

An AUN/SEED-Net seminar on disaster prevention measures. Japan and ASEAN, both prone to frequent natural disasters, have much to learn by sharing their experiences.



AUN/SEED-Net

Creating ASEAN-Japan Knowledge Networks for the Future

The Southeast Asia Engineering Education Development Network (SEED-Net) Project began in 2001. Its roots lie in Japan's initiatives to help the region bounce back from the financial crisis touched off in 1997. The Japanese Government supports SEED-Net through JICA, which works for the project's vision of sustainable development for Southeast Asia and Japan through the development of highly skilled human resources in the engineering field.

Following a two-year preparatory stage ending in 2002, SEED-Net was formally launched in the first of three 5-year phases implemented so far. Today the program brings together 26 leading institutions of higher learning from all 10 ASEAN countries and 14 supporting universities in Japan. An autonomous subnetwork of the ASEAN University Network (AUN), SEED-Net has two core missions: to nurture internationally competitive engineering personnel and to enhance the quality of engineering education and research at the schools. These missions involve the creation of networks at



Through this program, Japan and ASEAN countries share technology and know-how and engage in joint research projects together.

the personal level, among Southeast Asian and Japanese researchers who work together, and at the institutional level.

Dr. Chitoshi Miki, who leads AUN/SEED-Net on the Japan side as the Secretariat's chief advisor, describes the program as an effective way to build cooperative ties with a human touch between ASEAN and Japan. Promising Southeast Asian researchers come to Japan with JICA support. The participating Japanese universities provide advanced facilities and fertile intellectual environments for these engineers to further their knowledge. As of May 2013, a total of 573 Southeast Asian scholars had earned master's or doctorate degrees at schools in ASEAN and Japan. Many of them are now active at universities throughout the region, sharing what they have learned with the next generations.

TACKLING REGIONWIDE CHALLENGES

Bandung Institute of Technology (ITB) is one of four Indonesian universities taking part in the program. Major areas of study include the core engineering fields of manufacturing and industry, but Phase II of SEED-Net brought a fresh focus on interdisciplinary research on issues affecting the region as a whole. Dr. Andi Mahyuddin, the institute's program coordinator for SEED-Net, says that energy and the environment are likely to be the subjects with the biggest impact in years to come.

Dr. Iman Reksowardojo, head of the combustion engine and propulsion laboratory at ITB, is leading efforts to develop automobile and aviation engines that use biofuels to reduce CO₂ emissions and make more efficient use of ASEAN's rich natural resources. "ASEAN is growing fast, and we need to secure the energy to support that growth. We are not particularly rich in energy resources, but Southeast Asia has the potential to become the Middle East of biofuels."

In his work Dr. Iman draws on his own experi-

ence in Japan—he earned his PhD from Hokkaido University, where he researched diesel engine technology and exhaust emission systems. Inside his lab, a dynamometer provided through AUN/SEED-Net is used to test a wide variety of biofuels, including fuels sourced from rambutan, coconut, rubber seed, and tapioca. Dr. Iman’s test engine can consume any kind of fuel—a big advantage in a scattered archipelago like Indonesia, where different resources are available in different regions.

This kind of research is already having a dramatic impact. One former AUN/SEED-Net researcher at Chulalongkorn University in Thailand recently won a \$25 million grant for a biofuels project. “In Thailand, this work has made a major contribution in terms of how the Thai government is implementing bioethanol policies,” says Dr. Iman. “These are real contributions that have been made by people who have studied as part of the AUN/SEED-Net program and continued their work back in their countries.”

NETWORKING TO GROW KNOWLEDGE

One of Dr. Iman’s students is Hong Duc Thong, a young lecturer from the Ho Chi Minh Technical University in Viet Nam who is currently completing his PhD at ITB after a stint at Hokkaido University—a triangular academic route common for AUN/SEED-Net. His dissertation aims to produce an airplane biofuel that works as effectively as conventional fuel while producing less CO₂. He is grateful that SEED-Net gave him the opportunity to hone his theories in Japan’s advanced academic environment.

Hong will present his results at the 6th AUN/

SEED-Net Regional Conference on Energy Engineering at ITB in early September. SEED-Net provides funding for researchers to attend and present papers at these gatherings. “We want to be able to address regional issues,” says Dr. Andi. “We have published hundreds of papers and organized conferences in many fields.” Since 2011 the *ASEAN Engineering Journal* has appeared twice a year with JICA support, providing a valuable publishing channel for ASEAN researchers. Dr. Iman says: “It is very important to show people the strong work being done in Southeast Asia.”

A BIG ROLE FOR JAPAN

Japanese academics also play important parts in the SEED-Net approach. Collaborative research activities are a growing part of the program, and some of the most successful studies so far have been those pairing young Southeast Asian researchers with research partners and advisors from Japanese universities. JICA does not support individual universities through SEED-Net so much as it seeks to forge networks of multiple schools. One way to accomplish this is to get Japan’s leading engineering teachers into the field, forming connections with researchers throughout the region.

An impressive network of academic contacts now links young graduates in the field throughout ASEAN with their counterparts in Japan and the wider Pacific region. Back at ITB, Dr. Andi states: “There are more opportunities now. Many of our graduates are going on to do advanced degrees, and around 30 percent of them end up working for multinationals. Our greatest hope is to see this network sustained into the future.”



AUN/SEED-Net brings together a talented international team to work with Dr. Iman Reksowardojo on biofuels.

The View from Japan

A Border-Hopping Research Experience

Many SEED-Net participants are true globe-trotters, hailing from one Southeast Asian country, doing graduate work in another ASEAN member state, and also attending school in Japan with JICA’s support. In its first decade of activity, JICA funding helped SEED-Net provide 795 scholarships and produce 514 graduates, including 135 PhD earners.

One scholarship recipient now working toward her PhD in Japan is Touch Samphors, a young Cambodian researcher at the Tokyo Institute of Technology (Tokyo Tech), an active SEED-Net participant on the Japan side.

After getting her undergraduate degree in Cambodia, she took advantage of AUN to head to Thailand, where she earned a master’s degree in civil engineering at Chulalongkorn University. There a Japanese professor dispatched as part of SEED-Net helped her to propose a research area and apply for the PhD program in Japan. At Tokyo Tech, she is drawing on the stimulating academic environment to take her work to the next level. “SEED-Net has been very good for me as a way to

meet people from around the world while I gain high-level knowledge and travel widely for my conferences,” she smiles.

JICA funding covers the costs of participation in one regional conference, in addition to expenses in Japan. “There are regional conferences for each different major. For civil engineering, the next one will take place in November in Thailand, and I’ll present my master’s thesis there.” Touch is active in Japan as well, having presented a paper at the Japan Geotechnical Society conference. SEED-Net goes beyond simply bringing people to Japanese laboratories with its strong focus on real-world networking.

JICA is expanding its support for collaborative and post-doctoral research in Phase III of AUN/SEED-Net. Touch hopes to continue being a part of this network once she becomes a lecturer herself—one with valuable connections throughout the region.



Touch works on data analysis with her fellow SEED-Net researchers.