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4. International Activities

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This GCOE program has promoted the establishment and development of the new academic field of "Human Security Engineering" by aiding the overseas dispatch of associated faculty members, and contributed to the proliferation of this program as a global hub for research and educational activities. It has also contributed to the promotion of Human Security Engineering as a global base for worldwide interdisciplinary research and educational activities.

The number of faculty members' visits to foreign countries (Except assistant professors)

* The count number of 2012 is summed up from April to December. (2012年度は4月〜12月までの合計です。)
4-2 Education and Research Activities at Overseas Bases

2009

Report on the GCOE Intensive Course, "Geotechnical Infrastructure Asset Management" 1

GCOE 集中講義開催報告 -Geotechnical Infrastructure Asset Management-

Date: March 16 - 20, 2009
Venue: Asian Institute of Technology, Bangkok, Thailand

As a joint initiative of the Global COE (GCOE), a five-day intensive course was held from March 16 to 20, 2009 at the Asian Institute of Technology, an overseas partner base of the GCOE. The focus of the course was "Geotechnical Infrastructure Asset Management," which is a part of the area of "Infrastructure Asset Management," a key discipline in the research field of Urban Infrastructure Management. The course program is described in Table 1. In addition to masters and doctoral program students from AIT's School of Engineering and Technology (SET), the course participants included visiting academics from India, as well as doctoral students and researchers from other Thai universities. In total, 43 people participated, and 37 of them, whose attendance was over 80 percent, were awarded a certificate to verify their satisfactory completion of the course.

A group photo of all the participants taken at the end of the course clearly shows the remarkable diversity of student nationalities, and highlights AIT's international character. This course was the first initiative of the Global COE affiliated with AIT, one of our overseas partner bases. We expect to repeat the course with AIT next year, and are currently planning a similar intensive course for late September 2009 at AIT's Vietnam branch (Asia Institute of Technology Center in Vietnam, AITCV).

Through intensive courses like these, we are gathering the information required to formulate scientific principles for "Human Security Engineering in Asian megacities." At the same time, we are striving to train skilled, local professionals who will then be able to apply these principles for the benefit of their local communities.

- Hiroyasu Ohtsu, Professor (Overseas base leader, Bangkok)

<table>
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<td>- Basic Concept of Road Infrastructure Asset Management</td>
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<td>- Classification of viewpoints of management</td>
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<td>March 16</td>
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<td>- Management from Microscopic Viewpoint - Ground anchor maintenance strategy -</td>
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<td>- 1. Basic concept of ground anchor maintenance strategy</td>
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<td>- 2. The simulation of deterioration process on ground anchor</td>
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<td>- 4. Numerical example</td>
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<td>March 17</td>
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<td>- 1. Definition of Risk</td>
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<td>- 1) Basic Stochastic and Statistical Knowledge</td>
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<td>March 17</td>
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<td>- Introduction of Risk Analysis</td>
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<td>- Introduction of Risk Analysis</td>
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<td>- 3. Method of Calculating Occurrence Probability</td>
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<td>- 4) Calculation of function including random variable</td>
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<td>March 20</td>
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<td>- Management from Microscopic Viewpoint (1) - LCC Evaluation Models Considering Performance Determination of Ground Anchor System</td>
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3月16日（月）から20日（金）の5日間、グローバルCOEの関連事業として、海外連携拠点であるアジア工科大AIT（Asian Institute of Technology、タイ）において集中講義を開催しました。今回の講義内容は、研究領域「都市基盤マネジメント（Urban Infrastructure Management）」の主要分野であるインフラストラクチャー・アセットマネジメント（Infrastructure Asset Management）の内、地盤構造物を対象とした「地盤構造物アセットマネジメント（Geotechnical Infrastructure Asset Management」です。その講義プログラムは、Tabel 1に示す内容です。

今回の受講者は、アジア工科大AITのSET（School of Engineering and Technology）の修士課程学生・博士課程学生に加えて、インドからのアジア工科大AITへの派遣教員、およびタイの他大学の博士課程学生および研究スタッフで、総受講者数は43名でした。この内、出席率が80%を越える受講者のうち37名に、本講義の受講を証明する証明書（Certificate）を授与しました。

最後に、受講者との集合写真を撮りましたが、その写真から国際機関であるアジア工科大AITが、多国籍の学生によって構成されていることがお分かり頂けると思います。

今回は、海外連携拠点であるアジア工科大AITとの始めてのグローバルCOEの関連事業としての集中講義でした。本講義は、来年度も継続する予定ですが、その前に本年9月下旬に、アジア工科大AITのベトナム分校（AITCV）においても、同様の集中講義を実施する予定です。

このような集中講義を通じて、アジアアメニティーでの人間安全保障工学という学理を構築するための情報を集約すると共に、その学理を実践する現地の人材育成に努めていきたいと考えています。

- 大津広康教授（バンコク海外拠点リーダー）
Intensive lectures related to the Global COE program were held over six days between September 21 and 26, 2009 at the Asian Institute of Technology Center in Vietnam, Ho Chi Minh City, in March 2009 as part of the Global COE program at AIT. Since the following programs are related to the COE project, I have taken part in the above programs, including the GEM program that I took part in.

The lectures were held as a course of the Professional Master Program in Geotechnical Engineering and Management (GEM), a program within the Professional Master of Engineering (PME) program that AIT offers to practitioners in Vietnam with at least two years of professional experience after graduating university. The PME master's program currently comprises the eight programs below, including the GEM program that I took part in.

As indicated by this list of the programs, it is clear that the need for recurrent education for practitioners in Vietnam cover a wide range of fields at present, from those related to IT, environmental management, and business administration in addition to fields related to social infrastructures.

The content of the lectures held this time consisted of commentaries on Geotechnical Infrastructure Asset Management, a topic that covers geotechnical infrastructures, which is a main field of Infrastructure Management within the subject Urban Infrastructure Management in which I serve as field leader, under the subject called Risk Management for Infrastructure Development and Planning, a program offered by the GEM program. The lecture agenda is given in Table 1.

In the previous report, I introduced the intensive lectures held in March 2009 as part of the Global COE program at AIT. Since the participants of those lectures were mainly masters and

### Table 1: Lecture Agenda 講義プログラム

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<td>Introduction</td>
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<td>10:00-11:30</td>
<td>Fundamental Knowledge of “Project Risk Management” (1)</td>
</tr>
<tr>
<td>13:00-14:30</td>
<td>Example of Project Risk Assessment (1) Bangkok Subway Construction Project</td>
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<tr>
<td>14:30-16:00</td>
<td>Example of Project Risk Assessment (2)</td>
</tr>
<tr>
<td>Sep. 22</td>
<td>Risk Cost Evaluation Focusing on Underground Construction Projects</td>
</tr>
<tr>
<td>10:00-11:30</td>
<td>Basic Concept of Road Infrastructure Asset Management from Macroscopic Viewpoint</td>
</tr>
<tr>
<td>13:00-14:30</td>
<td>Management from Microscopic Viewpoint (1) Mathematical Background of Geo-Risk Evaluation</td>
</tr>
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<td>14:30-16:00</td>
<td>Management from Microscopic Viewpoint (2) Mathematical Background of Geo-Risk Evaluation</td>
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<td>Sep. 23</td>
<td>Example of Project Risk Assessment (3)</td>
</tr>
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<td>18:00-21:00</td>
<td>Bangkok Subway Construction Project</td>
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<td>Sep. 24</td>
<td>Risk Cost Evaluation for Recurrent Education Programs Geotechnical Infrastructure Asset Management Management from Macroscopic Viewpoint</td>
</tr>
<tr>
<td>18:00-21:00</td>
<td>Management from Microscopic Viewpoint (3) LCC Evaluation Models Considering Performance Deterioration Final Examination</td>
</tr>
</tbody>
</table>

As mentioned above, the program of the Global COE project is related to the field of ‘risk management’ as well as the field of IT, environmental management, and business administration. In addition, the program also covers fields related to social infrastructures. The content of the lectures held this time consisted of commentaries on Geotechnical Infrastructure Asset Management, a topic that covers geotechnical infrastructures, which is a main field of Infrastructure Management within the subject Urban Infrastructure Management in which I serve as field leader, under the subject called Risk Management for Infrastructure Development and Planning, a program offered by the GEM program. The lecture agenda is given in Table 1.

In the previous report, I introduced the intensive lectures held in March 2009 as part of the Global COE program at AIT. Since the participants of those lectures were mainly masters and
doctrinal program students of AIT and peripheral universities, and the purpose of the lectures was to comment on theories, the session spanned a total of 15 hours. In contrast to that session, all nine participants of the lectures this time were engineers already working as consultants at architectural firms, and since the purpose of the lectures was to expand the time dedicated to practical discussions and exercises, the session was accordingly stretched to a total of 21 hours. Also, as indicated in Table 1, the time of the lectures was fixed between 18:00 and 21:00 except on the last day, Saturday, so that the participants could attend after working hours.

My impression of the actual lectures was that the participants’ response to my initial explanation centering on theories was not at all as enthusiastic as that of the students the last time. To accommodate this, I switched to more practical exercises using Excel software on my computer halfway into one lecture, and the participants’ response changed completely—it set in motion an active question and answer discussion. Although this episode may be unrelated to the quality of the lectures, it had its effect in allowing me to grasp the needs of engineers in Vietnam regarding related fields.

My experiences of the intensive lectures at the AIT last time and at the institute’s satellite center this time enabled me to collect information about establishing the discipline of human security engineering for Asian megacities and, at the same time, inspired me to continue fostering local human resources in regions that put the discipline into practice.

-Hiroyasu Ohtsu, Professor (Overseas base leader, Bangkok)

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Report on the GOCE Special Seminar of Environmental Analysis

Date: April - May, 2009
Venue: Tsinghua University, Shenzhen, China

Kyoto University–Tsinghua University Cooperative Research and Education Center for Environmental Technology was constituted in October 2005 funded as an endowed faculty chair, and since October 2008, the Shenzhen base has been supported by the GCOE and EML program. Since 2005, Shenzhen base has produced several researches, in which environmental analytical technology is a vital part. Therefore, theoretical foundations and application of environmental analytical technology have an important role in our studies, and for this reason, the "Environmental Analytical Technical Seminars" were held as GCOE Special Seminars in Shenzhen base and at the Beijing campus of the Tsinghua University, as follows.

1. Basic knowledge of an environmental analysis (April 17th, 2009)
2. The pretreatment method of environmental samples, and the principle of LC/MS/MS (April 22nd, 2009)
3. The preparation method of standard solution, and the operation method of GC/MS and LC/MS/MS (May 12th, 2009)

The questionnaire carried out at the end indicated that the 2005年10月より京都大学－清華大学環境技術共同研究センター（寄附講座）として、2008年10月以降はグローバルCOEの重要海外拠点としてその活動を展開させている深圳拠点では、既に多くの協働での研究が行われています。このうち環境分析技術は、研究の基盤であり、基本と応用を学ぶことは極めて重要であると言えます。そこで深圳拠点では、GCOE特別セミナーとして「環境分析技術セミナー」を開催しました。本セミナーでは、講義として

1. 環境分析技術の基本的な考え方・測定データの取り扱い方 (2009年4月17日)
2. 環境試料の前処理方法とその適用・LC/MS/MSの測定原理 (2009年4月22日)
3. 標準試料の調製、GC/MS、LC/MS/MSの測定方法とメンテナンス方法 (2009年5月12日)
4. 分析法開発のノウハウ (2009年4月25日~4月29日)（北京本校にて）

をテーマとして取り上げました。セミナー終了後の参加者へのアンケートでは、「実際役に立った」との意見が多く寄せられ、現地でのニーズと本セミナーの趣旨の良い一致が見られました。
participants had found the seminars very useful. This implies the contents of the seminars fit their needs. A total of 72 people participated in the seminars. The third seminar in particular was attended by members of the Shenzhen Water Quality Centre. Enhanced cooperation with not only the Graduate School at Shenzhen, Tsinghua University but also Tsinghua University and the Shenzhen's municipal agency will be beneficial to future research activities. At the end, the participants of all the seminars received a certificate. The knowledge and technology demanded in the Shenzhen area will be continuously incorporated in the education provided at the Shenzhen base in collaboration with the Graduate School at Shenzhen, Tsinghua University. Through the education, I hope to make a contribution to the aim of the GCOE program, the establishment of the discipline “Urban Human Security Engineering.”

