

Promoting diversity in the Japanese Geotechnical Society: Benefits of involving more women and international members

地盤工学会におけるダイバーシティの推進：女性と外国人会員を増加させるメリット

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1. Before coming to Japan

I was born and raised in Lima, the capital city of Peru. Since both of my parents are Japanese, my three sisters and I studied at La Union, a school for “Nikkei” or Peruvians of Japanese descent. There, we were encouraged to keep close ties to Japanese culture from early childhood. After finishing school, I was admitted by the Pontifical Catholic University of Peru to pursue a Bachelor’s Degree in Chemistry. Initially, I did not have in mind any area of specialty; however, while taking classes, I developed a dream to apply my studies to understanding and solving environmental problems.

During my last year at university, I had the opportunity to work in an international consulting company offering engineering and environmental services for mining and construction. There, I came to realize the serious environmental problems caused by improper mining waste management, such as acid rock drainage (ARD). Contamination by ARD can devastate rivers, streams, and aquatic life for many years because it can occur indefinitely, long after mining has ended. So, having this in mind, I decided to come to Japan, a country that has developed highly advanced technology to mitigate and prevent environmental problems, to study and research cost-effective and readily available solutions to prevent ARD from spreading.

Although I spent 24 years of my life in Peru and consider myself 100% Peruvian, I am convinced that growing up in two totally different cultures allowed me to value and appreciate Peruvian and Japanese culture, enrich my life experience, broaden my vision and better understand both cultures. I am sure that this will help me act as a bridge connecting both Peru and Japan.

2. My first contact with geotechnical and geo-environmental engineering

In 2008, I came to Japan for the first time and, after taking an intensive Japanese course, started my Master’s studies at Kyoto University in 2009. Although I am a chemist, I joined a civil engineering laboratory that conducts research mainly on geotechnical and geo-environmental engineering.

My research work during my Master’s course, which continued into my Ph.D. studies, was related to the use of minerals barriers (as bottom liners or adsorption layers, Fig. 1) to mitigate ARD. The potential use of bentonite, zeolite and ferrihydrite to prevent ARD from spreading was evaluated in terms of hydraulic conductivity (physical parameter) and metal immobilization (chemical parameter)

over the long term by using ARDs having different pHs and metal compositions (containing Pb, Zn, Fe, etc.).

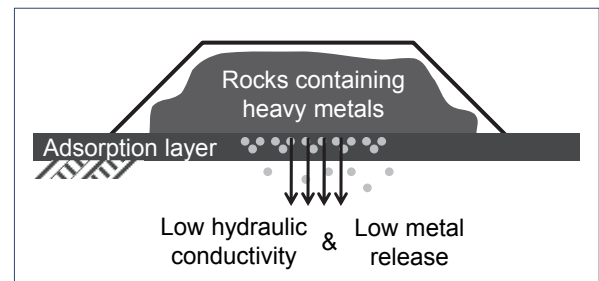


Fig. 1. Design of a containment for rocks with ARD potential generation

In the beginning, it was very difficult for me to understand concepts of this new field of specialization. Now, after five years of training, I can say that being a chemist allows me to easily understand complex mechanisms that occur in the environment on a micro scale and the experience in engineering gained at Kyoto University has helped me think on a macro scale.

In April 2014, after graduating from university, I joined the National Institute for Environmental Studies as a Research Associate. Using the experience acquired in Peru and Japan, I am currently working on a project on the standardization of testing methods and the use of geochemical modeling to assess long term environmental safety of reused or recycled materials. Working in Japan is challenging for me. However, I am always learning from everybody at my workplace, especially from Dr. Sakanakura, my boss, exchanging information and I am enjoying the experience very much.

Fig. 2 shows an average schedule for both weekdays and weekends. While making this schedule, I realized that I do not have strict schedule for mornings and afternoons. Rather than setting tasks for every hour, I prefer working according to the urgency of each job or balancing between laboratory and desk work. On weekends, I am focused on tasks at home and making sure I spend relaxing time with my husband and call my family who live in Peru and in the United Kingdom. I usually do not work on weekends unless I have something urgent to do.

