TRY BIG towards the Upcoming Presidential Election of ISSMGE

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Summary

Happy New Year 2017 and Season's Greetings to all of you. This document introduces myself and my scopes as one of the candidates for ISSMGE Presidency for the term of 2017-2021. I put emphases here on "AVE" three issues;

- **A**chievements as the former President of Japanese Geotechnical Society and as the Vice President for Asia of ISSMGE,
- **V**ision of the future of geotechnical engineering and
- **E**nergy to work for better future of 20,000 ISSMGE members, showing the colleague geotechnical engineers "YOU ARE VALUABLE, YOU ARE VERY GOOD, YOU DESERVE IT and YOU CAN DO IT."

My pledge in what follows is based on my past experiences as a Vice President for Asia of ISSMGE, President of Japanese Geotechnical Society with more than **9000** members, Chief Editor of the Soils and Foundations Journal and Professor at the University of Tokyo as well as many international activities in the past 30 years. I believe that geotechnical engineering should make more important and direct contributions to the development of human community.

Dear geotechnical colleagues,

As one of the presidential candidates of ISSMGE, it is my great pleasure to describe who I am, what I have done and what I will do for the international society during the period of 2017 – 2021. I have made many contributions to ISSMGE and have ample experiences as the President of the Japanese Geotechnical Society. Based on them, I will energetically work for the benefit of the international geotechnical community and open a new era for our discipline.

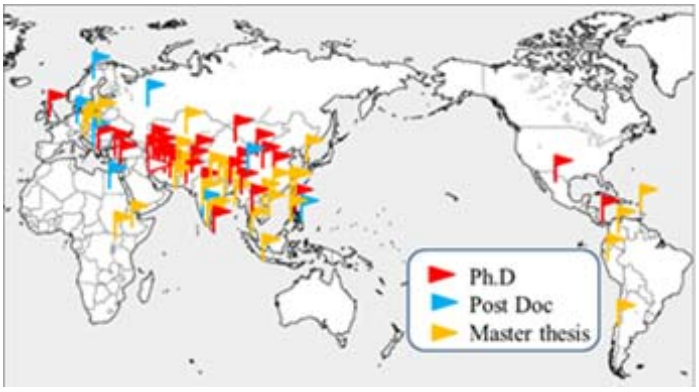

Figure 1 Distribution of former international students

(1) Who am I?

I graduated from the University of Tokyo in 1977, developed during the master course a computer code for dynamic analysis of soft ground and obtained a doctoral degree in 1982 by conducting laboratory work on deformation of sand undergoing stress axes rotation. After obtaining the doctoral degree, I worked at the University of British Columbia (Canada) as a post-doc fellow, at the Asian Institute of Technology (Bangkok, Thailand) as an assistant professor and at Public Works Research Institute (Tsukuba, Japan) as a visiting researcher in addition to at the University of Tokyo as Professor until 2015. Figure 1 shows the distribution of international students (in addition to many Japanese students) whom I supervised at several institutions. I became Professor Emeritus in 2015 and am currently working for Tohata Architects & Engineers as Director

Table 1 Societal memberships

Name of Society	**Status**
Japanese Geotechnical Society	**Former President**
ISSMGE	*Vice President for Asia*
Japan Society of Civil Engineers	Fellow
Japan Association for Earthquake Engineering	Former Vice President
Japan Landslide Society	Former Board Member
Architectural Institute of Japan	Member
Science Council of Japan	Associate Member
Southeast Asian Geotechnical Society	*Life Member Membership 1980s～*
Nepal Geotechnical Society	*Honorary Member*
Indian Geotechnical Society	*Life Fellow*

(http://www.tohata.co.jp/), Chuo Kaihatsu Corp. (geotechnical) as a Technical Advisor (http://www.ckcnet.co.jp/) and the Kanto Gakuin University as a Visiting Professor.

I am affiliating with many academic/ engineering societies, both domestic and international, and have been playing important roles therein (Table 1).