1 Basic knowledge of an environmental analysis
In this seminar, the participants understood basic ideas and points to pay attention when conducting environmental analysis, and also the treatment of measurement data. For instance, they were informed of the difference between random errors and systematic errors, and the concepts of accuracy, reproducibility, and repeatability. Moreover they learned how to set a detection limit, and how to draw the baseline of a chromatogram. After the seminar, the participating students actively exchanged questions and concerns they had on instrumental analysis, ensuring that the seminar provided information they truly wanted to know. They demonstrated the high level of interest; one of them asked a question on the number of duplicate measurement required to guarantee reproducibility. The basic knowledge attained in the seminar will be greatly helpful for the participants in their future research activities.

2 The pretreatment method of environmental samples, and the principle of LC/MS/MS
In this seminar, the participants received explanations of kinds and methods of pretreatment required to analyze micro pollutant contained in water samples, and also the measurement principle of LC/MS/MS. Some of the methods were familiar to the participants, but there were others that they had not heard of before, making the participants realize a wide range of choices for pretreatment. Moreover, reference was made to a combination of a suitable pretreatment method and a target compound's physical properties and chemical structure, providing basic knowledge regarding a choice of a suitable method of pretreatment. The second half of the seminar was devoted to explain the measurement principle of LC/MS/MS expecting the newly equipped tandem mass spectrometer (MS/MS) to be used as LC/MS/MS. Although some participants had had experience of using GC/MS as mass spectrometry technology, it was necessary to give the information because the measurement principle of GC/MS differs from that of LC/MS/MS. The participants showed some but limited understanding of the structure of an interface, an ionization part, and the principle of fragmentation, probably because it was the first seminar for them. Therefore in addition to this, there is a need for another seminar that they acquire hands-on experience of using LC/MS/MS.

3 The preparation method of standard solution, and the operation method of GC/MS and LC/MS/MS
In this seminar, practical skill instructions were given using GC/MS to measure triphenyl phosphate and LC/MS/MS to measure ethinyl estradiol. First, we prepared standard solutions for calibration curve using each substance. Then, standard solution of 10 μg/L, 20 μg/L, 50 μg/L, and 100 μg/L were prepared using the reference standard.
solution of 2 mg/L. The participants got directions on the setting method of the analysis conditions, using GC/MS and LC/MS/MS, for measuring the standard solution prepared by each group. Finally, the participants evaluated the correctness of dilution operation on the linearity of a calibration curve. The participants acquired the proper usage of laboratory glassware and microsyringes through the seminar. Furthermore, they deepened their understanding of the apparatus by having operated GC/MS and LC/MS/MS. At the end of the seminar, each participant received a certificate. An anonymous survey was carried out after the seminar, and many participants answered that the seminar had been beneficial for them. In addition, there was a remark on having the seminar for a longer period of time, indicating a need to continuously hold seminars.

4 Know-how of analytical method development

At the beginning of the seminar, the instructor held a hearing on issues the participants have in their daily analyses. By then, their analysis had yielded results that were considerably different from a theoretical value. Hence we agreed on the need for pinning down causes and making improvement. In the seminar we reviewed on the proper use of basic apparatus, principals of GC/FID, pretreatment methods, and measurement conditions. The participants were well versed in the use of laboratory glassware, but some incorrect operations of the equipment that could cause errors were spotted. Then appropriate directions and explanation of the errors were given. Similarly we reviewed pretreatment methods step by step; thereby we were able to reduce the number of errors. Additionally we went over the conditions of the daily-used GC/FID. We checked the measurement condition first, and then found out that measurements were made under the condition that column temperature was lower than the boiling point of several object substances. We therefore performed column washing for a whole day; however we could not lower the blank level at which we could measure the concentration of object substances. We picked up a column that was applicable to analysis of organic acid, and attempted its analysis. Specifically we considered conditions that we could attain quantifiable separation and a peak stage, changing the condition of increasing temperature. As the result, we achieved a reasonable peak shape and separation. Because of a time restriction, we did not achieve the establishment of conclusive measurement condition. We acquired, however, good understanding of procedures for examination of analytical methods by the hands-on experience.

− Makoto Yasojima, Program-Specific Associate Professor (GCOE-HSE)

μ g/L, 100 μ g/L の標準溶液を作成しました。各グループが調整した標準溶液を測定するための分析条件の設定方法について、GC/MS および LC/MS/MS を用いて指導しました。最終的に、検量線の直線性からの希釈作業の正確さを評価しました。このセミナーを通じて、参加者は、ガラス器具やマイクロシリンジの正しい使い方を習得しました。さらに、実際に GC/MS、LC/MS/MS をオペレートしてみることで、これらの機器に対して理解を深めました。セミナー終了後に、参加者に対して certificate を授与しました。また、無記名アンケート調査を行ったところ、参加者からは、大変有意義であったという返答が多く返されました。一方で、セミナーの時間をもっと増やして欲しいという意見もあり、今後継続的に講習を行う必要性が示唆されました。
A five-day GCOE intensive course on geotechnical infrastructure asset management was held, from March 15 to 19, 2010 at AIT (Asian Institute of Technology), one of the overseas bases of the GCOE program "Global Center for Education and Research on Human Security Engineering for Asian Megacities."

Among the four research fields of the program (Urban Governance, Urban Infrastructure Management, Health Risk Management, and Disaster Risk Management), I serve as a research field leader of Urban Infrastructure Management. The focus of the course was one of the disciplines in the field, geotechnical infrastructure asset management. This intensive course was the third of its kind, after the first at AIT in March 2009, and the second at AIT centre in Vietnam in September 2009.

Building upon the achievements from the past two years under the GCOE program's "strongly locally-oriented" principle, I expounded on the following two problems arising in Bangkok and throughout Thailand:

1. Issues inherent in megacities
   Land subsidence caused by groundwater extraction/ Effect assessment on infrastructures, and ground deformation after water level restoration following regulation of ground water pumping / Effect on underground infrastructures and foundation of infrastructures

2. Issues on links between megacities and rural areas
   Evaluation of socioeconomic loss caused on road slopes and in residential areas as a result of landslides related to torrential rain, and establishment of its early warming system

Reflecting international and multicultural characteristics of AIT, students from Thailand, Vietnam, Indonesia, Myanmar, Nigeria, and so forth participated in the course (photos below). Same as last year, I granted a certificate on completion of the five-day course to students who had attended more than 80 percent of the entire course.

- Hiroyasu Ohtsu, Professor (Overseas base leader, Bangkok)
A series of summer training courses has been held annually since 2005. The training course intended for practitioners and researchers involved in road asset management, by giving lectures on basic concepts including life cycle cost analysis and data arrangement, and the latest research findings of this field. In addition to the Professors from Kyoto University, Dr. Kiyoyuki Kaito (Osaka Univ.), Prof. Nguyen Xuan Dao, Mr. Nguyen Dinh Thao (UTC), Dr. Keizo Kamiya (Nippon Expressway Research Institute Company Limited), Dr. Yasuhito Sakai (Hanshin Expressway Company Limited), and Dr. Kazuya Aoki (Pasco Corporation) provided 15 lectures in total. Finally, the 25 participants, who took an exam based on the summer course lectures, obtained a certificate for the completion of the course.

- Mamoru Yoshida, Program-specific Assistant Professor (GCOE-HSE)

A series of summer training courses has been held annually since 2005. The training course intended for practitioners and researchers involved in road asset management, by giving lectures on basic concepts including life cycle cost analysis and data arrangement, and the latest research findings of this field. In addition to the Professors from Kyoto University, Dr. Kiyoyuki Kaito (Osaka Univ.), Prof. Nguyen Xuan Dao, Mr. Nguyen Dinh Thao (UTC), Dr. Keizo Kamiya (Nippon Expressway Research Institute Company Limited), Dr. Yasuhito Sakai (Hanshin Expressway Company Limited), and Dr. Kazuya Aoki (Pasco Corporation) provided 15 lectures in total. Finally, the 25 participants, who took an exam based on the summer course lectures, obtained a certificate for the completion of the course.

- Mamoru Yoshida, Program-specific Assistant Professor (GCOE-HSE)
From March 28 to April 2, 2011, a six-day intensive course was held on Risk Management for Infrastructure Development and Planning, a course within the Professional Master of Engineering (PME) program offered to practitioners, at the Asian Institute of Technology in Vietnam (AITVN), Ho Chi Minh City, a satellite center of the Asian Institute of Technology (AIT), one of the overseas bases of the Kyoto University Global COE Program “Global Center for Education and Research on Human Security Engineering for Asian Megacities (GCOE).”

Among the four research fields of the GCOE program (Urban Governance, Urban Infrastructure Management, Health Risk Management, and Disaster Risk Management), I serve as a research field leader of Urban Infrastructure Management. The focus of the course was one of the disciplines in this field, geotechnical infrastructure asset management. The course was held according to the agenda given in Table 1, with each lecture consisting of a 90-minute session for a total of 21 hours including the final exam. As text material, I used a publication I compiled for the GCOE program, Geotechnical Infrastructure Asset Management (Second Edition).

This intensive course was the second of its kind, following the first in September 2009. In the previous course, all participants were professional engineers with a keen interest in not only theories but also practical application. With this in mind, in each lecture I distributed practical exercises to be solved using Excel software, which were highly welcomed as they both furthered understanding and could be used in real-life business. I firmly believe that winning the participants’ understanding, even in an introductory course for practitioners, is valuable in spreading knowledge about the field in the future.

During the course, on March 29 the AITVN held a conference on Geotechnical Engineering in the Context of Climate Change for university faculty members, government officials, and engineers. I gave a special lecture titled “Monitoring and Early Warning of Landslides: Experiences in Japan and Thailand” and spoke about the in situ monitoring I conduct in Thailand as part of the GCOE program, and the early warning system I propose for landslides. The proposal, which reflects the increasing frequency of slope disasters in Southeast Asia due to variations in rainfall pattern as a consequence of climate change, received many responses and set in motion an active question and answer discussion.

I plan to continue grasping opportunities like this to spread knowledge about relevant fields in Asia and to share information from the perspective of human security engineering.

