



# Knowledge Co-Creation Program (Group & Region Focus)

## GENERAL INFORMATION ON

**Non-Revenue Water Management. (Leakage Control) (B)**

**課題別研修「上水道無収水量管理対策(漏水防止対策)(B)」**

**JFY 2017**

**NO. J1704394 / ID. 1784465**

**Course Period in Japan: November 5<sup>th</sup> to December 16<sup>th</sup>, 2017**

This information pertains to one of the JICA Knowledge Co-Creation Program (Group & Region Focus) 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.

'JICA Knowledge Co-Creation Program'(KCCP)as a New Start

In the Development Cooperation Charter which was released from the Japanese Cabinet on February 2015, it is clearly pointed out that *"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."* We believe that this 'Knowledge Co-Creation Program' will serve as a center of mutual learning process.

# **I. Concept**

## **Background**

The leakage rate through distribution 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 blockage of water supply or outbreak of diseases due to the contamination of water. Despite of those serious situations, countermeasures for it have not smoothly applied in daily maintenance work such as leakage detection and repair and in preventive measures in planning, designing, and constructing distribution facilities.

There is an urgent and increasing demand for technical capacity development in non-revenue water management with the background that limited number of technical staffs has practical knowledge and experience in this sector.

## **For what?**

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

## **For whom?**

This program is offered to technical staffs engaged in water supply works in the aspect of planning, design, construction, operation, maintenance.

## **How?**

Participants have opportunities to learn non-revenue water management through lectures, field trips, practical work, and discussion. Participants will also propose an Action Plan describing what the participant will do after they go back to home country through the use of the knowledge and ideas acquired and discussed in Japan among other participants.

Besides, this program will provide an opportunity for all participants to exchange the ideas and information of each country and to develop human networks among participants.

## ***II. Description***

**1. Title (J-No.)**

Non-Revenue Water Management (Leakage Control) (B) (J1704394)

**2. Course Period in Japan**

November 5 to December 16, 2017

**3. Target Regions or Countries**

Iraq, Egypt, Ethiopia, Guinea, Malaysia, Nepal, Peru, Rwanda,

**4. Eligible/ Target Organization**

(1) Department of water supply of central/local government

(2) Other public organizations in charge of water supply works

**5. Course Capacity (Upper limit of Participants)**

8 participants

**6. Language to be used in this program**

English

**7. Course Objective**

Action Plans for the respective country/city is implemented and non-revenue water management on participant's organization is strengthened.

**8. Overall Goal**

To be able to implement projects of non-revenue water management for aiming to conserve water resources and improve fiscal conditions of operating organizations in water supply sector

## 9. Expected Module Output and Contents

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

### (1) Preliminary Phase in a participant's home country

(Before arriving in Japan)

Expected Module Output	Activities
Inception Report is formulated (See ANNEX)	Formulation and submission of Inception Report

### (2) Core Phase in Japan

(November 5 to December 16, 2017)

Expected Modules Output	Subjects/Agendas	Methodology
1) Participants can understand existing situations and good examples of other participants' countries, and get an idea applicable for their own country.	<ul style="list-style-type: none"><li>- Presentation of Inception Report</li><li>- How to prepare an Action Plan</li><li>- Presentation of Action Plan</li></ul>	Lecture, Exercise, Discussion
2) Participants can explain outline and history of water supply works in Japan.	<ul style="list-style-type: none"><li>- Legal structure on water supply sector in Japan</li><li>- Role of central/local government in water supply sector in Japan</li><li>- Outline and history of water supply works in Nagoya City</li><li>- Waterworks Management</li><li>- Sound water business management</li><li>- Field visit of purification plants and intake facilities</li></ul>	Lecture, Discussion, Field visit
3) Participants can explain relationship between non-revenue water management and planning/design/construction of water supply facilities.	<ul style="list-style-type: none"><li>- Outline of leakage preventive works</li><li>- Planning of water distribution facilities</li><li>- Design of distribution pipeline</li><li>- Distribution network calculation</li><li>- Construction management of distribution pipeline</li><li>- Type of pipe material, Joints, Pipe connection</li><li>- Mapping system of distribution pipeline</li><li>- JICA Project on non-revenue water management in developing countries</li><li>- Presentation from ex-participants of this training</li></ul>	Lecture, Exercise, Discussion, Field visit