From July to December, 2016, I was a Distinguished Visiting Professor at the Indian Institute of Technology (IIT) Bombay in Mumbai, INDIA. I am always trying to make my scope broader. Therefore, in 2017, I will be working at IIT Hyderabad, India.

As a researcher, I have been working on geotechnical earthquake engineering through damage reconnaissance (in Japan, China, Taiwan Island, Philippines, Indonesia, India, Iran, Costa Rica and some more), shaking model tests (1-g, centrifugal, and E-defense full-scale tests on damage mechanism and mitigation technology), development of numerical/analytical methods for performance-based design, torsional and triaxial shear (including zero-gravity shear to create very low effective stress), consolidation under elevated temperature, swelling soil tests, etc. Another expertise of mine is the early warning technology for mitigation of rainfall-induced slope failures. In 2008 I published a comprehensive book "*Geotechnical Earthquake Engineering*" with 700 pages from Springer Verlag (Figure 2) for which I spent 23 years to write.

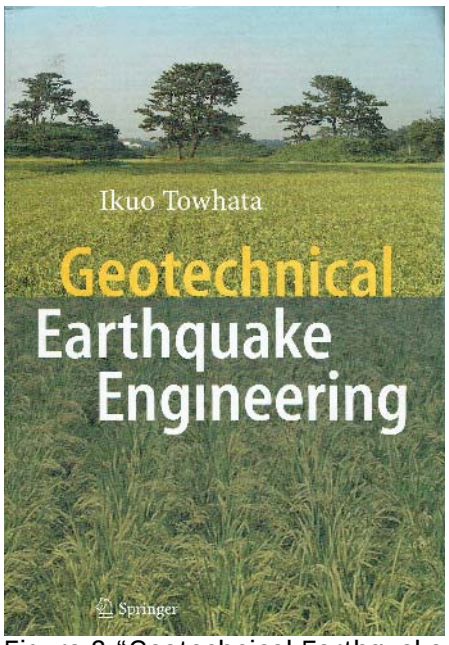

Figure 2 "Geotechnical Earthquake Engineering" published in 2008

Because of those efforts, I have received multiple awards from JGS (Japanese Geotechnical Society) and JSCE (Japan Society of Civil Engineers) as well as the prestigious Shamsher Prakash Research Award of USA. After the 2011 gigantic Tohoku earthquake in Japan, I have been devoting myself to recovery efforts as will be stated later. After completion of my service at the University of Tokyo, I have been engaged in international consulting in Asia, Europe and South America.

(2) What have I done for the geotechnical engineering community?

In a presidential campaign, contributions to ISSMGE in the past and in future are more important than a personal research history. In the societal work, it was always tough to take the ultimate resonsitbility as chief but I was able to learn lessons and get valuable experiences.

1) In 1977, I attended the ICSMGE in Tokyo for the first time as a student assistant. Since the 1989 ICSMGE in Rio de Janeiro, I participated in all the ICSMGEs and contributed as a session Co-Chairman, Chairman, speakers and Heritage Lecturer in the 2005 Osaka Conference.

For activity of ISSMGE, I have been a member of TC203 (Earthquake Geotechnical Engineering and Associated Problems) as well as the Chair of ATC3 (Asian TC on Geotechnology for Natural Hazards). I belong to the Joint Technical Committee 3 on Landslide (ISSMGE, ISRM & IAEG) where I am striving to push forward a flagship study on earthquake-induced landslides.

I was a secretary general for the 1st Earthquake Geotechnical Engineering Conference (IS Tokyo in 1995). I was the organizing chairman for the 3rd International Young Geotechnical Engineers' Conference in Osaka (Figure 3), 2005, together with working for the organizing committee of ICSMGE in Osaka at the same time.


Figure 3 Third International Young Geotechnical Engineers' Conference in Osaka in 2005 (I designed the logo, inspired by growing plants)

I managed this one-week conference for young people with registration fee of only US 300 $ per person, inclusive of accommodation, meals, parties, technical trips etc.

