

Knowledge Co-Creation Program (Group and Region Focus)

# Stabilizing Power Systems to Introduce Various Kinds of Renewable Energy (B)



Course Period:

May 31- June 17, 2022



# How do you introduce renewable energy to your country?

Gain insight to an essence of impact of variable renewable energy (VRE) on the stability of the power system and

the specific measures
to stabilize the power system
more practical, more interactive,
more inspirational
from the experiences of Japan.





#### **Outline**

This program is designed for the engineers of leading organizations in charge of electric power system to learn about the impact of variable renewable energy (VRE) on the stability of the power system and the specific measures to stabilize the power system.

The sessions will be held online and will include self-study and discussion with web conference.

All sessions are carried out in English.

The period of the program is from May 31 to June 17, 2022.

Course Capacity: 13 participants



# JICA Knowledge Co-Creation Program (KCCP)

The Japanese Cabinet released the Development Cooperation Charter in February 2015, stated 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 foundation of mutual learning process.

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# For What?

# To Whom?

#### **Background**

Recently, against the backdrop of global initiative to limit carbon emissions and as a result of dramatic decline in costs of variable renewable energy (VRE), many countries are accelerating to introduce VRE. However, it is not easy for the electric power system to be ready for accommodating large amounts of VRE. This program will show the impact of VRE on the stability of the power system and the specific measures to stabilize the power system.

#### **Objectives**

Participants obtain skills and knowledge on planning and designing the electric power system to stably accommodate large amounts of VRE based on the understanding of the characteristics and challenges of VRE and electric power system in each country.

## Job Areas and Organizations

This program is designed for the Engineers in charge of planning / designing electric power system (e.g. transmission and substation facilities) of leading organizations in charge of electric power system.

The applying organization with the best intention to utilize the opportunity of this program will be highly valued in the selection.

#### **Targeted Countries**

[Group A]
Bangladesh, Laos, Mongolia,
Pakistan,
Philippines, Sri Lanka, Vietnam

[Group B] Armenia, Azerbaijan, Brazil, Georgia, Mexico, Ukraine

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



# When?

#### **Online Program Period**



From May 31 to June 17, 2022

You are expected to finish "Online Self-Study" before the online program period as shown above. During the program, you will deepen your knowledge through "Online Interactive Q&A Session" and "Lectures" by Japanese lecturers.

# Online Q&A Session and

All participants will be connected via Zoom in following time zones.

[Group A]

Lectures

Japan: 0000PM and 0230PMBangladesh: 0900AM and 1130PM

• Laos : 1000AM and 0030PM

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• Mongolia: 1100AM and 0130PM

Pakistan: 0800AM and 1030AM
Philippines: 1100AM and 0130PM

• Sri Lanka: 0830PM and 1100PM

Vietnam: 1000AM and 0030PM

[Group B]

• Japan: 0900PM and 1130PM

• Armenia: 0400PM and 0630PM

• Azerbaijan: 0400PM and 0630PM

• Brazil: 0900AM and 1130AM (@Brasilia)

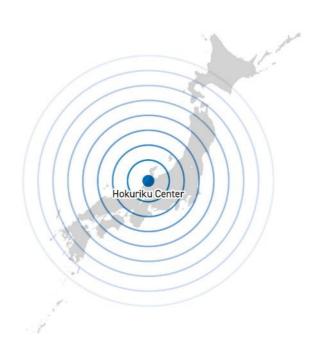
Georgia: 0400PM and 0630PMMexico: 0700AM and 0930AM

• Ukraine: 0300PM and 0530PM

Note: May change according to the application.

# Where?

This course is carried out totally online, organized by JICA Hokuriku Center. You will receive essential reading materials for your self-study at your office or home. As the online homeroom and Q&A sessions are held to support your learning process, you are required to have a certain IT environment. For detail, see page 14.





# How?

#### How to Learn

- Online Self-Study
- Online Interactive **Q&A Session**
- Lectures
- Workshops
- Discussions
- Presentations





























#### Language

English

#### Commitment to the SDGs













#### **Program Structure**

Expected Module Output	Subjects/Agendas	Methodology
1. Participants are able to understand the impacts and difficulties when various kinds of VRE are massively introduced.	<ul> <li>1-1. Policy, institutional arrangements and organization for introducing RE</li> <li>1-2. Basic technology and equipment for RE power generation system</li> <li>1-3. Challenges on introducing high penetration VRE</li> </ul>	Online Self- Study Online Interactive Q&A Session

