatching experts and volunteers in various development sectors to partner countries; the other is domestic cooperation by inviting participants from developing countries to Japan. The latter method is the Knowledge Co-Creation Program, formerly called Training Program, and it is one of the core programs carried out in Japan. By inviting officials from partner countries and with cooperation from domestic partners, the Knowledge Co-Creation Program provides technical knowledge and practical solutions for development issues in participating countries.

The Knowledge Co-Creation Program (Group & Region Focus) has long occupied an important place in JICA operations. About 400 pre-organized course cover a wide range of professional fields, ranging from education, health, infrastructure, energy, trade and finance, to agriculture, rural development, gender mainstreaming, and environmental protection. A variety of programs is being customized by the different target organizations to address the specific needs, such as policy-making organizations, service provision organizations, as well as research and academic institutions. Some programs are organized to target a certain group of countries with similar developmental challenges.

Japanese Development Experience

Japan, as the first non-Western nation to become a developed country, built itself into a country that is free, peaceful, prosperous and democratic while preserving its tradition. Japan will serve as one of the best examples for our partner countries to follow in their own development.

From engineering technology to production management methods, most of the know-how that has enabled Japan to become what it is today has emanated, of course, has been accompanied by countless failures and errors behind the success stories.
Through Japan's progressive adaptation and application of systems, methods and technologies from the West in a way that is suited to its own circumstances, Japan has

developed a storehouse of knowledge not found elsewhere from unique systems of organization, administration and personnel management to such social systems as the livelihood improvement approach and governmental organization. It is not easy to apply such experiences to other countries where the circumstances differ, but the experiences can provide ideas and clues useful when devising measures to solve problems.

JICA, therefore, would like to invite as many leaders of partner countries as possible to come and visit us, to mingle with the Japanese people, and witness the advantages as well as the disadvantages of Japanese systems, so that integration of their findings might help them reach their developmental objectives.

Contact Information for Inquiries

For enquiries and further information, please contact the JICA overseas office or the Embassy of Japan. Further, address correspondence to:

JICA Kansai Center (JICA Kansai)

Address: 1-5-2, Wakinohama-kaigandori, Chuo-ku, Kobe, Hyogo 651-0073, Japan

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