



# TRAINING AND DIALOGUE PROGRAMS

## GENERAL INFORMATION ON

### NON-REVENUE WATER MANAGEMENT

集團研修「上水道無収水量管理対策」

*JFY 2010*

<Type: Leaders Training Program / 類型: 中核人材育成型>

NO. J10-00805 / ID. 1080229

From October 1, 2010 to March 18, 2011

Phases in Japan: From November 1 to December 18, 2010

This information pertains to one of the Training and Dialogue Programs of the Japan International Cooperation Agency (JICA), which shall be implemented as part of the Official Development Assistance of the Government of Japan based on bilateral agreement between both Governments.

# ***I. Concept***

## **Background**

The rate of water leakage through distribution and service facilities in water supply system is considerably high in many developing countries. Water delivered from a purification plant sometimes cannot fully reach the end of distribution network and, worse still, the shortage of water volume and water pressure even causes stoppage of water supply or outbreak of diseases due to the contamination of water. Despite the realities of these conditions, we recognize some definitive delays not only in daily maintenance work such as leak detection, leakage repair but in preventive measures in planning, designing or constructing distribution facilities.

There is an urgent and increasing need for technical training in non-revenue water management with the background that there is a limited number of engineers having practical knowledge and experience of this field.

## **For what?**

This program aims to obtain and upgrade knowledge and skills on non-revenue water management focusing on leakage prevention work.

## **For whom?**

This program is offered to technical officers engaged in operation / maintenance and non-revenue water management in waterworks systems.

## **How?**

Participants will have opportunities to analyze how produced water is used and what causes non-revenue water in their countries through the Japanese experiences. Drawing an Action Plan, the participants will also be able to identify the approaches and strategies which will be most suitable and practical to their own countries.

## II. Description

### 1. Title (J-No.): NON-REVENUE WATER MANAGEMENT(J1000805)

### 2. Period of program

<b>Duration of whole program:</b>	October 1, 2010 to March 18, 2011
<b>Preliminary Phase:</b> (in a participant's home country)	October 1 to October 30, 2010
<b>Core Phase in Japan:</b>	November 1 to December 18, 2010
<b>Finalization Phase:</b> (in a participant's home country)	January 2011 to March 2011

### 3. Target Regions or Countries

Bangladesh, Bolivia, Brazil (2), Egypt, Ethiopia, India, Iraq, Jordan, Kenya (2), Philippines, Sri Lanka, Tanzania, Turkey and Vietnam

### 4. Eligible/ Target Organization

- (1) Waterworks section of central/local government, waterworks public corporation, administration body in charge of water resources
- (2) Special organization in charge of maintaining and managing waterworks system

### 5. Total Number of Participants:

15 participants

### 6. Language to be used in this course:

English

### 7. Program Objective

To develop an understanding of activities and systems for maintaining and managing waterworks in Japan as well as to build human capacity in applying effectively the output of the program in participant's home country and in developing the participant's duties

### 8. Overall Goal

Safe drinking water will be supplied and available in the target countries.

### 9. Expected Module Output and Contents:

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

<b>(1) Preliminary Phase in a participant's home country</b> (October 1 to October 30, 2010 ) <i>Participating organizations make required preparation for the Program in the respective country.</i>	
Expected Module Output	Activities
Inception Report is formulated	Formulation and submission of Inception Report

**(2) Core Phase in Japan**

(November 1 to December 18, 2010 )

*Participants dispatched by the organizations attend the Program implemented in Japan.*

Expected Modules Output	Subjects/Agendas	Methodology
1) Able to understand a comprehensive knowledge of various problems on non-revenue water	-General Information on Waterworks in Japan and Nagoya -Non-revenue Water Management in Nagoya	Lecture Observation Exercise
2) Able to understand leakage detectors operation	-Property of Leakage -Mechanism and Operation of Leakage Detection Equipment	Lecture Observation Exercise
3) Able to understand classification of leakage prevention works and analysis of water distribution volume and leakage volume	-Analysis of Distributed Water Volume and Leakage Volume -Classification of Leakage Prevention and Repair Work	Lecture Exercise
4) Able to understand planning of leakage prevention	-Planning of Leakage Prevention Work -Comparison of Cost and Effectiveness -Selection of Materials	Lecture Observation Exercise
5) Able to understand practical knowledge and techniques for planning, designing and construction management as measures of leakage prevention	-Main Facility Designing -Distribution Control -Corrosion Control -Designing of Transmission Pipes -Rehabilitation and Replacement of Pipeline -Types and Specification of Meters, Pipes Joints -Management of Mapping Data -Disaster Control	Lecture Observation Exercise

**(3) Finalization Phase in a participant's home country**

*Participating organizations produce final outputs by making use of results brought back by participants. This phase marks the end of the Program.*

Expected Module Output	Activities
To implement the Action Plan (Interim Report)	Application and implementation of the Action Plan (Interim Report) back in the participant's country directed to solution of problems and issues in order to achieve the program objective.