Hiroyasu Ohtsu, Professor (Overseas base leader, Bangkok)
Training Seminar on Analytical Technology for Promotion of Japan-China Cooperative Research

Date: August 2 - 9, 2011
Venue: Katsura campus and RCEQM, Graduate School of Global Environmental Studies, Kyoto university, Shimadzu techno-research, Inc., Kyoto and Hiyoshi co., ltd. Shiga

This training seminar was carried out mainly by the training for analytical methods of emerging contaminants such as pharmaceuticals & personal care products (PPCPs), endocrine disrupting chemicals (EDCs), persistent organic pollutants (POPs), disinfection byproducts (DBPs), volatile organic compounds (VOCs) and heavy metals. This seminar intended to:

1. establish better relationship between Kyoto Univ. and Tsinghua Univ. in cooperative researches;
2. promote the advanced analytical technology of Kyoto Univ. to students from both Tsinghua Univ. and Kyoto Univ., who are the young hopeful researchers.

Three labs (Prof. Tsuno's lab, Prof. Itoh's lab, and Prof. Takaoka's lab) in the Graduate School of Global Environmental Studies of Kyoto Univ. provided the participants three-day (from August 2nd – 4th) training for analysis for estrogens in water sample, DBPs in tap water and heavy metals in sludge. The participants divided into three groups to learn different analytical technology in the three labs. During the training, the participants learned how to pre-treat samples, how to prepare standard solution for calibration curves, how to operate the instruments such as GC-MS, GC-ECD, and ICP-MS, how to analyze data, and so on.

Training for PPCPs analysis in wastewater treatment plant (WWTP) was carried out on August 5th – 6th at RCEQM of Kyoto Univ. On the first day of the training, the detailed background knowledge on LC-MSMS was introduced firstly. Next, the participants learned how to collect influent and effluent samples from Otsu WWTP using the automatic sample collector, how to pre-treat samples using the automatic solid phase extractor and how to analyze PPCPs using LC-MSMS. Training for data acquisition was performed on the second day, including correction of peak areas and calculation of recovery rate.

On August 8th, the participants visited Shimadzu techno-research Inc. The overview for micropollutant analysis was presented in this training. Then the pretreatment method for dioxin in the air sample and water sample was demonstrated by the instructors of the company. After that, they visited the different departments of the company and the instructors introduced many advanced analytical instruments to them.

On August 9th, the participants visited Hiyoshi Corporation and learned analytical methods on VOCs. The introduction of the company was given firstly. Next, the participants visited the lab of the company. Then they learned how to collect river water sample, pre-treat sample, measure sample by headspace GC-MS and data analysis.

Through this training seminar, the advanced analytical technology of Kyoto Univ. and two Japanese companies was promoted to students from Tsinghua Univ. and Kyoto Univ., who are the young hopeful researchers. A better cooperative relationship in research and education between two universities was also achieved.

- Makoto Yasojima, Program-specific Associate Professor (GCOE-HSE)
The Japan-China students’ academic exchange seminar relevant to water included two sections. The first section on Aug. 10th was the site visit to the Keage water treatment plant, Konan-chubu wastewater treatment plant and Biwa Lake Museum; the second section on Aug. 11th was the symposium on the ongoing research and/or future research done in Tsinghua and Kyoto Univ.

The academic exchange seminar was aimed to:
(1) promote the advanced technology and management experience of Japanese water treatment plant (WTP) and wastewater treatment plant (WWTP) to students from Tsinghua Univ. who are the young hopeful researchers;
(2) share the ongoing research and/or future research being done in Tsinghua Univ. and Kyoto Univ.;
(3) enhance the academic cooperation-exchange between young hopeful researchers from Japan and China.

On August 10th, ten participating students from both Tsinghua Univ. and Kyoto Univ., visited the Keage WTP, Konan-chubu WWTP and Biwa Lake Museum. Through the site visit, the students experienced the practical engineering case and understood the knowledge learned from the textbooks deeply. In addition, the advanced technology and management experience of Japanese WTP and WWTP were promoted to the students from Tsinghua Univ.

On August 11th, a symposium on ongoing research and/or future research being done in Tsinghua Univ. and Kyoto Univ., was held. First, Prof. Tsuno from Kyoto Univ. gave the opening address. Next, five faculty members and one PD of Kyoto Univ. gave seminar in the morning session; and fourteen students from Tsinghua Univ. and Kyoto Univ. gave presentation on their doctoral or master research topics in the afternoon section. The topics cover membrane technology, PPCPs, POPs, wastewater treatment models, catalysts, anaerobic digestion technology, wastewater reuse technology, bio-remediation technology and so on. At last, Prof. Tanaka gave the closing remarks and also presented prospects on the future academic cooperation-exchange between future young researchers from Japan and China. Also, he awarded the EML short-course internship certificates to the five Tsinghua Univ. students. A better understanding and awareness of the detailed research topics of both universities were achieved through this symposium.

A banquet closed the symposium, offering the students from two universities a chance to communicate further and deepen their friendship.

-Makoto Yasojima, Program-specific Associate Professor (GCOE-HSE)
Geotechnical Infrastructure Asset Management (Third Edition). This intensive course was the third of its kind, following similar GCOE Program-related activities that started in 2009 on which I previously reported. This time, in light of the damage caused by massive flooding and landslides in East Asia and Southeast Asia between October and November 2010, and more recently in the provinces of Surat Thani and Nakorn Si Thammarat in Southern Thailand in late March 2011 (see Photo 1), I focused the content on commentary and responses to issues related to the most recent incidents. Following the disasters in late March, the Thai government conducted an emergency survey on landslide risk across the whole of Thailand. It released a report that more than 1 million people in the country currently face the threat of landslides due to deforestation and an increase in severe torrential rain caused by climate change.

The participants of this intensive course included students from countries like Vietnam, Myanmar, Nepal, and Pakistan in addition to those from Thailand (see Photo 2). With the risk of landslides from downpours becoming evident in all Asian countries, the participants showed a keen interest in the course content. Plans for an early landslide warning system aimed at evacuating residents in heavy rain prompted many questions from the participants.

At the end of the five-day course, I awarded customary certificates to participants with an attendance of at least 80% (see Photo 3). As mentioned earlier, the frequency of massive natural disasters stemming from floods and landslides is on the rise in Asia. I plan to continue grasping such opportunities, and collecting and analyzing information on relevant topics taking a “thoroughly field-oriented approach” which is the basic principle of this GCOE Program. My aim is to spread the knowledge acquired as a result and to share information from the standpoint of Human Security Engineering.

- Hiroyasu Ohtsu, Professor (Overseas base leader, Bangkok)

1 Landslide in Kao Panom district, Krabi province in March 2011
1. Introduction
On March 22 and 23, 2012, a two-day mock lecture titled "GeoRisk Engineering" was held for students of Chulalongkorn University and the Graduate School Kasetart University at the seminar room of Chulalongkorn University (see Photo 1).

2. Lecture contents
In this lecture, I proposed strategic measures for slope maintenance and repair, citing as indices the risk of landslides and slope failures as a result of climate change. Specifically, I used the diagram in Figure 2 and suggested that in the event stability cannot be controlled across an entire slope, slope failure damage scenarios would expand according to the scope of ground movement. I then explained that the damage/loss anticipated in each scenario consists of both direct losses, incurred by the government agency responsible for road administration, and indirect losses, incurred by road users and residents who actually suffer the damage.

In the lecture, I used the textbook published as the first edition of this program’s series of English-language textbooks (see Photo 3).

The textbook is organized as follows.

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This textbook comes with a DVD containing exercises in Excel format, which I asked the participants to run on their personal computers during the lecture so that they may understand actual probability and risk calculations (see Photo 4).

Following the lecture, I received comments from the participants, which included positive feedback on the textbook. I invited the participants to join the collaborative program before closing the mock lecture (see Photo 5).

- Hiroyasu Ohtsu, Professor (Overseas base leader, Bangkok)
Providing for the mobility of people is one of important factors to support our daily lives, not only in developed countries but also in developing ones. Transportation also influences patterns of growth and economic activity by providing access to land. The performance of the system affects public policy concerns like air quality, environmental resource consumption, social equity, land use, urban growth, economic development, safety, and security. Transportation planning recognizes the critical links between transportation and other societal goals. It is needless to say that planning for transportation facilities, demand analysis, project evaluation method, and trip survey technique are key factors to obtain efficient transportation services, which include both private cars and public transportation like buses and trains.

From such a viewpoint, this course aimed at providing fundamental concepts and/or knowledge associating with transportation planning and results of application and particularly focusing on transportation in cities. Benefits of the course are to help participants understand concepts and basic theory of transportation planning. It also provides the fundamental knowledge on urban transportation systems, as well as cost/benefit analysis in transportation planning.

The First day
After the remarkable opening ceremony from the both representatives of co-organize institutions, Prof. Kiyoshi Kobayashi (KU) and Prof. Tran Duc Su (UTC), the Transportation Planning course started with the lesson of General Introduction by Assoc. Prof. Kakuya Matsushima. The lesson provided the general information about natural, socioeconomic, conditions of Japan and Vietnam; highway network of Asia and Vietnam, master plan of Hanoi to 2030 and vision to 2050; background knowledge for Transportation Planning and general framework for the course.

In the second lesson, Dr. Ly Huy Tuan, from Transport Development and Strategy Institution, Ministry of Transport of Vietnam, provided information about the transportation situation, transportation network planning and transportation strategy in Vietnam. In the third lesson, Mr. Ichizuru Ishimoto, from Nippon Koei Co., Ltd., gave the knowledge on project management and the application for transportation projects in Vietnam practices. In the fourth and fifth lessons, Prof. Kiyoshi Kobayashi provided the knowledge in transportation planning in deep and how to generally evaluate a project, especially for transport infrastructure project. In the end of the first day program, Assoc. Prof. Kakuya Matsushima provided the background for Cost/Benefit analysis.

The Second day
The program of second day started with the two lessons of urban transportation in Vietnam by Dr. Akira Hosomi, Japan International Consultants for Transportation Co., Ltd. In the third and fourth lessons, Assoc. Prof. Kakuya Matsushima provided the knowledge in 4-steps travel demand estimation. In the fifth and sixth lessons, Mr. Nguyen Trong Hiep provided the knowledge on person trip survey in Hanoi and using JICA Strada for travel demand forecasting, respectively.

The Third day
Assoc. Prof. Kakuya Matsushima opened the third day with the
lesson of Urban Economic model. After that, he gave the lecture on SNA and economic circular flow. In the last lesson of the Transportation Planning course, Assoc. Prof. Kakuya Matsushima continuously introduced about the computable urban economic model and applications for transportation project evaluation. The third day ended with the examination for evaluating the understandable level of participants attending the course.

The Fourth day
In the fourth day, selected students joined the site visiting activities for enhancing the knowledge and approach the learning issues in practice.

The Transportation Planning course attracted about 100 participants including Official Staff of MOT and Departments of Vietnamese Government, Official Staff of Consultants, UTC’s lecturers and students attended the Transportation Planning course. After each lesson, there always were discussions between presenters and audiences for clarifying the issues in question and for cooperation in future as well. In the evening of the day, participants received the Certificate for the training course from representatives of both co-organized institution, Prof. Kiyoshi Kobayashi, Graduate School of Management, Kyoto University and Assoc. Prof. Nguyen Van Vinh, Vice Rector of University of Transport and Communications.

- Kakuya Matsushima, Associate Professor
  (Dept. of Urban Management, Graduate School of Engineering)
4-3 Natural Disasters in Asian regions

The purpose of this symposium was to share lessons learned from the Great East Japan Earthquake and from disaster recovery experiences in Asia from the standpoint of urban human security engineering, as well as to explore new paradigms of safety and security in preparation for future events such as simultaneous earthquakes in the Tokai, Tonankai, and Nankai regions, and of new research, human resources development, and practical science that are required to provide urban human security engineering.

