

Chapter 8

Resonance in the Asian Program for Incubation of Environmental Leaders

Neth Baromey, John Stuart Blakeney, Bayarlkhambaa Byambaa, Ki-Ho Kim, Mingguo Ma, Jatuwat Sangsanont, Sour Sethy, Chettiyappan Visvanathan, Xin Li, and Yuan Qi*

Abstract The following accounts are from teaching staff at universities that have collaborated with The University of Tokyo in the APIEL's field exercises, as well as three alumni. The purpose of this chapter is to reflect the mutual influences of resonances

*All the authors contributed equally to the article and are listed alphabetically.

N. Baromey

Faculty of Social Science and Humanities, Royal University of Phnom Penh,
Phnom Penh, Cambodia

J.S. Blakeney

Ernst and Young, Harcourt Centre, Dublin, Ireland

B. Byambaa

Two-Step-Loan Project, Japan International Cooperation Agency, Ulaanbaatar, Mongolia

K-H. Kim

Asian Institute for Energy, Environment and Sustainability,
Seoul National University, Seoul, Republic of Korea

M. Ma • X. Li • Y. Qi

Cold and Arid Regions Environment and Engineering Research Institute,
Chinese Academy of Sciences, Lanzhou, China

J. Sangsanont (✉)

Asian Program for Incubation of Environmental Leaders (APIEL),
Department of Urban Engineering, Graduate School of Engineering,
The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8654, Japan
e-mail: jatuwat@env.t.u-tokyo.ac.jp

S. Sethy

Faculty of Science, Royal University of Phnom Penh, Phnom Penh, Cambodia

C. Visvanathan

School of Environment, Resources and Development, Asian Institute of Technology,
Pathumthani, Thailand

created by Asian Program for Incubation of Environmental Leaders (APIEL) and collaborators across region, stakeholders and disciplines in Asia. The teaching staffs from Asian Institute of Technology, Cold and Arid Regions Environment and Engineering Research Institute, Chinese Academy of Sciences, Royal University of Phnom Penh and Seoul National University have shared their experiences with APIEL to foster future environmental leaders. Three APIEL alumni comments impact of APIEL on academic and professional development, its relevance to subsequent activities, and their own development.

Keywords Alumni • Career • Collaboration • Resonance

8.1 Collaboration with APIEL in Thailand Unit: As We Look Ahead int. the Next Century^{1,2}

Leaders Will Be Those Who Empower Others—Bill Gates

8.1.1 Introduction

As Asia is composed of many highly populated countries at differing stages of development, the key is to build a sustainable society within the inherent constraints of the earth. An interdisciplinary, multifaceted approach is essential to tackle global environmental issues, which are becoming more complex, varied and are deepening. Initiatives confined to regions cannot resolve global-scale environmental problems. At the same time, however, local perspectives are crucial for resolving global issues, and regional idiosyncrasies, social conditions, political systems, and cultural backgrounds must all be taken into account.

The APIEL was designed to build broad and resonant networks among universities, research institutions and program graduates throughout Asia. For the APIEL Thailand Unit, two leading universities in Thailand—the Asian Institute of Technology (AIT) and Kasetsart University (KU)—worked jointly with The University of Tokyo (UT). The unit's objective is to produce individuals who attain knowledge, skills, and competencies and who can play a major role as environmental leaders in various settings, such as educational research institutions in Asia or in other parts of the world and in global organizations and corporations.

¹This sub chapter is written by one of the authors, Chettiyappan Visvanathan, from School of Environment, Resources and Development, Asian Institute of Technology, Thailand.

²Further information about Thailand Unit can be found in Chap. 4.

8.1.2 Partnering Institutions

AIT promotes technological change and sustainable development in the Asian-Pacific region through higher education, research and outreach. AIT was established near Bangkok in 1959, and has become a leading regional postgraduate institution and is actively working with public and private sector partners throughout the region and with some of the top universities in the world. Specifically, Environmental Engineering and Management and Water Engineering and Management partnered in the course with APIEL over 4 years for knowledge and experience sharing from AIT.

KU is a public university where bodies of knowledge and research potential have been continually accumulated for nearly seven decades. Today, it is a national research university endorsed by the Commission on Higher Education of Thailand with the vision to become “the world’s leading research university in agriculture, food, technology and innovation.” The Faculty of Engineering in KU is one of the top ranking institutes of engineering in Thailand. It offers bachelor, master, and doctoral programs in 15 fields including Department of Environmental Engineering. It educates engineers to serve society, develop the country, and pursue excellence in engineering and scientific advancement.

8.1.3 Thailand Unit Conducted Over the Years

UT, AIT and KU have collaborated to tackle Asian environmental problems in a tropical environment. This unit ensures student exchange between the three participating institutes covering an interdisciplinary program with from 10 to 20 students from more than ten countries.