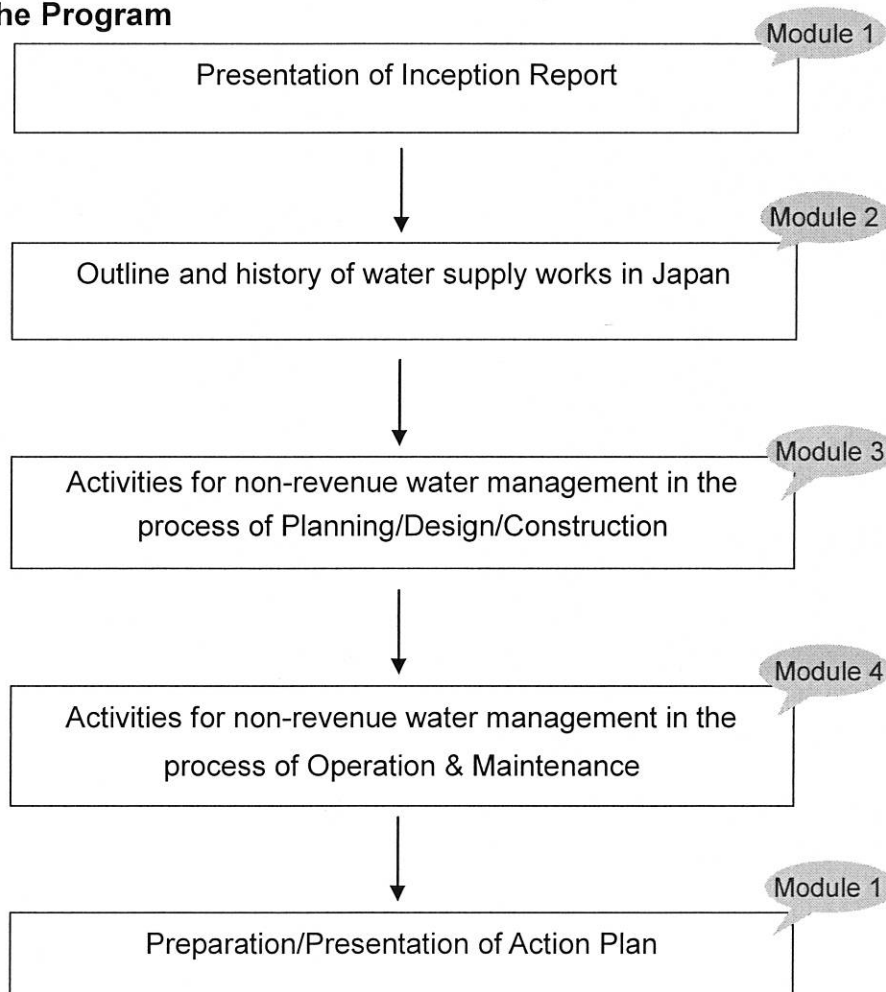
4) Participants can explain factors and countermeasures on non-revenue water in the process of operation and maintenance of water supply facilities.	<ul style="list-style-type: none"> <li>- Outline of leakage preventive works</li> <li>- Leakage detection [field visit &amp; practical work]</li> <li>- Repair work of leaking pipe [field visit &amp; practical work]</li> <li>- Water pressure control for distribution pipeline</li> <li>- Water meter reading, Countermeasures for illegal use</li> <li>- Analysis of distributed amount</li> <li>- JICA Project on non-revenue water management in developing countries</li> </ul>	Lecture, Exercise, Discussion, Field visit
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### (3) Finalization Phase in a participant's home country

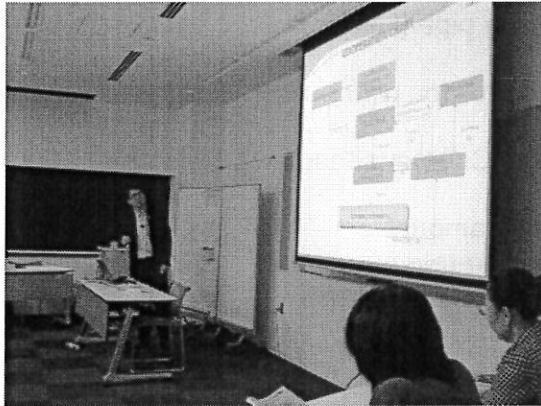
(Three months after the program in Japan)

Expected Module Output	Activities
To implement the Action Plan	- Sharing and finalizing the Action Plan in the participant's organization.

