

文部科学省 社会システム改革と研究開発の一体的推進 戦略的環境リーダー 育成拠点形成事業

EDL総括シンポジウム2013

— 真のグローバル人材育成に向けて —



EDL Wrap-up Symposium 2013

- Strategies to Develop Genuine Global Human Resources -

2014年 2月 13日(木), 14日(金)

会場：つくば国際会議場 2階中ホール
茨城県つくば市竹園 2丁目 20-3

主催：筑波大学環境ディプロマティックリーダーの育成拠点
Environmental Diplomatic Leader (EDL) Education Program
University of Tsukuba



University of Tsukuba



趣旨と目的

文部科学省・先導的創造科学技術開発費補助金・社会システム改革と研究開発の一体的推進による「環境ディプロマティックリーダー (EDL) の育成拠点」が 2009 年に開始され、2010 年度に第 1 期履修生を受け入れて以降、2014 年 3 月の第 6 期修士 7 名、博士 1 名まで、EDL (修士) 46 名、上級 EDL (博士) 9 名、計 13 カ国 55 名を輩出した。この間、我々は、専門能力 (Environmental Science and Technology)、外交力 (Diplomacy)、そしてリーダーシップ (Leadership) を身につけ、種々の地球規模課題に対峙し得る人材：EDL を育成してきた。その過程で幸いにも、学内関係組織はもとより、環境リーダー事業実施 17 大学、関係省庁・組織、海外連携機関、国際機関等による多大な協力、指導を賜ることができた。

2011 年度には、事業中間評価において EDL プログラムが最高位の S 評価を得、また、多くの客員教授ならびに外部評価委員等から、EDL 履修学生の総合的な質について、とくに俯瞰的理解力、説明力、討論力、ならびに真摯な姿勢等に関し、高い評価を得た。履修生への高評価は、プログラム関係者への最大の賛辞であり、また最も喜ぶべきものである。

海外インターンシップ等の活動を通じ、チュニジア、フランス、モンゴル、ベトナム、インドネシア、中国等各国・地域の政府機関・国際機関・研究機関等と、個別の環境問題解決の方策のみならず、地域固有の問題と国家政策ならびに地球規模課題の関係性、中央政府による施策と地方政府の執行上の課題、環境および持続性に関する高等教育に関する問題等、専門的かつ俯瞰的見地から議論し、連携できたことにより、EDL プログラム全体の質的向上が推進されたことも、大きな成果であった。

2013 年度には、環境リーダー事業実施 17 大学との連携において、本学が幹事校となり横浜国立大学、東京農工大学との共催により、環境リーダープログラム合同会議 2013 を開催することができた。当会議により、2012 年度において事業を終了した 5 大学を含め、各大学の事業遂行上ならびに終了後の継続上、有益な情報を交換するとともに、事業後の大学間連携の方策として、UNEP (国連環境計画) における環境および持続性に関する高等教育機関の国際的連携枠組みである GUPES (Global Universities Partnership on Environment and Sustainability) への 17 大学参画に向け合意が得られたことも収穫であった。

国際科学会議は、「グローバルな持続可能性」に向けた社会的転換を進めるために、科学に立脚した知識を産み出す統合研究計画としての “Future Earth” (2015 - 2025) を提唱しているが、その中で人材育成は重要なテーマの一つであり、国内外から 17 大学による環境リーダー育成の成果に対し期待が高まっている。

2013 年度末において、補助金事業としての EDL プログラムは終了するが、教育プログラムとしての EDL は、本学の生命環境科学研究科が中心となり推進する教育プログラム、Sustainability Science, Technology and Policy (SUSTEP) プログラムへ継承される。SUSTEP の育成人材像の根幹は、EDL におけるそれそのものであり、我々は責任を持って EDL において生み出した成果を継承、発展させ、真のグローバル人材を育成するとともに、国際的な地球環境・持続性統合研究の潮流である “Future Earth” にもしっかりと寄与していきたいと考えている。

本シンポジウムでは、EDL プログラムの成果を総括し、SUSTEP における教育上の課題のみならず、我が国の高等教育における環境・持続可能性教育、グローバル人材育成の課題を議論することを目的とする。

筑波大学環境ディプロマティックリーダーの育成拠点
プログラムリーダー

辺 村 真 貴

Objectives and Purpose

The Environmental Diplomatic Leader (EDL) Education program was launched in 2009 supported by Funds for the Integrated Promotion of Social System Reform and Research and Development from the Japanese Ministry of Education, Culture, Sports, Science and Technology. Since then, 55 EDL candidates, including March 2014 graduates have completed our program, consisting of 46 EDLs and 9 Senior EDLs from 13 countries. During this program, we developed EDLs, who gained specialized abilities in Environmental Science and Technology, Diplomacy and Leadership who can face various global challenges. During this process, we received enormous cooperation and guidance not only from relevant organizations on campus but also from 16 other universities undertaking similar projects, relevant ministries and agencies, overseas collaborative institutes and international organizations.

In 2011, our program earned the highest mark “S” in the midterm evaluation by MEXT and was regarded with high esteem by guest professors and the EDL external evaluation committees, pointing, in particular to our students’ abilities to grasp issues comprehensively, to describe, their debating skills and sincere attitude. This high esteem for our students is a great credit and the best compliment for faculty.

Through activities such as international internships to Tunisia, France, Mongolia, Vietnam, Indonesia, China etc., students had opportunities to discuss not only ways to address specific environmental issues but also relationships between localized problems and national policy/global issues, issues created by central government policies and enforcement by local government, issues related to higher education in environment and sustainability. These led to qualitative improvements promoted throughout the entire EDL program and contributed to our program achieving significant results.

In 2013 our university hosted the Joint Congress of Environmental Leader Program 2013 with 16 other universities participating in the MEXT International Environmental Leaders Training Program. Yokohama National University and Tokyo University of Agriculture and Technology were co-hosts. In a joint meeting at the Congress, we achieved consensus for joining GUPES (the Global Universities Partnership on Environment and Sustainability) and collaborate with 17 universities, including 5 universities that have already finished their 5-year projects. GUPES is an international coalition framework for environment and sustainability organized by UNEP and our participation will promote cooperation, exchange of valuable information among universities and will play an important role in maintaining close coordination between each university.

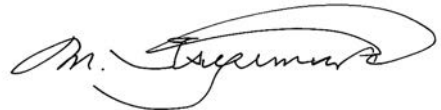
Furthermore the International Council for Science advocated “Future Earth” (2015 – 2025) as an international research initiative to produce knowledge based on science and the development of

human resources is one of its important aims and expectations are high for continued progress in the environmental leader training programs of the 17 universities.

The funds provided by MEXT for the EDL program will finish this March, however the EDL program will continue as the SUSTEP program, Sustainability Science, Technology and Policy and the Graduate School of Life and Environmental Sciences at the University of Tsukuba will play a central role in facilitating this program.

The nurturing of human resources that SUSTEP aims to achieve is the same focus as EDL and we accept responsibility to take over EDL's achievements, expand them and continue to develop genuine global leaders. We affirm our commitment to contribute to our Future Earth, which is the trend towards an international global environment and integrated research for sustainability.

In this symposium, we summarize the EDL program accomplishments and discuss not only issues in SUSTEP education but also higher education in environment/sustainability in Japan and issues in developing global leaders.

A handwritten signature in black ink, appearing to read 'M. Tsujimura', with a large, sweeping flourish extending from the end of the name.

Maki Tsujimura
EDL Program Leader

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■ プログラム Program

プログラム

2014年2月13日(木) 10:00 – 17:15

10:00 – 10:15 開会挨拶

EDL プログラムリーダー 辻村 真貴

10:15 – 10:45 2013年度EDL活動報告・在学生アンケート結果

EDL 専任准教授 孫 晁剛

10:45 – 12:00 2013年度インターンシップ報告(各15分)

	研修先	研修期間	
10:45	ケニア	8月26日～9月7日	Michael Assefaw Gebreslassie
11:00	インドネシア	9月1日～9月12日	Junping Liu
11:15	フランス・チュニジア	9月19日～9月27日	Nguyen Thi Tam
11:30	長崎・諫早・水俣	7月7日～7月10日	Jelena Aleksejeva
11:45	水俣ユニット	11月23日～11月27日	富松 幸亮

12:00 – 12:15 集合写真撮影

12:15 – 13:15 昼食

13:15 – 13:45 EDL履修生による口頭ポスター紹介(各1分)

13:45 – 14:30 ポスターセッションA : A1～A13

14:30 – 15:15 ポスターセッションB : B1～B12

15:15 – 17:05 EDL履修生による研究発表(各12分)

15:15	Utilization of Soybean Curd Residue for Polysaccharides Production by <i>Morchella Esculenta</i> and Evaluation of the Biological Activity	Shuhong Li
15:27	The Interaction between Shallow and Deep Groundwater in Baiyangdian Lake Watershed, North China Plain	Jie Zhang
15:39	Groundwater Recharge Processes in Tull River Watershed, Ulaanbaatar, Mongolia	Kohsuke Tomimatsu
15:51	Effect of Mg ²⁺ on Nitrification Capability of Aerobic Granules when Treating Synthetic Wastewater	Wenlong Wang
16:03	Analysis of the Benefits of Introducing an Integrated Solid Waste Management Approach in Developing Countries: Case Study in Kathmandu City	Singh Rajeev Kumar
16:15	The Application of Life Cycle Assessment towards Integrated Municipal Solid Waste Management in Gia Lam District, Hanoi City, Vietnam	Dinh Thu Hang
16:27	Informal learning and Practice of Indigenous Ecological Knowledge among Maasai Children in Kajiado County, Southern Kenya	Xiaojie Tian

- 16:39 Kathmandu's Attempts to Improve the Water Supply System: A Historical Analysis Banu Yasin
 16:51 In vitro and in vivo Anti-Diabetic Activity of Extracts from *Actinidia Kolonikta* Liu Yu

17:05 - 17:15 まとめ

2月14日(金) 10:00 - 16:40

10:00 - 10:05 挨拶

筑波大学学長 永田 恭介

10:05 - 10:15 来賓挨拶

文部科学省研究開発局環境エネルギー課環境科学技術推進官 木下 圭晃
 科学技術振興機構研究領域主管 山下 廣順

10:15 - 10:55 EDLプログラム5年間の総括 -1-

10:15 私はEDLから何を学んだのか？そして何をを目指すのか？

EDLプログラムリーダー 辻村 真貴

10:35 未来の環境リーダーにグローバルヘルスを教えるー垣根を越える必要性ー

EDL専任教授 若杉 なおみ

10:55 - 11:10 集合写真撮影

11:10 - 11:40 EDLプログラム5年間の総括 -2-

11:10 フィールドワーカーからフィールドインストラクターへ：EDL教員としての挑戦

EDL専任准教授 孫 暁剛

11:25 EDLでの2年間を振り返って

大阪府立大学准教授 遠藤 崇浩

11:40 - 12:45 修了生セッション：EDLで学んだことと現在の活躍

進行：大阪府立大学准教授 遠藤 崇浩

修了生アンケート結果報告

EDL専任准教授 孫 暁剛

修了生発表（各4分）

Anis Chekirbane（2013年3月上級EDL）

Yudi Setiawan（2013年3月上級EDL）

Zhao Yingxin（2013年7月上級EDL）

Otgonbayar Zagdraguchaa（2011年7月EDL）

白石 拓也（2012年3月EDL）

Pham Tien Dat（2012年7月EDL）

長濱 和代（2013年3月EDL）

Mahdi Khalil Ikhlayel (2013 年 7 月 EDL)

Syeda Masuma Khanam (2013 年 7 月 EDL)

意見交換

12:45 - 14:00 昼 食

14:00 - 15:00 基調講演

古代オリエント世界における地球規模課題

筑波大学学長補佐室長 池田 潤

15:00 - 15:15 休 憩

15:15 - 16:20 パネル・ディスカッション

国際的枠組みによる大学院における環境リーダー人材育成のあり方
ー地球規模課題解決のためのグローバル人材育成のためにー

パネリスト：

森 壮一 / 文部科学省研究開発局 研究開発分析官

池田 潤 / 筑波大学学長補佐室長, 人文社会系教授

若杉 なおみ / 筑波大学生命環境科学研究科 EDL 専任教授

Zhao Yingxin / 天津大学 School of Environmental Science and Engineering 助教

Pham Tien Dat / Center for Agricultural Research and Ecological Studies, -Hanoi University
of Agriculture 研究員

戸田 美紀 / 上級 EDL 履修生, 筑波大学生命環境科学研究科持続環境学専攻 (博士後期)

ファシリテーター：

辻村 真貴 / EDL プログラムリーダー, 筑波大学生命環境科学研究科持続環境学専攻長

16:20 - 16:25 閉会挨拶

筑波大学副学長 清水 一彦

16:25 - 16:40 集合写真撮影

Program

February 13 (THU), 2014 10:00 — 17:15

10:00 — 10:15 Opening

Maki Tsujimura / EDL Program Leader

10:15 — 10:45 EDL Program Activities 2013 - Voice from EDL Candidates

Xiaogang Sun / Associate Professor of EDL

10:45 — 12:00 Reports of International and Domestic Internship 2013 (15 min/each)