2.	Participants are able to understand Japan's situation of the electric industry, as well as its experience in introduction of renewable energy and the measures for stabilization of power systems.	2-2. 2-3. 2-4.	Power system planning and operation Challenges on introducing high penetration VRE Technical investigation for RE grid-interconnection (Grid Code)	Presentation Lectures Exercise and issue analysis Discussion
3.	Participants are able to identify the technology of Battery Energy Storage System (BESS) and hydro (pumped storage) generation as measures for system operation (supply & demand balance, grid operation).	3-1. 3-2.	Power system planning and operation Challenges on introducing high penetration VRE	Presentation Lectures Exercise and issue analysis Discussion
4.	Participants are able to understand the know-how of power system planning and operation to keep quality and reliability of power supply when various kinds of VRE are massively introduced.	4-1. 4-2. 4-3.	Technical investigation for RE grid- interconnection (Grid Code) Grid stabilization measures for RE interconnection such as mitigation for voltage /frequency fluctuation, excess energy, insufficient grid capacity Exercise and issue analysis	Presentation Lectures Exercise and issue analysis Discussion
5.	Participants are able to formulate an Action Plan describing measures to share the knowledge acquired during this program.	5-1. 5-2.	Guidance (Online Guidance) Presentation of the Action Plan (Online discussion)	Presentation Lectures Exercise and issue analysis Discussion

#### Program Schedule (Lecture titles are tentative)

#### Day 1 (Tue., May 31)

- Opening Ceremony / Program orientation
- Q & A Discussion on "Outline of Electric Power Industry in Japan"

#### Day 2 (Wed., June 1)

- Inception Report Presentation (1st day)

#### Day 3 (Thu., June 2)

- Inception Report Presentation (2nd day)

#### Day 4 (Fri., June 3)

- Online Lecture "Initiatives on Renewable Energy by TOYAMA-city"

#### Day 5 (Mon., June 6)

- Action Plan Guidance

#### Day 6 (Tue., June 7)

- Q & A discussions on
  - "Overview of Hokuriku Electric Power Transmission & Distribution Company and Outline of Renewable Energy"
  - "Basics of Renewable Energy"
  - "Grid-interconnection Code and Access Examination for Power Distribution Grid"
  - "Planning and Operation of Distribution Power Grid"
  - "Issues and Countermeasures for Distribution Power Grid"

#### Day 7 (Wed., June 8)

- Day for studying materials

#### Day 8 (Thu., June 9)

- Q & A Discussions on
  - "Grid-Interconnection Code and Access Examination for Bulk Power System"
  - "Planning of Bulk Power System"
  - "Issues and Countermeasures for Planning of Bulk Power System"

#### Day 9 (Fri., June 10)

- Day for studying materials

#### Day 10 (Mon., June 13)

- Q & A Discussions on
  - "Power System Operation in Bulk Power System"
  - "Various Operational Issues in Bulk Power System and Countermeasures"
  - "Surplus Power Measures"

#### Day11 (Tue., June 14)

- Day for making Action Plan Report



#### Day12 (Wed., June 15)

- Exercises of

"Power System Analysis", "Examples of access studies"

#### Day13 (Thu., June 16)

- Action Plan Presentation (1st day)

#### Day14 (Fri., June 17)

- Action Plan Presentation (2nd day)
- Closing Ceremony



#### **Implementing Partner**

[Course Leader]
Mr. TSURUI Toshihiro

Japan Electric Power Information Center, Inc. Electric Power Cooperation Dept.



Hokuriku Electric Power Transmission & Distribution Co., Inc. Corporate Planning Dept.



Hokuriku Electric Power Transmission & Distribution Co., Inc. Corporate Planning Dept.







#### Japan International Cooperation Agency (JICA)

#### Senior Advisor

Mr. OGAWA Tadayuki



#### **Program Officer**

Mr. NAITO Takeshi

Energy and Mining Group, Infrastructure Management Department



#### **Deputy Director**

Ms. YAGO Naoko

Hokuriku Center



#### Staff

Ms. SAKAMOTO Megumi

Hokuriku Center





# Eligibility and Procedures

#### 1. Expectations to the Applying Organizations

This course is designed primarily for organizations that intend to address specific issues or problems identified in their operations. Applying organizations are expected to use the program for those specific purposes.

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

In this connection, applying organizations are expected to nominate the most qualified candidates to address the said issues or problems, carefully referring to the qualifications described in section 2 below.

Applying organizations are also expected to be prepared to make use of knowledge acquired by the nominees for the said purpose.