The symposium started with opening remarks by Prof. Masayoshi Nakashima (Director, Disaster Prevention Research Institute, Kyoto University) and by the event organizer, Prof. Yuzuru Matsuoka (Leader of Global COE “Global Center for Education and Research on Human Security Engineering for Asian Megacities”), followed by a keynote speech by Prof. Liang-Chun Chen (Director, National Science and Technology Center for Disaster Reduction, Taiwan) titled “Natural Disaster Risk Governance: Towards Social Safety and Human Security.”

In Part 1 “Lessons Learned from the Great East Japan Earthquake,” under Prof. Tomoharu Hori (DPRI, Kyoto University) as chair, seven faculty members of Kyoto University presented reports about the Great East Japan Earthquake through various perspectives, namely damage to infrastructures, tsunami inundation simulations, the relationship between tsunami warning system and evacuation behaviors, information sharing using Information Communication Technology, disaster debris management, recovery of cities and villages, and engineering technologies aimed at mitigating human casualties.

Part 2 “Lessons Learned from Disasters in Asian Regions” invited Mr. Shigeru Sugawara (Mayor of Kesennuma City, Miyagi Prefecture) and Mr. Hanief Arie (Deputy of Head, Indonesian President’s Delivery Unit for Development Monitoring and Oversight) to deliver keynote speeches about their practical experiences in the process of disaster recovery.

Part 3 “New Paradigm of Social Safety and Human Security” comprised a panel discussion with Prof. Hirokazu Tatano (DPRI, Kyoto University) as moderator and Mr. Tomio Saito (Administrative Director, Hyogo International Association), Mr. Motoaki Ue (Crisis Management Supervisor, Wakayama Prefecture), Mr. Shigeru Sugawara, and Assoc. Prof. Rajib Shaw (Graduate School of Environmental Studies, Kyoto University) as panelists. The members shared the issues of urban crisis management drawing on their experience in the Great East Japan Earthquake, the 1955 Great Hanshin Earthquake, and the 2011 Tohoku Disaster.

The 2011 Tohoku Disaster

The 2011 Tohoku Disaster was a major earthquake and tsunami that occurred in northeastern Japan on March 11, 2011. The earthquake registered a magnitude of 9.0 on the Richter scale and was the most powerful earthquake ever measured in Japan. The tsunami that followed caused massive destruction and loss of lives.

Exploring New Paradigms of Social Safety and Human Security -Lessons learned from the 2011 Great East Japan Earthquake and Tsunami-

Date: November 22nd, 2011
Venue: Campus Plaza Kyoto, Japan
Organizer: Kyoto University Global COE Program "Global Center for Education and Research on Human Security Engineering for Asian Megacities"
Co-organizer: Disaster Prevention Research Institute, Kyoto University
Supporter: Yomiuri Shimbun Osaka - Kyoto Convention Bureau

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The objective of this forum is to discuss the roles of global environmental studies in the restoration process from the Great East Japan Earthquake. For this purpose, we invited four guest speakers to address various aspects such as energy policy, environmental engineering, geotechnical engineering, and crisis management. After the four presentations, a panel discussion was held to further deepen the discussion.

First, Prof. Ueta made a presentation entitled “the restoration from the Great East Japan Earthquake and environmental energy policy.” He showed several key issues to set a new energy policy in the restoration process. Then, Assoc. Prof. Hirayama reported this work on disaster waste and the damage on water supply systems from the viewpoint of environmental engineering. Prof. Katsumi discussed issues and problems caused by the earthquake from geotechnical engineering aspects (e.g., liquefaction). Lastly, Dr. Okumura from Disaster Reduction and Human Renovation Institution talked about the characteristics of the Great East Japan Earthquake with many specific examples, and the problems that emergency headquarters in the Tohoku area faced.

In the following panel discussion, the panel received more than 20 questions from the audience. These questions ranged from the accident in the atomic power plant to the tsunami. It was a great opportunity for us to exchange information and opinions on various issues related to the earthquake.
The 33rd Symposium on Environmental & Sanitary Engineering Research Special Session - The Great East Japan Earthquake: what environmental & sanitary engineering can do now.

Date: July 29th, 2011
Venue: Jin-yu Hall, C cluster, Katsura Campus, Kyoto University
Organizer: Association of Environmental & Sanitary Engineering Research
Co-organizer:
- Kyoto University Global COE Program "Global Center for Education and Research on Human Security Engineering for Asian Megacities"
- Kyoto University International Center for Human Resource Development in Environmental Management "Environmental Management Leader"

The Great East Japan Earthquake occurred on March 11, 2011. Varied assistance has been provided for the rehabilitation and reconstruction of the damaged area. Environmental and sanitary problems, including water supply, wastewater treatment, disaster waste management, and radiation derived from the damaged Fukushima nuclear power plants, are urgent and remain unresolved. As a project of the 33rd symposium on Environmental & Sanitary Engineering Research, a special session on the Great East Japan Earthquake was held at Jin-yu Hall on July 29, 2011. The purpose of this session was to share information about the present status of environmental and sanitary issues caused by the Great East Japan Earthquake, and to discuss the future plans with respect to each issue. Additionally, an exchange of information on the latest and most practical environmental and engineering technologies that are oriented towards solving health risk issues in Asian countries was held based on presentations in the poster session.

In the special session, four presentations were given. First, Assoc. Prof. Nagahisa Hirayama (Kyoto University) gave a presentation titled "Damages, emergency responses, and future issues of the water supply system after the 2011 Tohoku Disaster." In his presentation, he stated that it was very difficult to determine what damage had been caused to the water supply system in the initial aftermath of this earthquake. Therefore, he emphasized the importance of developing predictions for damage to water supply systems following earthquakes before future disasters occur.

Second, Mr. Seiichiro Okamoto (Public Works Research Institute) gave a presentation titled "The impact on public health associated with the earthquake disaster on sewer systems and its measurement." In his presentation, he showed that over 100 each of wastewater treatment facilities and pump stations, and pipes and drains were damaged extensively by this earthquake. He mentioned that the elimination of sewage is the most important issue during the immediate response and that the rehabilitation of other infrastructure such as water and gas supply generates renewed sewage issues that require attention.

Third, Dr. Hidetaka Takigami (National Institute for Environmental Studies) gave a presentation titled "Current status and future plans for disaster waste management." In his presentation, he showed that over 100 each of wastewater treatment facilities and pump stations, and pipes and drains were damaged extensively by this earthquake. He mentioned that the elimination of sewage is the most important issue during the immediate response and that the rehabilitation of other infrastructure such as water and gas supply generates renewed sewage issues that require attention.

Finally, Assoc. Prof. Tomoyuki Takahashi (Kyoto University Research Reactor Institute) gave a presentation titled "Radionuclides in the environment and radiation effects from the Fukushima Daiichi Nuclear Power Plant accident." He mentioned the radiation-exposure pathway, radiation protection standards, current status of radiation emissions and contamination, and radiation standards for various media at the site of the nuclear disaster. The discussion focused on radiation-exposed waste treatment. We shared a common understanding that strong collaboration among the ministries of Japan is the most important factor involved in solving these problems. In the poster session, thirteen poster presentations by doctoral students in the Human Security Engineering Education Program were presented, engendering lively discussions of practical environmental engineering technologies that are oriented toward solutions for practical problem as well as in-field-oriented policies.

2011年3月11日に発生した東日本大震災においては、すでに今後の復旧・復興に向けて、さまざまな取り組みが進められているが、環境衛生工学が対象とする分野においても、上下水道や廃棄物、放射線など、早期回復が求められる重要な課題が多くある。そこで、本シンポジウムにおける企画セッションとして、実際に被災地にて活動された各分野の諸先生を中心に、その現状と、課題や対策について報告いただき、聴講者の方々ともとに議論を行った。また、ポスターセッションにおいてポスター発表を行い、アジア諸国における健康リスク問題に対する問題解決指向型の最新かつ実践的な環境工学、技術に関する情報交換を行った。
**2011 Great East Japan Earthquake and Tsunami: Challenges and Opportunities to Improve Disaster Management, Recovery and Reconstruction (Symposium on Humanitarian Logistics and Emergency Management)**

2011年東日本大震災と津波－災害マネジメント、復旧、復興を改善するためのチャレンジと機会－（ヒューマニタリアンロジスティクスと非常時に関するシンポジウム）

**Date:** February 1st, 2012  
**Venue:** Global Hall JINYU, Katsura Campus, Kyoto University  
**Organizer:** - Japan Science and Technology Agency (JST)  
- Kyoto University Global COE Program “Global Center for Education and Research on Human Security Engineering for Asian Megacities”

The complex environment left by the huge humanitarian crises of the 2011 Great East Japan Earthquake and Tsunami in Tohoku region, Japan has put forward several questions to academics and practitioners of disaster planning, emergency preparedness and business continuity. The purpose of the symposium is to bring an opportunity for multidisciplinary researchers to discuss and exchange ideas on:

- Risk management strategies in the context of natural hazards;  
- Emergency management response and recovery;  
- Reconstruction after natural disasters;  
- Debris management after disasters; and  
- Modeling techniques applied for disaster mitigation.

The overall objective is to allow the proposal of innovative academic and practical approaches to reduce the post-disaster effect.

The objective of the workshop was successfully accomplished through active participation of academics and practitioners from multidisciplinary fields. The common objective was to lessen effects of future disasters through efficient planning. The concepts of disaster management, recovery planning and preparedness were discussed. Several past disasters including The 2011 Great East Japan Earthquake and Tsunami in Tohoku region Japan were presented. Issues and lessons left behind were outlined. The current practice of post-disaster recovery and research ideas for making the future disaster recovery process more efficient were discussed. Most importantly the workshop provided an opportunity of group discussion for practitioners and people from academia of different fields to understand the disaster management recovery and reconstruction process more precisely. Participants of the workshop commended importance of such events and were looking forward for organization of such events in future as well.

2011年に日本の東北地方を襲った東日本大震災は甚大な被害を及ぼし、混乱を引き起こしました。東日本大震災により引き起こされた混乱した状況は、研究者、実務家双方にとって、防災計画、緊急時への備え、事業継続性など多くの問題を突き付けました。本シンポジウムでは、分野にわたる研究者による意見交換の機会を目的としました。主なテーマは以下の内容です。

- リスクマネジメント戦略  
- 緊急時対応と復旧  
- 復興  
- 廃棄物マネジメント  
- 災害緩和に向けたモデル研究

被災後の減災に向けて、学術的な面、実践的な面から議論し、有用な提案を目指しています。

様々な参加者の積極的な協力により、ワークショップは成功のうちに終了しました。今後の災害による被害軽減を目指し、効果的な計画を定めることが重要であることを確認しました。東日本大震災を含めた過去の災害について発表がなされ、災害マネジメント、復旧計画、災害への備えなどの方向性について、議論しました。災害後に残された問題や教訓を概説しました。また、災害からの復旧の現在の取り組みや将来の災害復旧のための研究構想についても議論しました。

本ワークショップの最大の成果は、災害マネジメントとして復旧と復興の過程をより詳細に理解するため、様々な分野の実務家と研究者が集い、議論する機会をもつことができました。参加者は本ワークショップの意義を改めて確認し、また同様の議論の場が開かれることが期待しました。
Workshop on Lessons from the 2011 Tohoku Disasters for Water Supply Systems in Kansai District

Workshop on Lessons from the 2011 Tohoku Disasters for Water Supply Systems in Kansai District’ was held at Global Hall Jinyu, Kyoto University at Katsura Campus on March 2nd, 2012. The purpose of this workshop is to learn from the experience of City of Sendai Waterworks Bureau on the 2011 Tohoku Disaster and to discuss what we have to do for the disaster prevention from the presumed Tokai, Tonankai, and Nankai catastrophic disasters.