	<u>Destination</u>	<u>Period</u>	
10:45	Kenya	Aug 26—Sep 7	Michael Assefaw Gebreslassie
11:00	Indonesia	Sep 1—12	Junping Liu
11:15	France and Tunisia	Sep 19—27	Nguyen Thi Tam
11:30	Nagasaki, Isahaya, Minamata	Jul 7—10	Jelena Aleksejeva
11:45	Minamata Unit	Nov 23—27	Kohsuke Tomimatsu

12:00 — 12:15 Group Photographs

12:15 — 13:15 Lunch

13:15 — 13:45 Poster Introduction by EDL Candidates (1 min/each)

13:45 — 14:30 Poster Session A : A1—A13

14:30 — 15:15 Poster Session B : B1—B12

15:15 — 17:05 Oral Presentation by EDL Candidates (12 min/each)

15:15	Utilization of Soybean Curd Residue for Polysaccharides Production by <i>Morchella Esculenta</i> and Evaluation of the Biological Activity	Shuhong Li
15:27	The Interaction between Shallow and Deep Groundwater in Baiyangdian Lake Watershed, North China Plain	Jie Zhang
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- 16:27 Informal Learning and Practice of Indigenous Ecological Knowledge among Maasai Children in Kajiado County, Southern Kenya
Xiaojie Tian
- 16:39 Kathmandu's Attempts to Improve the Water Supply System: A Historical Analysis
Banu Yasin
- 16:51 In vitro and in vivo Anti-Diabetic Activity of Extracts from *Actinidia Kolonikta*
Liu Yu

17:05 – 17:15 Closing

February 14 (FRI), 2014 10:00 – 16:40

10:00 – 10:05 Opening Remarks

Kyosuke Nagata
President of University of Tsukuba

10:05 – 10:15 Opening Address by Invited Speakers

Yoshiaki Kinoshita
*Director for Environmental Science and Technology, Ministry of Education,
Culture, Sports, Science and Technology - Japan*

Kojun Yamashita
Program Officer of Research Domain, Japan Science and Technology Agency

10:15 – 10:55 A Summary of EDL Activities – 1 –

- 10:15 What Have I Learn from EDLs, and What do I Want to Achieve? – Perspectives as an EDL Program Leader –
Maki Tsujimura / EDL Program Leader
- 10:35 Teaching Global Health to Future Environmental Leaders – Necessity to Cross Borders –
Naomi Wakasugi / Professor of EDL

10:55 – 11:10 Group Photographs

11:10 – 11:40 A Summary of EDL Activities – 2 –

- 11:10 From Fieldworker to Field Instructor: My Challenge and Achievement as an EDL Teaching Staff
Xiaogang Sun / Associate Professor of EDL
- 11:25 My Two-year Experience in the EDL Program: A Reflection
Takahiro Endo / Associate Professor, Osaka Prefecture University

11:40 – 12:45 EDL Graduates' Session :

“What They Learned in the EDL Program and Current Career”

Chair: Takahiro Endo / Associate Professor, Osaka Prefecture University

Voice from EDL Graduates Xiaogang Sun / Associate Professor of EDL

Self-Introduction by EDL Graduates

Anis Chekirbane Senior EDL, March 2013

Yudi Setiawan Senior EDL, March 2013

Zhao Yingxin	Senior EDL, July 2013
Otgonbayar Zagdraguchaa	EDL, July 2011
Takuya Shiraishi	EDL, March 2012
Pham Tien Dat	EDL, July 2012
Kazuyo Nagahama	EDL, March 2013
Mahdi Khalil Ikhlayel	EDL, July 2013
Syeda Masuma Khanam	EDL, July 2013

Open Discussion

12:45 — 14:00 Lunch

14:00 — 15:00 Keynote

Global Issues in Ancient Near East

Jun Ikeda

*President Office Chief of Staff, Professor
Faculty of Humanities and Social Sciences, University of Tsukuba*

15:00 — 15:15 Break

15:15 — 16:20 Panel Discussion:

“How We Should Develop Environmental Leaders within International Framework
– Towards fostering human resources to solve global issues –”

Panelists:

Soichi Mori

Senior Policy Analyst for Research and Development, Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Jun Ikeda

President Office Chief of Staff, Professor, Faculty of Humanities and Social Sciences, University of Tsukuba

Naomi Wakasugi

Professor of EDL, Faculty of Life and Environmental Sciences, University of Tsukuba

Zhao Yingxin

Assistant Professor, School of Environmental Science and Engineering, Tianjin University

Pham Tien Dat

Center for Agricultural Research and Ecological Studies, Hanoi University of Agriculture

Miki Toda

Senior EDL Candidates, Doctoral Program in Sustainable Environmental Studies, Graduate School of Life and Environmental Sciences, University of Tsukuba

Facilitator:

Maki Tsujimura

EDL Program Leader, Chair of the Doctoral Program in Sustainable Environmental Studies, University of Tsukuba

16:20 — 16:25 Closing Remarks

Kazuhiko Shimizu

Vice President of University of Tsukuba

16:25 — 16:40 Group Photographs

■ 基調講演 Keynote

古代オリエント世界における地球規模課題

池田 潤

筑波大学学長補佐室長，人文社会系教授

文明は古代メソポタミアに始まり、地球規模課題もまた古代メソポタミアに始まったことが知られる。たとえば、王碑文やギルガメシュ叙事詩には、メソポタミアの王たちが木材を求めて遠征を繰り返すことが記録されている。

乱伐の結果、有名なレバノンスギの森は消滅し、現在ではごく一部の地域に小規模に残存するのみとなった。楔形文字で書かれた粘土板文書や旧約聖書をひも解きながら、文明の黎明期における地球規模課題を論じる。

- 経歴
- 1983年3月 筑波大学第一学群人文学類卒業
 - 1986年3月 筑波大学大学院博士課程文芸・言語研究科文学修士
 - 1995年7月 テル・アビブ大学大学院博士課程文化科学研究科博士
(言語学)
 - 1996年4月 関西外国語大学 外国語学部 助教授
 - 2000年4月 筑波大学 文芸・言語学系 講師
 - 2003年4月 筑波大学 文芸・言語学系 助教授
 - 2004年4月 筑波大学大学院 人文社会科学研究科 助教授
 - 2007年4月 筑波大学大学院 人文社会科学研究科 准教授
 - 2009年4月 筑波大学大学院 人文社会系 教授、現在に至る
 - 2013年4月 筑波大学 学長補佐室長、現在に至る



- 受賞歴
- 江上波夫記念流沙海西奨学会賞 (1995年)
 - 日本オリエント学会奨励賞 (1996年)

- 主な著書
- P. C. クレーギー『ウガリトと旧約聖書』(教文館) 1990年4月 (共訳書)
 - D. コロン『古代オリエントの印章』(学芸書林) 1998年1月 (訳書)
 - 『ヘブライ語のすすめ』(ミルトス) 1999年4月
 - P. ジョンソン『ユダヤ人の歴史』(徳間書店) 1999年9月 (共訳書)
 - 『ユダヤ教思想における悪』(晃洋書房) 2004年6月 (共著)
 - P. ビエンコウスキ他『古代オリエント事典』(東洋書林) 2004年7月 (共訳書)
 - 『楔形文字を書いてみよう読んでみよう—古代メソポタミアへの招待』(白水社) 2006年3月
 - 『ヘブライ語文法ハンドブック』(白水社) 2011年8月
 - その他論文等多数

Global Issues in Ancient Near East

Jun Ikeda

President Office Chief of Staff,

Professor, Faculty of Humanities and Social Sciences, University of Tsukuba

Civilization started in Ancient Near East, and so did global issues. For instance, royal inscriptions and the epic of Gilgamesh testify to repeated expeditions by Mesopotamian kings in search of timber, which caused deforestation of cedars of Lebanon with only small remnants of the original forests surviving. Various global issues at the dawn of civilization will be discussed based on cuneiform documents and the Old Testament.

Academic background:

- 1979-1983 College of Humanities, University of Tsukuba, Japan B.A. in Humanities, 1983
- 1983-1986 Graduate School of Literature and Linguistics, University of Tsukuba, Japan M.A. in Linguistics, 1986
- 1986-1995 Shirley & Leslie Porter School of Cultural Studies, Tel Aviv University, Israel Ph.D., 1995



Professional career:

- 1996-2000 Associate Professor, Department of Foreign Languages, Kansai Gaidai University
- 2000-2003 Assistant Professor, Institute of Literature and Linguistics, University of Tsukuba
- 2003-2009 Associate Professor, Institute of Literature and Linguistics, University of Tsukuba
- 2009 to date Professor, Faculty of Humanities and Social Sciences, University of Tsukuba
- 2012 to date President Office Chief of Staff, University of Tsukuba

Dr. Ikeda has been teaching descriptive linguistics, comparative linguistics, Hebrew and Akkadian among others at College of Humanities, Master's Program in Area Studies and Doctoral Program in Literature and Linguistics, and received a Best Faculty Member Award in March 2013. Dr. Ikeda authored four books on Semitic languages and published over fifty papers and articles based on his solid philological work as well as laboratory experiments, and fieldwork in Ethiopia. Dr. Ikeda is a member of Linguistic Society of Japan, Society for Near Eastern Studies in Japan (director, editor-in-chief), the Japan Experimental Linguistics Society (director, vice president), Japanese Association for Digital Humanities, and International Association for Assyriology among others.

■ EDL プログラム 5 年間の総括 A Summary of EDL Program Activities

「私は EDL から何を学んだのか？そして何をを目指すのか？」

辻村 真貴

EDL プログラム・リーダー，筑波大学生命環境系教授

2009 年に EDL が開始された頃、私は単なる水文学専門の大学教員に過ぎなかった。私の知識は、今でも大して多くはないが、当時は水文学の中でも、ほんの狭い分野に特化していて、俯瞰などという能力からはほど遠い状態であった。EDL プログラムの申請文書を作成したという経緯から、プログラム・リーダーに選ばれたものの、開始当時の私には、その資格も能力も全くなかったと言って良い。

私の狭い視野を啓いてくれたのは、間違いなく、EDL プログラムの同僚教員、そして客員教授の方々である。

若杉教授は、私の専門の水循環・水資源が、いかにグローバル・ヘルスと関係が深いのか、否、私のような水研究者・教育者がグローバル・ヘルスを学ぶことがいかに重要かを教えてくださった。私が、何とかプログラム・リーダーとしての体裁を保ってこられたとすれば、それは若杉教授との出会いがあったからである。

遠藤准教授（現 大阪府立大学）、孫准教授からは、水問題の真の解決には、科学的理解だけではなく、政策・システムの深い理解と革新が必要不可欠であること、地域における水問題の解決には、地域固有の伝統習や文化への理解がきわめて重要であることを、教えて頂いた。

UNICEF 東京事務所代表の平林国彦博士は、EDL 特講の中で、医師でもあるその経験と具体的なデータを基に、「環境リスクを解決することにより、400 万人の子供達を死から救うことができる。地球上で年間 120 万人が大気汚染により、220 万人が水質汚染により、350 万人が食糧不足により、そして 1200 万人が感染症により命を失われている。」と指摘をされた。私はこの講義で、環境問題の解決が人の命を救うことに直結していることを、深く認識させられた。

東京大学客員教授の丸山康樹博士は、環境問題の本質がエネルギー問題の中に現れていることを明示し、私の眼を啓いてくださった。

College of St. Benedict and St. John's University の Joseph DesJardins 教授は、その包容力と情熱のあふれる講義の後で、履修学生の受講姿勢を高く評価し、わざわざ来日し本講義をできることの喜びを厚く語ってくださった。

UNESCO 前事務局長の松浦晃一郎博士は、中間および最終年度外部評価委員会の中で、EDL プログラムが履修学生の幅を着実に広げ進展してきたことを高く評価し、事業終了後もプログラムをしっかり継続していくよう訓示された。

さらに、環境リーダー育成事業を推進してきた 17 大学の仲間達と協同で創りあげた、「環境リーダープログラム合同会議 2013 予稿集」が、今後 10 年の環境・持続可能性に関する国際的統合研究プラットフォームである“Future Earth”に関する報告書（文部科学省研究開発局・森 壮一研究開発分析官：「科学コミュニティと現実社会の関係を再考する」第三報告書『フューチャー・アースに関する調査研究』に引用されたことは、我々のプログラムが、我が国の環境人材育成の一翼を担っていることを明確に示したものであり、勇気づけられた。

さて、EDL プログラム 5 年間を総括し、履修生に対し何を教育してきたかを、深い洞察と学識に基づいて考究し今後の展望を明確に示すことが本セッションの本来の目的であるが、私自身、教育して

きたというより、本プログラムの遂行を通じて学んできたというのが真実である。したがって、本セッションのプレゼンテーションにおけるまとめとしては、私自身の今をさらけ出し、聴衆の皆さんに見て頂く以外にない。人材育成目標としての主要項目、科学技術力、外交力、リーダーシップを私自身が5年間でどこまで身につけることができたか、皆さんの判断にゆだね、さらに、今後も、国際的視野を持ってグローバル・リーダーの育成に尽力することを各位の前で誓うことが、私が今できる最善の表明である。

最後に、EDL 修了生、履修生の皆さんには、どうか、私の姿勢から、EDL として不足している部分、足りない部分を見つけ、各自の参考にして欲しい。私が今、皆さんに自信を持ってなし得る最大そして唯一の教育は、反面教師としてのそれである。

What Have I Learned from EDLs, and What do I Want to Achieve? – Perspectives as an EDL Program Leader–

Maki Tsujimura

EDL Program Leader, Professor, Faculty of Life and Environmental Sciences, University of Tsukuba

I have learned an importance of comprehensive view and deep understanding of environment and sustainability to solve global issues by organizing EDL program as a program leader, since it was launched in 2009.

