



IAC News No.98

Japanese Crises and the Future of Civil Engineering - from the Perspective of Our Origins and Culture - (1/3)

Prof. Ieda delivered a Presidential Speech at the 2020 JSCE Annual Meeting. The IAC News introduces the speech from this issue to No.100.

■ Introduction

Since the first president, Prof. Koi FURUICHI, gave an address in 1914, the president of the time has given a magnificent address every year at annual meetings of Japan Society of Civil Engineers. It is a tremendous honor for me to receive such an opportunity. But at the same time, it is a lot of pressure. That's why first of all I researched about what the 107 presidents before me had talked about. I found that what they discussed could be roughly divided into three categories. The first type of address is about academic and technical content that reflects one's specialty. The second is discussing specific policies and measures that the civil engineering industry should work on based on the issues of the times. The third type of address is about the philosophies and attitudes of people involved in civil engineering and a vision for how the organization should be. This was also the case with the address given by the first president, Prof. FURUICHI and many presidents have based their addresses on similar topics ever since. While I feel a little bit nervous about doing so, I'm going to take the plunge and give a talk that carries on from this line of 'type 3' addresses.



Prof. Dr. Hitoshi IEDA
108th JSCE President

■ Japan's Inherent Facing Crises

We face a wide range of issues such as intensifying disasters due to global warming, aging infrastructure facilities (problems relating to maintenance systems), social system changes due to the decline in population, distortions caused by economic globalization, or pandemics like COVID-19. It goes without saying that it is important to seriously tackle these specific issues by way of precise and concrete means. However, we should recognize that we face following three serious inherent crises in more profound areas that are separate from the aforementioned specific issues.

The first crisis is 'the decline of Japan's presence'. Japan's GDP share in relation to the world as a whole has more than halved from 13% to 6% in the last 20 years, and even in terms of GDP per capita, Japan used to be the second largest in the world, but now finds itself down in 26th. As the population declines, the strength of the nation will fall unless production per capita is increased. This situation is serious. In the ranking of largest companies in the world by market capitalization,

in 1989, 21 Japanese companies were among the top 30 companies, but now there is not a single one that ranks in the top 30. Under these circumstances, Mr Jitsuro TERASHIMA, a well-known social critic, stated in his most recent book that ‘many people mistake the stagnation in a buried economy for ‘stability’ or tell themselves that this is what it is.’ Even more so than the situation itself, it might be more serious to not actually recognize a crisis as a crisis.

The second crisis is ‘concerns about the innovation of Japanese technology and technical’. From 2000 to 2019, there have been 13 Japanese Nobel laureates, ranking third in the world along with France, after the United States and Britain. However, if we convert this to the number of winners per capita, the situation changes completely. Britain, the United States, Switzerland, the Scandinavian countries, and France rank high, whereas Japan ranks considerably low with Germany. Furthermore, according to a survey conducted over the last three years, the number of papers in the field of natural science is 65,000 in Japan, while it is 280,000 in the United States, which is an overwhelmingly large number even considering the population ratio. In addition, China has finally surpassed the United States with 306,000.

Looking at China's infrastructure, the length of expressways is now 10 times that of Japan, and the length of high-speed railway lines is 8 times that of Japan. The construction market is also in a different league. Technology evolves only when we engage in a vast amount of work. In the years to come, China will also produce considerable results not only in the field of ICT but also in many other fields. It is essential for Japan to steer its business toward undertaking a ‘vast amount of work’ and promote ‘vitality’ in its overseas markets.

The third crisis is ‘concerns about the motivation of Japanese labors’. According to an international comparative survey on the “motivation” of workers conducted by an overseas research company, Japan is surprisingly low, ranking 132nd out of 139 countries. The WorldSkills Competition was once dominated by Japan, but nowadays Switzerland, China, and South Korea are emerging, and Japan is unable to finish near the top. In recent years, the number of doctoral degree holders per capita has been increasing year by year in most developed countries, but only in Japan is this number in fact declining. Japanese society is becoming relatively ‘less educated’.

It goes without saying that the aforementioned crisis in Japan is also a crisis of the civil engineering industry.

■ A Crisis is also an Opportunity to Make Leaps Forward

Such a situation is undoubtedly a crisis. However, considering the mentality of the Japanese people, there is a possibility that each person will be able to rise from the brink of defeat and turn this set of circumstances into a new development opportunity by admitting to ourselves that this is in fact a crisis.

Prof. Tokujiro YOSHIDA, the 37th president, said in his president's address in 1950 that “Japanese civil engineering technology is at least 20 to 30 years behind UK or USA.” Roughly 30 years later, in 1979, Japan grew to become a magnificent nation of technology, to the extent that American sociologist Ezra VOGEL wrote the book ‘Japan as Number One’. This was the result of our seniors grappling with a vast amount of work, taking on the challenges of science and technology, and

practicing them boldly.

