

**Annual Conference
Mongolian Association of
Civil Engineers**

Ulaanbaatar, Mongolia, June 9, 2007

**Capacity Building from Japanese
Perspective**

- Japan was a developing country -

**ISHII, Yumio Dr.Eng.
President, Japan Society of
Civil Engineers**

(Chairman, CTI Engineering)

1 . Definition of Capacity Building

By Dr. Russel Jones, Vice-President of WFEO:

“Capacity Building is a dedication to the strengthening of economies, governments, institutions and individuals through education, training, mentoring, and the infusion of resources. Capacity building aims at developing secure, stable, and sustainable structures, systems and organizations, with a particular emphasis on using motivation and inspiration for people to improve their lives.”

Japanese Experience for 130 years proved his definition is right.

National consensus for modernization

High level of primary education

Japanese young engineers’ will

Foreign consultants’ assistance

2. History of Project Delivery Systems in Japan and Emergence of the Civil Engineering - Success of Capacity Building & Technology Transfer -

Meiji Era (1868 - 1914)

Centralization of All Resources to Government

- Faster Catch-up to Europe and US
- 1-party system or “Force Account” was effective
- All engineers are “In-House” engineers

Hiring Foreign Experts = Consultants

Employed foreign engineers for the Capacity Building

Total : 2,299 (1867 to 1889)

Civil Engineers : 146 (108 persons came from England)

The New Generation of Japanese bred Civil Engineers

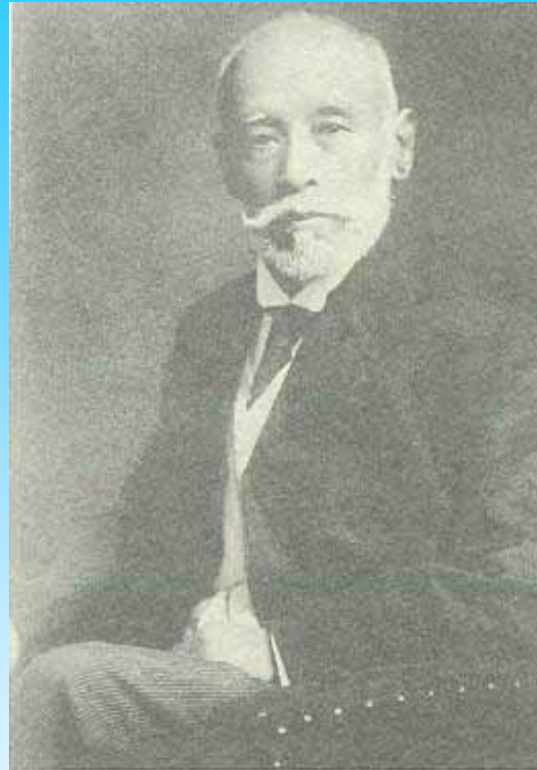
Leading Engineers in Technology Transfer and Capacity Building



J.de Rijke

Dutch river engineer
seconded in 1873
(1842 - 1903)

Reference : "デ・レーケとその業績"
issued by Kisogawa-Karyu Work Office,
Ministry of Construction, 1982



FURUICHI, K.

Japanese Civil Engineer
Founder of JSCE in 1914
(1854 - 1934)

Reference : "古市公威"
issued by 故古市男爵記念事業會, 1937



HIROI, I.

Japanese Civil Engineer
and professor
(1862 - 1928)

Reference : "工學博士廣井勇伝"
issued by 故廣井工學博士記念事業會,
1930

3. New Project Delivery Systems lead Emergence of Contractors & Engineering Consultants (after WW through Mid-60s)

- Success of CB and TT from US in all the phases of civil engineering-

Post-war Construction

- Military Works of Allied Forces
- Prevention against (frequently occurring) natural disasters
- Urban reconstruction from war damage

Deployment of US Delivery System

- Cancellation of **Force Account** or 1-party System
- **Privatization** of Construction
- Emergence of **Independent Consultants and Contractors**
- Deployment of **2-party System**: Client-Contractor

4. Technology Transfer realized High Economic Growth



Technology Transfer from US and Europe

Feasibility study, B/C analysis, Cost allocation

**Highway Plan & Design, Arch and Gravity Dam,
Water Resources, Flood control, Hydro power**

High dams (Loan from WB ; T. T. by US

Consultants: Atkinson Inc. (US), OCI (US))

Railway system (Bullet train; Loan from WB)

**Highway System (Loan from WB ; T.T by Foreign
consultants : Watkins (US) and Dorsch (German))**

New Projects, New Delivery systems after WW II

Highway Network System

US consultant, Watkins 's advice

Courtesy:Japan Highway Public Corporation



"The Condition of Japanese Road (1957)" from *Report of the Committee for the Study of the Kobe Nagoya Expressway Survey by a Group of Experts headed by Ralph J. Watkins (Tokyo 1957)*

Success of Technology Transfer and WB Loan



In 1963, Tokyo-Nagoya Expressway was so designed as to preserve the scenery of Mt. Fuji.