## <Structure of the program>

1. Preliminary phase (activities in your home country): Preparation of the inception report.
2. Core Phase (activities in Japan):

### Topic outline

#### (1) Presentation of Inception Report

An inception report presentation meeting is held with attendance of lecturers and people concerned. Time allocation for each presentation is 20-minute which includes interpretation and 10-minute question & answer session. To make the presentations more understandable and attractive, the participants are advised to make effective use of visual references, such as photographs and figures.

#### (2) Outline of Waterworks and Non-revenue Water Management in Japan

- 1) Understanding an outline of waterworks in Japan as an introduction
- 2) Waterworks in Japan and Outline of Non-revenue Water Management in Japan
- 3) Outline of Waterworks Facilities in Nagoya City
- 4) Outline of Leakage Prevention in Nagoya City

#### (3) Leakage Detection

Deepening basic understanding on leakage and preparing understanding on leakage prevention at planning, designing, and construction stages

- 1) Property of Leakage
- 2) Analysis of Distributed Water and Leakage Volume
- 3) Classification of Leakage Prevention Work
- 4) Leakage Prevention Work Plan
- 5) Leakage Prevention Planning
- 6) Operation and Practice of Leakage Detection Equipment
- 7) Judgment of Leakage

#### (4) Planning Stage

- 1) Main Facilities Planning
- 2) Distribution Control
- 3) Rehabilitation and Replacement of Pipeline
- 4) Leakage Prevention Control

#### (5) Designing Stage

- 1) Selection of Distribution and Service Pipe Materials
- 2) Designing of Distribution Pipes
- 3) Type and Specifications of Meters
- 4) Distribution and Service Pipe Joints Specifications

#### (6) Construction and Maintenance Stage

- 1) Corrosion Control on Transmission, Distribution and Service Pipes
- 2) Pipe-Laying Work Supervision
- 3) Management of Mapping Data
- 4) Management and Maintenance of Service Installation
- 5) Sales Office Work (Tariff)
- 6) Disaster Control

#### (7) Preparation and Presentation of Action Plan

(Leakage Prevention Plan to be implemented in home country)

Preparation of the Action Plan by utilizing the contents of training program in Japan, with suggestions from the instructors to make plans workable and applicable in own organization

General discussion on the training program and applicability in home country

· Presentation and Discussion on the Action Plan

A presentation meeting is scheduled at the end of the program. Participants will present their Action Plans to lecturers in the program. More details will be given in the program.

3. Finalization Phase (activities in home country)

After the end of the core phase in Japan, participants are expected to implement the Action Plan (Interim Report) during the *three (3) months* of finalization phase.

**10. Follow-up Cooperation by JICA:**

In this program, JICA might extend follow-up support to participating organizations that intend to develop the result of the project further. Please note that the support shall be extended selectively based on proposals from the participating organizations.

### **III. Conditions and Procedures for Application**

#### **1. Expectations for the Participating Organizations:**

- (1) This program is designed primarily for organizations that intend to address specific issues or problems identified in their operation. Participating organizations are expected to use the project 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 project to meet specific requirements of applying organizations and effectively facilitate them toward solutions for the issues and problems.
- (3) As this program is designed to facilitate organizations to come up with concrete solutions for their issues, participating organizations are expected to make due preparation before dispatching their participants to Japan by carrying out the activities of the Preliminary Phase described in section -9. .
- (4) Participating organizations are also expected to make the best use of the results achieved by their participants in Japan by carrying out the activities of the Finalization Phase described in section -9.