The COVID-19 pandemic has caused many sufferers, deaths, and great economic damage. While the world has been hit by a shared catastrophe, the response in each country has been communicated by the media. The differences between them can be compared against each other, which is very different from the catastrophes of ordinary natural disasters and wars. For example, while the social morals of Japanese people, who refrain from going out even if they are not obligated to do so and have established good hygiene habits such as wearing a mask and washing their hands, are by no means bad by international standards, many Japanese recognized the obvious fact that the information infrastructure, the digitization of administration, and work style improvements were behind the times. I think that if we can overcome these weaknesses as soon as possible by using the sense of urgency as the starting point for making a shift and leaping forward, it will lead to a considerable improvement in productivity.

I think we can turn the aforementioned three crises into opportunities to leap forward by having a strong awareness of them and working diligently with a transformation-orientated mindset.

■ Thinking from the Origins of Civil Engineering

However, in order to overcome these three inherent crises, I think that transforming the superstructure such as programs and work systems is not enough. Rather, I wonder is it not important to look at the inner parts that govern our minds, such as our own way of thinking and awareness of values in the organization, that is, the substructure, and to reaffirm our own identity and actively transform ourselves.

In the sense that a major turning point is required, this has been mentioned in the addresses of the presidents who have come before me. For example, Prof Minoru MATSUO, the 84th president, gave an address entitled “Engineering in the Midst of a Historic Turning Point” in 1997, and triggered by various scandals and troubles in consensus building with citizens, called for the need for our own transformation of the civil engineering industry. This shift was largely extrinsic in motivation, stating “how will the industry change in response to external criticism and environmental changes?” The issue I especially want to bring to the table now, however, is rather our internal self-assessment and self-transformation based on the ‘inherent sense of urgency’.

One of the important points for conducting a self-assessment of our mentality is to reaffirm the ‘origins of civil engineering’, that is, our identity. There may be various opinions about what the ‘origins of civil engineering’ are. The various opinions can be summarized as follows.

The first of the ‘origins of civil engineering’ is the ‘teleological origin’. The Code of Ethics of the Japan Society of Civil Engineers states that “we will contribute to the well-being and prosperity of the people and the nation as well as the welfare of humankind and its sustainable development with our wisdom.” This sense of a social responsibility corresponds to this ‘teleological origin’.

The second is ‘proximity to the natural environment’. The proximity of the civil engineering field to nature is extremely high, in terms of protecting citizens from the threat of nature, bringing the benefits of nature to the people, and understanding and protecting fragile natural environments

and ecosystems.

The third is ‘relationship with the public, that is, politics’. Civil engineering is a field that interacts with the public. The general public are users, taxpayers, landowners, and voters. Therefore, given that the field of civil engineering essentially contains politics, politics can also be said to be one aspect of the origin of civil engineering. These second and third points are, as you would expect, also touched upon by the Code of Ethics of the Japan Society of Civil Engineers.

Sixth Engineers’ Lounge “DOBOKU”

The Professional Development and Education Program Group of the International Activities Center regularly holds the Engineers’ Lounge “DOBOKU” for young civil engineers to deepen their understanding of overseas construction and get them interested, attracted, and inspired to engage in overseas construction projects.

This event welcomes as instructors engineers who are flying the flag overseas to explain not only the outline of overseas projects, but also future challenges and prospects, interesting experiences and anecdotes from their time in the field, and difficulties they have faced. Event participants can also get a real sense of overseas construction, assignments, and life through open discussions with the lecturers.

Holding the event online for the second time using Zoom meant a wider range of people could participate, and the bar for participating in the event was even lower, enabling participation from all over Japan or, better yet, the world.

On this occasion, marking the 6th time we have held this event, we welcomed Mr. Yasushi Kawaguchi from the Asia Branch of Obayashi Corporation and Mr. Keiichiro Ishii and Mr. Junro Nawano from the International Branch of Shimizu Corporation as lecturers. In addition to listening to talks on the topics of ‘the project’ and ‘the work of young engineers and local life’ in relation to the Existing First Bridges Rehabilitation Project adjacent to the constructions of the second bridges of Kanchpur, Meghna, and Gumtii in Bangladesh, there was online discussion with the event participants.

With regards to large construction projects of the scale that one can rarely experience in Japan, the lecturers explained how to ensure the progress of constructions at sites where public security is a concern, the importance of communication with companies, local engineers, and workers, their track records of large-scale procurement of materials and equipment, and how to manage field teams without a hitch.