In the first session, the invited person from City of Sendai Waterworks Bureau has a lecture on their experiences, and lessons of the 2011 Tohoku Disasters. In addition, we would share the experiences of supporting some water utilities in Tohoku region.

In the second session, using the workshop method with the involvements of water professionals in Kansai region, we would discuss what we, the stakeholders on water supply system in Kansai region, have to do from the viewpoint of secure the urban human security after the presumed catastrophic earthquake and tsunami disaster in the West Japan, the Tokai, Tonankai and Nankai earthquake.

At first, Assoc. Prof. Hirayama, an organizer of this workshop and symposium and a chairperson of Kansai Research Community for Water in the Future, would address the objectives of this event. In the first session, Mr. Sato (City of Sendai Waterworks Bureau) had a presentation on damages to water supply system in City of Sendai in the 2011 Tohoku Disaster and their emergency and restoration responses in the aftermath of 2011 disasters. Based on their experiences, he pointed out four subjects, which water professionals should overcome in the future; 1) Earthquake resistant counter measures, 2) Establishment of operating system for water, 3) More effective emergency water supply operation, 4) Management of resources for emergency restoration. In addition, Mr. Kumaki (Kobe City Waterworks Bureau) and Mr. Kadowaki (Hanshin Water Supply Authority) reported their activities of the 2011 Tohoku Disaster.

In the second session, all of participants were divided into five groups, and, using the workshop method, we would discuss the issues for water professionals in Kansai region to have to struggle for disaster prevention based on the first session lectures on the lessons from the 2011 Tohoku disaster.
The Group to Act on the Toilets with Sustainability (GATS), formed mainly by researchers from Kyoto University, has been awarded the Japan Water Prize (Gran Prix). This year's Japan Water Prize, presented to recognize activities related to water, was awarded to the Group to Act on the Toilets with Sustainability (Chief Researcher: Professor Yoshihisa Shimizu, Graduate School of Engineering), formed mainly by researchers from this university.

The Group to Act on the Toilets with Sustainability was formed immediately after the Great East Japan Earthquake by thirteen volunteers to use the research results accumulated in developing nations regarding the diversion of urine and feces. The members include Associate Professor Hirohide Kobayashi, Assistant Professor Hidenori Harada, and Assistant Professor Ayako Fujieda, all of the Graduate School of Global Environmental Studies, as well as Associate Professor Tomomori Matsuda and Assistant Professor Nagahisa Hirayama of the Graduate School of Engineering.

The Great East Japan Earthquake, which struck on March 11, 2011, devastated the Pacific Coast areas of the Tohoku and Kanto regions. The number of fully or partially destroyed homes topped 240,000, and there were 8 million households with no electricity as well as 1.8 million with no water. The number of evacuees topped 400,000 at its peak, and over 2,000 evacuation shelters were set up. Water, food, medicine, blankets, clothing, and other donations of emergency supplies came in from all over the country. However, there were not enough toilets, nor was the issue of toilets given sufficient priority, and as existing water-based flush toilets could not be used, a great number of people were forced to relieve themselves in poor and unsanitary conditions, posing a serious problem for the evacuees.

The Society has worked to develop stand-alone waterless urine and feces-diversion toilet units and bring them to affected areas to try and alleviate the effects on the surrounding environment. Rather than simply being set on the floor, they can be easily installed above existing toilets, whether Oriental- or Western-style, even in shelters or temporary housing, and can be used until the water and sewage systems are fully restored. This will act to help the toilet situation in disasters such as the Great East Japan Earthquake.

During development, a survey was made on the state of commercially available portable toilets, and it found that all of them process the waste into solid form using coagulating agents. The researchers were therefore concerned that the daily accumulating waste would need to be disposed of, and thus create an even greater burden for the affected areas. With the dry toilet, the waste is separated out into solid and liquid, and the urine, which does not contain pathogens, is treated by hygienically treated by alkalization or drying with the addition of a compound of slaked lime and rice-hull charcoal. The feces are able to be precipitating out pollutants (nitrogen, phosphorus) for removal and then discharged or percolated through soil. The feces-diversion toilet units can separate out solid and liquid, and the urine, which does not contain pathogens, is treated by hygienically treated by alkalization or drying with the addition of a compound of slaked lime and rice-hull charcoal.

The Japan Water Prize (Gran Prix) was selected from 176 applicants by the Japan Water Prize Committee (Honorary President: His Imperial Highness Prince Akishino (Fumihito); Chair: Chief Executive Director Mamoru Mohri, National Museum of Emerging Science and Innovation).
Geoenvironmental issues caused by the 2011 Great East Japan Earthquake

Takeshi Katsumi
Professor, Graduate School of Global Environmental Studies

The Great East Japan Earthquake that occurred on March 11th caused various geoenvironmental problems such as the generation of large amounts of waste, tsunami sediments (see Photo 1), salt intrusion, radioactive contamination of soils, and others. The disposal of the disaster wastes and tsunami sediments is a pressing issue for which, among other possible solutions, the creation of hilltop parks by constructing embankments using disaster debris has been proposed. In order to do this, the evaluation of the environmental suitability of waste materials and tsunami sediments, and their mechanical properties and structural stability, as well as the understanding of the conditions to which the areas are faced are required. Ground improvement/modification technologies to strengthen the soils and/or to control the seepage may also be considered. During a visit to the affected area we found that an emergency groundwater well designed for disaster cases worked adequately, since we could obtain clean water from an affected well (see Photo 2) even though all the area was covered with mud and rubble caused by the tsunami. Preservation of the groundwater and geo-environment and understanding of natural resources by the local communities are important from the viewpoint of disaster mitigation.

To deal with these geoenvironmental issues, we are promoting initiatives to leverage the collaboration of members of the academic societies. It would be greatly appreciated further guidance and cooperation of the members of the HSE program.

Strategy of separation and treatment on disaster waste

Misuzu ASARI
Assistant Professor, Kyoto University Environment Preservation Research Center

The first step of recovery and reconstruction is probably removal of disaster waste (Debris). One week after the March 11 earthquake and tsunami, the Task team on Disaster Waste Management and Reconstruction was established after discussions and preparations within the Japan Society of Material Cycles and Waste Management (JSMCWM). Active opinion and information exchange has been made through the website (http://eprc.kyoto-u.ac.jp/saigai/) and the mailing list.

I worked hard to support the recovery—rather than surveying and researching—such as visiting affected areas and collecting data. The first step of recovery and reconstruction is probably removal of disaster waste (Debris). One week after the March 11 earthquake and tsunami, the Task team on Disaster Waste Management and Reconstruction was established after discussions and preparations within the Japan Society of Material Cycles and Waste Management (JSMCWM). Active opinion and information exchange has been made through the website (http://eprc.kyoto-u.ac.jp/saigai/) and the mailing list.

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International Activities
How to determine the acceptable risk level after the Tsunami and the nuclear accident?

『正しく怖がる』とは言うけれど…

Katsuya Yamori
Professor, Disaster Prevention Research Institute

In the aftermath of the Tohoku Earthquake and Tsunami disaster, aphorisms by Torahiko Terada, a well-known Japanese physicist and essayist, are often being quoted, because they are helpful to overcome the current difficulties. One of these aphorisms is, “maybe we are afraid too little, or too much, but what counts is to be afraid just enough.” Some people reflect this idea and state that we should neither overestimate, nor underestimate, the risk of tsunamis and radioactivity and maintain that we should be “correctly” afraid of these risks. However, the catastrophe has shaken the idea of “correctness” itself. For example, we now realize that nobody, not even experts, can ascertain with certainty, the safe limit for radioactive contamination in vegetables, or how high a tsunami will hit a given area. Ulrich Beck, a famous sociologist, called this type of postmodern society, a “risk society.” What we should do in a risk society is not to learn the correct standards of risk levels prescribed by experts, but to create a socially acceptable risk standard through the collaboration between experts and non-expert.

東日本大震災以後、物理学者寺田寅彦の言葉がしばしば取りあげられています。「ものを怖がらな過ぎたり、怖がり過ぎたりするのはやさしいが、正当に怖がることはなかなかむつかしいことだ」も、その一つです。少なからぬ論者が、この言葉を、様々なリスクについて、それを過小評価して油断することもなく、逆に過大評価してパニックに陥ることもなく、「正しく怖がる」ことが重要だ、という意味だとしています。しかし、このたびの大震災で揺らいでいるのは、「正しく怖がる」というときの「正しさ」の基準（規範）です。たとえば、野菜の放射能汚染はどの程度まで許容されるのか、ここには何メートルの津波が来るのか。これらの課題について、だれも専門家といえども、絶対的な「正しさ」を提供することができない社会（社会学者ベックの言う「リスク社会」）に私たちが生きていることを、今回の大震災はあらためて明らかにしました。だから、今なすべきことは、「正しく怖がる」というよりも、「どのように怖がることにするか」について、専門家、非専門家をまじえ社会全体で決めるとき、および、その作業のための政策やツールを生み出すことだと思われます。

1 Manuals were submitted to the mayors of Sendai and Kyoto. (仙台市長と京都市長にマニュアルを提出)
2 Enormous damage of the tsunami (津波被害の大きさに言葉を失う)
3 Tsunami sediment covered the town (Ishinomaki City) (津波堆積物が街を覆う [石巻市])

1 A nursery school swept away by the tsunami, Iwate prefecture (岩手県南部の保育所)
2 A house where Torahiko Terada spent his childhood in the late 19th century, Kochi Prefecture (寺田寅彦が幼少期を過ごした高知県内の屋敷)
The Great East Japan Earthquake had caused serious damages in several beautiful villages and towns. Some of such villages and towns already started the recovery processes with the consideration of their honorable beautiful landscape. Agency for Cultural Affairs, for example, is supporting such processes with their new program for promotion of tourism and local revitalization. It is sometimes said that disaster prevention promotion is contradictory to landscape conservation. But from the viewpoint of cultural landscape, which focuses the relation between human and natural condition, we should regard disaster prevention as landscape evolution, with deep consideration of local features. In this September, some parts of ‘Sacred sites and pilgrimage routes in Kii mountain range’ were damaged by the typhoon 12. During its long history those sites and pilgrimage routes had been partly transformed after floods and heavy rains. Nevertheless the sites and routes have been kept beautifully until now. In some recent heavy rain cases, the old routes helped some villages and towns from being isolated as they were tougher than newer roads and rails. Heritage succession always requires and sometimes realizes toughness against disaster impact as well as cultural progress. Though it might be a hard work to find the recovery process with consideration of landscape evolution, highly impressive cultural landscape will appear in near future as the result of such challenging efforts.