#### **2. Nominee Qualifications:**

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

- (1) Current Duties: be a technical official in charge of maintaining and managing waterworks system
- (2) Experience in the relevant field: have more than 5 years' experience in maintaining and managing waterworks system, and be middle class administrative officials who are less than forty (40) years of age.
- (3) Educational Background: be a university graduate in an engineering discipline or the equivalent.
- (4) Language: be proficient in speaking and writing English. (Experience has shown that some participants find themselves unable to make progress in their training because of inadequate knowledge of English. If you have taken TOEIC or TOEFL test, attach the score sheet on the application form.)
- (5) Health: must be in good health, both physically and mentally, to participate in the course in Japan.
- (6) Must not be serving any form of military service.

Pregnancy :Pregnant participants are strictly requested to complete the required procedures before departure in order to minimize the risk for their health. The procedures include the following;

- letter of the participant's consent to bear economic and physical risks,
- letter of consent from the participant's supervisor,

letter of consent from your Embassy in Japan,  
medical certificate.

Please ask Staffs in JICA office for the details.

### 3. Required Documents for Application

- (1) **Application Form:** The Application Form is available at the respective country's JICA office or the Embassy of Japan.
- (2) **Nominee's English Score Sheet:** to be submitted with the application form. If you have any official documentation of English ability (e.g., TOEFL, TOEIC, IELTS), please attach it (or a copy) to the application form.
- (3) **Job Report:** to be used for screening the applicants. Fill in the Job Report Format at Annex 1 on page 12, and submit it with the Application Form.
- (4) **Medical Record:** the result of most recent medical checkup done written in English, to be submitted with the application form.

### 4. Procedure for Application and Selection :

#### (1) Submitting the Application Documents:

Closing date for application to the JICA Center in Japan: **September 1<sup>st</sup>, 2010**

**Note: Please confirm the closing date set by the respective country's JICA office or Embassy of Japan of your country to meet the final date in Japan.**

#### (2) Selection:

After receiving the document(s) through due administrative procedures in the respective government, the respective country's JICA office (or Japanese Embassy) shall conduct screenings, and send the documents to the JICA Center in charge in Japan, which organizes this project. Selection shall be made by the JICA Center in consultation with the organizations concerned in Japan based on submitted documents according to qualifications. *The organization with intention to utilize the opportunity of this program will be highly valued in the selection.*

#### (3) Notice of Acceptance

Notification of results shall be made by the respective country's JICA office (or Embassy of Japan) to the respective Government by **October 1<sup>st</sup>, 2010.**

### 5. Document(s) to be submitted by accepted participants:

#### **Inception Report** -- to be submitted by **October 20<sup>th</sup>, 2010:**

Before coming to Japan, only accepted participants are required to prepare and send an Inception Report to JICA or the Japan International Cooperation Center, preferably by e-mail to [cbictp1@jica.go.jp](mailto:cbictp1@jica.go.jp) . Guideline for Inception Report is at Annex 2 on page 13.

### 6. Conditions for Attendance:

- (1) to observe the schedule of the program,

- (2) not to change the program subjects or extend the period of stay in Japan,
- (3) not to bring any members of their family,
- (4) to return to their home countries at the end of the program in Japan according to the travel schedule designated by JICA,
- (5) to refrain from engaging in political activities, or any form of employment for profit or gain,
- (6) to observe the rules and regulations of their place of accommodation and not to change the accommodation designated by JICA, and
- (7) to participate in the whole program including a preliminary (preparatory) phase prior to the program in Japan. Applying organizations, after receiving notice of acceptance for their nominees, are expected to carry out the actions described in section -9 and section -4.

## IV. Administrative Arrangements

### 1. Organizer:

(1) **Name:** JICA Chubu

(2) **Contact:** Ms. Moeko IMAYOSHI ([cbictp1@jica.go.jp](mailto:cbictp1@jica.go.jp))

### 2. Implementing Partner:

(1) **Name:** Staff Training Center (STC), Nagoya City Waterworks and Sewerage Bureau

(2) **Contact:** Mr. YAMADA Katsuyuki, Senior Staff, STC

(3) **URL:** <http://www.water.city.nagoya.jp/english/>

(4) **Remark:** Staff Training Center was established by the integration of Waterworks Bureau and Sewerage Bureau in 2000. The former Technical Education Center of Waterworks Bureau and Staff Training Center of Sewerage Bureau are the base of STC. STC conducts various important training courses for the staffs of the bureau and for the overseas participants.

### 3. Travel to Japan:

(1) **Air Ticket:** The cost of a round-trip ticket between an international airport designated by JICA and Japan will be borne by JICA.