From 2009 to 2012, major sectors of environmental problems have been addressed in the joint program. In 2009, issues on sustainable solid waste management in Asian developing countries were taken up. By 2011, another important issue on sustainable urban water use and management was addressed. Flooding is a natural phenomenon and various human activities as well as climate change have aggravated the problem, causing economic loss. The nationwide flooding in late 2011 resulted in huge losses in Bangkok and other urban areas. Thus in 2012, Thailand Unit focused on the issue of urban waste management with a special focus on flood management in Bangkok.

The series of Thailand Unit demonstrated that students from different nationalities and academic backgrounds could sit together and review these issues from various angles, within the technical, economic and social context. The unit revealed the importance of incubating new environmental leaders with negotiations skills for considering the importance of “economic growth along with environmental protection.” This can be achieved only by providing these leaders with communication and management skills. In this way, complex issues can be expressed in layman’s language to the public, and support can be gained for environmental protection.

This specially designed, short but focused, unit provided the best format for the students to understand the problems by equally mixing classroom lectures, fieldwork and sampling, as well as community consultations. This, nontraditional format educational concept is one of the aspects most highly appreciated by all the students who took part.

8.2 Collaboration with APIEL in Oasis Unit^{3,4}

Cold and Arid Regions Environment and Engineering Research Institute (CAREERI), Chinese Academy of Sciences, is the Chinese collaborative partner in the APIEL for Oasis Unit (see Table 8.1). CAREERI is a large research institute that has seven laboratories and three research centers, highlighting the characteristics of the glacier, desert, and alpine areas of ecological environments and the sustainable development of resources.

The memorandum of understanding on academic cooperation between the Graduate Program in Sustainability Science, UT, and the Laboratory of Remote Sensing and Geospatial Science, CAREERI, was signed on 31 December 2008. The APIEL Oasis Unit was designed and developed at that time. Since then, for 4 consecutive years, joint fieldwork was performed in the Heihe River basin, the second largest inland river basin in China. The river basin is also an important scientific research base for CAREERI and even for the whole country. Forty-one students from 14 countries in total have joined the joint fieldwork during the past 4 years. There are 14 students and 4 professors from CAREERI that have joined the fieldwork (Table 8.1). Students and teachers from CAREERI are familiar with the Heihe River basin; they supported the members from UT by providing relevant data, information, and suggestions.

Another important partner of the joint fieldwork comes from the Zhangye Water Authority. In particular, Director Tuo Xingfu, Vice Director Liu Guoqiang, Luan Limin, Zhang Wenwu, and Liu Xiaojun from the water authority contributed to the fieldwork significantly through their active participation and full support. The local water resource managers have a deep understanding of local environmental problems, and they also have abundant experiences dealing with those problems.

As Chinese-side participants, CAREERI students take the role of collaborators during fieldwork. Because there are some differences between their studying specialties and the investigative contents of the fieldwork, the improvement in specialized knowledge is relatively limited. But our students have benefited a great deal from the following two perspectives:

1. *English conversation and application ability*: This is a distinct opportunity for CAREERI students to use their English in real-world situations. UT students

³This subchapter was written by three authors of Mingguo Ma, Xin Li and Yuan Qi from Cold and Arid Regions Environment and Engineering Research Institute, Chinese Academy of Sciences, China.

⁴Further information about Oasis Unit can be found in Chap. 5.

Table 8.1 Students and professors from CAREERI who have participated in the Oasis Unit

Year	Students	Teachers
2009	Song Yi, Tan Junlei, Wang Haibo, Yu Wenping	Prof. Li Xin, Prof. Ma Mingguo
2010	Song Yi, Tan Junlei, Wang Xufeng, Hu Wenbing, Yu Wenping, Liu Chao, Fang Miao, Zheng Zhong	Prof. Li Xin, Prof. Ma Mingguo, Assoc. Prof. Qi Yuan, Assoc. Prof. Ge Yingchun
2011	Wang Xufeng, Wang Haibo, Xu Fengying, Xie Yanmei	Prof. Li Xin, Prof. Ma Mingguo
2012	Wang Xufeng, Jia Shuzheng, Xiao Lin, Wang Hongshu	Prof. Li Xin, Prof. Ma Mingguo

come from all corners of the world and English is the common language for communication. There are few opportunities for the Chinese students to use English so often and intensively.

2. *Exchange of learning styles*: The learning style of APIEL is itself distinctive and worth learning. For example, the professors give the fullest play to students' initiatives. Discussion is one of most important learning tools in the fieldwork. The Chinese students can use these learning and communication skills developed during fieldwork in their future study and work. The effect is especially clear when our students join the fieldwork and training classes with UT students.

From my point of view, the Oasis Unit has the following three features. They are valuable experience and lessons. They are important for us to develop a new cooperation plan.