#### 2. Nominee Qualifications

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

#### **Essential Qualifications**

- 1) Attendance: the training course participants are required to attend Online Q&A Session and Lectures at designated time on page 7.
- 2) Engineers in charge of planning / designing / operating electric power system (transmission ,substation and distribution facilities)
- 3) At least 5 years' working experience in the relevant field such as power



- transmission, transformation or distribution.
- 4) Educational Background: be a graduate of university or equivalent
- 5) Language Proficiency: a competent command of spoken and written English proficiency active participation in discussions, which requires high competence in English. Please attach an official certificate for English ability such as TOEFL, TOEIC etc, if possible.
- 6) Technical Requirements:
  - Technology Proficiency
    - Basic computer skills such as, sending/receiving email with attachments, and using a web browser.
    - Online course is delivered using the following services, Web Conferences
      (Zoom), Cloud Storage (GIGAPOD), YouTube and other online platforms may
      be used. Online tutorial and support by JICA will be limited. The ability to
      be self-directed in learning new technology skills are required.
  - b. Internet Connection
    - High Speed Broadband Connection (at least 2Mbps).
    - \* Internet access charge incurred for this course shall be borne by your organization.
  - c. 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)
  - d. Software (which may be required)
    - Zoom Client for Meeting (https://zoom.us/download)
    - \* In case you are using your office computer and use of Zoom is not authorized by your IT administrator, please notify JICA at the time of application.
- 7) Health: must be in good health to participate in the program.



#### **Recommended Qualifications**

Age: between the ages of twenty-five (25) and fifty (50) years Gender Consideration: JICA promotes gender equality. Women are encouraged to apply for the program.

Difficulties/Disabilities: The participation of person with difficulties/disabilities is welcomed. Reasonable accommodation for persons with difficulties/disabilities will be made. Please write your situation in the Questionnaire on medical status restriction of the Application form. (Japan ratified the Convention on the Rights of Persons with Disabilities in January 2014 and JICA has observed it.)

#### 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:** You should submit it with the application form.
  - \*The following information should be included in the photocopy:

    Name, Date of Birth, Nationality, Sex, (Passport Number and Expiry Date, in case of passport)
- (3) **English Score Sheet**: to be submitted with the application form, if the nominees have any official English examination scores. (e.g., TOEFL, TOEIC, IELTS)
- (4) **Questionnaire**: to be submitted with the application form. Fill in Annex I of this General Information.

#### 4. Procedures for Application and Selection

#### (1) Submission of the Application Documents

Closing date for applications: Please confirm the local deadline with the JICA overseas office (or the Embassy of Japan).

(All required material must arrive at JICA Center in Japan by April 20, 2022)

#### (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 April 28, 2022.

### 5. Additional Document(s) to Be Submitted by Accepted Candidates

<u>Inception Report</u> -- to be submitted by May 18, 2022

Accepted candidates are required to prepare an Inception Report (Please read Annex II "Inception Report" for detailed information.) with Microsoft PowerPoint format. The Inception Report should be sent to JICA by May 18, 2022, via designated online platform.

JICA will inform you of access information of online platforms with acceptance notice of your participation to the training course. After you store the data, please email to Ms. YAGO, JICA Program Officer (Yago.Naoko@jica.go.jp), to notify it.

<u>Action Plan</u> -- to be submitted <u>by June 14, 2022</u> (during the course)

Participants are required to prepare Action Plan and to make presentation at the end of the course. Detailed information is to be announced during the course.

#### 6. Conditions for Participation

The participants of KCCP are required

- (1) to strictly observe the course schedule,
- (2) not to change the program topics, and
- (3) not to record or share the online training program without permission of JICA.



# Administrative Arrangements

#### 1. Organizer (JICA Center in Japan)

- (1) Center: JICA Hokuriku Center (JICA HOKURIKU)
- (2) Program Officer: Ms. YAGO Naoko (Yago.Naoko@jica.go.jp)

#### 2. Implementing Partner

- (1) Name: Japan Electric Power Information Center, Inc.
- (2) URL: https://www.jepic.or.jp/en/
- (3) Remark: Japan Electric Power Information Center (JEPIC) is an organization established in 1958 to conduct research and exchange information with electric utilities worldwide, and cooperate with developing countries to help build out their electric power infrastructures.
- (1) Name: Hokuriku Electric Power Transmission & Distribution Co., Inc.
- (2) URL: http://www.rikuden.co.jp/english/
  Hokuriku Electric Power Transmission & Distribution Co. is a subsidiary of the above URL company.
- (3) **Remark:** Hokuriku Electric Power Transmission & Distribution Co. works to ensure the neutrality and fairness of our power transmission and distribution, delivers a stable electricity, and contributes the development of Hokuriku region in Japan.