(2) **Travel Insurance:** Term of Insurance: From arrival to departure in Japan. The traveling time outside Japan shall not be covered.

### 4. Accommodation in Japan:

JICA will arrange the following accommodations for the participants in Japan:

JICA Chubu International Center (JICA Chubu)

Address: 4-60-7 Hiraikecho, Nakamura-ku, Nagoya 453-0872, Japan

TEL: 81-52-533-0220 FAX: 81-52-564-3751

(where "81" is the country code for Japan, and "52" is the local area code)

If there is no vacancy at JICA Chubu, JICA will arrange alternative accommodations for the participants.

### 5. Expenses:

The following expenses will be provided for the participants by JICA:

(1) Allowances for accommodation, living expenses, outfit, and shipping

(2) Expenses for study tours (basically in the form of train tickets).

(3) Free medical care for participants who become ill after arriving in Japan (costs related to pre-existing illness, pregnancy, or dental treatment are not included)

(4) Expenses for program implementation, including materials

For more details, please see p. 9-16 of the brochure for participants titled "KENSHU-IN GUIDE BOOK," which will be given to the selected participants before (or at the time of) the pre-departure orientation.

### 6. Pre-departure Orientation:

A pre-departure orientation will be held at the respective country's JICA office (or Japanese Embassy), to provide participants with details on travel to Japan, conditions of

the program, and other matters.

## ***V. Other Information***

Profile of Waterworks and Sewerage Bureau, the City of Nagoya  
Staff Training Center, Nagoya City Waterworks and Sewerage Bureau

Water is an essential element for human life. Seawater evaporates by heat energy from the sun, precipitates into rain or snow, falls to the earth, and returns to the sea in the form of rivers and underground water. We utilize water for various purposes in this natural water cycle.

In order to maintain a sound water environment, cooperation among all the people living in each basin is essential. In addition, in order to cope with a crisis, such as an earthquake, heavy rain, or a drought, it is necessary to expand and improve the water-related infrastructure, including maintenance of facilities, as well as making close relationship between local governments. It is important to develop qualified human resources engaged in the water business to carry out these measures.

The waterworks and sewerage in Nagoya City have a history of more than 90 years. We will contribute to the development of human resources in areas, taking advantage of the technology and skills we have obtained.

On the other hand, there are many countries in the world where people cannot receive the benefits of water due to the lack of water resources or water pollution. Japan provides these countries with economic and technical aid in cooperation with the United Nations. The City of Nagoya contributes to solving the world's water problems by accepting trainees and participants.

### International Cooperation

The safe water supply is the most fundamental and essential element for human life. However, it is estimated that 1.1 billion people throughout the world do not have access to safe drinking water, and 2.4 billion people do not have sufficient sanitary facilities. Under such conditions, Waterworks and Sewerage Bureau, the City of Nagoya is engaged in technology transfers, accepting participants from foreign countries and dispatching our staff members abroad, in order to help achieve the following international goal: "To halve the proportion of people without access to safe drinking water and basic sanitation by 2015"

## **VI. ANNEX:**

### **Annex 1**

Applicants are required to fill in the Job Report Format for application.

#### **Job Report Format**

1. Program	<b>NON-REVENUE WATER MANAGEMENT</b>
2. Name of Country	
3. Name of Applicant	
4. Name of Organization	
5. Type of Organization and Service	
6. Present situation related to waterworks, water supply, etc	
7. Your (applicant's) duties including years of experience	
8. Difficulties in performing your duties	
9. Most interesting subjects to you in this field, or special requests for the program. Also the reasons.	
10. Expectations to the program.	

#### **Appendix: Organization Chart**

The applicant should draw an organization chart (starting from a section at the lowest level). Indicate your present position with asterisk (\*) in the organization chart.

## Guideline for Inception Report

### Format

-Typewritten in English on A-4 size paper (21 cm x 29.5 cm) and single-space.