1. *Before hand preparation and field survey*: It is better to see once than to hear a hundred times. Even though the students obtained information about the research area by reading papers and presentations before they visit the Heihe River basin, this information is still abstract. It is very difficult for UT students to prepare research topic and survey plan reflecting real-world situation. In the first 2 days of the fieldwork, students are guided to visit some places along the Heihe River, as well as the local water authority and the irrigation channel system. In this way, they can gain more information about this region, such as government policy, local customs, and potential difficulties with their upcoming work. After the 2-day visit, students usually find some problems with their original plan, and groups are divided according to their interests. Professors give their advice when students make their plans.
2. *Data collection through experiments and interview survey*: Usually, students have 4 days to collect data and information to support their research. In this process, they need to communicate with local people, such as farmers, government officials, scientists, and so on. Students from CAREERI play an important role in this process because of language limitations.
3. *Getting to a conclusion and giving suggestions to the local water authority*: Based on the collected data and information, students are asked to arrive at a

conclusion and give suggestions to the local water authority about how to solve the environment problem that they find. The local water authority also gives feedback and comments to the students. Although field experiments make a limited contribution to solving local environmental problems, the students' ability to find and solve problems has improved.

The fieldwork is in the process of improving. The fieldwork had been performed during the summer from 2009 to 2012 in the Heihe River basin. There are some big differences between these four fieldwork exercises. Knowing these differences is important for us to develop a new cooperation plan. On one hand, beforehand preparation is very important for a successful fieldwork. Especially, it is important to find concrete research topics, which can save time and greatly improve working efficiency during field survey. The students who joined fieldwork in 2009 were better prepared than the students of other years. On the other hand, the active participation of CAREERI students is important for a successful fieldwork. The Chinese students just acted as guides in 2009. However, they participated in the fieldwork fully in 2010–2012. They discussed and worked together with UT students during the whole process from preparation, survey, until final report writing.

Based on the comparisons on these four times of field exercise units, the following suggestions can be made to improve collaboration with UT.

1. The preparation of the field exercise unit can be improved by making a feasible proposal that can be applied on site by both UT and CAREERI students. The proposal needs to include the background, purpose, research content, experimental design, and anticipated results. Both UT and CAREERI students need to spend enough time to prepare this proposal during the preparation phase.
2. There were three different research topics in each year and two study areas in 2010. One common research topic is enough for each fieldwork although the investigation or measurement can be divided into two or three parts. However, different parts should be around the same topic. The students should try to obtain more samples of the questionnaire survey and the measurements, which can improve the persuasiveness of conclusive results and suggestions to the local water authority.
3. A Chinese student from UT side is necessary for each student group. A Chinese student can offer a lot of help to the other students during the whole process of the fieldwork program. For example, background information can be obtained more easily because of the limitations caused by language barrier.
4. Comparisons of the methodologies and results can be carried out among the different fieldwork areas.
5. If the survey contents are close to the specialties of the Chinese students, our students can be more involved in the preparation work. If possible, these students could participate in making the fieldwork plans in Japan during the preparation stage.

8.3 Collaboration with APIEL in Cambodia Unit^{5,6}

8.3.1 Introduction

The Royal University of Phnom Penh (RUPP) is the oldest and the largest public university in Cambodia. RUPP first opened its doors as the Royal Khmer University on 13 January 1960, with the National Institute of Judicial and Economic Studies, the Royal School of Medicine, a National School of Commerce, the National Pedagogical Institute, the Faculty of Letters and Human Sciences, and the Faculty of Science and Technology.⁷ The language of instruction during this period was French.

However, today it is unique in Cambodia for offering specialist degrees not only in fields including the sciences, humanities and social sciences, but professional degrees as well in fields such as information technology, electronics, psychology, social work, tourism, and the environment. It also provides Cambodia's foremost degree-level language programs through the Institute of Foreign Languages. RUPP has many achievements, and it now has full membership in the ASEAN University Network. The APIEL Cambodia Unit was initially set up in 2011.

8.3.2 Institutional Involvement in the Cambodia Unit

The Cambodia Unit is organized by three universities: UT, Seoul National University (SNU) and RUPP. It has organized two field trips/lecture programs that were held in September 2011 and in August 2012. The unit was designed based on experienced, professional skill development, and lessons that the universities use to effectively and efficiently instruct the students. Various activities including lectures from experienced resource persons, fieldwork, group work and group presentation are used.

8.3.3 Achievements of the Cambodia Unit

The program was designed to follow a participatory, problem-solving approach. There is a combination of activities such as lecturing and fieldwork. Through the

⁵This subchapter is written by two authors, Sour Sethy from Faculty of Science and Neth Baromey from Faculty of Social Science and Humanities, Royal University of Phnom Penh, Cambodia.

⁶Further information about Cambodia Unit can be found in Chap. 7.