### Structure of the Program



**Reference:** Photos of the past program  
(NOTE: Activities are subject to change in this year's program.)



Inception report presentation (Module 1)



How to prepare an Action Plan (Module 1)



Replacement of service pipe (Module 3)



Action plan presentation (Module 1)



Practical work of service pipe connection (Module 3)



Pipe material, Joint type (Module 3)



Practical work of leak sound detection bar (Module 4)



Equipment demonstration by local company



**Reference:** Program Schedule in the past  
(NOTE : Activities are subject to change in this year's program.)

DATE	DAY	ITEM	DATE	DAY	ITEM
10-Nov	Tue	Arrival	30-Nov	Mon	(L) Futures Planning for Action Plan No.3
11-Nov	Wed	JICA Briefing/Orientation			(L) Futures Planning for Action Plan No.3
		(L) Introduction of NAWS	1-Dec	Tue	(Ob) Ductile Cast Iron Pipes plant
		(L) Program Orientation	2-Dec	Wed	(Ob) Plant Tour
		Courtesy call to Nagoya City Mayor	3-Dec	Thu	(L) Specific Procedures for completed work inspection
12-Nov	Thu	(L) Outline of Nagoya City			(L) Keypoints about completed work inspection
		(L) Movie: Non Revenue Waterworks engineering	4-Dec	Fri	(L) MAPPING INFORMATION MANAGEMENT COMPUTER MAPPING SYSTEM
		(L) Japanese politics and government			(L) JICA Grass Roots Project "Sri Lanka Capacity Building "
		Country report presentation rehearsal			(L) Discussion
		(L) Japanese Class	5-Dec	Sat	(Water Event organized by NIC and JICA)
13-Nov	Fri	(L) Sound Water Services Management (referring Japanese History of Waterworks)	6-Dec	Sun	
		(L) Japanese Class	7-Dec	Mon	(L) Leakage Repair in Nagoya
14-Nov	Sat				(Ob) Center tour, field work observation
15-Nov	Sun		8-Dec	Tue	(L) Maintenance and Operation of Water Supply Facilities
16-Nov	Mon	(L) Futures Planning for Action Plan No.1			(Ob) Meter manufacturing plant tour (assembly and inspection process)
		(L) Futures Planning for Action Plan No.1	9-Dec	Wed	(Ob) Plant tour of PE pipe manufacturer
		(L) Japanese Class			(V) Visit to Abuta Grand Shrine
17-Nov	Tue	(P) Country Report Presentation			(L) Water meter reading
		Waterworks Business Fair	10-Dec	Thu	(L) Water rate system
		Welcome party			(L, Ob) Operations at Branch Offices
18-Nov	Wed	(L) Outline of Nagoya Waterworks			(L, Ob) Operations at Branch Offices
		(V) Visit to NAGOYA Castle	11-Dec	Fri	(L) Public Relations Activity by Nagoya Waterworks Bureaus
19-Nov	Thu	(Ob) Observation of Historical museum of waterworks and sewerage			(Ob) Tour to Sewerage Museum
		(Ob) Observation of Nabeya Ueno Purification Plant			(L) THE PROJECT ON MANAGEMENT OF REGIONAL WATER SUPPLY IN INDONESIA
		(D) Meet NAGOYA CITY UNIVERSITY students			(L) TV Conference with 2013,2014 participants
20-Nov	Fri	(Ob) Inuyama Intake and Pump station	12-Dec	Sat	
		(V) Inuyama Castle	13-Dec	Sun	
21-Nov	Sat		14-Dec	Mon	(L) Action Plan Preparation/rehearsal
22-Nov	Sun				(L) Action Plan Preparation/rehearsal
23-Nov	Mon	(L) Futures Planning for Action Plan No.2	15-Dec	Tue	(L) Waterworks Administrative roles of Central Government
		(L) Futures Planning for Action Plan No.2			(Ob) EDO Tokyo Museum
24-Nov	Tue	(L) Leakage Control in Nagoya			(V) Visit to AKIHABARA
		(L) Work Plan for Maintenance	16-Dec	Wed	(PT) Leak Detection
		(L) Cool Japan (The study of Japanese culture through Japanese manga/Anime)	17-Dec	Thu	(PT) Leak Detection
25-Nov	Wed	(L) Characteristics of Leakage, Distributed&Leakage Analysis	18-Dec	Fri	Courtesy call to Director of Nagoya waterworks Bureau
		(L) Cost-Effective Analysis			(D) TV Conference with past JICA participants
		(D) Discussion			Discussion
26-Nov	Thu	(L) Outline of Training center and Pipe Joint Work	19-Dec	Sat	
		(PT) Pipe joints work, service pipe branching work	20-Dec	Sun	
27-Nov	Fri	(L) From Design to Work of Distribution Pipe	21-Dec	Mon	(L) NRW Management efforts in Cambodia
		(L) Water Distribution Pipelines Renewal Planning			(L) TV conference with Phnom Penh Waterworks Bureau
		(Ob) Odakano Distribution Plant	22-Dec	Tue	Discussion
28-Nov	Sat				Evaluation/Feedback
29-Nov	Sun				(P) Presentation of Action Plan
					Closing Ceremony
			23-Dec	Wed	Departure