Courtesy:Utsukushii Keikannwo tsukuru kai



Success of Technology Transfer after WW II

SAKUMA DAM The Highest and the Biggest

- Completed in 1956, Sakuma Dam was constructed in central Japan.
- Height of 155.5m, Power capacity of 350,000kw
- First deployment of heavy-duty machines by the advice of US consultant, G.F. Atkinson Inc.



Courtesy: J POWER

Success of Technology Transfer after WW II

KAMISHIIBA DAM

- Completed in 1955. first large arch dam in west Japan.
- US consultants, OCI for technology transfer for the planning, design and construction.



Courtesy: CTI Engineering

5. Establishment of Continuing Professional Development Systems of JSCE

1) JSCE and CPD

JSCE considers Capacity is the integral part of Ethics of its members. Committee on CPD was established in the course of New Code of Ethics

Amendment of JSCE Constitution in 1999 aiming to improve the quality of civil engineers set the basis of **Continuing Professional Development (CPD) System** in 2001

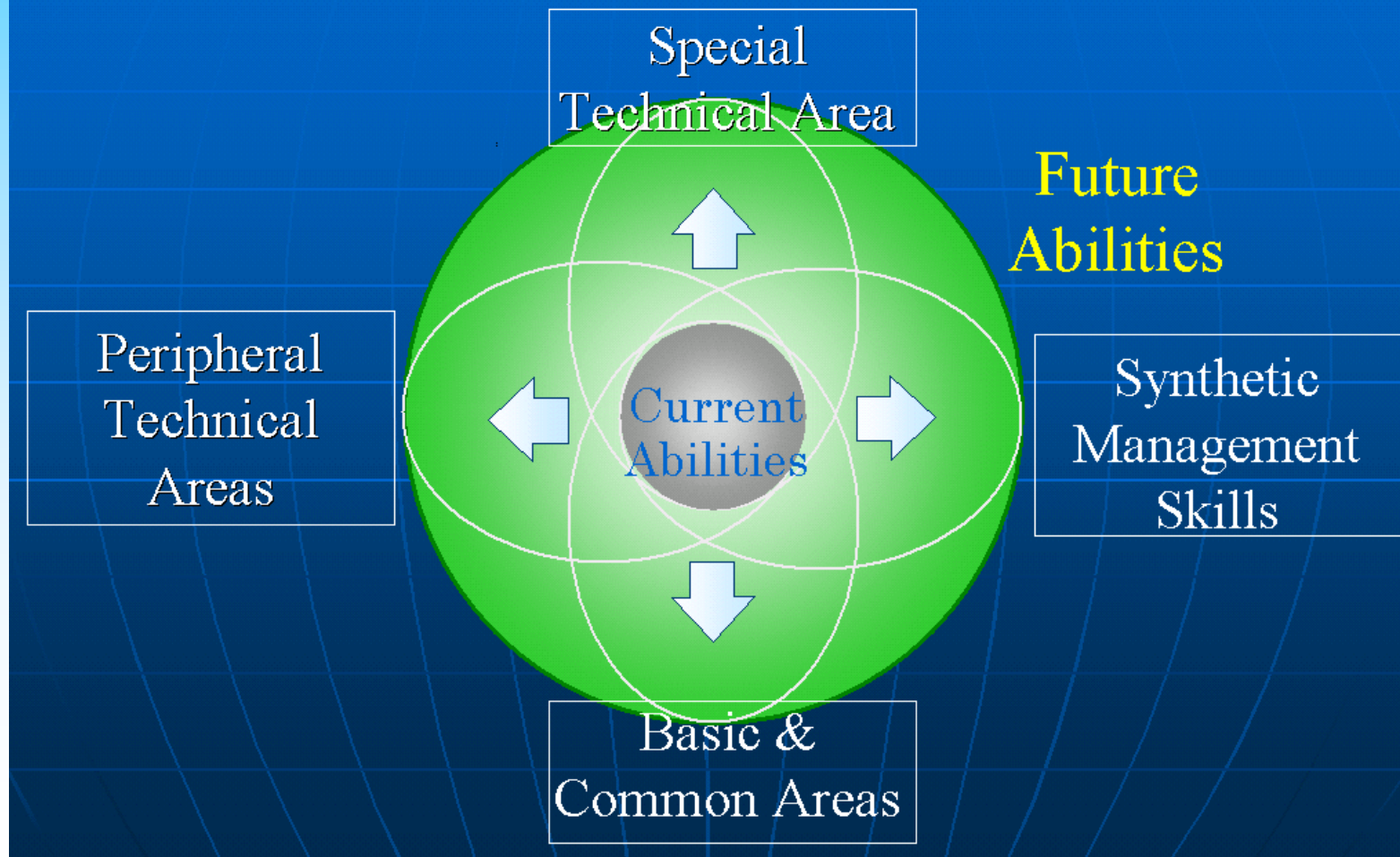
2) JSCE CPD System

- The objectives of the CPD
 - Provide systems to its members for acquiring sufficient abilities in the accomplishment of their engineering goals as well as to pursue their responsibilities through continuous career development.