⁷Further information about RUPP is found in their website (http://www.rupp.edu.kh/content.php?page=about_rupp).

involvement of the various activities and evaluations by Cambodian students, this program brought significant benefit to participants, especially those from RUPP.

8.3.3.1 Development of the Training Program

The training program was developed by UT in discussion with SNU and RUPP, and through a series of discussions and meetings it was decided to base it on a participatory approach with professional (leadership) training. Therefore, the program has been implemented effectively and successfully. Participants in the Cambodia Unit were able to learn many things, not only from a technical perspective, but also about the social and multicultural components. This design provided us with ideas on how to successfully coordinate with stakeholders from different nationalities. It was also found that the participants, particularly the Cambodian students, absorbed good lessons, learning how to manage their time, and improve their learning style, research skills and English language ability.

8.3.3.2 Fieldwork

From the hands-on practices, RUPP students gained deeper knowledge on sustainable development in Cambodia. They basically preferred to have practical training and visits to project sites. They also said that the practice at the sites was complementary to the theories and that the concepts were easy to understand, thus they were interested and they found the program enjoyable. They were able to get more understanding of the real situation and lifestyles in local communities. Furthermore, the program provided a valuable opportunity for Cambodian students, who usually have limited chances for practical training. The students enjoyed this approach and were willing to become involved in the fieldwork. They wished that the unit could be available to other students, as well.

8.3.3.3 Cooperation in the Future

The Cambodia Unit has been active only 10 days per program including the lectures and fieldwork, but the students have felt that there were positive results. The Cambodia Unit has also contributed to a positive outcome for our society, as well as sustainable development, through the problem-solving approach, especially on the environment, society, and the economy. Importantly, the Cambodia Unit will be an initial point and have continuing good opportunities for further cooperation of the relevant stakeholders in the future.

RUPP wishes the unit will continue its mission for the sake of sustainability and for producing more young environmental leaders for this region as well as for the world. RUPP is ready to continue to cooperate with the unit as well as with UT and SNU. The perspective of RUPP is that the Cambodia Unit should continue and should engage

more stakeholders from different countries. In this way, the unit's vision will be widely shared and make both a global and region contribution. Additionally cooperation in the future should be not focused only on a short training program, but should also consider long-term joint research and capacity building for continuing education.

8.3.4 Conclusion

The unit was based on a problem-solving approach, which was popular with the students and the course designers, thus the students found it more attractive to be involved. Based on this approach, the students learned many things, such as the technical, social, and cultural aspects. The key achievements of the unit included:

1. The students who participated absorbed various information, particularly concept of sustainability related to social, environmental and economic factors. These give them ideas on how to help their countries develop sustainably.
2. Networking for the future was started with the unit. RUPP's APIEL alumni association was also established by the students themselves. Additionally, the initiatives of the Cambodia Unit will be a starting point for networking and cooperation in the future.

8.4 Two Years Collaboration With APIEL⁸

8.4.1 Introduction

For the past 2 years, the Asian Institute for Energy, Environment and Sustainability (AIEES) at SNU has been given a great opportunity to participate in APIEL and send students as well as professors to lead the students during the field trips for APIEL. One of the reasons why we have participated in this program is that AIEES is also planning to build an Asian green leadership center at AIEES in the years to come. In this regard, since UT started APIEL earlier, by participating together, we wanted to learn how UT is operating their international education program.

Two years ago, SNU hosted the Asian University Conference for Green Leadership. For this conference, we invited Professor Hanaki, where he introduced the APIEL to us. And we have been participating ever since. Professor Hanaki also took part in a seminar prior to the establishment of AIEES back in 2008. Therefore, AIEES has had a deep connection with him, and based on this relationship of trust, we have collaborated with APIEL.

⁸This subchapter is written by one of the authors, Ki-Ho Kim, from Asian Institute for Energy, Environment and Sustainability, Seoul National University, Republic of Korea.

8.4.2 *Current Situation*

AIEES at SNU has participated in APIEL three times, starting from the Cambodia Unit in August 2011. In the Cambodia Unit, the local partner universities were RUPP, and in the Greater Pearl River Delta (GPRD) Unit, Hong Kong University of Science and Technology and Sun Yat-sen University. Each of these universities has provided graduate students and lecturers.

From SNU, 20 students have taken part so far. Students with diverse majors, such as international studies, environmental studies, natural science, engineering, law, and agricultural science, have participated in the field program for cultivating leadership concerning the environment and returned good feedback.

8.4.3 *Major Elements of Education*

In the Cambodia Unit, the program mainly covers topics, from infrastructure to environmental management issues—waste disposal, recycling, and water quality protection—and SNU has focused on rural development and capacity building as well as contributing to physical and social capacity development for sustainable development.