Abbreviation: L: Lecture, P: Presentation, Ob: Observation/Field Visit,  
D: Discussion, V: Visit, PT: Practical work,

### ***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) The participant's organization needs to support participants for holding the meeting aiming at sharing their knowledge or experiences learned from this program with their colleagues and related persons after returning to home countries.

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

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

##### **(1) Essential Qualifications**

- 1) Current Duties: be a technical official in charge of water supply works  
**Counterparts of Japan's bilateral cooperation program are highly prioritized.**
- 2) Experience in the relevant field: have more than 5 years' experience in water supply works
- 3) Educational Background: be a university graduate in engineering discipline or the equivalent.
- 4) Language: be proficient in speaking and writing English. (Our past experience has shown that some participants find themselves unable to make progress in their training because of inadequate knowledge of English.)
- 5) Health: must be in good health, both physically and mentally, to participate in the course in Japan. Pregnant applicants are not recommended to apply due to the potential risk of health and life issues of mother and fetus.

##### **(2) Recommendable Qualifications**

- 1) Expectations for the Participants: Have ability of human communication skills for effective learning in amicable collaboration.
- 2) Age: Be over twenty-eight (28) and under forty-five (45) years of age.

#### **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) Photocopy of passport**

To be submitted with the application form, if you possess your passport which you will carry when entering Japan for this program. If not, you are requested to submit its photocopy as soon as you obtain it.



\*Photocopy should include the followings:

Name, Date of birth, Nationality, Sex, Passport number and Expire date.

### **(3) 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)

## **4. Procedure for Application and Selection:**

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

Closing date for applications: **Please inquire to the JICA office (or the Embassy of Japan).**

(After receiving applications, the JICA office (or the Embassy of Japan) will send them to the JICA Center in Japan by **September 8, 2017**)

### **(2) Selection:**

After receiving the documents through proper channels from your government, the JICA office (or the embassy of Japan) will conduct screenings, and then forward the documents to the JICA Center in Japan. Selection will be made by the JICA Center in consultation with concerned organizations in Japan. The applying organization with the best intention to utilize the opportunity of this program will be highly valued in the selection. Qualifications of applicants who belong to the military or other military-related organizations and/or who are enlisted in the military will be examined by the Government of Japan on a case-by-case basis, consistent with the Development Cooperation Charter of Japan, taking into consideration their duties, positions in the organization, and other relevant information in a comprehensive manner.

### **(3) Notice of Acceptance**

Notification of results will be made by the JICA office (or the Embassy of Japan) **not later than October 5, 2017**.

## **5. Documents to be submitted by accepted candidates**

Inception Report: to be submitted to the JICA office by **October 25, 2017**;

Before coming to Japan, only accepted candidates are required to prepare an Inception Report (detailed information is provided in the **ANNEX, "Guideline for Inception Report"**.) The Inception Report should be sent to JICA Center in Japan(JICA Chubu)by October 25, 2017, preferably by e-mail to [cbictp1@jica.go.jp](mailto:cbictp1@jica.go.jp)

## **6. Conditions for Attendance:**

- (1) to strictly adhere to the program schedule.
- (2) not to change the program topics.
- (3) not to extend the period of stay in Japan.
- (4) not to be accompanied by family members during the program.
- (5) to return to home countries at the end of the program in accordance with the travel schedule designated by JICA.