It was definitely my fellow teachers and visiting professors involved in the EDL program who broadened my narrow point of view.

Professor Wakasugi taught me how important it is for a researcher on water and educator like me to study global health, rather than simply studying how closely my specialization in the water cycle and water resources is related to global health. My encounter with Professor Wakasugi has allowed me to cope as an EDL program leader.

Associate Professor Endo (currently teaching at Osaka Prefecture University) and Associate Professor Sun taught me that a deep understanding of policies, systems and innovation besides scientific understanding is indispensable for actually solving water problems, and that it is crucial to understand the traditional wisdom and culture in order to solve regional water problems.

Dr. Kunihiko Hirabayashi, who is the representative of the Tokyo Office of UNICEF, pointed out in his special lecture on EDL, on the basis of his experience as a doctor and other data, that “Solving environmental risks will save four million children from death. Worldwide, air contamination kills 1.2 million people, water pollution 2.2 million people, food shortage 3.5 million people, and infection 12 million people annually”. His lecture hammered home the point that solving environmental problems is directly linked to saving human lives.

Dr. Koki Maruyama, who is a visiting professor of the University of Tokyo, clearly showed me that the essence of environmental problems can be found in the energy problem.

After delivering an impressive and inspiring lecture, Professor Joseph DesJardins of College of St. Benedict and St. John’s University evaluated highly the attitude toward learning of the students enrolled in the course and showed his appreciation for being given the opportunity to come to Japan to deliver the lecture.

Dr. Koichiro Matsuura, former secretary-general of UNESCO, was pleased to note that the EDL program has made progress by increasing the variety of enrolled students in the external evaluation committee for the interim and final year, and expressed his hope that the program will continue to develop steadily even after the project ends.

In addition, the proceedings of the Joint Congress of Environmental Leader Program 2013, which was held with colleagues from 17 universities who have been working on the environmental leader development project, were quoted in the “Survey Research on Future Earth”, which is the third report of “Reconsideration of the Relations between the Scientific Community and the Real World” written by Soichi Mori, a senior researcher and development policy analyst affiliated with the Research and Development Bureau of the Ministry of Education, Culture, Sports, Science and Technology. This report describes the “Future Earth”, and is an integrated research platform for the environment and sustainability for the next 10 years. All of this greatly encourages us because it clearly indicates that our program is playing a role in developing human resources in the environmental field.

The main objective of this session is to summarize the five years of the EDL program and clarify what we have taught students on the basis of deep insight and wisdom, and to outline the prospects for the future, but the fact remains that I myself have learned much throughout the program instead of actually teaching. Accordingly, I hope that you will judge me based on the targets of human resource development, namely, scientific ability, diplomatic ability, and leadership. I will continue to do my best to develop global leaders while maintaining an international viewpoint among other experts.

Lastly, I sincerely hope that both students who have finished and those who are still undergoing the EDL program will exceed me and improve to be a real Environmental Diplomatic Leader.

Teaching Global Health to Future Environmental Leaders –The necessity to cross borders–

Naomi Wakasugi

Professor of EDL, Faculty of Life and Environmental Sciences, University of Tsukuba

Thirty thousand km..., is the distance I have driven from my home in Tokyo to come to Tsukuba University to teach in the EDL program during the last 4 years. This long distance touched me and I feel now that these 4 years have passed just like a few months, I thought however that this distance must be much less than the distance between my students' countries and Japan. To my surprise, the longest stretch is from Tunisia, ten thousand km from Japan and the shortest is from China (Beijing) two thousand km from Japan. The world is globalizing and shrinking. I feel very happy that we could meet here in Tsukuba, each of us overcoming respective geographical distances and spend time together in a very intimate atmosphere. This encapsulates one Japanese expression, "Ichigo Ichie "(One meeting, One opportunity), which means, "every encounter is a unique, once only opportunity of a lifetime".

Environmental study is a newly constituted academic area and very promising and exciting. It is attracting world interest and becoming one of the main objectives of international society as you heard in the discussion on SDG (Sustainable Development Goals) as a post-MDG world goal.

Facing such strong expectations, what is required for new environmental study? I would like to suggest the necessity to "Cross Borders". Environmental issues should be tackled by crossing three borders. One is the border of country. In other words, becoming International/Global in outlook. It is clear that there is no national border for environmental issues. Air, sea, birds, viruses and so on do not recognize national borders. We really need to act internationally and globally now. The second border to cross is between natural science and social science. In other words, we must facilitate multi-disciplinarity. Classical environmental study has been mainly based on natural science and dealt with nature as just an object of research. However in order to solve crucial and urgent global problems such as, population, food, water, energy, climate, pollution and human health, environmental study is required to cross the border of academic disciplines. Economics, Politics, Sociology, Ethics, Psychology, and Medicine etc. should be included in addition to basic natural science and together with scientific results should be translated into good environmental policies. The third is the border between on site- field and laboratory and office desk. Similarly to this, we need to have both a Bird's eye and Insect's view, or "Think globally Act locally". We cannot work well without knowing reality, the real problems taking place in the field. So we should not hesitate to go out of our laboratory or office.

Teaching global health to future environmental leaders in the EDL program was therefore exciting and meaningful for me. Global health study is also a new area compared to traditional medicine or country specific public health. It is international/global, multidisciplinary and field-based. Furthermore, everyone might agree that human health and environment are inseparably related. In general people feel Medicine is something far from them and difficult to understand despite that our body is the nearest aspect of nature to us. That is why the objective of my class was not to teach medicine but to teach students to grasp and understand the actual situation and the problems of people's health in the world in connection with global environmental issues. I taught Poverty, Development, Population, Gender, Sustainability, Pollution, Health system/policy in addition to aspects of diseases such as global infectious diseases AIDS, Malaria etc. and water related diseases. EDL special lectures (I, III; Meet the leaders) and intensive lecture on Environmental Ethics and PCM workshop, all of these I organized and offered to students based on the same idea and same objective. I hope I could contribute towards your progress as a true Environmental Leader.

Finally I deeply wish all of you a very meaningful and delightful future. Bon voyage!

From Fieldworker to Field Instructor: My Challenge and Achievement as an EDL Teaching Staff

Sun Xiaogang

Associate Professor of EDL, Faculty of Life and Environmental Sciences, University of Tsukuba

My major is ecological anthropology and African area studies. Before came to Tsukuba, all my passion and interests were to conduct fieldwork in rural Africa. When I joined the EDL Program five years ago, I realized that just sharing my experience and research findings with students was not enough. Through discussing with other professors on the principle of the EDL and receiving suggestions and comments from them, I found out what I could contribute to the program. I should try my best to help students of other scientific disciplines learn the right attitude and practical skills of fieldwork, which they can apply not only in research but also in future works. I would like to summarize my challenges and achievements through three activities: Cultural Ecology course, international internship, and EDL Debate.

The aim of Cultural Ecology course was to help students have a **holistic** understanding on the interaction between human and nature; to find out the **reality** of local society, the essential of environmental problems, and local adaptive strategies through fieldwork, and to think how to **integrate** local knowledge and adaptive strategy with scientific technology for sustainable development. To achieve these, I not only introduced three ecological anthropological perspectives on global environmental issue, which are historical ecology, cultural ecology, and political ecology, but also provided first hand data and case studies to explain the complexity and dynamics of global and local environmental problems.

International internship is regarded as the best practice of fieldwork. Before the internship, pre-study seminars are held and students are asked to collect information and give presentations on the topics they are interested in. During the internship, students are asked to examine current conditions, understand the reality for local people, and learn directly from specialists who are dealing with these problems. After internship, students work on the final report. Through the whole process, students not only experience real field, but also learn how to establish a research project to study environmental problems they faced.

EDL Debate was an idea coming from EDL students. Several controversial issues, such as nuclear power plant problems, human population problems, and CBDR on global warming have been discussed in the past four years. I strongly believe it both helped students have a broader and deeper understanding on current environmental issues, and improved their English talking and debating ability.

My Two-year Experience in the EDL Program: A Reflection

Takahiro Endo

Associate Professor, College of Sustainable System Sciences, Osaka Prefecture University

I was engaged in the EDL program as an associate professor from 2009 to 2011. Reflecting on those days, it seems EDL was a big experiment to establish an education model for environmental problems. At least a decade has passed since the necessity for a new educational model was advocated which deals with the natural sciences as well as the social sciences to solve environmental problems. EDL has provided an answer to this issue by creating a unique curriculum which balances and combines class education to teach theories with field education to pay attention to practical solutions.

Despite my short engagement, the EDL program reminded me how important it is to have skills and knowledge in a specialized field to facilitate education in an inter-disciplinary subject such as environmental management. To put it differently, it is expected that every researcher has one foot in their own specialized field and the other in different fields.

Second, discussion with international students gave me the incentive to learn the history of environmental policies in Japan more deeply. In my lecture, I could not give good answers to questions international students asked on environmental policies in Japan. In reflection, I am now engaged in a lecture that deals with environmental policy in Japan with special reference to water management policy.

Lastly, the EDL program gave me an opportunity to re-think the importance of human networks. Needless to say, the knowledge and information one man can have is limited. Increasing my own knowledge is important, but knowing someone who has different skills and knowledge I don't have is sometimes much more important.

For example, in the EDL seminar, I could learn directly from many high-ranking specialists and policy makers thanks to the personal network of Professor Wakasugi Naomi and other faculty staff. That was a great experience for me. In addition, with the assistance of Mongolian researchers introduced by Professor Tsujimura Maki, Associate Professor Sun Xiaogang and I could organize a field trip to Mongolia where we studied groundwater problems with students from Bangladesh, China, Kyrgyz, Indonesia, Japan and Vietnam. Who could ever imagine such a class ten years ago? Lastly, I would like to say these programs could not have been achieved without excellent office staff, Ms. Morikawa Rie and Takeuchi Michiyo.

Human networks established in the EDL program are not visible or tangible. It is, however, an asset without doubt. It is asset shared by the University of Tsukuba, Japan and international students' mother countries. However this asset will be diminished and disappear very soon if we stop using it. How we keep this social network workable remains to be solved.

■ 2013年度 EDL 活動報告 Activities of EDL Program 2013

Activities of the EDL Program in 2013 and Voice from Candidates

Sun Xiaogang

Associate Professor of EDL

Faculty of Life and Environmental Sciences, University of Tsukuba

The academic year of 2013 is the fifth and the last year of the EDL program. In April 2013, we had 10 new students from five countries joined the program. In July 2013, 10 candidates from the Master's course and 4 senior candidates from the Doctoral course graduated. We are looking forward to another 8 candidates who will graduate in March 2014. Most of the activities of this program, such as the training courses, International Internships to Kenya, Indonesia, France and Tunisia, and Domestic Internship to Nagasaki and Minamata, EDL special seminars, PCM workshops, and the EDL café and debate have been successfully accomplished. At the annual symposium, I will first review all the activities in 2013, and then report the suggestions and comments from the questionnaire answered by the EDL students. I hope this may help us make more progress in our future works.

■ インターンシップ報告 Report of Internship 2013

Kenya Internship (August 26 – September 7, 2013)

Students: Michael Assefaw Gebreslassie, SHI Wansheng, KOYAMA Nika, LU Mengqian, Pham Thi Thanh, MIKI Yurisa, Khonsavanh Vilaysack, Vo Thu Thi and Philip Temulun.

Supervisors: Dr. SUN Xiaogang and Dr. Rie Murakami-Suzuki

The EDL internship to the Republic of Kenya took place during the summer of 2013 and focused on environmental conservation, economic development and community-based environmental activities. The group included two professors and nine graduate students of the University of Tsukuba. Before traveling, we undertook a thorough literature review on several topics that included nature conservation, climate change, environmental problems, environmental education, community based conservation, ecotourism, cultural diversity, economic development and urbanization.

Kenya is an East African country known as ‘Safari Capital’ of the world. Famous for its natural environment especially wildlife and savanna grasslands, the country is characterized by diverse topography composed of highlands, lake region, rift valley, coastal region and drylands. Filled with excitement and wonderful taste of nature, our internship started in the beautiful and fast growing city of Nairobi. During the first day, we were able to recognize lively economic transactions, higher rates of urbanization and associated problems in the capital city. There is high traffic congestion in the city and this would inflict negative impacts on national development.

The Department of Geography and Environmental Studies hosted us during our visit to the University of Nairobi. The Professors of the department delivered presentations related to biodiversity, population growth and urbanization in Kenya and students of the same department guided us during our tour of Nairobi.

In the following day, we visited UNEP (United Nations Environment Programme) headquarters office. The EETU (Environmental Education and Training Unit) of the UNEP presented different papers regarding the mission of UNEP, climate change, adaptation programs and sustainable environmental development.