#### 3. Reference

\*YouTube of "Knowledge Co-Creation Program and Life in Japan" and "Introduction of JICA Center" are viewable from the link below.

Image videos of 'Introduction of JICA Center (YouTube)' show the following information of JICA Centers: Location, Building, Entrance, Reception(Front desk), Lobby, Office, Accommodation(Room), Amenities(Hand dryer), Bathroom(Shower and Toilet), Toiletries, Restaurant, Laundry Room(Washing machine, Iron), ICT Room(Computer for



#### participants), Clinic, Cash dispenser, Gym, Neighborhood

Part I: Knowledge Co-Creation Program and Life in Japan			
English ver.	https://www.youtube.com/watch?v=SLurfKugrEw		
French ver.	https://www.youtube.com/watch?v=v2yU9lSYcTY		
Spanish ver.	https://www.youtube.com/watch?v=m7l-WlQSDjI		
Russian ver.	https://www.youtube.com/watch?v=P7_ujz37AQc		
Arabic ver. <a href="https://www.youtube.com/watch?v=1iBQqdpXQb4">https://www.youtube.com/watch?v=1iBQqdpXQb4</a>			
Part II: Introduction of JICA Centers in Japan			
JICA Hokuriku	A Hokuriku <a href="https://www.jica.go.jp/hokuriku/english/office/index.html">https://www.jica.go.jp/hokuriku/english/office/index.html</a>		

### Annex I

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1	Intern	ot Fn	viron	ment
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	Please describe your internet environment at office and home. (Ex. no internet at home, 5GB only at home, etc)
(2)	Please also describe your devices on attending on-line course. (Ex. PC at office and/or home).

#### 2. Support of your supervisor

JICA expects your supervisor (boss) at your workplace to support you during this training course and to observe your Action Plan presentation at the last day of the course. Please secure his/her attendance on the day.

After the course, JICA also expects you and your supervisor to implement your Action Plan together with your colleagues. JICA will request you and your supervisor to fill in the monitoring sheet for follow-up of your Action Plan one (1) month after the course.

#### Information of Your Supervisor

Name	
	Organization:
Position	Department/Division:
	Position:
Office	Address:



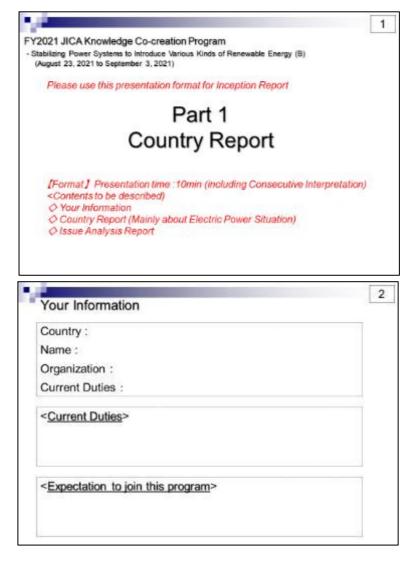
	TEL:	Mobile (Cell Phone):
	FAX:	E-mail:
Message		
to JICA		
Signature		

### Annex II

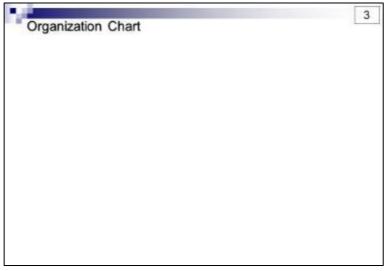
#### **Inception Report**

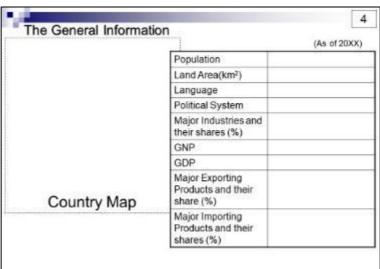
Accepted participants are requested to prepare an Inception Report, referring to the following format (Microsoft Power Point) as an example.

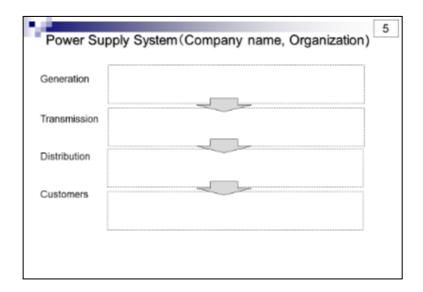
- > Detailed explanation for each slide should be written on the NOTE of PPT.
- > The Report should be uploaded to designated Platform of JICA Hokuriku Center by May 18, 2022. The access information will be notified with acceptance notice.
- > Online discussion (Zoom) will be organized on June 1 and 2, 2022, in order to discuss the issues of each participant.