Disposal of Disaster Wastes for Rapid Resumption of Production

I went for a survey to find out how firms worked around disaster wastes that prevented them significantly from restarting their daily production. Among the firms I visited, there was a firm that engaged all its employees in disposal of wastes and cleaning until the end of April and finally restarted normal production in July. Management of disaster wastes is crucially important for business continuity. Disaster wastes in plant sites are classified into ones that were generated in their own firm and ones that flowed from another site. It depends on jurisdiction whether the latter type of the waste is disposed by jurisdiction or firms themselves who are suffering from those inflows. Sendai city provides that disposal service, although the priority is given to roads and public buildings, namely houses and private firms have to wait for long time. Hence firms should choose between the followings; waiting for the public service or asking the private service by paying money. However, even if firms take the latter way, they can not necessarily catch some private services immediately.
Urine diversion toilet system for securing sanitation in emergent conditions

Hidenori Harada
Assistant Professor, Graduate School of Global Environmental Studies

After the Great East Japan Earthquake and Tsunami, numerous people suffered from improper sanitation. To secure sanitation at emergent situation, treatment of feces, has a greater priority than that of urine since they contain most of pathogens in excreta. To cope with the disaster in Tohoku and future event, the author and colleagues established an interdisciplinary project team, headed by Prof. Yoshihisa Shimizu (GS of Engineering), and urgently started the development of disaster-responsive sanitation system employing no-water urine-diversion (or urine-and-feces separation) toilet.

A portable urine-diversion toilet unit was developed by using ready-to-assemble plastic cardboard so that it is easily transported and stocked. Separated feces from urine are processed by the mixture of lime and dry soil/coaled husk for sanitization and deodorization without water. Although urine can be simply treated to remove a part of nutrient, it may be discharged without treatment at emergent conditions since it contains few pathogens. So far, we have distributed 54 units and are further improving the unit.

Furthermore, we proposed the new urine-diversion sanitation system for public buildings that flushes feces to sewage and recovers nutrient from urine in usual situations, and can be converted to the system that employs no-water treatment of feces in emergent situations. A toilet system is under development to implement this system.

During the investigation of the damage caused by the disaster, it was found that the industrial park in Iwate was damaged by the earthquake in April, 2011. A waste dump in Miyagi was also affected by the disaster in August, 2011.

1. Industrial park damaged by the disaster (Iwate, April, 2011) (被災した工業団地 [岩手県, 2011年4月])
2. Disaster waste dump (Miyagi, August, 2011) (がれき集積場 [宮城県, 2011年8月])

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Urine diversion toilet system for securing sanitation in emergent conditions

緊急時の衛生確保を実現するし尿分離トイレシステム

原田 英典
地球環境学堂 助教

東日本大震災により、多くの人々が非衛生的な環境での排泄を余儀なくされた。緊急時のし尿処理において優先度が高いのは病原体を含む大便の処理である。同震災および将来の災害に対応すべく、筆者を含めた学際的なチーム（代表：清水芳久工学研究科教授）が立ち上げられ、水を用いないし尿分離（大便と尿を分離）トイレを用いた、災害対応型し尿処理システムを緊急開発し、その社会実装に取り組んだ。

まず、プラスチック板泡からなり、備蓄・運搬が容易なポータブルし尿分離トイレユニットを開発した。尿と分離回収された大便に消石灰と殻殻炭/乾燥土壌の混合物を添加することにより、水を使わずに関生化学を実現するとともに、臭気を大幅に軽減できる。一方、尿は簡易処理により一部栄養塩類の沈殿化が可能だが、ほぼ病原体を含まないため緊急時には放流を行う。これまで54基を東北各地に導入し、同時にさらなる改良を進めている。

続いて将来への備えとして公共施設向けに、平時には大便は水洗・下水道放流、尿は栄養塩回収・下水道放流を行い、非常時には大便の無水処理が可能な災害対応型し尿処理システムを考案し、これを実現する実装設備の開発を行っている。
Humanitarian logistics in the Great Tohoku Disasters

About 450,000 people were displaced to refugee centres due to damage by tsunami in the Great Tohoku Disasters. We have performed research on the relief distribution of emergency goods including water, food, blankets and other daily commodities for these displaced people from the viewpoint of humanitarian logistics. We obtained following important lessons learned for the preplanning for relief and recovery from disasters based on our research: (1) Although the prefectures and municipalities are responsible for the relief distribution of emergency goods, the collaboration with Self Defence Force, private freight carriers and volunteers is required. Pre-agreements among these stakeholders are effective. (2) Access roads to refugee centres should be re-opened if they are damaged and the use of ships and helicopters should be considered if necessary. (3) The regional community network should be effectively used. (4) The communication systems should be maintained to get dynamically changing information of the number of displaced people and their demands. (5) Planning the appropriate location and operation of depots for storing emergency goods and dispatching them is important. (6) Preparing trucks, drivers, fuels, maps, folk lifts and workers is essential. (7) The exercise of distributing emergency goods to refugee centres is required.

GIS Based Disaster Response Support Activities for National and Local Government

One of the most important study topics for me is to develop GIS based disaster correspondent support system for local government In the Great East Japan Earthquake, I have been doing some support activities with our experimental knowledge from the previous ones in the Great Hanshin-Awaji Earthquake, Chuetsu Earthquake, and so on. Firstly in March, I and my research colleagues joined in the Emergency Mapping Team (EMT) activity in Cabinet Office, Government of Japan. We made two thematic maps. One is Depot for relief distribution (Iwate Prefecture) (救援物資の配送拠点 [岩手県]). The other is Location of refuge centres and the depot of municipality (Ishinomaki City) (避難所および市の配送拠点の位置 [石巻市]).

International Activities
Preparation for earthquakes considering regional characteristics
地域特性に応じた地震防災対策

Yasuhiro Hayashi
Professor, Architecture and Architectural Engineering, Graduate School of Engineering

Many wooden houses collapsed due to severe ground motions caused by the inland shallow earthquake occurred directly under the big city during the 1995 Great Hanshin-Awaji earthquake. On the other hand, in the 2011 off the Pacific coast of Tohoku Earthquake, many towns suffered serious damage from the big subduction zone earthquake and tsunami. In addition, the damage of wooden houses caused by shaking was not so severe, but earthquake damage occurred in the wide area and had serious influence on the economy and culture of an every place region. Moreover, the influence of earthquake damage changes greatly with regional characteristics such as earthquake environment, industry, economy, and society. Thus, the aspect of damage changes greatly with types of earthquakes. Therefore, earthquake countermeasures suitable for each

阪神淡路大震災においては、大都市直下で発生した内陸地殻内地震による激しい揺れによって多くの木造住宅が倒壊しました。一方、東日本大震災においては、プレート境界型の巨大地震によって、多くのまちが津波被害によって甚大な被害を受けました。そして、揺れによる木造住宅の被害程度はそれ程でもありませんでした。また、地域で多様な被害が発生し、地域の経済や文化に深刻な影響を及ぼしました。このように、地震のタイプによって被害の様相は大きく異なります。また、産業・経済の低迷や過疎高齢化など、日常的に地域が抱えていた地域固有の問題点が地震被害によって深刻化しますので、地域へ及ぼす大地震被害の影響は、地震環境を含む広い意味での地域特性によって大きく違います。従って、地震被害の軽減のためには、地域に適した地震防災対策が実施されなければならない。建築保全再生学講座では、懸念される大地震の想定被
region must be implemented in order to mitigate earthquake damage. Therefore, we have conducted the field surveys of the supposed stricken area of a scenario earthquake to investigate the local characteristic, and are going to propose earthquake countermeasures suitable for the region. Moreover, methods for the seismic performance evaluation and seismic retrofit of wooden houses have been developed considering regional structural properties.

Minoru Yoneda
Professor, Environmental Engineering, Graduate School of Engineering

The vast land was radioactively contaminated by Fukushima Daiichi nuclear power plant accident. The land over 20 mSv of annual exposure level is supposed to be decontaminated by the central government, but the other by local governments. Decontamination Plaza is established near JR Fukushima station and co-managed by Ministry of Environment and Fukushima prefecture. It works for introducing the status of decontamination projects and various decontamination skills. However, decontamination projects are not actually going well. The main reason is that the neighbors don’t accept the establishment of a temporary storage yard to put radioactively contaminated soil and wastes. In case of Fukushima city, the temporary storage yard is set only in Onami area on a baseball yard in this March. The fact that more than 20,000 flexible container bags of the size of about 1m³ are expected to arise from the decontamination of Onami area which is composed of less than 400 houses shows the difficulty of proceeding decontamination projects. The society for decontamination of environmental radioactivity was built in last autumn and expected to work for not only establishing decontamination technology but also constituting the society which can coexist with risks of radioactivity and the network of volunteers who has a certain level of expert knowledge.

Struggling for decontamination of Fukushima

災地の地域特性を調べ、地域に適した地震対策について研究しています。また、全国各地の地域型木造住宅の構造的特徴の違いを調べ、その特徴を反映した耐震性評価法と耐震補強法の研究も行っています。

1 Static loading tests of a frame of machiya in Kyoto (京町家の静的加力実験)

2 Structural survey of traditional wooden houses all over Japan (地域型木造住宅の構造調査)

1 Inside of Decontamination Plaza (除染プラザ内部)

2 Temporary storage yard of Onami area in Fukushima city (大波地区の仮置き場)
Resettlement Site of 1989, 1936 Sanriku Tsunami

Norio Maki
Associate Professor, Disaster Prevention Research Institute

田ノ浜の復興計画（出典:内務大臣官房都市計画課,三陸津波に因る被害都町村の復興計画報告書,1934）

Impacted area of the East Japan Earthquake Disaster is periodically hit by tsunami. After the 1896 Meiji Sanriku and the 1933 Syowa Sanriku Tsunamis, the impacted villages moved to the resettlement sites constructed in higher ground. Now those resettlement sites have a good landscape after 80 years. However, some resettlement sites suffered from devastating damage because of unexpected height of tsunami. And expanding residential areas in lowland from the resettlements were flashed away by the tsunami. People moved towards sea side for the lack of lands and seeking for easy access to the sea. Some people constructed new house when they get big money from a big catch. However, resettlement sites from the Meiji Sanriku stayed at higher ground and did not suffered from devastating damage. It is because new business opportunities were established along the national highway which was constructed at the higher ground. Now many communities impacted from the East Japan Earthquake Disaster have plan to move resettlements in higher ground. It is important to develop business opportunity at resettlement site to keep people in higher ground.

Effective Emergency and Recovery System in Water Sector including Lessons from the 2011 Tohoku Disaster

Nagahisa Hirayama
Associate Professor, Environmental Engineering, Graduate School of Engineering

In the 2011 Tohoku Disaster, an estimated damage to distribution pipeline system by seismic ground motions based on the experience of 1995 Kobe Earthquake was very high. However, the actual damage was found to be much less than the estimated one. One of the reasons could be the difference of earthquake mechanism between inter-plate earthquake and intra-plate earthquake. The fragility curves and damage estimation procedure might not appropriately model the 2011 inter-plate huge earthquake, indicating that the damage estimation modeling should be revised based on the 2011 events. Water works bureaus, organizations, and water professionals tried to establish emergency water supply system by tank vehicles for the tsunami stricken areas. However, the security of portable and sufficient water in the tsunami stricken areas should be more important to develop business opportunity at resettlement site to keep people in higher ground.
require the installation of temporary water purification facilities with the cutting-edge water treatment technologies including membrane filtration.

In order to establish risk/crisis management in water sector for super huge catastrophic disasters, now, we are going to promote the practice oriented research activities; the joint research project with Kobe Waterworks Bureau and LADWP (Los Angeles Department of Water and Power), and the activities of Kansai Research Community for Water in the Future, which organized the symposium and workshop entitled ‘Workshop on Lessons from the 2011 Tohoku Disasters for Water Supply Systems in Kansai District’ on Last March, 2012.