Photo: EDL Kenya internship group with EETU staff at UNEP headquarters office

An extended discussion was conducted between students and several environmental practitioners. The significance of environmental diplomacy and ecosystem based adaptation programs were highlighted in order to minimize negative impacts of climate variability. Adjacent to UNEP is a splendid forest known as Karura. Gazetted in 1932, the forest is one of the largest forests located within an urban center. Karura forest was previously a venue for serious crime. However, relentless efforts begun by Prof. Wangari Maathai and then coordinated by the Kenya Forestry Services, the forest became a city-based green-lung. Thus, we were able to learn the challenges of such a forest due to its location within a city and the progress in sustaining its very existence. We enjoyed the breathtaking beauty and cleanliness of the forest, its waterfalls and the late Wangari Maathai’s corner.

On the third day of the internship, we went to the Kenya Wildlife Services headquarters and we were privileged to have an extensive explanation about wildlife in Kenya. Though Kenya is one of the wildlife rich countries, it is not without challenges. Habitat fragmentation and loss, human-wildlife conflict, poaching, diseases and irresponsible tourism are the main problems threatening wildlife in Kenya. Some of the ongoing efforts include raising public awareness, strengthening management and control, technology-supported wildlife tracking and coordinated wildlife research. On the same day, we went on an awe-inspiring safari walk in Nairobi National Park where a number of wild animals are kept viz: lion, rhinos, zebra, leopard and others.

We moved to Amboseli located in the Southern part of Kenya along the border with Tanzania. Amboseli is known as one of Kenya's 'conservation jewels'. The region includes Amboseli National Park and six group ranches. The region is endowed with a spectacular panorama naturally decorated with wildlife diversity and grasslands. It holds a significant location close to Mt Kilimanjaro and Tsavo ecosystem. During our stay in this region, we observed Amboseli National Park, Kuku group ranch, Maasai cultural village and visited Amboseli National Park headquarters. We undertook practical vegetation rehabilitation surveys and land-use mapping under the guidance of ecologists and geographers. We experienced wildlife observation and telemetry-supported lion monitoring inside the national park. The field work clarified the complex linkages between different components of environment where the biotic, hydrological, topographic and human activities interplay to survive.

We were honored to visit a Maasai village where cultural demonstrations were presented. The group members were able to interview the local people about different issues related to the environment and livelihoods. Later on, as we visited the branch of African Wildlife Fund at Namanga, we were able to understand the necessity of land-conservancies to allow access to land for wildlife. As part of land conservancies, safe implementation of ecotourism, environmental education and community development is practiced.



Photo: Elephants in Amboseli National Park backed by Mt Kilimanjaro

Towards the end of the internship we returned to Nairobi and every member presented findings during a workshop held at JSPS Nairobi Research Center. We visited a number of sites with diverse geographic settings. The fast rate of urbanization adds to pollution and traffic congestion which is an impediment to sustainability. Land-use changes result in a complex set of environmental problems and blockage of wildlife movement. Hence, the group came to the conclusion that Kenya has been working to protect its natural environment. However, conservation needs to be prioritized and better management procedures should be applied in order to achieve sustainable development. The efforts to

minimize society's vulnerability to natural hazards and climate change can lead to socio-economic and environmental benefits. Thus, the internship added to our knowledge of environment and geography, and helped us to understand another culture. Furthermore, the internship presented a wide array of environmental challenges and possible mitigation measures in the developing world.

Key words: Environmental conservation, forest, wildlife, urbanization, environmental education, ecotourism, community based conservation, environmental education.

International Internship in Indonesia (September 1-September 12, 2013)

Supervisors: Dr. Naoko Kaida, Dr. Norifumi Hotta

Participants: Liu Junping, Tran Dang An, Naoyuki Shibayama, Mariko Furukawa, Haruka Tsunetaka, Tomoharu Kubo

The hydrogeological and sediment investigation of Mt. Merapi area, Java Island, Indonesia, are described in this report.

The hydrogeological investigation was carried out by studying the characteristics of the hydro-chemistry of surface water and spring water in the volcano region, which is directed towards regulation and development of Yogyakarta's water resources.

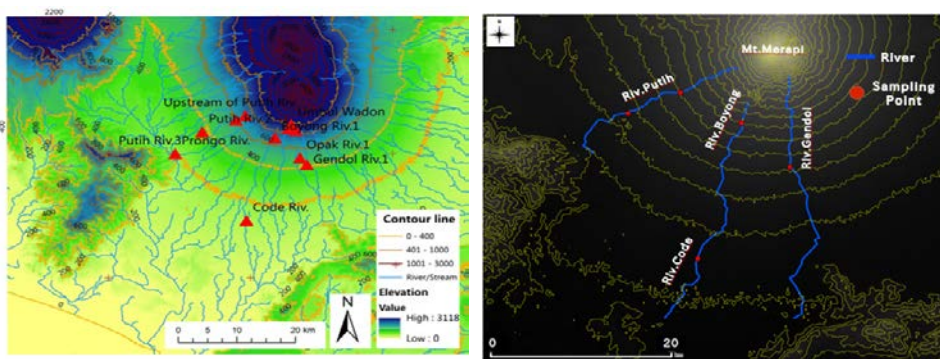


Fig 1 Sampling points in Mt. Merapi area

The sampling area is located in the river basins surrounding Mt. Merapi, at an elevation of 200m-1000m asl (Fig 1) and impacted by pyroclastic volcanic sediment. Water composition was undertaken by analysis of samples from both springs and rivers, and hydrochemical analysis was used to evaluate the quality of groundwater and river water to identify the evolution and influences from the sediment. River water discharge containing sediment from the Mt. Merapi eruption was also investigated. The quality of surface water and groundwater, hydrology processes, and sediment impact were all obtained, and may provide some information for water research on tropical volcanic regions.

Water and sediment management was also studied in this internship (Fig 2). The main water resources in this region are spring water, upstream groundwater and surface water downstream. The main threats to water source sustainability are volcanic eruption products such as volcanic ash, lava flow coupled with increasing water usage, disposal of chemicals to land surface, discharge of wastewater and waste into rivers. Sediment processes, especially lava flow results in much damage to the environment and human life in this region, however it also provides many valuable benefits for people in Yogyakarta. Suggestions about water management and necessary measures related to sediment management were also given.



Fig 2 Sand mining and water transportation in Mt. Merapi area

Day1 (2nd September): Visited UGM (University of Gadjah Mada), located in Yogyakarta, had a lecture about the eruption of Mt. Merapi and effective utilization of volcanic ash for soil improvement from MPBA. Presentations on our research topics and pre-study about Mt. Merapi.

Day2 (3rd September): Had a lecture about data processing techniques and how to use statistics and numerical methods effectively. Undertook field survey upstream and mid-stream of the Putih River.

Day3 (4th September): Had a lecture about water management by a government officer, who belonged to PAMDes (Paguyayuban Air Minum Desa), undertook field survey upstream of the Kuning river and visited Kinahrejo village which was seriously damaged by volcanic eruption in 2010.

Day4 (5th September): Undertook field survey of the Gendol River, Opak river, and downstream area of the Putih River and Prongo-Putih confluence.

Day5 (6th September): Visited the batik factory near the Code River and watched the production processes of batik.

Day6 (7th September): Visited Borobudur, which is a 9th-century Mahayana Buddhist Temple in Magelang, Central Java, Indonesia. Visited the Prambanan, which is a 9th-century Hindu temple compound in Central Java, Indonesia.

Day7 (8th September): Visited the Wonogiri Batik museum.

Day8 (9th September): Participated in the 4th- International Workshop on “Multimodal Sediment Disaster”.

Day9 (10th September): Made preparation for the field survey presentation at Gadjah Mada University.

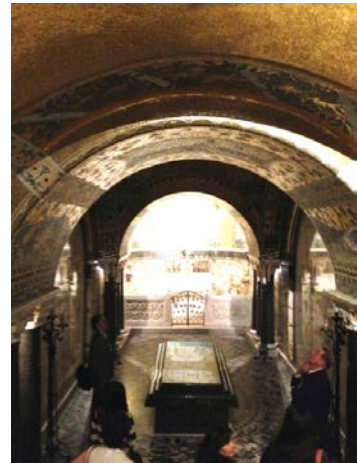
Day10 (11th September): Visited the wastewater treatment plant built for treating the wastewater from Yogyakarta city, and had discussions with plant staff.

International Internship: France and Tunisia (September 19th to 27th, 2013)

NGUYEN, Thi Tam

France and Tunisia have significant environmental issues and the international internship created a big opportunity for EDL members to review these problems as well as have a great time in both France and Tunisia.

From September 20th to 21st, we visited UNESCO World Heritage Centre, Eau de Paris (Paris Water Authority), Paris Water Museum and Pasteur Institute. From which, I gained a deeper understanding about water quality, challenges to water security as well as the water supply system in Paris. The center for all matters related to World Heritage, UNESCO was established in 1992 and undertakes many activities, programs and plans for water solutions. I learned this information from an interesting lecture provided by one specialist of the Division of Water Sciences, UNESCO. However, my friends and I recognized one significant problem which should be considered now and in the future, that is how to create a link between scientific work and policymaking and improve cooperation between scientists and policy makers. Furthermore, we learnt of the long relationship between Vietnam and France through the stamp exhibition while visiting the Pasteur Institute. These experiences supported me and widened my view of environmental management.



Louis Pasteur's Tomb in Pasteur Institute, Paris



World Heritage Patrimony, Carthage in Tunis

From September 21st to 26th, we explored Tunisia. We spent time in this beautiful North African country. Visiting the High Institute of Fisheries and Aquaculture in Bizerte, Tunisia helped to improve my knowledge of aquaculture production systems. However, there are both positive and negative environmental aspects from aquaculture. They can create and provide local conditions suitable for a variety of aquaculture species. Nevertheless, it is very difficult to maintain the original stock species and its special characteristics will disappear in the near future. Another problem I found is there is no established water treatment facility. Wastewater from the production system is discharged directly into the sea. Seawater quality is threatened by this problem. I was especially impressed with the system of medical waste treatment and collection in

Jendouba regional hospital. One hundred percent of the medical waste is treated according to the advice of the environmental field staff of this hospital. This information is different from what I got on the Internet. The field trip helped me open my mind and re-check information. We visited Sidi El Barrak dam and other places related to environmental issues such as water supply, waste treatment system, and public health. We also visited the archeological site of Carthage. We stopped by the JICA office in Tunis and I added to my understanding at each site I visited.

In conclusion, I learnt many things from the lectures as well as experiences shared by professors and staff. I visited many places and all impressed me. Furthermore, from this internship, I found both the innovations and problems remaining in the other countries' activities. I learnt many lessons and experiences about environmental management in France and Tunisia that will be very helpful in my future work. Moreover, I would like to say THANK YOU to Professor Naomi Wakasugi who was mainly responsible for our trip. I greatly appreciate her efforts in arranging this internship. In addition, thanks go to Mrs. Michiyo Takeuchi, who prepared many things and helped us very much during the EDL internship. I would like to express my special thanks to the professors and instructors in France and Tunisia for our great trip. I also thank my friends who made our friendship closer after this trip. I wish I could have another chance to not only study but also make friends and explore new lands.



**Group photo with Pr. Jean-Louis Virelizier
Professor emeritus at Institute Pasteur, Paris**

Internship in Nagasaki, Isahaya, Minamata (July 7-July 10, 2013)

Jelena Aleksejeva

Graduate School of Life and Environmental Sciences

Introduction

The EDL Domestic Internship took place between July 7th and July 10th 2013. Its purpose was to familiarize participants with environmental, health and socio-political issues and their ramifications, as represented in certain areas in Southern Japan. These case-study areas included Nagasaki in relation to the atomic bombing and coal mining industry, and Kumamoto prefecture in regard to Minamata disease, its aftermath and current status, and the Land Reclamation Project in Isahaya Bay. The Internship, however, was but the final phase of an ongoing series of preparatory lectures conducted at the University of Tsukuba, which were aimed at providing necessary background knowledge to the internship participants.

Internship Agenda

The first place visited during the course of the internship was Nagasaki City. The participants visited the Atomic Bombing Museum where they inspected historic material from the World War II bombing event. The next stop was the Island of Gunkanjima, a former coal mine that was completely abandoned after the decline in demand for coal. Following this was a visit to Isahaya Bay where the internship participants had the opportunity, beyond a mere site inspection, to interact with government officials and affected fishermen with regards to the ongoing Land Reclamation Project. The last but longest segment was dedicated to the City of Minamata. The participants were able to turn knowledge obtained through the preparation courses into experience, by visiting the RBS - a night soil and sewage treatment plant dedicated to sustainability promotion. Finally, the internship concluded with an in depth review of the Minamata Disease outbreak in the Kumamoto Prefectural Government Building, where the participants also could interact with government representatives. In the following fieldwork, participants visited the outbreak site where the first Minamata Disease case occurred, and the Museum dedicated to Minamata Disease research, as well as the Minamata Municipal Museum. The final stop before returning to Tsukuba was the National Institute for Minamata disease, where a Minamata Disease victim shared his experience and thoughts with the internship participants in constructive conversation.