In the recent years I spent much time on ISSMGE activities as one of the Board Members (Appointed Board member 2009 - 2013 and Vice President for Asia 2013-2017). Figure 4 illustrates my international activities in Asia during this period. I took care of the publication of Bulletin as the chief editor from 2010 to 2014. I enthusiastically asked many people to contribute articles on disaster reconnaissance, challenge on frontiers, new technologies and important projects. Because of their kind supports, I successfully increased the number of issues per year from 4 to 6. Moreover, I am one of the earliest donors to the ISSMGE Foundation that supports young engineers who wish to attend international conferences. I lectured in an ISSMGE Webinar on geotechnical earthquake engineering in November, 2012.

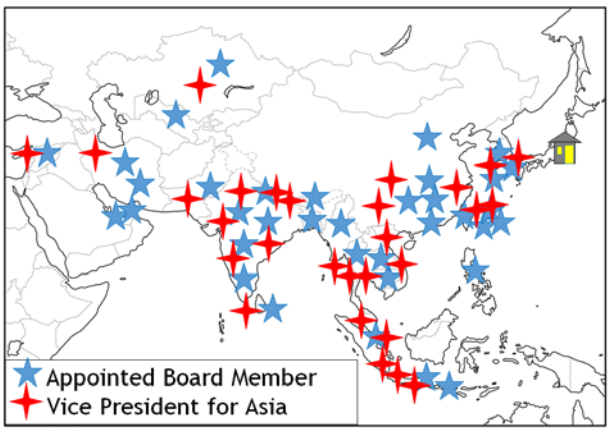

Figure 4 My activities in Asia from 2009 to 2017

Four years ago, in my campaign for VP Asia, I offered two pledges - they were, "LCC: Low Cost Conferences" and "Geotechnical Engineering of the people, by the people and for the people". LCC with low registration fee was realized three times in Nepal 2014 on natural disaster and mitigation, Asian Regional Conf. SMGE in Fukuoka, 2015, and Mini Symposium "New Concepts and New Developments in Soil Mechanics and Geotechnical Engineering" in Nagoya, 2016. I also organized a sustainability/maintenance conference in Mumbai, India, in 2016 in collaboration with colleagues of the Indian Geotechnical Society.

Establishing financial sustainability for small member societies has been one of my concerns and helping host internationally valuable conferences combined with an exciting field excursion was my solution. The above-mentioned conference in Nepal (2014) was able to attract many international participants and the Society's financial basis was remarkably strengthened. The new motto "Geotechnical engineering for the people and with people" is touched upon in the next section.

2) For JGS (Japanese Geotechnical Society), I was the Chief Editor of the Soils and Foundations Journal. As the President of JGS from 2014 to 2016, I steered activities and interest of more than 9000 members consisting of 7562 regular members as well as 920 student members and 843 company members. It is always tough to be a chief and shoulder responsibilities but I was able to learn many lessons. I solved the financial problem of the society by turning a 350 thousand US $ deficit several years ago into a 110 thousand $ profit in 2015. I launched work to translate and internationally distribute all the technical standards of JGS so that experiences and good ideas might be shared by the international community. Consequently, JGS is recently more recognized by people as a valuable institution because of its many activities "for the people and with people." In 2009, I was the chief organizer of the JGS National Conference. I organized this big event with 1500 participants.

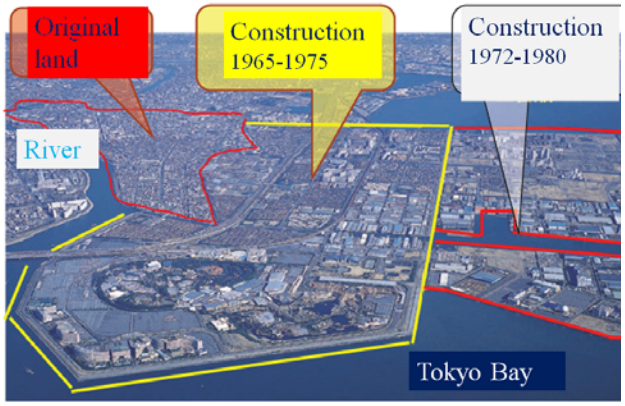

Figure 5 Aerial view of Urayasu City where young reclaimed islands were severely affected by subsoil liquefaction during the 2011 Tohoku gigantic earthquake (provided by Urayasu City)