現在，東日本大震災の経験を踏まえ，神戸市，ロサンゼルス市電気水道局との共同研究，あるいは関西水未来研究会での「東日本大震災から学ぶ関西の水道がやるべきことシンポジウム・ワークショップ」を開催するなど，東海・東南海・南海地震等のスーパー広域災害に向けた水道事業体の災害対応や危機管理の構築に関して実践的な研究を進めています。

1. Comparison Results of Pipeline Damage Ratio in Japanese Experience (既往の地震災害における水管被害率の比較)
2. Temporary Water Recycling System in the Tsunami Stricken Areas (復旧期における応急的水循環システム)
3. Participants Involvements of Workshop on Lessons from the 2011 Tohoku Disasters for Water Supply Systems in Kansai District (東日本大震災から学ぶ関西の水道がやるべきことシンポジウム・ワークショップ)
The record rainfalls accompanying a number of typhoons that swept through the northern regions of Thailand from June 2011 caused extensive flooding in central Thailand, after which the floods spread throughout the basin of the Chao Phraya River that flows from Nakhon Sawan Province into the Gulf of Thailand, causing extensive damage in the provinces of Ayutthaya and Pathum Thani and northern Bangkok Province (Figure 1). I report here on the results of the survey of flood damage that the Global Center for Education and Research on Human Security Engineering for Asian Megacities (GCOE-HSE) carried out in mid-November 2011 while flooding was still in progress in line with its basic principle of “thoroughly field-oriented approach.”

As has been already reported, the factories of a great many Japanese companies suffered damage as a result of the prolonged flooding of Rojana Industrial Park and Nava Nakorn Industrial Park, located respectively in Ayutthaya Province and Pathum Thani Province to the north of Bangkok. Don Muang Airport (formerly Bangkok International Airport) was in time also disabled by floods that submerged its runways and aprons (Figure 1, Photo 2). The surroundings of Phahon Yothin Station, the furthest north of the stations of Bangkok’s subway system that opened in July 2004, were also submerged in about 50 cm of water as of November 17 during our study (Figure 1, Photo 3). However, because the stations and the tops of ventilation and air-conditioning shafts were designed to block the entrance of flood waters, the subway system continued to function almost normally and served as an important means of transportation for the people of Bangkok right through the record floods.

The Chao Phraya River’s basin in this area is notable for the shallow incline of the riverbed, and the fact that most of the basin is composed of low-lying land. For example, the area extending from the Gulf of Thailand to Ayutthaya approximately 100 km to the north is a low-lying plain with an altitude of no more than 3 m. Because the Chao Phraya basin is low-lying, it has a long history of flood damage. After the extensive flooding that occurred in 1983, a dyke was built and pump stations deployed inside it as countermeasures (Figure 2). Much of this dyke, which is known locally as the King’s Dyke, doubles as a road. These countermeasures were designed to protect central Bangkok within the dyke by deflecting floodwaters coming from the north to the east and west of the city. They were effective enough measures at that time when the most built-up areas lay within the dyke, and the areas outside the dyke served as a natural drainage basin. However, as a result of Thailand’s economic development since the 1980s, urbanized areas have expanded outside the dyke with the construction of residential districts and industrial estates, as a result of which disparities have emerged in the damage suffered by communities according to whether they lie inside or outside the dyke.
Flooding countermeasures in Bangkok since 1983

Flooding countermeasures in Bangkok since 1983

People destroying big bag barriers deployed to block flood waters from the North

Elevated expressway

The blue lines in Figure 4 are canals and agricultural water channels constructed mostly in the Meiji period (1868-1912), and it is owing to this network of waterways combined with the low lying aspect of the land that Bangkok has long been referred to as the Venice of the East. To protect against the recent floods, sluices on canals and other waterways were closed, and sandbags (known locally as “big bags”) were stacked along the outside edge of the King’s Dyke. However, land remained submerged in Pathum Thani Province and northern parts of Bangkok Province for a prolonged period. In Japan, floods generally recede within one or two days, but as mentioned above, because the Chao Phraya basin is low-lying across its area, floodwaters remain in place seemingly for ages unless pumps are used to drain them. As a result, people in areas outside big bag barriers have to put up with the reeking smell of static and increasingly stagnant water, while those on the inside of such barriers are able to lead life as normal in dry conditions.

It was owing to these circumstances that, as reported in Japanese newspapers and television, people living outside big bag barriers eventually joined each other in destroying some barriers (Photo 5). These people no doubt struck Japanese TV viewers watching such scenes as being totally lawless, but from our close-up perspective in the field, we could sense the difficulties involved in bridging the wide gap between the viewpoints of communities and individuals on the outside of big bag barriers who had to suffer for so long, and the government determined to protect the city center at all costs as the nation’s economic and political heart.

Another issue that illustrated the differences in perception between ordinary people and the government during the flooding was the way some people illegally parked their cars along flyovers and elevated expressways to protect them from floodwaters (Photos 6 & 7). This illegal parking along one or two lanes of such roads not only causes traffic jams, but might also lead to secondary disasters by preventing emergency vehicles from reaching their destination when called out. However, the fact is that compared with Japan, cars are luxury items in Thailand, and are accordingly regarded as valuable possessions by their owners.

Our survey of the flooding in Bangkok brought home to us the gap between the viewpoints of local communities and individuals on the one hand, and government on the other. It goes without saying that human security engineering is concerned with protecting rights from the perspective of the individual, but it should also concern itself with the protection of rights from the public interest perspective. Thailand needs to work swiftly to restore and rebuild infrastructure after the floods, but our survey suggested that issues arising from the differing perceptions of communities/individuals and the government are likely to emerge during the recovery process too.

http://www.bangkokpost.com/(As of Nov. 15)
This GCOE program has invited foreign researchers active in their respective countries in order to move forward in cultivating a cutting-edge research base formation system and a human resource development program for young researchers across the globe. Through joint cooperation with our own researchers, these visiting researchers have produced abundant research accomplishments. Additionally, exchanges with cutting-edge researchers have also contributed to the stimulation of our students' intellectual interest in academic activities as well as to the expansion of their interdisciplinary and international perspectives.

The number of visiting foreign researchers

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* The count number of FY2012 is summed up from April to December. (2012年度は4月〜12月までの合計です。)

List of visiting foreign researchers (GCOE-HSE)

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<th>Name</th>
<th>Affiliation</th>
<th>Country</th>
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<tr>
<td>Chatchai Ekpanyaskul</td>
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<td>2008.9.15 - 2008.9.21</td>
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<tr>
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<tr>
<td>Maisara Ali</td>
<td>Associate Professor, International Islamic University Malaysia</td>
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<td>Samer Madanat</td>
<td>Professor, University of California</td>
<td>The United States of America</td>
<td>2008.9.18 - 2008.9.24</td>
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<td>Hao Jiming</td>
<td>Professor, Tsinghua University</td>
<td>China</td>
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<td>Hu Hongying</td>
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<td>Zhang Xihui</td>
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<td>Qureshi Ali Gul</td>
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<td>Lalith Ramya Lal Wickramaratne</td>
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<td>Hao Jiming</td>
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<td>Bernard Tan Tiong Gie</td>
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<td>Dato Mohd Jamil Maah</td>
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<td>Nik Meriam Nik Sulaian</td>
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<td>Vaidya Chetan Kumar Vamanrao</td>
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</table>

* Only Graduate School of Engineering 4 departments (Civil and Earth Resources Engineering, Urban Management, Environmental Engineering, Architecture and Architectural Engineering)
Aiming for the proliferation and development of Human Security Engineering—a new academic field that goes beyond the borders of existing disciplines such as Civil Engineering, Architecture, Environmental Engineering, and Disaster Prevention Engineering, which have tended to progress on separate levels until now, this GCOE established a website (http://hse.gcoe.kyoto-u.ac.jp/) to announce its latest activities and use Kyoto University and its seven overseas bases as hubs to issue newsletters and distribute information throughout Asia and the world. In addition, brochures including area-specific activities were published in each overseas base to appeal to local students, practitioners, and researchers.

The website gave an overview of Human Security Engineering, provided reports of our activities in symposia and workshops, and introduced research fields and the research conducted by young researchers and PDs. This has greatly contributed to the proliferation activities of this GCOE program in Japan and overseas. The newsletter was issued quarterly.

### Website

- English Home Page
- Japanese Home Page
- Overseas Bases
- Events
- Overseas Training
Newsletter No. 1–No. 16
Serious Stories about Engineers

The big triangle in the HSE logo stands for "A" of Asia. Did you know that?

Yes, actually, it's "E" for engineering. So, the logo symbolizes the engineers tackling human security issues in Asia.

Well, let's keep it secret for a while. Why do you think so?

Actually, it's "E" in Japanese stands for "A" of Asia. Did you know that?

No, they are magicians! By turning them all in red. 70% of red ink in Japan is used for this.

Red ink in Japan is used for this creative work, especially by artists! It seems like a magic to me.

The big triangle in the HSE logo stands for "E" of engineering. It also represents the engineers tackling human security issues in Asia.

So, the logo symbolizes the engineers working in Japan.

Please note that the vertical line of the "E" is missing only for design purpose. We have no intention to say the engineers are worn out.

Yes, I have 4 more years to go, right? We have 4 years before graduation.

And sometimes we realize engineering other than HSE is also very important.

Well, let's keep it secret for a while. What are the three stripes on the triangle?

They are working! They are working! They are working! They are working!

Many of them are working! They are working! They are working! They are working!

Professors are working! They are working! They are working! They are working!

And sometimes we realize engineering other than HSE is also very important.

Welcome to HSE! Do you understand? The program is finally over.

We have 4 more years to go, right? We have 4 years before graduation.

And sometimes we realize engineering other than HSE is also very important.

Thank you, HSE! A funny punchline is planned here.

To be continued...
This summer, we put every effort to save energy.

"Hot, very hot!"

So, when we have a symposium, we have many complaints about air conditioner.

The air-conditioner isn't working.

Sorry.

Then, when we turn on the air conditioner, other people complain like this.

Too cold! We have to save energy!

Sorry, sorry.

So, when we have a symposium, we have many complaints about air conditioner.

Then, what about cancelling the symposium? I am pretty sure that this is just another way to make people angry.

I was looking forward to this for years!

In short, people get angry whatever I do. Hopefully, this is because it is too hot, and not my fault...

If you check your desk is intact when you come to your office, you think you travel too much.

If you have a warm welcome from your colleagues like this, I think you should stay on campus a little more.

Welcome to Kyoto University! How can I help you?

Well, I think I am working here...

I flew 200 times last month.

If you have this kind of conversation with your colleagues, you travel a little too much.

Some professors travel a lot by the nature of their research (hopefully).

I got one mega miles this year.

Wow!

But, if never happened! I realized sometimes people don't act as others expect. This may be one thing that human security engineering tells us.

I was ready to count how many times he would say "HSE" or "Human Security Engineering."

One of HSE faculty members went on TV. Live on air!

 kẻ talked and talked, and I was waiting and waiting... the magic word!

This is not the end of the revision process. You tend to have a "new" suggestion.

I think this is much better.

The magic of HSE is... Now, you realize this is the ultimate goal! I hope you will survive this thesis season.

The use of articles ("a/an" and "the") is one of the hardest parts in learning English. You get many corrections from your supervisor.

Sometimes, you'll have another suggestion in the second revision, to plural form. How nice!

Fix them up ASAP.

The magics of HSE, Looks very familiar!

Hot, very hot!

This summer, we put every effort to save energy.

Send the file or FD to FD, please.