Internship Experience

During the extensive preparation courses before the internship the participants were able to obtain knowledge on the issues that have troubled and in many cases still trouble the visited areas. However, knowledge was translated into experience when the internship took place, via participants' on site investigation. By visiting the troubled areas, it became possible to understand the scale of the locations and their geographic characteristics, while interaction with the local government and afflicted people provided firsthand understanding and personal point of view which is unique when it comes to empathizing with the affected people. It also allowed for a first hand understanding of the social consequences of such issues, rather than just the physical ones that can only be studied in literature.

Concluding Remarks

The locations visited during this internship can perhaps be categorized into well-known ones and ones that are usually known only by people affiliated with environmental studies. Indeed, Nagasaki and the Atomic Bombing are well known throughout the world, while the Minamata Disease outbreak, one of the biggest environmental disasters in history, shares but a fraction of the Atomic Bombing's fame. But for both cases it is often felt that they have been in the past for decades now. The internship proved this to be false, as it became apparent to the participants that such events scar the earth and plague its inhabitants even today, more than half a century later. This is a valuable lesson that time does not always heal and the danger of forgetting without resolution is always present. Finally, and perhaps most importantly, this invaluable experience in the field is what will allow the participants to make correct decisions, to plan more efficiently and to be more empathic in their future tackling problems of this nature. This could potentially make the difference in dealing with cases in a successful way; one that does not repeat mistakes of the past, and does disregard or forget the affected areas and their people.

Minamata Unit 2013 (November 23-November 27, 2013)

Kohsuke TOMIMATSU

1. Outline

Minamata disease is the biggest and severest public disease in Japan, which for the first time in human history caused environmental pollution. More than 200,000 people suffered and 20,000 are estimated to have Minamata disease. However, Minamata disease is still not solved yet.

The Minamata Unit is organized jointly with five different universities in Japan; Kyushu University, Kumamoto University, University of Kitakyushu, University of Tsukuba and Gifu University. 34 students from 15 countries participated in this unit supported by 18 teaching staff. From the EDL program, two professors; Naomi WAKASUGI and Rie MURAKAMI and 5 students; Jelena ALEKSEJEVA, VO Thi Thu, Koichi SAKAKIBARA and Rajeev Singh KUMAR and myself participated.

The Minamata Unit internship included two parts; at first we learnt about Minamata and what has occurred since the outbreak of Minamata disease in 1951 and later about Minamata in the present and how to overcome Minamata disease now and in the future. The EDL unit began on October 29th before the November 23rd to 27th internship. The program comprised 16 lectures from different stakeholders; patients, local government, media, NGO, researchers as well as medical site, fieldwork and group work.

2. Schedule

Our review for this internship included taking 7 lectures; on general information, medical, research and media, by Dr. Sakamoto, Prof. Wakasugi, Dr. Nishimura and Mr. Yamaguchi from October 29th to Nov. 19th.

During the daytime, we visited Minamata Disease Municipal Museum, To-mi house, Hot house (1st day), Kuratake (2nd day), ECO PARK, National Institute for Minamata Disease, So-shisha, Minamata Disease Museum, Tsubodan, Hyakken Drain (3rd day), Airinkan, Minamata ECO town tour, Tanaka Sh_ten Co., Ltd, Institute of Garbage Classification (4th day) and Moyai Hall (5th day). Also, we received 8 lectures from Medical, Local government, researchers, NGO and companies.

During the night time around 8 pm to 12 pm, we did group work following PCM (Project Cycle Management) method and discussed Minamata disease. Each group did a presentation to show the progress of their group work.

3. Experiences and Impression

The opportunity to meet Minamata patients during the internship made a deep impression. I thought Minamata disease was over before I visited Minamata, however patients are still alive and suffered from serious symptoms. Even now some patients can't get support and are still struggling against the government and Chisso. I felt anger toward the government and Chisso. On the other hand, when I took a lecture from Mr. Tanaka from Kumamoto Prefectural Government, I realized that helping all patients is impossible due to budgeted limitations, the number of workers and amount of responsibility.

When public diseases like Minamata disease occur they are excessively difficult to solve. We should not commit the same mistake again and learn from this tragic experience. I will work in the chemical industry after graduation so that I want to keep Minamata disease in my mind forever therefore I decided to support an NGO in Minamata.



Photo 1. Participants and Teachers on 19, -November, 2013



Photo 2. Group work on 17, -November, 2013



Photo 3. Certification of Minamata Unit

■ EDL 履修生による研究発表 Research Presentation by EDL Candidates

□ 頭発表 Oral Presentation

Utilization of Soybean Curd Residue for Polysaccharides Production by *Morchella Esculenta* and Evaluation of the Biological Activity

Shuhong LI, Yingnan YANG, Zhongfang LEI, Zhenya ZHANG

Doctoral Program in Sustainable Environmental Studies

Soybean curd residue (SCR) is the main surplus material from soybean products, and it is often regarded as waste. It is a loose material consisting of nutrients, including protein, fibre, minerals and fat. Recently, more attention has focused on the utilization of SCR to produce value added products in the food industry, such as soluble dietary fibre, polysaccharides, antioxidant material and protein. These nutrients could allow them to be used as high quality media for edible fungi fermentation.

The mushroom *Morchella esculenta* (*M. esculenta*) has long been known for its medicinal properties. Recently, many reports on *M. esculenta* have been published concerning their health-promoting properties including antioxidant activity hepatoprotective activity, antimicrobial properties and anti-tumor effect.

In this study, SCR was used as nutrient media to ferment polysaccharides by *M. esculenta*, and the fermentation conditions were optimized and physicochemical properties of SCR before and after fermentation were compared. Furthermore, the characteristics, purification and biological activity including antioxidant, immunomodulatory and antitumor activity of produced polysaccharides were investigated. Compared with polysaccharides obtained from fruit bodies and mycelia, polysaccharides fermented by SCR have the advantages of waste minimization, time efficiency and high production levels at low cost.

The polysaccharides fermented by SCR show high antioxidant activity, including ABTS, DPPH, hydroxyl radical scavenging activities and ferrous metal ion chelating activity. The characteristics of crude and purified polysaccharides were studied by GC-MS and FTIR. Moreover, the antitumor and immunity activity of the polysaccharides was studied using the DLD-1, HepG2, Hela and RAW264.7 cells. SCR fermented by *M. esculenta* for use in polysaccharides production was a good choice for SCR reuse and could be used to produce antioxidants for food, pharmaceutical and cosmetics.

The Interaction between Shallow and Deep Groundwater in Baiyangdian Lake Watershed, North China Plain

Jie ZHANG

Doctoral Program in Sustainable Environmental Studies

In arid/semi-arid regions, consumption of deep groundwater resources is increasing due to growing water demand in every sector. Intensive groundwater surveys were conducted in Baiyangdian Lake Watershed (BLW), northwest North China Plain, as BLW suffers from serious water problems due to high economic growth and improper groundwater resource utilization. The objective of this study is to clarify the groundwater flow regime in the study area, particularly focusing on the interrelationship between shallow and deep groundwater.

For this purpose, 187 surface water and groundwater samples from different aquifers were taken in the study area, most of which are located in the plains area around two cities (Baoding and Dingzhou). Major trace elements of solute ions concentrations and stable isotopes of $\delta^{18}\text{O}$ and δD were determined for all water samples. Groundwater samples were divided into 3 groups (Aquifer 1, Aquifer 2 and Aquifer 3) according to the aquifers they belong to. The stable isotopic compositions of the groundwater show that Aquifer 1 is greatly influenced by surface water, which recharges the groundwater after the evaporation process, and Aquifer 3 was recharged by precipitation falling in mountainous areas. However, the situation of Aquifer 2 is more complex. Chemical composition of water shows that water samples taken from the Dingzhou area were characterized by Ca- HCO_3 , whereas those taken in Baoding area were more complex due to surface water influences.

The results indicate that in a specific area near Baoding city, anthropogenic activity might induce the recharge processes from Aquifer 1 to Aquifer 2, which can be proved by the similarity of the chemical traces of major ions and stable isotopes. However such kind of interrelationship cannot be found in other regions in the study area.

Keywords: Interaction; Shallow groundwater; Deep groundwater; Baiyangdian Lake Watershed

Groundwater Recharge Processes in Tuul River Watershed, Ulaanbaatar, Mongolia

Kohsuke TOMIMATSU

Master's Program in Environmental Sciences

Ulaanbaatar (UB), the capital city of Mongolia, located in a semi-arid region has shown significant economic growth. Approximately 90 % of the population in UB depends on groundwater for domestic use. Previous studies show that the Tuul River, flows through UB as the major river, and is the dominant source of groundwater in the alluvial plains. Also, precipitation in winter might affect groundwater in UB. However, the mechanism of groundwater recharge by river water during the snowmelt season has not been investigated. Therefore, my objective is to evaluate the role of river water in groundwater recharge in spring in Ulaanbaatar.

We undertook a field survey in UB city from 29th April to 6th May 2013. In this survey, 49 locations (Wells: 40, Springs: 2, Rivers: 7) were investigated and Electric Conductivity (EC), Oxidation Reduction Potential (ORP), Dissolve Oxygen (DO), pH, Water Temperature, Static Groundwater Level (SGWL) and (Dynamic Groundwater Level) DGWL were measured. Water samples were taken for the analysis of inorganic solute constituents and stable isotopes of $\delta^{18}\text{O}$ and δD .

The groundwater level for the Tuul river flood plain was lower in the spring of 2013 than when observed in summer 2009 and 2010, suggesting recharge from the river water was dominant due to a high hydraulic gradient during spring.

The stable isotopic ratio of ^{18}O and deuterium in the groundwater was higher during spring than in summer in 2009 and 2010, whereas that of the river water in spring 2013 was lower than that of summer 2009 and 2010.

Keywords: groundwater, Tuul River, stable-isotopes, groundwater levels, inorganic ion

Effect of Mg^{2+} on Nitrification Capability of Aerobic Granules when Treating Synthetic Wastewater

Wenlong WANG

Master's Program in Environmental Sciences

1. Introduction

Aerobic granulation, a novel wastewater biotechnology is favored for the treatment of various wastewaters. Compared with conventional activated sludge treatment, the aerobic granular process possesses distinctive advantages such as excellent settling capacity and good biomass retention. This technology, however, is still under investigation due to the unstable structure of the aerobic granules. It was reported that Mg^{2+} could improve granule morphology and accelerate aerobic granulation through enhancing microbial activity and extracellular polymeric substances (EPS) production [1]. Up to the present, limited information could be found on the change in the nitrification capacity of aerobic granules after Mg^{2+} addition.

2. Methods

Two identical sequencing batch reactors (SBRs), R1 and R2 were run under the same operating conditions (except Mg^{2+} concentration) to treat synthetic wastewater with 5mg/L and 50mg/L of Mg^{2+} being added, respectively. Chemical oxygen demand (COD), ammonium, nitrate and nitrite were determined according to standard methods. Some physicochemical characteristics of granules including granular size distribution, mixed liquor (volatile) suspended solids (ML(V)SS), and sludge volume index (SVI) were also determined in this study.

3. Results and discussions

The results showed that Mg^{2+} addition had a positive effect on the stability and nitrification capacity of aerobic granules. Regular granules were observed on day 9 in the two reactors. On day 30 the LSS in R2 increased to 7.85g/L, greater than 7.31g/L in R1(Fig.1). The surface charge of sludge particles in R1 decreased faster than that in R2. Moreover, approximately 60% of the granules in R1 were in the range of 0.3-0.5 mm, and the granules larger than 0.5 mm comprised about 29%. In contrast, about 53% of granules were in the range of 0.3-0.5 in R2, and the granules larger than 0.5 mm comprised approximately 28%. COD removal in R2 was greater than that in R1. The nitrification capacity of the granules in R1 increased from 42.2 (day 10) to 73.8 $mg\ N\ g^{-1}\ VSS\ day^{-1}$ (day 36), which correspondingly increased from 52.0 to 99.3 $mg\ N\ g^{-1}\ VSS\ day^{-1}$ in R2, signaling the enhancement effect of Mg^{2+} addition on nitrification capacity of the granules(Fig.2).

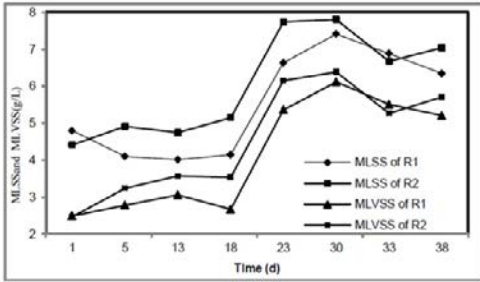


Fig.1 The variation of MLSS and MLVSS in R1 and R2

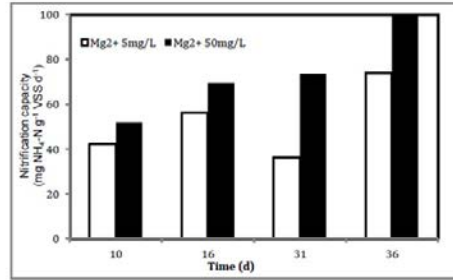


Fig.2 The variation of nitrification capacity during granulation

Reference

- [1] X.-M. Li, et al. Enhanced aerobic sludge granulation in sequencing batch reactor by Mg²⁺ augmentation, *Bioresource Technology* 100 (2009) 64-67

Analysis of the Benefits of Introducing an Integrated Solid Waste Management Approach in Developing Countries: Case Study in Kathmandu City

Singh Rajeev Kumar

Master's Program in Environmental Sciences

Abstract

Kathmandu metropolitan city, Nepal's capital, consists of two sister cities: Lalitpur to the South and Bhaktapur to the East. The rapid economic and population growth experienced in the last decade has brought about a significant increase in the amount of urban waste generation. The main problems associated with waste management are the lack of proper sorting at source, low recycling levels and inappropriate final disposal that causes environmental pollution around the present landfill site where methane gas (CH₄) is liberated openly in the air and leachate gets mixed in the nearby river. The current dumping of organic wastes causes the emission of CH₄ into the environment.