- 3 Agenda of JSCE CPD System:
 - 1) Provision of CPD program
 - 2) Recording of CPD activities/ participation
 - 3) Certification of CPD

3) Concept of JSCE's CPD System

4 Educational Fields



4) JSCE CPD System

CPD System provides

Certified 400 programs a year,
including the applications for certifications
from other associations
Improvement of CPD Management System

CPD Record

Acquired Unit recorded into Data Base since April
'05

Renewal of Qualification

Requirement for qualification renewal
250 CPD units in 5 years
(50 CPD units/ year)

5) Educational Areas of JSCE CPD

Basic & Common: Ethics, General Science, Environment, Socio-economics, Jury, Common Culture

Civil Engineering:

Applied Mechanics, Seismology,

Hydraulics, Hydrology, River, Water Resources, Ocean

Geotechnics, Soil Mechanics, Foundation

Highway, Railway, Urban Planning, National Development Scheme, Survey

Concrete, Steel, Construction Techniques

Construction Management, Design management, Contract, Cost Estimation

Relevant Engineering:

Environment Impact Assessment, Environment Survey,

Information Technology, Communication, Computer Software

Management:

Construction-, Project Management, Quality Control, Risk Management,

Public Economics, Infrastructure Investment, Cost/Benefit Analysis

Educational Systems & CPD Unit



Participation to W/S, Lectures	1.0/H
Presentation & Publication	
Oral Presentation	0.2 - 0.4/Min
Publication to Academic Proc.	40/Doc.
Publication to Magazines	10/Doc.
Author of a Book	3/H
Training	
Trainee	0.5/H
On-the-Job-Training	10/Course
Instructor & Speaker	
Universities, Academic Societies	10
Private W/S	5
Work Experience	
Team Leader	20
Team Member	10
Patent Invention	40

6. CPD Consortium in Engineering Societies

- Japan Federation of Engineering Societies
- Japan Society of Civil Engineers
 - Qualification: 4 grades of Professional Civil Engineer
- Japan Society of Mechanical Engineers
- Institute of Electrical Engineers of Japan
- Society of Chemical Engineers, Japan
- Japanese Geotechnical Society
- Institution of Professional Engineers, Japan (IPEJ)
 - Qualification: Professional Engineer, JP
 - APEC Engineer
- Japan Civil Engineering Consultants Association
 - Qualification: Registered Civil Engineering Consulting Manager

7. JSCE CPD System and JABEE

- JSCE is an active member of Japan Accreditation Board for Engineering Education (JABEE) since its establishment in 1999

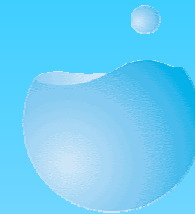
JABEE

- Promote educational programs in institutions of higher education
- Evaluate the education system of colleges and universities
- Qualify colleges and universities
- Waive students of accredited colleges and universities from the initial exam of “Professional Engineer. JP”
- Education system is closely related with JSCE CPD

8. Global Involvement of Japanese Civil Engineers in Capacity Building

1) World Water Forum in Japan

- 3rd WWF3 held in Kyoto, Shiga, and Osaka, March 2003
- Japanese Civil engineers played the leading role
- 24,000 people participated
- The **Ministerial Declaration** states the importance of Capacity Building for water management.



World Water Council
3rd World Water Forum



2) Capacity Building by FIDIC

- The International Federation of Consulting Engineers(FIDIC), represents consulting industry centered civil engineering in the world amounting to approx. 12,000 firms in 65 nations. Japan is an active member.
- **Capacity Building** and **Independence** are the main issues of FIDIC activity.
- FIDIC aims to develop and guide implementation to Capacity Building in the consulting industry at the levels of the individual firms, the national member associations, as well as the overall industry.
- Collaboration with World Bank and developing countries.

3) Capacity Building and Technology Transfer - Japanese Contribution in Civil Engineering-

- JSCE assists Capacity Building and Technology Transfer in the developing countries through **AOC** with civil engineers' societies
- JSCE **invites leaderships, young engineers and students** from civil engineers' societies of developing countries
- JSCE, ASCE and PICE founded **Asian Civil Engineering Coordination Council, ACECC**. **4th CECAR in Taipei** organized by ACECC in 2007
- **International Summer Symposium** by JSCE is annually held for Foreign Students
- **Special Curriculum in English** for Foreign and Japanese students at Japanese Universities
- Numbers of Japanese civil engineers have being seconded to developing countries as consultants for Capacity Building and Technology Transfer by **ODA Program**
- CB and TT for Developing Countries by **Consulting Firms** are Integral part of JBIC and JICA projects

Thank you for your attention!