The event participants asked many questions such as (1) What should young engineers who are expecting to be assigned overseas learn before they are assigned?, (2) How best to communicate one’s thoughts to local workers who have different perceptions of quality and safety?, (3) What

were the factors behind achieving the completion of the first large-scale public works in Bangladesh within the construction period?, (4) as well as about additional safety measures introduced after the 2016 terrorist attack and the circumstances around taking this action. In response to these questions, the lecturers offered their opinions such as, (1) “Since there is a great deal of trust in Japanese engineers overseas, I recommend that you acquire a wide range of knowledge and skills before being assigned,” (2) “It is important to communicate to local workers not only verbally but also with gestures and drawings,” (3) “In order to ensure that everything goes according to the work schedule, it is essential to devise and set up how to raise the operating rate of heavy machinery,” (4) “We must never be passive about safety measures, instead, we need to be aware of safety at all times.” It was no doubt a precious experience for the young engineers who are set to flourish overseas.

As mentioned earlier, this is the second time the event has been held online, and while it is now possible to communicate information to more and more young engineers, it has also become possible to receive feedback and requests from them as well. We would like to continue to request more feedback on how we can use this event in a wide variety of different ways.

【Reported by Shigemiki Marutaka (Professional Development and Education Program Group)】

Creating a Place for Engineers from Abroad - JSCE 2020-2024 Project -

The Japan Society of Civil Engineers has marked four projects to be achieved in its five-year plan ‘JSCE Five-Year Plan - We connect regions, generations, and values to create a future society (JSCE 2020-2024)’. One of these projects, which is led by the Diversity & Inclusion Committee (D&I Committee), is ‘Creating a place of activities and tools to realize Civil Engineers’ D&I Ver. 2.0’. We call the current situation in which the term ‘diversity’ has become commonplace and women’s involvement in the civil engineering industry is gradually making strides as ‘Civil Engineers’ D&I Ver. 1.0’. The next stage is ‘Civil Engineers’ D&I Ver. 2.0’, in which a diverse range of individuals, not limited to women, and more organizations are involved in society. Among the efforts of ‘Civil Engineers’ D&I Ver. 2.0’, the International Activities Center and the D&I Committee run the ‘Creating a Place for Engineers from Abroad’ initiative.

Efforts focusing on engineers from abroad have begun in several organizations of JSCE. For example, the Kanto Chapter held a company information session for international students, and the Consultant Committee established the Global Civil Engineer Subcommittee. Furthermore, the JSCE Magazine organized a special feature in the form of ‘Welcome to Japan! - Internationalization of human resources in the field of “DOBOKU” (Civil Engineering)’ in its November 2019 issue. The purpose of the International Activities Center and the D&I Committee is to create and run a ‘place’ to expand and accelerate these efforts.

The first thing we did was to start a monthly meeting between the stakeholders. We welcomed Dr. Ji Dang from the IAC International Student Network Group and Dr. Thi Ha from the Consultant Committee to share the status of the efforts and hold themed discussions. Going forward, we aim to increase the number of organizations involved, as well as create opportunities where individuals get involved and a situation where it is common practice for members from overseas to participate in the various activities of JSCE. We will report the progress of our efforts to IAC News from now on.

【Reported by Kiko Yamada-Kawai, Vice-Chair, the Diversity & Inclusion Committee】

Updates

- ◆ IAC YouTube Channel
https://youtube.com/channel/UCGI6DHzX_cGD-mHUrRkA
- ◆ Construction 2050 Alliance - The role of construction in the national Recovery Plans
<https://committees.jsce.or.jp/kokusai/node/196>
- ◆ 17th World conference on Earthquake Engineering (17WCEE)
<http://www.17wcee.jp/>
- ◆ The Second International Conference on Press-in Engineering (ICPE) 2021, Kochi: <https://icpe-ipa.org/>
- ◆ 9th International Conference on Experimental Vibration Analysis for Civil Engineering Structures (EVACES2021)
<https://ec-intl.co.jp/evaces2021/>
- ◆ 9th Civil Engineering Conference in the Asian Region (CECAR9) in Goa, India (Sept 21, 22, and 23, 2022): <http://www.cecar9.com/>
- ◆ jhappy - JICA's Grant Aid Cooperation -
Facebook: <https://www.facebook.com/jhappy20161110/>
Twitter: https://twitter.com/jhappy_official
- ◆ The International Infrastructure Archives
– A Compilation of Japan's Greatest Projects in Transfer of Civil Engineering Technology in Service –
<http://www.jsce.or.jp/e/archive/>
- ◆ IAC “News Pick Up!!” on the JSCE Japanese website
http://committees.jsce.or.jp/kokusai/iac_dayori_2020
- ◆ Summary of featured articles in JSCE Magazine Vol. 105, No.12, December 2020
<http://www.jsce-int.org/pub/magazine>
- ◆ Journal of JSCE : <https://www.jstage.jst.go.jp/browse/journalofjsce>



Civil Engineering Heritage:

Kurobe Dam

<https://committees.jsce.or.jp/heritage/list/2020>

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§ IAC Facebook §

Recent activity of International Activities Center is introduced on this Facebook. Please see this home page

<https://www.facebook.com/JSCE.en>).

Comments and Questions

Please send us your feedback and comments to help us improve the IAC news. We look forward to hearing from you.

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