In this research we analyze the potential environmental and socio economic benefits of organic waste treatment and recycling of inorganic materials. The recovery of organic waste by composting and bio-gasification has both environmental and socio economic benefits. The treatment of organic wastes (that account for more than 60% of the total waste in developing countries) will not only lessen the burden of waste transportation and final disposal but it will also have a huge impact on GHG emission reduction. Socio-economic benefits are not only related to job creation but also a higher quality of life associated with a cleaner environment. We use an Integrated Waste Management approach, Life cycle Assessment concept and IWM2 software in this research for creating different scenarios regarding the waste management of Kathmandu city to predict the environmental burdens. These provide four different scenarios that focus on organic recovery and informal recycling at the transfer station. The scenarios are evaluated in terms GWP, Biochemical Oxygen Demand, final disposal waste and recycling levels and highlight the benefits of improving the present landfill and a new sanitary land fill site is introduced. The results indicate that the introduction of composting of household waste and bio-gasification of commercial waste will render both environmental and socio-economic benefits.

This study provides recommendation to both government and various projects closely associated with non-governmental agencies in order to facilitate sustainable approaches to manage solid waste in Kathmandu city.

Keywords: Life Cycle Assessment, Waste management, Organic waste, Sanitary landfill and Composting

The Application of Life Cycle Assessment towards Integrated Municipal Solid Waste Management in Gia Lam District, Hanoi City, Vietnam

Dinh Thu Hang, Helmut Yabar

Master's Program in Environmental Sciences

The increasing generation of Municipal Solid Waste (MSW) has become a serious problem in Vietnam in general and in large cities in particular due to population growth and rapid economic development. This is especially critical in Hanoi, the capital and a mega city of Vietnam. The amount of MSW generated in Hanoi has been increasing steadily, pushing waste management to the forefront of environmental challenges with which it must contend. However, Hanoi is still missing a lot of necessary information on the status of MSW, especially in suburban areas where not only rapid development but also lack of management and investment in Municipal Solid Waste Management (MSWM) systems exist. In order to address this important issue this research aims to examine the current MSW situation in terms of waste generation and characterization as well as treatment and final disposal. The research then identifies the main weakness and challenges and proposes effective solutions to solve these problems in Hanoi using Gia Lam district as a case study.

In order to achieve this goal, alternative MSW models have been proposed that take into account current conditions and pay attention to the recovery of organic wastes as well as recycling of specific materials. Both the current situation and alternative models are analyzed by means of Life Cycle Assessment (LCA).

This research aims to achieve a sustainable MSWM system based on: environmental impacts minimization, an increase in recycling levels and decrease in the amount of final disposal waste. To achieve this, in addition to technological solutions, policies for MSW as well as activities aimed at increasing the awareness of people will be proposed based on the lessons learned from other countries.

Key words: Integrated solid waste management, Life Cycle Assessment (LCA), recycling technology, organic recovery, Gia Lam, Hanoi

Informal learning and Practice of Indigenous Ecological Knowledge among Maasai Children in Kajiado County, Southern Kenya

XiaoJie TIAN

Master's Program in Environmental Sciences

Indigenous Ecological Knowledge (IEK) is reevaluated and recognized as one of the most important alternatives for improving local capacity in response to global climate change. Meanwhile, modernization centralized development have hastened changes in the livelihood and environment of indigenous societies worldwide. The objective of this study is to understand how younger generations in indigenous societies inherit IEK under the influence of social and environmental changes. Four months' fieldwork was undertaken to investigate the processes of Maasai children's informal learning and practice of IEK.

Under the influence of rangeland privatization, market economy, and modern education, pastoral Maasai in Southern Kenya are experiencing significant lifestyle and socio-economic changes. Most children have participated in formal education; and many households have diversified their livelihoods. However, the result of this study shows that livestock still play an important role in local subsistence and culture through the age-sex division of livestock related daily activities. All the Maasai children continue to participate in subsistence activities from an early age. School children participate in pastoral activities such as milking livestock daily (5.2 times per week per person) and herding during the weekend and holidays (2.6 times per week per person).

The Maasai have abundant ecological knowledge about the environment, mostly related to livestock management. Children's informal learning and practice of IEK happens simultaneously through daily activities and communication with different people in different spatiotemporal environments. The process of children's IEK informal learning and practice is comprehensive and integrated. Daily changes such as weather, movement of wildlife and livestock, etc., create uncertainties inside children's daily activities. These uncertainties enable the repetitions of daily activity to become new processes of IEK informal learning and practice. Results of this study illustrate the dynamic, continuously repeated but ever-new processes of Maasai children's IEK informal learning and practice.

Key Words: Indigenous Ecological Knowledge (IEK), Maasai children, daily activity, environmental uncertainty, process of informal learning and practices

Kathmandu's Attempts to Improve the Water Supply System: A Historical Analysis

Banu Yasin

Master's Program in Environmental Sciences

ABSTRACT

This study analyzes publications by the National Planning Commission, the Central Bureau of Statistics of Nepal, other Nepalese government bodies and international organizations to understand why the water supply companies (previous and current) have not succeeded in improving water quantity and quality for Kathmandu residents. Their management mechanisms and who played important roles in changing and forming the water supply system in Kathmandu are reviewed. The Nepal Water Supply Corporation (NWSC) was the first large and advanced water supply company in the country. Securing and expanding funds for water infrastructure became difficult in the 1990s because of the Maoist situation and the rapid increase in the valley population. Considering this situation the government of Nepal established Kathmandu Upatyaka Khanepani Limited (KUKL) in 2008, which replaced NWSC. Unfortunately, since its foundation, KUKL has experienced problems such as corruption, delays and malpractice. A series of scandals were exposed regarding untreated and dirty water supplies in various parts of the valley. As a result, the water supply has been unreliable, and citizens have spent many days without water in their houses. As a solution, the government has begun to monitor the work of KUKL and pressured KUKL to complete the remaining work included in its deal with the Kathmandu Valley Water Supply Management Board (KVWSMB). The study also recommends that community participation be emphasized in planning water distribution and monitoring the work of the KUKL.

Key words: Water supply, Water quality, Management mechanism, Water- infrastructure, Water distribution.

In vitro and in vivo Anti-diabetic Activity of Extracts from *Actinidia Kolomikta*

Yu LIU

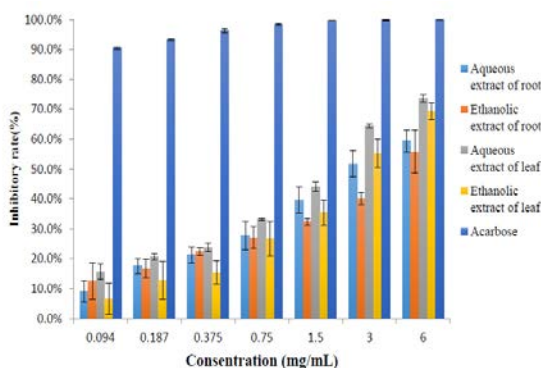
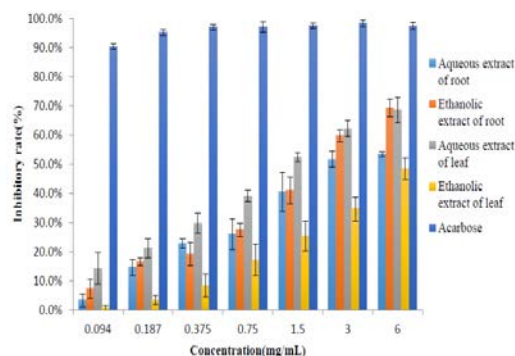
Master's Program in Environmental Sciences

Diabetes is a chronic disease, which occurs when the pancreas do not produce enough insulin, or when the body cannot effectively use the insulin it produces. This leads to an increased concentration of glucose in the blood. According to a WHO report, about 347 million people worldwide have diabetes. Diabetes is predicted to become the seventh leading cause of death in the world by the year 2030. There are mainly two types of diabetes, type 1 and type 2. Type 1 diabetes is characterized by a lack of insulin production and type 2 diabetes is caused by the body's ineffective use of insulin. More than 90% of diabetes patients are Type 2. The main treatment methods of type 2 diabetes are physical exercise and intake of an alpha-glucosidase inhibitor. Some plants that have been used as traditional medicine are reported to have potential for diabetes treatment.

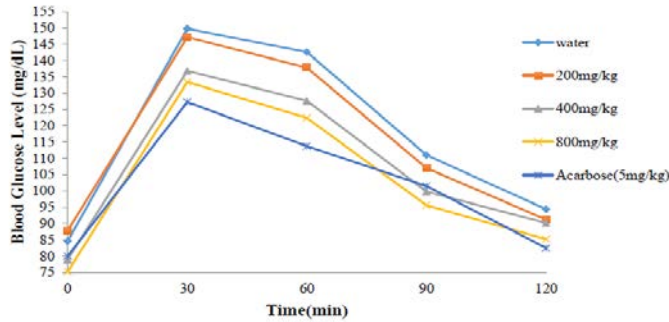
The genus *Actinidia* consists of over fifty-eight species widely distributed throughout the Asian continent. Specific *Actinidia* species, such as *A. arguta* and *A. chinensis* are used in health foods and medical agents for cancer treatment. *Actinidia kolomikta* has many biological effects, such as anti-cancer, anti-microbial, anti-oxidative properties, hypoglycemic and anti-hydrotic effects.

Anti-diabetic activity of leaves and roots extracted by water and ethanol has been confirmed in this research by in vitro and in vivo tests.

For the in-vitro part, alpha-glucosidase inhibitory activity of extracts from both roots and leaves of *Actinidia kolomikta* extracted with both aqueous and ethanolic methods was tested in our research. Aqueous extract from leaf showed the best inhibitory activity both in tests using sucrose and maltose as substrates. A dosage dependent inhibitory activity of alpha-glucosidase inhibitors mentioned by other researchers also showed in our study.

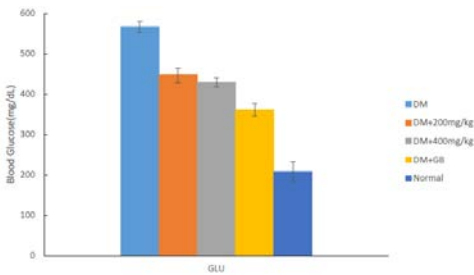
Alpha-glucosidase inhibitory activity of extracts from *Actinidia kolomikta* used sucrose as substrateAlpha-glucosidase inhibitory activity of extracts from *Actinidia kolomikta* used maltose as substrate

An oral glucose tolerance test was performed on non-diabetic rats. The result showed the hypoglycemic activity of the aqueous extract of *Actinidia kolomikta* after the intake of sugar. The hypoglycemic activity of the extract was higher in concentration than the commercial drug acarbose which was used as a control in this test.

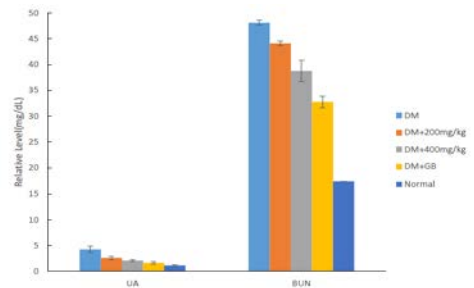


Effect of aqueous extract from leaf of *Actinidia kolomikta* on oral glucose tolerance test in normal rats

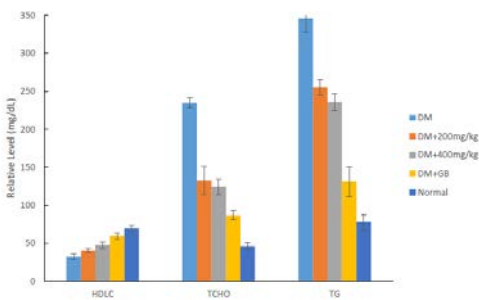
Long term antidiabetic activities of the extract from *Actinidia kolomikta* are also demonstrated in our study when compared with commercial a antidiabetic drug Glibenclamide. The results showed the blood glucose regulatory activity of the extract from *Actinidia kolomikta* after long term administration. High regulative activity of the extract to mediate complications in diabetes was also demonstrated by the effects of the extract on protein metabolism, lipid profile and liver function.



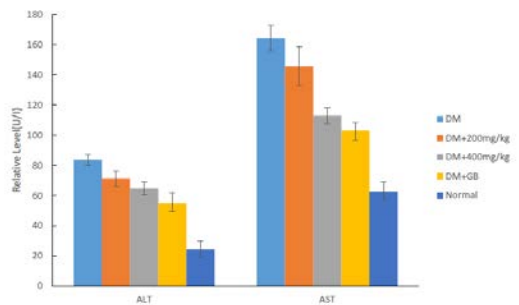
Effects of Ethanolic Extract from Roots of *Actinidia kolomikta* on blood glucose level. DM: Diabetic control; GB: Glibenclamide; Normal: Non-diabetic control; GLU: blood glucose level.