My JGS activities further include recovery from the 2011 gigantic Tohoku earthquake. It was clearly demonstrated by this big natural disaster that

geotechnical engineering has to make more contributions for people's safety and welfare. Therefore, I worked hard not only on damage reconnaissance but also on

- technical advisory for reconstruction of residential areas affected by seismic slope instability and liquefaction,
- assessment and classification of residential lands from natural-disaster viewpoints,
- establishment of the "Authorized Evaluator of Residential Land" for people, etc.

Figure 5 shows an aerial view of Urayasu City that was severely affected by subsoil liquefaction. I have been working as the chairman of the technical advisory committee for developing a difficult scheme for "soil improvement under existing houses". Based on the people's decision, loose sandy subsoil will be reinforced by underground walls of grid shape (Figure 6). Another remarkable achievement was the full involvement of JGS in the 40-year process towards solving of Fukushima No.1 Power Station's nuclear incident in which geotechnical expertise will be essentially important (Figure 7). Because of those efforts, the JGS membership started to expand after a continuous decrease for decades. My experiences will help me work for the international geotechnical community from now on.

Figure 6 Geotechnical support for people's recovery from earthquake disaster (technical development of underground grid walls in liquefaction-prone soil)

Figure 7 Contribution of JGS for solving the nuclear incident of Fukushima No. 1 Power Station caused by tsunami

(3) What will I do for ISSMGE?

ISSMGE has been evolving very fast in the recent times but, at the same time, has several issues yet to be solved;

- Collaboration with industries and public sectors has to be promoted. The number of our Corporate Associates is merely 25.
- More efforts are needed to further improve our public image.
- Our Case History Journal should attract more interest from potential authors and readers. Don't you think that peer review is too strict to practitioners who have good ideas to share with you but do not have much experience in paper writing?
- ISSMGE should use its capacity to be more actively involved in new topics such as global environmental issues, population increase, geo-informatics etc. by applying its geotechnical capacity to new fields. As the President of the Japanese Geotechnical Society until 2016, I have been tackling these issues.

As one of the Presidential Candidates, I promise that I will TRY BIG for you. I will fully use my past experiences for the good future of international geotechnical engineers.

1) I will improve the status of geotechnical engineering by disseminating to the public that you are doing good things. ISSMGE will be expressing professional opinions on important geotechnical topics to show that **YOU ARE VALUABLE**. ISSMGE will recommend member societies and technical committees, if agreed, to national governments and public sectors as an authority to take initiative towards solving problems that are concerned by people.
2) I will offer you an ISSMGE-authorized place where you can show that **YOU ARE VERY GOOD** so that you can get more business/research opportunities. Scientific research and engineering practice will be equally respected. Our Case History Journal will offer a place where practitioners can publish their good ideas and achievements without meeting unnecessarily strict scientific peer-review processes. This idea will enable the journal to have

more contents as compared with, on average, 4 articles in each of 4 issues per year currently.

In ISSMGE's international conferences, there will be special sessions or days in which practitioners and public sectors or clients communicate with each other so that their technical seeds and needs may be understood clearly. The 2015 Asian Regional Conference in Fukuoka, Japan, did this (proceedings available from http://doi.org/10.3208/jgssp.v02.esd).

3) Importance of advanced soil mechanics and geotechnical engineering will be appealed to the public and customers so that they may understand your importance and provide more funding to your expertise: **YOU DESERVE IT**.

   Recent experiences have shown that the total construction cost can be significantly saved by spending slightly more budget on field investigations and laboratory soil tests in order to capture the subsoil conditions more precisely. Those efforts make it possible to propose a more rational design as well as construction planning. This point has to be appealed strongly. Furthermore, a life-cycle-cost perspective will be made possible if precise subsurface information is available. These ideas are consistent with the recent world-wide awareness of ecology and sustainability, and can appeal to the public. The saved budget can be spent on other projects for the welfare of people. Herein collaboration among practitioners, academicians and policy makers will be very important.