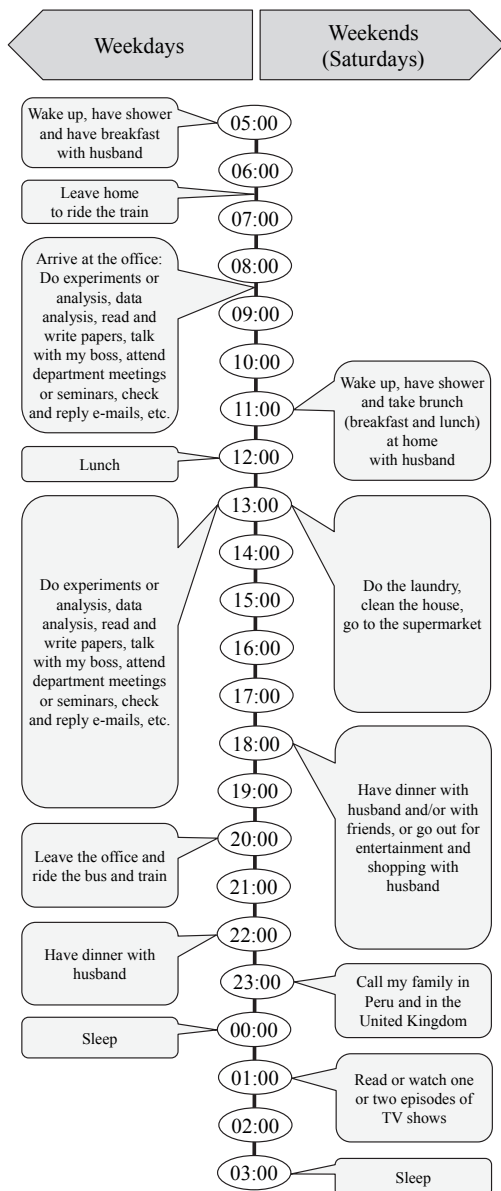


Fig.2. Average schedule for weekdays and weekends

3. Diversity at the geotechnical and geo-environmental engineering: Women and international researchers

When I joined my laboratory at Kyoto University in 2009, I met a Colombian female “senpai” (senior) who once told me that she was the first international female Ph.D. candidate of the laboratory. Also, she shared with me an anecdote about the first time she attended a conference organized by the Japanese Geotechnical Society (JGS): she mentioned that as soon as she entered the conference room, she realized that there were no other female in that room; “I was the only woman there!”, she said. In Peru, I graduated from the Sciences and Engineering Faculty, Chemistry Department; while there were usually more men than women, depending on the specialty, I did not know that there were so few numbers of females in the geotechnical and geo-environmental world in Japan.

I spent five years at Kyoto University, starting from a Master’s course and pursuing Ph.D. studies afterwards in

the same laboratory. Luckily, Professor Katsumi, my supervisor, gave me the opportunity to present my research progress and results in several conferences organized by this organization (Fig. 3). The first time I attended a JGS conference, I had the same experience as my Colombian *senpai*, meeting very few women at the event. However, I feel that, as time passes, more women are taking active participation in JGS conferences and meetings.



Fig. 3. Presentation at the U.S. – Japan Geo-environmental Engineering Workshop 2011

I also realized, however, that the number of foreign members in JGS is still very limited. My laboratory was always full of international students and, therefore, it made me initially misjudge the real situation in JGS. In the five years that I spent at Kyoto University, I had not only *senpai* and “*kohai*” (juniors) from Japan, but also from Colombia, Samoa, Malaysia, Vietnam, Bangladesh, China, Dominican Republic, Thailand and Peru. At times, the number of international students even surpassed the number of Japanese students. Thanks to this, I have been able to meet and interact with a large number of professionals from a broad range of cultures which made my working experience in Japan even richer. I also remember that my Peruvian *senpai*, who is now a faculty member at Kyoto University, told me that when he joined the laboratory there were not many international students, but the number kept increasing with time. This makes me believe that there is a big interest from people outside Japan in doing research in areas regarding geotechnical and geo-environmental engineering in Japan. Therefore, there is an expanding sector and a future opportunity for JGS to become a more diverse organization.

4. Members of the JGS: Women and international members

Recently, I did a small research on the number of women and international JGS members. All the data collected and analyzed in this section has been provided by the JGS’s committee on Gender Equality and Diversity. Fig. 4 shows the number of JGS members classified by gender and type of membership (general and student). It can be clearly seen that the number of male members is much greater than the number of women members. Regarding general members, in 2006, there were 9,828 men and 152 women. In 2009, there were 8,112 men and 171 women and, in 2014, there were 7,102 men and 190 women. As for student members, in 2006, there were 668 men and 90 women; in 2009, there were 657 men and 73 women and in 2014, there were 551 men and 90 women. The percentage of women with general membership in 2006 was 1.5%, in 2009 it was 2.1% and in 2014 it was 2.6%, which may suggest that this number will keep increasing with time. This also shows that there is no shortage of enthusiastic women who want to take on the challenges in geotechnical and geo-environmental engineering. The percentage of women

with student membership in 2006 was 12%, in 2009 it was 10% and in 2015, it was 14%. This may suggest that more attention could be given at universities into attracting more female student into this area of specialization.