Effects of Ethanolic Extract from Roots of *Actinidia kolomikta* on Protein Metabolism. DM: Diabetic control; GB: Glibenclamide; Normal: Non-diabetic control; UA: uric acid; BUN: blood urea nitrogen.



Effects of Ethanolic Extract from Roots of *Actinidia kolomikta* on lipid profile. DM: Diabetic control; GB: Glibenclamide; Normal: Non-diabetic control; HDLC: high-density lipoprotein, TCHO: total cholesterol; TG: triglycerides.



Effects of Ethanolic Extract from Roots of *Actinidia kolomikta* on Liver Indicators. DM: Diabetic control; GB: Glibenclamide; Normal: Non-diabetic control; ALT: alanine aminotransferase; AST: aspartate aminotransferase

Both in-vitro and in-vivo test showed extracts from *Actinidia kolomikta* affects the treatment of diabetes and prevention of complications caused by diabetes was also demonstrated in this research.

ポスターセッション A Poster Session A

Exploring the Impact of Introducing Technology Innovation and Environmental Regulations in the Energy Sector in China: A Regional Case Study

Qian Zhou

Doctoral Program in Sustainable Environmental Studies

Abstract

In addition to GHG emissions air pollution caused by coal combustion are among the main consequences of China's dependence on this fossil fuel as a primary energy resource. In order to dramatically reduce its coal dependence the Chinese Government is trying to promote alternative renewable energy technologies as well as implementing stricter air pollution regulations. In this research we analyze the benefits of small-scale hydropower and wind power technologies and the potential implementation of stricter regulations to reduce SO₂ and GHG. We selected Chongqing city, one of the most polluted cities in China and an Acid Rain Control Zone, as a case study. For this purpose, we constructed a dynamic evaluation model based on an Input-Output (I/O) analysis for the period 2010-2030. The results indicate that the introduction of both renewable energy technologies and stricter regulations have an overall benefit on Chongqing's socio-economic and environmental development. However, the results also show that the lack of capacity for renewable energy technologies to meet the increasing energy demand as well as stricter emission constraints affect both economic growth and SO₂ and GHG reduction efforts from the latter half of the study period. To address this weakness, the study analyzes additional advanced gasification energy technologies as well as specific regulations to meet air pollution reduction targets. Some feasible policies are proposed by analyzing the potential economic benefits of reducing air pollution and GHG emissions in terms of improved quality of life and environmental conservation. We argue that these benefits will offset lower GRP growth obtained by the proposed policy.

A-2

The Effect of Phosphate on Stabilization of Heavy Metals in Sludge during Hydrothermal Treatment

Wansheng Shi

Doctoral Program in Sustainable Environmental Studies

Every year, a huge amount of sewage sludge is produced worldwide which requires safe and effective disposal. The best disposal method should not only make good use of the nutrient sources in sludge but also minimize the potential environmental risk of the pollutants contained in sewage sludge. Long term, land use may be the best alternative for sewage sludge disposal, and therefore land use pretreatment is necessary. Hydrothermal treatment (HTT) is widely recognized as an environmentally friendly process because of the produced hydrochar can provide some easily available nutrient sources, such as N, P and K, which can be used to improve the soil productivity. Moreover, it can be considered an additive for remediation of contaminated soil due to its strong binding capacity for some heavy metals (HMs) and trace organic pollutants (such as PAH, herbicide, pesticide, etc.). However, the risk of HMs in sludge after the HTT process should be evaluated. Furthermore, it's speculated that the behavior of phosphorus may affect the fractionation of HMs during HTT and affect its binding capacity with HMs.

Therefore, the objective of this study was to assess the risk of heavy metals in sludge after HTT and investigate the effect of phosphate on stabilization of heavy metals during HTT process.

In this study, the risk and stabilization of heavy metals (Cr was used as an example in this study) were evaluated based on their fractionation after sequential extraction. In order to investigate the effect of phosphate on Cr stabilization, phosphate was added to the sludge before the HTT process. The result showed that, Cr and phosphorus generally remained in the sludge residues after HTT process, Cr and phosphate were all transformed from an unstable state into a stable state. Phosphate addition and the HTT process showed the synergistic effect on Cr stabilization in sludge, and it is suggested that phosphorus in sludge played a positive effect on Cr stabilization during the HTT process, and this provided a new method for Cr stabilization for sludge disposal.

Key words: *sewage sludge, hydrothermal treatment, heavy metals, phosphate, stabilization*

Simulation Analysis of Optimal Policies to Reduce Water Pollutants Emission from Agriculture in Source Region of Liao River, China

Wei YANG, Yoshiro HIGANO

Doctoral Program in Sustainable Environmental Studies

Abstract:

Liao River is one of the seven largest rivers in China and has become one of three national-level controlling areas since the 9th 5-years plan due to severe water pollution. Liao River provides the base water for crop production and animal husbandry and is the water source of Jilin Province. However the source region is confronted with severe water environmental problems such as bad surface water quality and shortage of water resources. As major industry, such as agriculture contributes to a large proportion of water pollution in the source region of Liao River it is difficult to control agricultural pollution. This study aims to reduce water pollutant emission from agriculture, to use biomass resource effectively and to maximize the economic development simultaneously through the introduction of optimal policies and advanced technologies.

In this study, subsidization for expansion of green agricultural production, utilization of organic fertilizer and dissolution inhibition fertilizer and purification technology for irrigation drainage was introduced. Different biomass utilization technologies were introduced to produce energy and organic fertilizer. The government will take measures to promote the application of these technologies through introduction of synthetic policies. A dynamic mathematical model with an input-output approach was constructed using local economic and environmental characteristics to simulate the interrelation between the environment and socio-economic structure after the introduction of integrated policies. A socio-economic sub-model, material flow balance sub-model, energy balance sub-model and GRP objective function were specified in order to propose optimal policies to improve water quality and to realize development of the socio-economy. A simulation model was derived using LINGO programming. Total nitrogen, total phosphorus and chemical oxygen demand were used as the main constraint index of water pollution, which strongly affect the deterioration in water quality.

Cases of different water pollutant emission constraints and different technologies and policies will be determined. Analysis will be based on simulation and mathematical modelling. Based on the results, policy proposals will be made by clarifying the best trade-off between regional economic development and environmental protection as well as policy effectiveness and technologies adopted. Results for developing trends in the organic fertilizer industry and biomass energy industry will be obtained. Decreasing trends in water pollutant emission intensity for agriculture, developing trends for every industrial sector after introducing optimal policies and local GRP trends will be specified. This research will contribute to accomplishing the water pollution reduction goals set in 12th 5-years plan of Liao River Basin and to setting up a long-term water pollutant controlling mechanism, which can be used as a reference for use other river basins.

A-4

Seasonal Change of Groundwater Recharge and Flow Regime Revealed by Multi-tracer Approach in a Headwater, North China Plain

Koichi Sakakibara, Maki Tsujimura

Master's Program in Environmental Sciences

Water environmental issues have spread all over the world. Natural and anthropogenic factors associated with climate change and human activities cause regional heterogeneity in the quality and quantity of water resources. The water environment in the North China Plain, one of the largest agricultural areas in the world, faces a serious situation that consequently affects world food production and the world economy. Appropriate water management is necessary and an urgent matter in the North China Plain. However, this cannot be achieved without understanding the continuum of groundwater from recharge to discharge. Stable isotopes are well known as effective tracers to identify both source and flow paths in a groundwater system because of their conservative characteristics. Prior research using stable isotopes as tracers is extensive and has been previously reported. On the other hand, model construction of invisible groundwater flow paths allows decision and implementation of concrete projects for water management.

We undertook a case study of Wangkuai watershed, which is a main recharge zone for groundwater in the North China Plain. The objectives are to clarify the groundwater cycle process and to construct a groundwater flow path model using stable isotopes of oxygen and hydrogen. The results show that river seems to recharge groundwater during the rainy season, whereas interaction between surface water and groundwater gradually weakens after the rainy season. The inversion analysis and simple mixing model applied in the downstream area of Wangkuai watershed characterizes the multi-flow systems into 4 kinds of flow paths with certain stable isotope compositions and flow rate. Regional and seasonal differences in recharge and flow regime of groundwater in Arid- Semiarid regions including upstream in the North China Plain, necessitate accumulation of detailed studies and visualization of groundwater flow paths by model construction to facilitate more appropriate water management.

Key words:

Stable isotopes, groundwater flow system, inversion analysis, mixing model, North China Plain

Snowfall Variation in Mongolia and its Relationship with Atmospheric Circulation

Erdenebadrakh Munkhjargal

Master's Program in Environmental Sciences

Supervisor: Prof. Ueda Hiroaki,

Recent trend of snow and climate change in Mongolia

In Mongolia, certain impacts of climate change have already been observed. Batima and Dagvadorj found a substantial increase in the winter temperature of 3.61 °C during the last 60 years. As nomadic livestock husbandry is one of the important sections of the Mongolian economy and as it is highly dependent on weather conditions, even a few centimeters of snow accumulation severely affects livestock. Thus, the ability to provide long-term snow forecasts is important. Annual mean precipitation is 300-400 mm in the mountainous regions, 150-250 mm in the steppe, 100-150 mm in the steppe-desert, and 50-100 mm in the Gobi-desert. About 85% of total precipitation falls from April to September, of which about 50-60% falls in July and August. Snow contributes less than 20% to total annual precipitation. Snow cover in Mongolia shows clear periods in the cold season and dynamic variation at the parameters.

Snowfall process and atmospheric circulation

In Mongolia, snowfall is closely related to synoptic disturbance embedded in the westerly Jet. Ueda et al demonstrated that the springtime diminishment of snow is regulated through not only the surface temperature but also cyclonic activity relevant to the meridional warm air advection. Mongolia is located close to key regions in Eurasia, and high frequency cyclogenesis are distributed in the lee of the major mountains, while the most active area is located in the Mongolian Plateau. This distributional feature of extra tropical cyclones is consistent with the baroclinic frontal zone. Extratropical cyclone activity in East Asia has obvious seasonal and interannual variation. The highest frequency of cyclone is observed in spring time in East Asia and the frequencies of cyclodogenesis were 1.5 times larger than annual values.

Future study

My research attempts to evaluate these cyclic activities as a frequency of surface cyclogenesis and cyclone track by using re-analysis ERA-40 data (1981-2000) and observation data (1969-2012) from 40 meteorological stations. It then calculates future projections by using the CMIP5 model. One vital task is to investigate the temperature gradient of the upper and lower troposphere and the locations and paths of cyclones. The spatial distribution and temporal variation of cyclones are very important to predict weather conditions because cyclones often brings snow.

Keywords: snow cover, depth, re-analysis data, cyclone, air temperature.

A-6

Groundwater Flow System at Cu Lao Dung Island, Soc Trang Province, Vietnam

Tran Dang An

Master's Program in Environmental Sciences

Supervisor: Prof. Maki Tsujimura

Summary

In recent years, groundwater in coastal areas of the Mekong Delta has been intensively exploited in order to meet the huge water demand for drinking and agricultural activities. This fact coupled with changing unpredictable annual surface water results in many problems such as seawater intrusion, brackish water contamination and land subsidence in coastal areas.

In this study, multiple hydro-geochemical techniques and hydrographical analysis were employed to ascertain the characteristics of the groundwater flow system in relationship with surface water under effects of seasonal variations. Although almost all groundwater existing in the Mekong Delta originated upstream of the Mekong River, the water quality represents obvious spatial and temporal differences. This reflects geological conditions and changing hydro-geological processes due to complicated factors. Moreover, in some locations along coastal areas of Soc Trang, both shallow and deep groundwater has a very high chloride concentration. Plotting hydro-geochemical and stable isotopic information coupled with hydraulic heads on hydro-geological cross sections reveal that: (i) interaction between deep groundwater and surface water in this area is not dominant; (ii) groundwater quality among aquifers was formed through different hydro-geological processes and (iii) the groundwater flow system was clearly different in the dry and rainy seasons. More seriously, some areas close to Tran De estuary of the Mekong Delta may be intruded by seawater from the East Sea. This demonstrates the fact that intensive pumping activities and extreme reducing water recharged into coastal aquifers under methods to change meteorological and hydrological conditions are the main causes of imbalance in the groundwater flow system and increasing groundwater degradation in this region. Thereby, strict regulation on exploiting groundwater and integrated water resources management in the watershed should be considered in order to sustainably use this important fresh water and groundwater resource within the context of rapid socio-economic development, imbalance of water use in the Mekong River Basin and the undesirable effects of climate change.