The GPRD Unit provided an opportunity to study several components and techniques for a more sustainable urban plan and urban design. In particular, the students' practical exercises on mapping and gaining techniques for handling vast amounts of information related to cities greatly helped them come to arrive at the future direction of sustainable urban development.

In each unit, site visits to understand the local culture and history, as well as interviews with local residents, have provided a good opportunity for the students to draw a profound understanding of other cultures. The cooperation that the students from each university showed helped promote the understanding and capacity to produce definite outcomes on site. It is also significant that opportunities to directly experience the possible direction of sustainable development, rather than in theory, were provided to graduate students from each university through this program.

Each unit covered fields related to sustainable development, such as waste, sewage disposal, air quality management, urban planning, eco-tourism, and official development assistance from the Korean International Cooperation Agency and the Japan International Cooperation Agency. Through lectures from experts and field-work, each program was able to cover general plans and implementation measures for sustainable development in developing countries.

Furthermore, in each group, made up of graduate students from each university, exchanges were held for carrying out the research project: establishing strategies for sustainable development. These exchanges in combination with in-depth research under the instruction of the resource person for each group progressed to outcomes in forms of presentations and recommendations.

8.4.4 *Thoughts on the APIEL*

8.4.4.1 Strengths

“Concerning the management of APIEL, what has impressed me the most is that you have a full-time professor and administrator for this program. I think they are professionally and academically excellent. Whatever we are doing at universities, the most important thing seems to be the people who are operating the program. In the case of APIEL, the leader is Professor Keisuke Hanaki, who has a global perspective and great vision for the program. Also, the performance of supporting staff including faculty members and administrators has been excellent. If this program did not have those people, I think it would not have been managed in such a thorough professional manner.”

“For the content, as a participating professor who looked at and examined the participating students in the Cambodia and GPRD Unit, APIEL provided the students with good opportunities to promote ‘hands-on knowledge’ related to sustainability issues through the experience of participating in the unit. Through the experiences, they are expected to grow into more mature leaders.”

“In particular, the students worked in groups, enhanced communication, and engaged in vigorous discussion until late in the night with other students from different backgrounds and cultures to produce definite outcomes. This allowed the students to understand others who have different opinions and learn the attitude required of a leader to produce an outcome. Thus, the Cambodia Unit offered a very good platform for students to foster leadership. Another strength is that the unit was a melting pot for students of diverse nationalities, majors, and races, not only from SNU but also UT and RUPP.”

“It is doubtful whether it is possible to find facts and suggest solutions in a period of only 2 weeks or how much meaning there could be in such a solution. However, this program is very significant in that it allows the students to genuinely ponder the problems and become equipped with the technical capacity and passion to solve them.”

8.4.4.2 Weaknesses

“Regarding the education program provided, there was a lack of information concerning the site and there was realistically not enough time and process to sufficiently understand what was available. As a result, we had insufficient responsiveness to the field activities. Moreover, although the scope of the program for such a comprehensive subject as sustainable development seemed to be adequate on the surface, it turned out that there was limited time to engage in in-depth discussions.”

“Also, there was a disharmony between the lecture provided and the resolution of problems in the subject. The fieldwork had limitations, and lectures are composed and arranged according to the major subjects of the participating professors rather than the actual subjects.”

“Regarding the development of leadership, although SNU students might have a high level of academic understanding, there were times when I was skeptical about whether they had the capability for leadership in this era of climate change and sustainability.”

8.4.4.3 Suggestions

“At SNU, there is a similar program called the Green Leadership Program (GLP) at the undergraduate level to increase the students’ environmental awareness and leadership skills. GLP is provided for 5,000 undergraduate students at the university, regardless of their major. Sixteen new courses have been created for the program. At the end of 4 years, when a student takes 15 credits, or five courses, which corresponds to about one-tenth of the total 140 credits required for graduation, the student will receive a green leadership certificate along with a bachelor’s degree. After graduation, we expect the student can be not only a philosopher, economist, sociologist, and architect, etc., but also a green leader. It has been 3 years now since we began this program. By the end of the 2012 academic year, it is expected that we will begin to produce the first students to receive the green leadership certificate.”

“Although of a different character, I believe GLP at SNU and APIEL at UT can learn from each other. Of relatively recent birth, I think GLP can learn a lot from the maturity of APIEL. On the other hand, though a great program already, APIEL may want to seek to improve the present program towards a greater diversity in terms of the students and subjects the students are taking. Although the two programs may seem to be different, I think they provide possible future directions on how each program could evolve into. Therefore, the character of each program could be complementary, and as a result, I think the two can learn from each other.”

8.5 Comments from Alumni

8.5.1 *Impact of APIEL on Academic and Professional Development*⁹

Nothing else but an apple grows on an apple tree. Likewise, everything in this world is inter-related and one becomes a root cause of another.