-Page number at the bottom as -1-, -2-, -3-,

-Cover sheet includes following;

1. Full Name of Program: NON-REVENUE WATER MANAGEMENT
2. Name of Applicant:
3. Name of Organization:
4. Post and Duty:
5. E-mail Address (if available):

**!! The Inception Report should be submitted to [cbictpl@jica.go.jp](mailto:cbictpl@jica.go.jp) by October 20<sup>th</sup> !!**

### [ A. General Information]

<b>Name of Applicant's Waterworks Section, Country:</b>				
<b>Total Population in the Service Area</b>		<b>Water Pressure of Distribution Pipe</b>	<b>From    Mpa           ~ To        Mpa</b>	
<b>Population Served</b>		<b>Main Water Sources</b>		
<b>Service Ratio</b>	%	<b>Average Precipitation</b>	mm/year	
<b>Service Hours</b>	hours/day	<b>Ratio of Unaccounted for Water (%)</b>	<b>Total</b>	%
<b>Water Supply Capacity</b>	m <sup>3</sup> /day		<b>Leakage</b>	%
<b>Average Water supply Volume</b>	m <sup>3</sup> /day		<b>Illegal Use</b>	%
			<b>Others</b>	%
Water Distribution System				
<b>Type of Distribution Pipe</b>	<b>Jointing Type of Distribution Pipe</b>	<b>Distribution System</b>		
		(e.g. Gravity flow, Pump-up system etc.)		

Water Supply System for House Connection			
<b>Type of Service Pipe</b>	<b>Jointing Type of Service Pipe</b>	<b>Water Supply System for House Connection</b>	
		<b>(Ex. Direct Pressure, Water Tank etc.)</b>	
<b>Metering System</b>		<b>Water Charge</b>	<b>Mapping System</b>
<b>Type of Flow meter for Distribution Pipe</b>	<b>Type of Water Meter for Service Pipe</b>	<b>Water Charge Collecting Method</b>	<b>Scale for Pipe Drawings for Maintenance</b>

[B. Non-revenue Water Management (Leakage Control)]

<b>Name of Section in Charge of Leakage Control (Number of Personnel):</b>
<b>Leakage Detection Work System:</b>
<b>Leakage Repair Work System:</b>
<b>Name of Leakage Detection Instruments:</b>

**Measures for Illegal Use**

**Metering System**

**Problems Currently Faced:**

**Ongoing Counter Measures, Projects, etc. of Leakage Control:**

Any supporting data such as graphs, tables and figures that illustrate the content of the Inception Report should be annexed.

**NOTE:** Participants are advised to bring the Report data in USB or CD as they will be requested to make a presentation of the Report at the start of the program in Japan, or use the Report material for further discussions for formulation of an Action Plan.

## *For Your Reference*

### **JICA and Capacity Development**

The key concept underpinning JICA operations since its establishment in 1974 has been the conviction that “capacity development” is central to the socioeconomic development of any country, regardless of the specific operational scheme one may be undertaking, i.e. expert assignments, development projects, development study projects, training programs, JOCV programs, etc.

Within this wide range of programs, Training Programs have long occupied an important place in JICA operations. Conducted in Japan, they provide partner countries with opportunities to acquire practical knowledge accumulated in Japanese society. Participants dispatched by partner countries might find useful knowledge and re-create their own knowledge for enhancement of their own capacity or that of the organization and society to which they belong.

About 460 pre-organized programs 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 are being customized to address the specific needs of different target organizations, 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 was the first non-Western country to successfully modernize its society and industrialize its economy. At the core of this process, which started more than 140 years ago, was the “*adopt and adapt*” concept by which a wide range of appropriate skills and knowledge have been imported from developed countries; these skills and knowledge have been adapted and/or improved using local skills, knowledge and initiatives. They finally became internalized in Japanese society to suit its local needs and conditions.

From engineering technology to production management methods, most of the know-how that has enabled Japan to become what it is today has emanated from this “*adoption and adaptation*” process, which, of course, has been accompanied by countless failures and errors behind the success stories. We presume that such experiences, both successful and unsuccessful, will be useful to our partners who are trying to address the challenges currently faced by developing countries.

However, it is rather challenging to share with our partners this whole body of Japan’s developmental experience. This difficulty has to do, in part, with the challenge of explaining a body of “tacit knowledge,” a type of knowledge that cannot fully be expressed in words or numbers. Adding to this difficulty are the social and cultural systems of Japan that vastly differ from those of other Western industrialized countries, and hence still remain unfamiliar to many partner countries. Simply stated, coming to Japan might be one way of overcoming such a cultural gap.

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.



***CORRESPONDENCE***

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

**JICA Chubu International Center (JICA Chubu)**

**Address: 4-60-7 Hiraikecho, Nakamura-ku, Nagoya 453-0872, Japan**

**TEL: +81-52-533-0220 FAX: +81-52-564-3751**