4) From the viewpoint of soil mechanics, we should make more efforts on monitoring and back-analysis. In this field I have made a small contribution to the safety of landslide-prone people by developing a system of slope monitoring and early warning (Figure 8). This system uses a very modern MEMS technology and can detect minor slope displacement during heavy rain and advise people to evacuate well in advance if slope failure is likely. In this manner, monitoring and back analysis can reveal subsoil's material properties and what is going on underground so that necessary actions may be taken sufficiently before a catastrophic situation occurs. We have a good TC on numerical methods. **YOU CAN DO IT.**

Figure 8 Low cost monitoring of slope prone to rainfall-induced landslide: geotechnical engineering for the people

In addition to the above pledges that are based on my JGS experiences, I would like to make several CHALLENGES.

- As the President of JGS, I have been pushing OPEN ACCESS DATABASE of bore hole profiles. The idea was proposed together with several other institutes and states that bore hole data is a common property of people because people live on ground, people use ground water, people rely on lifelines and subways, and people plan to purchase land for future residence. Unfortunately, achievement is still limited. Similarly, in many countries, bore hole data is not well open to the public. One of the reasons for this is the strict copy-right regulation which does not allow information on private property to be freely released to the public. There will be intense discussions on priority between copy right and people's welfare. Availability of bore hole database will be combined with GIS technology, open new field of research and enable more rational construction planning. Please recall one of my new mottos "*Geotechnical Engineering for the people and with people.*"
- Concerns on global issues such as climate change (more heavy rains and more droughts?), population increase (more water supply) and energy supply are increasing and ISSMGE should pay attention to them. Fortunately we already have Technical Committees on some of these topics. Heavy rains are likely to cause landslide disasters and breaching of levees. Rising of the sea water level will affect the safety of the coast line in conjunction with the risk of coastal erosion that is

Figure 9 Earthquake damage to a well-designed building (sinking and tilting) caused by unsatisfactory subsoil condition

caused by insufficient sediment (soil) management. Shortage of water supply will require more systematic management of ground water. We geotechnical engineers should positively work on securing the water resources. On the basis of our past achievements, there are many future roles to be played for better future of our planet.

- More communication is necessary between engineers working on superstructures and underground structures (above and below ground surface). Buildings of good quality become bad if foundation and subsoil are bad, and vice versa (Figure 9). Piled raft foundation is an important target of this communication/collaboration. *I am currently a director of an architect office!* Building engineers are keen to use BIM (Building Information Modelling). Subsoil and foundation data should be combined with BIM. Herein our young promising engineers will be involved more in information technology.

Figure 10 Myself (6 years old) proudly playing in river where I constructed channels and dams

Figure 11 Soil investigation! in tropical rain forest of Amazon

(4) I am ready to start

I like soil. When I was a child, I was fascinated by constructing channels and dams in a nearby river channel (Figure 10). Also, I constructed a marvelous canal network in garden and my father got very angry to find that his beloved garden was destroyed by a promising geotechnical engineer.

Figure 12 Two powerful animals who attacked me in jungle

I like travel. I visited many interesting places in the world to see the dynamism of the earth and interesting geological/soil-mechanical processes (Figure 11). Visits to the rift valleys in Iceland and East Africa were unforgettable experiences. Another nice experience was in Borneo Island in Southeast Asia where I was attacked by two orangutans (Figure 12). I made a desperate fight but surrendered after 2 seconds. I am a very unique professor who made a brave fight against such powerful colleagues.

Last but not least, I have already completed heavy duties of Professor of University of Tokyo and President of JGS. My current positions are Director of an architectural office, Advisor for a geotechnical consulting firm and Visiting Professor at Kanto Gakuin University. They kindly allow me to spend time on international activities. Therefore, I believe I can contribute enthusiastically to make your future full of happiness.

Best wishes *January 7th, 2017*

Ikuo Towhata