Metaphorically, the author considers APIEL as an “apple tree” of her current progress, as it has grown an “apple seed” inside her. This is because the author has

⁹This subchapter was written by one of authors, Bayarlkhamb Byambaa, graduated from Graduate Program in Sustainability Science, Graduate School of Frontier Sciences, The University of Tokyo in Year 2011.

had a number of opportunities to join and become a member an APIEL unit, which has provided her with valuable experiences and practical knowledge.

First, the author had a chance to join the Oasis Unit 2010, which was held in the middle and lower reaches of the Heihe River basin in China. The field trip was fruitful, as the author learned many things and practiced leadership skills throughout the whole unit. The field exercise was very challenging and stimulating in the sense that it gave her a unique chance to carry out and pursue her own interests with real practice. It has changed and strengthened her views and knowledge towards the environment and human relationships, and has motivated her a great deal to contribute to environmental conservation. The lessons and skills the author has acquired are very much essential to her current work as an environmental specialist and as an activist in her home country, where there are many similar stories to the story of watershed management in the Heihe River basin.

The experiences the author has gained through fieldwork has broadened her understanding and knowledge of water environments and made her confident to apply the same approach and methodologies to her own research. A specific example of a knowledge application from the Oasis Unit was a water quality measurement analysis and assessment for her master's thesis field research. Before joining the unit, the author worried about her weak knowledge and understanding of water environments as the author is from a social sciences background. However, the author was always interested in becoming familiar with water quality issues and the author was longing to conduct research using an interdisciplinary methodology, especially for water quality sampling in the field. Luckily, with the support and valuable guidance of the professors and experts in the field throughout the unit, the author overcame her concerns not only through the fieldwork, but also it made it possible for her to realize interests in practice later on by applying water quality measurement analysis into her own field research in the Zaamar goldfield in Mongolia.

Most importantly, environmental leadership education exercises have motivated her to contribute to finding solutions for environmental problems by taking the initiative and doing her best in her future career. Experience from the Oasis Unit has directly influenced her thoughts and actions in helping to preserve the water environment in her home country. After returning to Mongolia, the author has reorganized and activated NGO activities and has launched a small project for creating a drinking water quality database at the provincial level in the South Gobi Province. From the project, environmental officers at 15 *soums* (districts) in South Gobi were provided with simple water quality testers and some knowledge and training for drinking water quality testing. Local people are now able to conduct monthly measurements at major sources of drinking water and submit their results to the monitoring database at the provincial center. The project is a pilot program; it has being implemented in only one province, however, it is a pioneer in the country where there was no permanent and long-term database for drinking water quality.

Second, as an APIEL alumna, the author was fortunate to join the Coca-Cola Young Environmental Leaders Summit in Hokkaido on March 2012. The lessons learned and skills acquired from the week-long intense workshop on corporate social responsibility and the practicum on the project design matrix are very much essential to her current work in Mongolia for the Japan International Cooperation

Agency's Two-Step Loan Project for Small and Medium-Scaled Enterprises (SMEs) Development and Environmental Protection. The author mostly works with SMEs to promote long-term business loans and to help them develop and design good and bankable projects. As well, the author assesses the environmental impact and socio-economic benefits of the projects.

Another valuable opportunity provided to her because of her APIEL experience was an internship at the Asian Development Bank Institute (ADBI) in Tokyo. During the 2-month internship at the ADBI, she joined the Climate Change and Green Asia Flagship project team and has completed a country report on climate change mitigation for Mongolia. Thanks to this internship and helpful guidance from her supervisor, the author was able to learn about climate change issues in Mongolia, a topic that she was not so familiar with. Through reviewing and analyzing official documents and literature on climate change mitigation in Mongolia, as well as the development trajectory and emissions, the author has assessed the correlation between CO₂ emissions and economic growth by analyzing the factors shaping the current emission scenario profiles, projected emissions, and economic growth in 2020. The author has developed recommendations for further policy action. Overall, her experience has deepened her understanding of climate change issues with a special focus on climate change mitigation in Mongolia.

A recent opportunity because of her APIEL experience, which was grown from the internship opportunity at ADBI, was participation in one of the ADBI jointly organized events, a sub-regional workshop on Millennium Development Goals and Post-2015 Development Agenda in the Central and East Asian countries in Almaty, Kazakhstan, in September 2012. The author had a chance to join the discussion on regional socio-economic and environmental development issues.

APIEL has given her a lot of opportunity, and it still does in fact. After such beneficial experience and all the lessons the author has received through APIEL programs, it became obvious that her future work and career would be related to environmental leadership. The author feels that she owes a lot to APIEL for contributing to the sustainable development of Mongolia and the region. All in all, APIEL has helped to form her ambition and vision to work in the environmental sustainability field, while keeping a good balance between academic and practical views. As time goes by, "apples" will be growing even tastier.