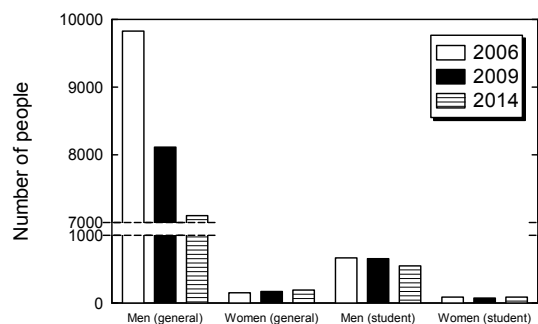


Fig. 4. Number of JGS members (general and student members)

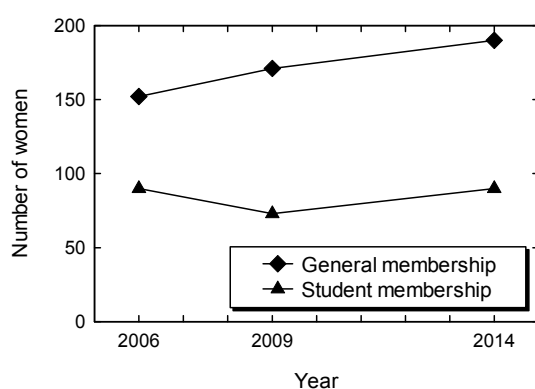


Fig. 5. Number of women in JGS (general and student members)

From Fig. 5, it can be clearly seen that the number of women with general membership has increased whereas for student members it seems to be stable. This result suggests that, every year, more of us have joined JGS, which may indicate that more women are dealing with geotechnical and geo-environmental engineering works. As for student memberships, there was no increment in the number of women.

Rough data about foreign members was also provided by the JGS's committee on Gender Equality and Diversity. Out of 8,421 members currently registered until February 2015, there were 207 foreigners, from which 188 were men (118 general members, 70 student members) and 19 were women (5 general members and 14 student members). Considering that no data was available for previous years, it is not possible to say if the number of foreign JGS members has increased or decreased. However, considering that several universities in Japan are offering undergraduate and graduate programs in English, I believe this number will increase with time.

5. Benefits of diversity

I believe that handling geotechnical and geo-environmental engineering problems, such as developing contamination prevention technologies, is a very complex task. In my opinion, having a diverse team, including people from different backgrounds, cultures and experiences, allows generation of more creative ideas and better methods of solving problems.

We currently live in a globalized world that requires more interaction among people from diverse countries and cultures than any time before in history. In order to guarantee a sustainable development and to address geo-environmental problems, it became necessary to exchange information and technologies between countries, share experiences regarding successful problem solutions and think both in a local and global scale. This requires people from different disciplines and considering perspectives such as science and engineering, politics, economics, etc.

Bringing more women into this research or work field not only represents equitable or balanced opportunities for both men and women, but also bringing new ideas and different perspectives to the organization and the workplaces in general.

I am sure that JGS will keep making efforts towards diversity and with time, more women and foreigners will join, which will undoubtedly enrich the organization.

Growing and living in Peru, a racially and ethnically diverse country, full of diverse cultures and traditions, and now living in Japan for almost 7 years has made me feel that Japan is less open to diversity in terms of ethnicity than Peru, but that the participation of women as part of the work force is increasing. Peruvian culture has been under great influence of immigrants coming from several countries such as Spain, China, Japan and diverse countries from Africa. Peru has, therefore, a fusion of legacy from the past and the influence of other countries. Japanese people and culture have been in Peru for over 100 years and there are currently about 90,000 Japanese descendants living in Peru. All of them are not only entirely part of the Peruvian society and consider themselves Peruvians, but have positively impacted the Peruvian culture.

I hope that, similar to the way Japanese people have influenced Peruvian culture, food, etc., people from different countries will also have little by little more participation in the Japanese society. It will enrich even more the culture and will bring different ideas to solve problems and keep growing in this globalized world.

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