- (6) to refrain from engaging in any political activities, or any form of employment for profit or gain.
- (7) to observe Japanese laws and ordinances. If there is any violation of said laws and ordinances, participants may be required to return part or all of the training expenditure depending on the severity of said violation.
- (8) to observe the rules and regulations of the accommodation and not to change the accommodation designated by JICA.

## IV. Administrative Arrangements

### 1. Organizer:

(1) **Name:** JICA Chubu International Center (JICA Chubu)

(2) **Contact:** ITO Hideki (Mr) ([cbictp1@jica.go.jp](mailto:cbictp1@jica.go.jp))

\* Please add the course number "J17-04394" to a message subject in your mail.

### 2. Implementing Partner:

(1) **Name:** City of Nagoya Waterworks and Sewerage Bureau

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

### 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 Hiraikicho, 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 "III. ALLOWANCES" of the brochure for participants titled "KENSU-IN GUIDE BOOK," which will be given before departure for Japan.

### 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 workshop, and other matters.

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

### **1. International Exchange with Local Communities:**

For the promotion of mutual friendship, JICA Chubu encourages international exchange between the JICA participants and local communities including students as a part of international development education program. You are expected to contribute by attending such activities and will possibly be asked to introduce the society, economy and culture of your home country. The participant's ethnic costume on such exchange programs will be highly welcomed by school children as well as local residents.

## VI. ANNEX:

### Guideline for Inception Report

The accepted candidates are requested to prepare an Inception Report to explain the actual situation and good practices on non-revenue water management, and as well as to introduce their job descriptions and own interests for the training course. The Inception Report must be sent to the JICA office until 25<sup>th</sup> Oct 2017 before arriving in Japan.

#### 1. Format

The Inception Report shall consist of the following sheet-A, sheet-B, and the Power Point file. The Power Point file will summarize both sheets with no more than 10 pages long.

#### 2. Sheet-A. General Information

Name, country:			
Brief description of;			
(1) Your job and your organization			
(2) Organization charts and function of each department			
Total Population in the Service Area		Water Pressure of Distribution Pipe	From Mpa ~ To Mpa
Population Served		Main Water Sources	
Service Ratio	%	Average Precipitation	mm/year
Service Hours	hours/day	Ratio of Unaccounted Water (%)	Total %
Water Supply Capacity	m <sup>3</sup> /day		Leakage %
Average Water supply Volume	m <sup>3</sup> /day		Illegal Use %
			Others %
Water Distribution System			
Type of Distribution Pipe	Jointing Type of Distribution Pipe	Distribution System	
		(e.g. Gravity flow, Pump-up system etc.)	
Water Supply System for House Connection			
Type of Service Pipe	Jointing Type of Service Pipe	Water Supply System for House Connection	
		(Ex. Direct Pressure, Water Tank etc.)	



Metering System		Water Charge	Mapping System
Type of Flow meter for Distribution Pipe	Type of Water Meter for Service Pipe	Water Charge Collecting Method	Scale for Pipe Drawings for Maintenance

\*Please bring Pipe Network Diagram (Soft copy or Hard copy) for practice session.

### **3. Sheet-B. Non-revenue Water Management (Leakage Control)**

Name of Section in Charge of Non-Revenue Water Management (Number of Personnel):
Typical Work Flow of Leakage Detection:
Typical Work Flow of Leakage Repair:
Name of Leakage Detection Instruments:
Countermeasures for Illegal Use
Metering System
Problems Currently Faced:
Ongoing Countermeasures or Projects on Non-Revenue Water Management:
Good examples to be shared among participants
The strategy and the future plan of your organization

#### **NOTE:**

- (1) Each participant will have 10-20 minutes for an oral presentation on his/her Inception Report including time for interpretation and Q&A.
- (2) It is recommended that an Inception Report contain related information or materials including statistics data or photos which could be useful in preparing 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**