8.5.2 *APIEL Experience and Its Relevance to One Student's Subsequent Activities*¹⁰

In this account, an alumnus discusses how his experiences in APIEL fed into his current career and future career plans. The author is currently training as an

¹⁰This subchapter was written by one of authors, John Stuart Blakeney, graduated from Department of Urban Engineering, Graduate School of Engineering, The University of Tokyo in Year 2011.

accountant with a large professional services firm and volunteering with the Irish National Trust. The APIEL includes students from diverse backgrounds with the author's undergraduate degree being in geography, a subject that explores the tension between human activities and development, and the natural environment, and thus led naturally to an interest in APIEL.

8.5.2.1 The APIEL Experience

“There was a core taught element to the APIEL which familiarized students with some of the main environmental issues which are being grappled with (particularly in Asia) and provided analytical frameworks with which such issues can be studied. Whilst it was important to have an understanding of the science behind the issues, with the main focus on environmental leadership, a key learning objective was to understand how stakeholders could be mobilized and managed to achieve particular objectives.

“However, it was the fieldwork element of APIEL that had the greatest impact on the students' development. The author took part in one overseas fieldtrip in the Pearl River Delta in China where students from a great diversity of backgrounds had the opportunity to network. The theme of the fieldwork was trans-boundary pollution. Given the current standoff on environmental issues between the developed and developing worlds, it was particularly fascinating to get first-hand insights into how political issues are dealt with in the Chinese context. This included privileged access to sites of pollution, and policymakers and business leaders who provided details of their own agenda and their vision for how environmental issues will be dealt with in the coming years and decades.

“Other students took place in field units in other parts of Asia, such as Thailand, Vietnam and Northern China. The following year participants from each of these field units were brought together at the Young Environmental Leaders Summit held in Hokkaido. This workshop focused on corporate social responsibility (CSR) and particularly on how, in recent times, companies have sought to integrate CSR into their core business strategies, rather than using it in a responsive way to manipulate public opinion.

“The Green Energy Workshop included the opportunity to examine the energy challenge faced by Japan. As part of this trip students visited a nuclear power plant and a nearby pump-storage plant and learned how the two are used in tandem so that the excess power generated at night by the nuclear plant can be used to provide for generation at peak daytime hours. Debates held during this unit provided students with a unique perspective on the controversy surrounding the future of the nuclear industry given the context of the Fukushima nuclear disaster, which shortly followed the field unit.

“By examining such tough issues in multidisciplinary groups, those from non-engineering backgrounds were forced to accept that ideology is constrained by what technology will allow. At the same time, those from purely technical backgrounds gained an understanding of externalities and the conflict that can exist between

achieving efficiency and economies of scale in production processes, whilst maintaining democratic accountability and broad access to the benefits of technology.”

8.5.2.2 APIEL and Future Career Opportunities

“Although the program has been running for just a few years, the APIEL boasts alumni in a wide range of fledgling careers. The author is determined to remain engaged with environmental issues and particularly with developments in how we power our society. Having had the opportunity to interact with businesspeople and politicians through APIEL, the weight of money and economics in the discussion of all the issues with which students were faced was apparent. As such, in order to have a real impact, the author felt it was vital to be able to understand the imperatives of the business community and this has led him to take a position as a trainee accountant. This is something he hopes to leverage in the future in either a leading business or regulatory role in the energy sector.

“Roles in business are available to those from non-business academic backgrounds provided they demonstrate the necessary qualities. Given the economic climate, the job market in Ireland is extremely competitive but recruiters have proven highly receptive to international experience and particularly to that gained during on APIEL. Working on projects in interdisciplinary, multicultural teams is a great challenge, and this is something that is acknowledged by businesses. Furthermore, by equipping young people with such skills and sending them to the global workforce, the program can have strong hopes for an extremely powerful alumni network which will reinforce its importance.

“Active engagement in civil society is something that should be strongly encouraged through APIEL. The author has joined the Irish National Trust which he hopes will allow him to stay in touch with and influence environmental policy even in the immediate future. Again having alumni involved in NGOs and charity organizations will provide APIEL with a great pool of experience to draw on.”

8.5.2.3 Recommendation

“There is perhaps one central facet in which the program might be further improved. Encouragement, facilitation and perhaps compulsion of students to take on internships and work placements would be invaluable in allowing them to link into the workforce and community on completion of their studies. Organizers should endeavor to develop strong relationships with a diverse range of institutions who could accept students to such positions. Such placements would also amplify the benefits of the Young Environmental Leaders Summit as students would be capable of bringing still more to their project groups.

“It is a credit to the largely young group of academics who have powered APIEL behind the scenes that it has come so far in such a short space of time. Their enthusiasm and effort has meant that the foresight of the Japanese Government in

investing in such a program has already paid rich dividends. Provided the same energy is dedicated to incremental improvement of the content and maintenance of funding for APIEL, it promises to be a forum that mediates and shapes opinion on environmental issues in Asia and further afield.”