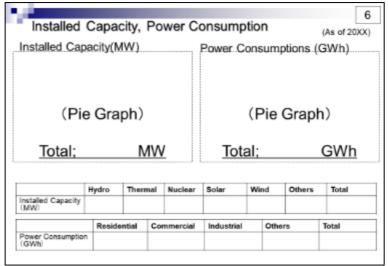


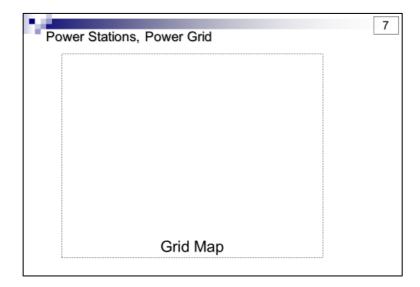




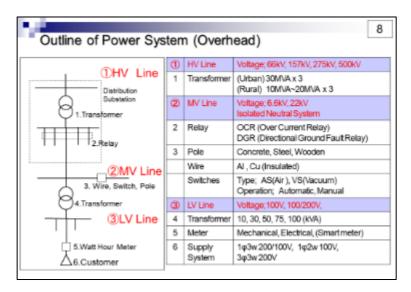


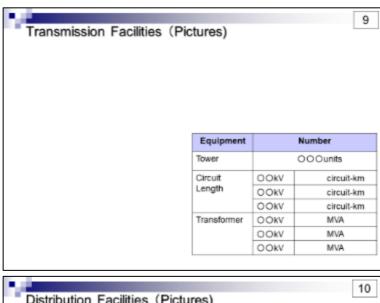
Power Supply System(Company name, Organization)				
Generation				
Transmission				
Distribution				
Customers				

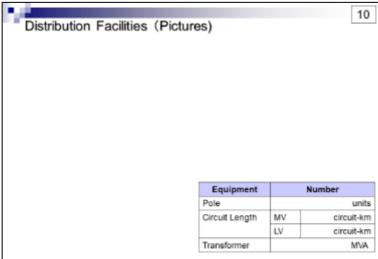




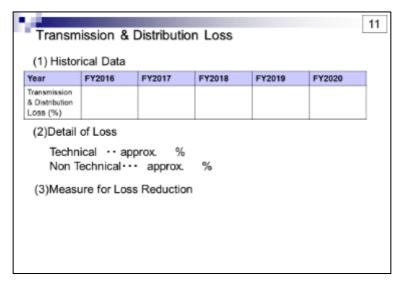




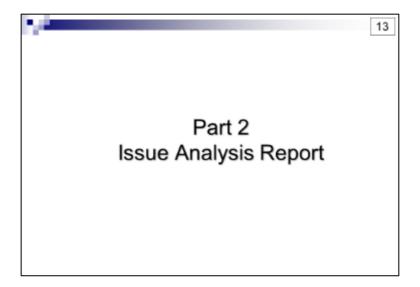




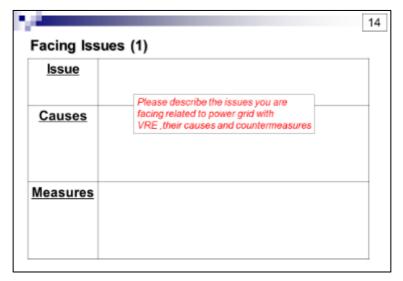


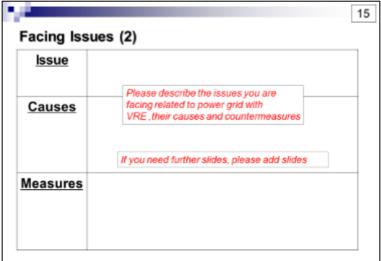














### For Your Reference

#### 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 from a process of adoption and adaptation, 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.



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.



#### Correspondence

For enquiries and further information, please contact the JICA office or Embassy of Japan.

#### Further, address correspondence to:

#### **JICA Hokuriku Center (JICA HOKURIKU)**

Address: 4th Floor, Rifare (Office Tower) 1-5-2, Hon-machi, Kanazawa-shi, Ishikawa-ken, 920-0853, Japan TEL: +81-76-233-5931 FAX: +81-76-233-5959

("81" is the country code for Japan, and "78" is the local area code)