Financial Data to Fire Department.

No, no. Faculty Development to Financial Division.

But, once you get used to them, they are very convenient.

HSE! (He saw an Elephant!)”

HSE? (He showed an evidence)

HSE!HSE! (She sold the elephant was heading to South East!)

This is another famous Kyoto vegetable, "Chinabari Radish." Good for pickles.

This is "Kamo Nasu." A Kyoto native eggplant.

Dr. Sasinko Seneviratne (HSE 2005)

Dr. Jongsu Koh (Hanumantakaram) (HSE 2006)

International Activities
People react to the word "Deadline" very differently.

You will be dead if you break it!

This is a Deadline Fundamentalist. Keep away from them.

There are two types of deadlines. Formal and "real" deadlines. Which one are you talking about?

Also, some people love breaking deadlines.

Deadline is something to break! Who cares?

Well, which one is close to your reaction? Me? I just hate it!

The problem is that I hit the "2" button wherever I go. Even when I am on the second floor!

Oh, no. I am on the second floor!

Boon!

Oh, I did it again...

My office is on the second floor. So, I hit the "2" button when I take elevator very often.

The situation is worse when you are in the lab.

Never ever hit the button "2" without really knowing what you are doing!

The end of project? What are you talking about?

Impossible! Exhausted!

I'm not. We can do it one more time (or more!!)

I'm really tired.

Here are some comments from the core faculty members of the HSE program at the end of project.

I'm really tired.

I'm not.

Check point #1: Some people are very sensitive to specific words.

Reviewer A: 
Accept
Reject

Comment

Never use the word "innovative." This is something readers will decide after publication.

Check point #2: Be careful when you challenge a well-accepted concept.

Reviewer B: 
Accept
Reject

Comment

What you call an innovate play is a "violation" for us. Without any evidence...

Check point #3: Some people may have done the same thing before.

Reviewer C: 
Accept
Reject

Why don't you just play rugby or American football?

Abstract

Don't you feel good if you can use your hands in soccer? ...........

No. 13

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No. 16

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GCOE-HSE Brochures

Kyoto University Global COE Program
"Global Center for Education and Research on Human Security Engineering for Asian Megacities" (English version)

京都大学グローバル COE プログラム
「アジア・メガシティの人間安全保障工学拠点」 (Japanese version)

京都大学全球 GCOE 項目
亚洲特大城市人员安全工程中心 (Chinese version)
Overseas Bases Brochures

- Shenzhen, China (English version)
- Shenzhen, China (Chinese version)
- Shenzhen, China (English version) Old version 1
- Shenzhen, China (Chinese version) Old version 1
- Shenzhen, China (English version) Old version 2
- Shenzhen, China (Chinese version) Old version 2
- Hanoi, Vietnam
- Singapore
- Bangkok, Thailand (English version)
- Bangkok, Thailand (Thai version)
- Bandung, Indonesia
- Bandung, Indonesia Old version
- Mumbai, India
- Kuala Lumpur, Malaysia
The IDRiM Society was officially launched on October 15, 2009 in Kyoto, Japan, at the 9th IIASA-DPRI Forum on Integrated Disaster Risk Management (IDRiM Forum). The move to set up the IDRiM Society was based on the success of a series of nine Forums (the IIASA-DPRI Forums) on Integrated Disaster Risk Management organized by the Disaster Prevention Research Institute (DPRI) of Kyoto University and the International Institute for Applied Systems Analysis (IIASA).

The main objective of the IDRiM Society is to promote knowledge sharing, interdisciplinary research and development on integrated disaster risk management contributing to the implementation of success models for efficient and equitable disaster risk management options. Furthermore, the IDRiM Society aims at promoting knowledge transfer and dissemination of information and concepts on integrated disaster risk management. To achieve these goals, the society is organizing annual conferences, issuing news letters and publishing an online journal.

The first annual conference (IDRiM2010) was held during 1st-4th, September, 2010 at the University of Natural Resources and Applied Life Sciences (BOKU), in Vienna, Austria. At this conference, more than 80 participants were gathered for the occasion and more than 50 speakers shared their research findings in the field of IDRiM including economic impacts, risk finance, poverty traps, disaster education, and information systems, as well as implementation science. The General Assembly meeting of the IDRiM Society was also held during the conference, and the Board of Directors and President of the IDRiM Society were elected. Professor Norio Okada, DPRI, Kyoto University, was elected as the first president of the Society.

The second annual conference (IDRiM2011) was held at the University of Southern California (USC) in Los Angeles, USA, on 14-16 July 2011. This conference was a memorial conference for the IDRiM Society because it was the first conference held in North America including the nine international forums held by IIASA and DPRI. About a hundred leading researchers and specialists were joined from 10 countries to share their research findings and opinions for improvement of integrated disaster risk management from the wide variety of disciplines at this conference. The third conference (IDRiM2012) will be held at...
Beijing Normal University on 7-9 September 2012.
The IDRiM Society is publishing the Journal of Integrated Disaster Risk Management (IDRiM Journal) from 2011. Two issues were published in 2011. You can access at the journal webpage: http://idrimjournal.com/. For the communication between members of the society, we are also publishing IDRiM newsletters. The newsletters provide the report of past conferences, and information about future conference, special issues and publication and so on. You can access at the IDRiM Society webpage: http://idrim.org/.

The IDRiM Journal (http://idrimjournal.com/) 1
1 IDRiM Newsletters (http://idrim.org/) 2

The Kyoto University GCOE program on “Global Center for Education and Research on Human Security Engineering for Asian Megacities” (GCOE-HSE) is one of the most important partners for IDRiM Society. The GCOE-HSE has been supporting the IDRiM Society’s activities since the beginnings of the society. For example, many researchers and students from GCOE-HSE made a significant academic contribution toward every conference. In the IDRiM journal, a special issue which is related to the GCOE-HSE activities are now planned. Together with the GCOE-HSE, IDRiM Society would like to contribute to establish world human security from the aspect of integrated disaster risk management.

- Hirokazu Tatano, Professor
  Research field leader, Disaster Risk Management

京都大学 GCOE プログラム「アジア・メガシティの人間安全保障工学拠点」(GCOE-HSE) は IDRiM Society にとって最も重要なパートナーの一つです。GCOE-HSE プロジェクトには、IDRiM Society の草創期から継続してその活動に対応する支援を継続していただいています。例えば、多くの研究者や学生諸君には現在までに開催されたすべての国際会議において重要な学術的貢献をしていただいています。また、IDRiM ジャーナルにおいても、GCOE-HSE プロジェクトに関連した特集号が企画中です。GCOE-HSE と共に、我々 IDRiM Society は、総合的災害リスク管理の側面から人間の安全保障を確立すべく貢献していきたいと考えています。

(多々納裕一 教授 災害リスク管理 研究領域リーダー)

1 Prof. Hirokazu Tatano, Kyoto University
2 Prof. Adam Rose, University of Southern California
In recent years, there have been increasing number of large-scale disasters (LSDs) occurring around the world, among which there have been some of the worst cases ever in history, e.g. the “3.11” Tohoku earthquake in Japan. The purpose of the conference was to promote discussion on integrated risk governance issues for large-scale disasters. Researchers in the field of disaster risk research from developed countries in North America, Europe, and East Asia and developing countries in Asia, Africa, and South America are invited to gather in Beijing to take part in this conference. Conference participants will spend three days engaged in intensive discussions on the scientific, technical, economic, financial, and educational issues regarding large-scale disasters. The ultimate purpose is to find new approaches to coping with natural disasters, indentify ways to fill the gap between science and implementation, and enhance collective decision making.

The IDRiM 2012 Conference was a great success. The three-day conference included two invited keynote speakers, two parallel sessions with the participation of well-known experts in various fields, 12 special specialized parallel sessions and a Young Scientist interactive poster session by young researchers. There were a total of 162 participants from 31 countries, of which 83 were from outside of China. The conference started with opening remarks from Prof. Fanghua Hao, Vice-President of Beijing Normal University and Prof. Norio Okada, President of the IDRiM Society. The opening remarks were followed by a keynote speech by Prof. Haresh Shah from Stanford University (United States) on Integrated disaster risk management. Highlights from the first day included a plenary panel session where invited experts presented arguments and promoted discussion regarding Critical Issues of Unprecedented Large Scale Disasters (LSDs), and the well-attended Young Scientists interactive poster session with more than 30 participants. Parallel session topics included risk assessment and modeling of LSD and new trends and development of disaster risk research; a session on models and management options for Natech risks and a session on monitoring, forecasting and early warning systems for LSDs. The first day finished with a reception and launching of the Global University Consortium for Integrated Risk Governance and Global Change with the participation of well-known experts in various fields, 12 special parallel sessions and a Young Scientist interactive poster session.

On the second day, the conference continued with a plenary session on multi-hazards planning and management of disaster recovery and reconstruction following LSDs. Parallel sessions covered topics such as multi-hazards and cascading effects, economic consequences of LSDs, and disaster preparedness and post-disaster governance issues based on lessons from Algeria, China, Japan and Taiwan. The conference was closed with a wrap-up and summary session on lessons learned and emerging issues from the conference. It was confirmed that next IDRiM 2013 conference will be held at Northumbria University in Newcastle, UK.
International Exhibition

International Conference on Sanitation Options in the Asia Pacific

Date: November 18 - 21, 2008
Venue: Horison Hotel Hanoi (40 Cat Linh street, Hanoi)
Host: International Water Association, South East Asian Water Utilities Network

This GCOE program participated in the international conference entitled Sanitation Options in the Asia Pacific (hosted by IWA and SEAWUN) held in Hanoi from November 18 to 21, 2008. One-hundred and thirty-five participants from a wide variety of backgrounds such as international institutions, research organizations, and administrative institutions representing Asian countries including Vietnam, Thailand, Indonesia, India, China, and Japan as well as many Western countries actively presented and discussed their research activities on sanitary problems in developing countries, which is one of the core areas of Human Security Engineering. Our GCOE gave a poster presentation and exhibited materials regarding the program. Participants from various countries came to see our posters, and the GCOE staff introduced the project and distributed nearly 100 copies of the program materials.

Domestic Exhibition

University Education Reform Program Joint Forum

Date: January 12 - 13, 2009
Venue: Pacifico Yokohama (1-1-1 Minato Mirai, Nishi-ku, Yokohama)
Host: Ministry of Education, Culture, Sports, Science and Technology (Higher Education Bureau, Office for University Reform), Bunkyo Kyokai

Members of this GCOE participated in the poster session on January 13 and the GCOE sectional meeting. Several dozen programs that were adopted this year participated in the GCOE poster session, where participants exchanged information about topics such as the management of their programs. At the GCOE sectional meeting, members of the GCOE programs adopted last year presented their achievements of the past year as well as those of the 21st century COE programs, the predecessor of the GCOE programs. While many presentations consisted of reports on research papers and patents, the presentations that included details about an enormous number of overseas students, the results of international exchanges, or the acquisition of a substantial amount of external funds had the strongest impact. And whereas the reports given by department heads for the most part emphasized already-published screening criteria, the words that had the most lasting impression were about the need to have a sound policy concerning what type of students to educate and to demonstrate that we have actually produced such students through the screenings (including midterm screenings).

International and Domestic Exhibitions

1. The Sanitation Options in the Asia Pacific Meeting
2. GCOE brochures exhibited at the conference

1. GCOE posters exhibited at the conference
2. Exhibition booth at the University Education Reform Program Joint Forum

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