8.5.3 The Experience of APIEL and its Impact on His Development¹¹

The APIEL was first organized when the author was studying at the Department of Urban Engineering, UT. At that time, knowledge limited to one specific academic environmental field was not enough; broad global environmental issues are becoming more and more important. APIEL could not be a more suitable and beneficial program for students in the environmental field. The APIEL curriculum not only consists of compulsory courses, which lets the students have a better understanding and analysis of environment-related problems in Asia but also consists of hands-on experience to propose environmental solutions in the region where actual environmental problems are occurring. Furthermore, the APIEL focuses on establishing, through collaborative projects, a network of people in environmental fields. This is one of the keys to success in resolving global environmental issues. The APIEL curriculum, which aims to incubate students to have the skills to solve environmental problems based on an interdisciplinary approach and specialized skills, really fascinated the author, making him decide to apply. At the end of the program, his decision could not have been more right as he has learned, accomplished, and gained a great deal.

The compulsory course for APIEL was especially meaningful. Students learned about the global aspects of environmental issues, focusing on Asian countries such as Japan, China, Korea and Hong Kong. The content was not limited to one aspect but came from various aspects. It helped them create a structured methodology for problem solving based on interdisciplinary knowledge gained from the APIEL curriculum and their own specialized skills from their academic fields. The integral knowledge was crucial for analyzing and solving global environmental issues and the course equipped them with it.

APIEL also provides students with a good experience in fieldwork, such as the Oasis Unit in 2009, which offered participants a chance to develop environmental leadership skills through education and from different disciplines. In the fieldwork for the Oasis Unit in Lanzhou Province in China, the focus was on sustainable watershed management in arid regions. During the program, the attendees developed their environmental leadership skills through three main parts: lectures, group work, and fieldwork.

Before the fieldwork, a lecture was delivered by a professor from CAREERI. The professor was highly knowledgeable about the environmental problems in the

¹¹This subchapter was written by one of authors, Jatuwat Sangsanont, graduated from Department of Urban Engineering, Graduate School of Engineering, The University of Tokyo in Year 2011.

study area. Students gained an understanding and much insight into the environmental issues, and were then capable of constructing their own strategy to identify and solve problems. The group work was done before and during the fieldwork in China. They had a chance to work with a diverse range of students from different backgrounds and countries. They also learned how to exchange their knowledge and ideas with other people from different academic backgrounds. They broadened their perspectives through discussion. During the fieldwork, they had a field survey, visited with the government officers, and talked with local stakeholders. This was a valuable opportunity to get hands-on experience dealing with environmental problems. After the fieldwork, APIEL provided a platform for the students to present their proposals to the government officers, who have the authority to make policy changes, and to get comments from them. From these comments, the students could better understand the weak points or impractical parts of their proposal. This was really interesting and challenging for them as students. This experience helped them develop as environmentalists for the future.

Moreover, the students had a chance to participate in another unit: the Coca-Cola Young Environmental Leaders Summit. This unit was held for current participants and alumni. Participants from more than ten countries with different educational backgrounds came together to discuss the creative corporate social responsibility approaches. The Coca-Cola Unit challenged students to develop innovative solutions for a topic that they were not familiar with. This summit was especially beneficial for them to develop communication and negotiation skills. In addition, they were able to build up their own worldwide network with young environmentalists from different countries. This network will be valuable and beneficial for students in the future.

The experience from APIEL had a great influence on students attending the program, including the author for his career. He would like to be involved with environmental issues in Asia, especially in the Southeast Asia region, where his home country is located. After he got his doctoral degree in 2011, he started working as a project researcher under the APIEL in the university. His work is concerned with facilitating environmental educational programs. He needed to construct programs in Asian countries with professors to help educate and incubate students to become environmental leaders. His work focuses on such programs as sustainable water management in Thailand and sustainable development in Cambodia. The fruitful experiences from participating in APIEL really helped him to achieve in his job as a facilitator. For instance, having a wide environmental perspective and understanding the students' points of view, as well as communicating and negotiating were all essential for him to fulfill his task as an environmental facilitator and educator. In his career, he hopes to contribute to work on a global scale in the sectors of renewable energy, environmental health, and water pollution, etc.

In conclusion, the APIEL provides the participating students with a valuable multidisciplinary curriculum, practical experience, and a broad network related to environmental issues. Through the program, they are challenged to develop integrated solutions to environmental problems. It helps reveal their weak points, such as the knowledge and communication skills required for discussions and negotiations with

people from different academic backgrounds. They are also motivated to promote sustainability of the environment and of society. Similar to other students, the author really enjoyed and appreciated the program. He felt thankful to have an opportunity to participate in this program and he hopes to work toward a sustainable future.

Open Access This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.