Key words: *Mekong Delta, Groundwater flow system; hydrogeochemical processes*

Estimation of Forest Carbon Stock in Thua Thien Hue province, Viet Nam Using MODIS EVI Time Series to Support REDD+

Pham Thi Thanh

Master's Program in Environmental Sciences

Supervisor: Prof. Kunihiko Yoshino

Abstract

Carbon stock plays a crucial role in maintaining global weather. However, in terms of total amount of CO₂ from deforestation and forest degradation; the magnitude of emission increasingly plays a significant role in global warming issues. An accurate database of above ground biomass and carbon stock is necessary for policy makers in order to implement Reducing Emission from Deforestation and forest Degradation (REDD+) guidelines. Therefore, to implement REDD+ in full scale at phase III (starting from 2016) in Viet Nam, integrating remote sensing and forest inventory data measurement will clarify forest and carbon stock distribution in large areas. To meet the standards for REDD+; remote sensing plays a significant role in monitoring, reporting and verification. The results from monitoring contribute to the validation and verification process related to the actual emissions reductions, and forest carbon market.

This study combines Moderate Resolution Imaging Spectroradiometer Enhanced Vegetation Index (MODIS EVI) and field inventory survey data to clarify forest volume, above ground biomass and carbon stock in forests. The preliminary hypothesis of this study is; EVI has significant correlation with carbon stock. Therefore, this study's main objectives are; (i) to investigate the feasibility of using Modis EVI time series for REDD+ monitoring and (ii) to determine the method for estimating forest carbon stock by using a remote sensing dataset.

A MODIS EVI, 16 days global with 250 m grid V005 obtained from Land Processes Distributed Active Archive Center (LP DAAC) was utilized. MODIS EVI was selected due to its characteristic of being very sensitive in high biomass regions and its reduced atmospheric influences compared with Normalized Different Vegetation Index (NDVI) (Huete et al. 1997). The datasets were acquired from January to December in 2011 including 23 time series with an interval of 16 days. These datasets were then filtered using the wavelet function method (Setiawan et al. 2011) to enhance the visual appearance of the image. Then, the EVI value was extracted and validated based on existing ground truth points that represent measured forest volume.

In this study, we found that different forest types had different forest volume due to different species, the best fit regression equation was $y = 199.77x - 62.315$ ($R^2=0.81$). This equation was further used for spectral modelling to estimate forest volume and the vegetation carbon pool. The forest volume also changed due to phenology stages.

Keywords: MODIS EVI, REDD+, *carbon stock, forest volume, Thua Thien Hue*

A-8

Mitigation of Socio-Economic Impacts in Involuntary Resettlement due to Infrastructure Development in Bangladesh

Miah Md. Tofail

Master's Program in Environmental Sciences

Supervisor: Naoko KAIDA

Background:

Protests have been increasingly observed against land acquisition and involuntary resettlement as a result of large road or infrastructure development projects. This is an emerging issue in many developing countries including Bangladesh. Affected people in Bangladesh are rarely satisfied with the inadequate compensation provided in the current system. Moreover, the current system provides all compensation, i.e., for land, houses, and crops in cash at one time and social bonding and community welfare aspects during involuntary resettlement are not carefully considered. Donors such as the World Bank, the Asian Development Bank and Japan International Cooperation Agency demand less social and environmental impacts during formulation and implementation of large infrastructure development projects. In such situations surrounding involuntary resettlement, researchers have been increasingly concerned with not only sufficient monetary compensation but also how the affected people feel satisfied with the overall resettlement program including its welfare aspects.

Objective:

The purpose of this research is to identify a satisfactory involuntary resettlement plan with proper compensation to minimize the socio-economic impacts in involuntary settlement and investigate the acceptability of the proposed compensation among the affected people. It also aims to determine which component is most important and the steps that must be taken for it to be adopted by the Government. Cash compensation along with welfare utility services will be proposed as suitable compensation in this research. This study tests the following hypotheses: 1) The affected people will have higher levels of satisfaction because of the proposed compensation package than the current system and 2) Affected people will sacrifice part of their compensation money to receive welfare activities.

Methodology:

Road Network Improvement and Maintenance Project-II, Contract # 04, consisting of 26.80 km National Highway improvement, was considered in this research. First, the current system of government resettlement policies are studied. Some base line data of affected people was collected. A questionnaire survey will be undertaken among the affected people. Approximately two hundred affected households will be selected through random sampling. The respondents will be asked to provide information about compensation choice and opinion regarding involuntary resettlement. They will give also their opinions about the welfare program component. Finally, I will investigate acceptability of the proposed compensation package through estimation of willingness to pay (WTP). Sensitivity to welfare program components will be investigated as well.

Expected Results:

In this research people's attitude to the proposed comprehensive compensation package will be obtained. Resettlement components the government should adopt will be determined. In addition, some problems during formulation and execution of resettlement plan will be revealed.

Keywords: Road construction project, involuntary resettlement, compensation, satisfaction, conjoint analysis.

Effects of Dam Irrigation Water on Groundwater Regime in Coastal Watersheds, Cap-Bon, North-East Tunisia

Naoyuki SHIBAYAMA

Master's Program in Environmental Sciences

Currently there are a number of global problems related to water resources. Due to population growth and increasing water consumption water demand is also increasing. At the same time temperature rise due to climate change and a decrease in precipitation is occurring. For these reasons groundwater is overexploited.

In arid and semi-arid regions people mainly use groundwater. In addition, population is concentrated in coastal areas. Seawater intrusion becomes a serious problem in coastal regions. With regard to sustainable use of groundwater resources, it is important to clarify the groundwater flow system.

The study area is Lebna and Chiba dam watershed, which are located in the coastal area of Cap-Bon north-east Tunisia. Annual mean precipitation is 420mm, and annual mean temperature is 24°C. In June 2013 a field survey was undertaken. In the field survey samples were collected from the sea, dam and wells in the Lebna & Chiba dam watershed. PH, temperature, electrical conductivity, ORP, DO and nitrate were measured in situ. Water quality was analyzed in the laboratory.

From the isotopic results, the average of d-excess values in Lebna dam watershed is lower than that in Chiba dam watershed. Considering the low values and their large dispersion of d-excess in Lebna, it indicates GW in Lebna dam watershed is affected by dam irrigation water.

Keywords: Tunisia, semi-arid area, groundwater, irrigation, seawater intrusion

A-10

A Possible Change of Convective Activity in Tropical Regions

Yurisa Miki

Master's Program in Environmental Sciences

Abstract

In climate change studies it is necessary to consider possible changes in the hydrological cycle. In the tropics, there is limited observed data, and this causes large discrepancies between models and observations in current climate. In this study, trends in convective activity in the tropics from OLR data from NOAA in 1981-2010 are discussed.

We calculated horizontal distributions of monthly mean OLR trends using liner regression coefficient. The spatial distribution of trends in OLR values is very similar to OLR climatology. It indicates that convective activity increases in strong convective regions such as the Maritime Continent, while decreases in weak regions such as the East Pacific.

Furthermore, histograms of OLR frequency were created. The results showed an increase in frequency of strong convection, and a decrease in relatively weak convection. This indicates that there was a possible change in the relationship between convection frequency and intensity during the last three decades.

Lastly, the spatial distribution of frequency trends in strong convection is shown. The results indicate that the frequency of strong convection is increasing in the regions where convective activity developed. In contrast, there were no significant changes in trends for relatively weak convection. These mean that an increase in strong convection is the main cause of development of observed convective activity.

From these analyses, we found that trends in convective activity were different in some regions, and caused by frequency trends in strong convection.

Keywords: Tropics, OLR, convective activity, observation, precipitation characteristics

Investigation of Precipitation and Accumulation of CO₂ by Inflowing Rivers during High Season in Lake Kasumigaura

Khonsavanh Vilaysack

Master's Program in Environmental Sciences

Introduction: Recently, Global warming is becoming a serious and concerning issue from local scale to global scale. As we all know, many researches are focusing on CO₂ emission and its circulation. Along the study of adaptation, there are many studies on how to reduce or control carbon dioxide gas and other greenhouse gas (Miyano, 2008). However, majority of researches are focusing on the CO₂ flux over forest, ocean, and grass land. But there is a few researches on lake water. Therefore there need to more research on this field (Fukushima, Miyano, 1995, 2008)

Study area: Lake Kasumigaura, Total surface area: 220 km², Nishiura: 172 km², Depth : Average 4 m, deepest 7 m, Watershed area: 2156 km²

Objective: To clarify that precipitation is contributing the C_w or not. And to investigate C_w in in-flow rivers during high and low water period.

Methodology

- Eddy correlation Method
- CO₂ concentration: CO₂ concentration in water (C_w): (1) in-flow rivers: water sample collecting from 58 inflow rivers in both high and low water level, Measuring CO₂ concentration using CO₂ Meter and Chemical analysis, (2) in Lake: monthly water sample collecting & measurement from Koshin. CO₂ concentration in atmosphere (C_a): (1) Open-path CO₂ / H₂O analyzer (Koshin Observatory), 30 minute average per data. (2) Monthly data collection. CO₂ in rain water: (1) monthly directly rain water collecting at Koshin station, (2) Water sample analysis

Discussion and future work: Data analysis, Water sample measurement and data collection, methodology development.

Keywords: CO₂ flux, CO₂ concentration, Lake Kasumigaura, Eddy correlation

A-12

Bi-Fuzzy Control Using DO as Parameter in SBR Process

Mengqian LU

Master's Program in Environmental Sciences

SBR (Sequencing Batch Reactor activated sludge process) is a kind of sewage treatment. The intermittent time is not fixed and the concentration of organic matter also changes greatly over time (dozens or even hundreds of times), if we control SBR's run-time with the same standard (like traditional ON/OFF control), the effluent will be substandard when influent concentration is high and sludge bulking will occur when it's too low. Applying fuzzy control in the SBR process is one solution. Traditional fuzzy controllers have been proved a success for their quick response and in eliminating overshoot, however, there is still a certain amount of steady-state error.

Double fuzzy control/Bi-control is an extension of this method based on fuzzy control principles. It can make further efforts to eliminate the steady state error, improve the SBR system's stability and robustness which are the biggest problems faced by single fuzzy control in aeration links.

One of the key factors determining the effect of aerobic bacteria is the concentration of dissolved oxygen (DO) in the tank. Due to different water quality, the control link of DO often appears to be nonlinear in a classical way. But this proves it can be detected on line and has some other excellent characteristics as short reaction time, high accuracy that is perfect for being the main parameter of fuzzy control.

The principle of this bi-fuzzy control system is: define E_0 as the critical value of DO's error size (E), EC_0 as the critical value of error rate of change (EC), determine the size of E/EC (large or small) by using judgment circuit. When $E \geq E_0/EC \geq EC_0$ or $E \leq -E_0/EC \leq -EC_0$ use SFC1 (Single Fuzzy Controller 1) to control the aeration link in SBR process, otherwise use SFC2. Although the fuzzy rules of the two fuzzy controllers are the same, the quantitative factor (KE/KEC) and the scale factor (KU) among the controllers are totally different.

In SFC1, KE/KEC will take a small value to reduce the resolution of input, and KU will take a large value to accelerate the change of output. This can speed up the process of the transition and prevent long reaction time or sludge bulking. In SFC2, KE/KEC will take a large value to improve the resolution of input, and KU will take a small value to decelerate the change of output. This can suppress the increase in overshoot and make the SBR system reach steady state as soon as possible.

Key words: SBR, Bi-fuzzy control, DO, sewage treatment, automatic control

An Exploratory Study of Impacts of Land Tenure Complexity into Land Degradation in Ahafo Ano South District of Ashanti Region, Ghana

Michael Assefaw Gebreslassie

Master's Program in Environmental Sciences

Supervisor: Prof. Masuda Misa

Introduction

Sub-Saharan countries have been suffering from land tenure complexity which in turn resulted to agricultural inefficiency, very limited socio-economic development and widespread environmental degradation. Ghana is a Sub-Saharan country located in West Africa with a total population of 25 million (Ghana Demographics, 2013). The purpose of this study is to investigate the relationship between land tenure system and land degradation and its impacts on rural development processes in Ahafo Ano South district of the Ashanti region, Ghana.

Statement of the Problem

Land is a symbol of wealth, power and knowledge among the Ashanti communities. The current land tenure system of the Ashanti region is the result of a compromise between customary system and colonial system. Hence, it presents a number of problems such as land tenure insecurity, boundary disputes, lack of uniform customary procedures and excessive land litigations (Surv. Timothy Anyidoho). Such situation perpetuates rural poverty, hinders cooperative rural development and deters sustainable livelihoods. Moreover, the absence of formal land tenure system exerts unplanned activities and unwise exploitation of resources especially soil and water. Thus, crop yields remain low which requires a long way to food security. Therefore, this study will investigate tenurial problems and possible remedial measures in order to ensure sustainable land utilization and rural development.

Objectives

Hypothesizing that land tenure complexity is the major determining factors behind delays in rural development, the main objectives of this study are:

- To determine the trends of land tenure in Ahafo Ano South district of the Ashanti region
- To examine the relationship between land-tenure security (in terms of land ownership and land leasing) and land degradation
- To find out challenges of rural development and resource utilization by presenting findings on land-tenure complexity.
- To propose tenurial strategies and policy implications for sustainable livelihoods, appropriate resource management and rural development

Methodology

I intend to conduct two field surveys in Ahafo Ano South district. Land-use mapping with the help of ERDAS-Imagine Remote Sensing software and GIS applications will be utilized. In addition, household surveys will be undertaken along with participatory rural appraisal (PRA) in order to fully incorporate the opinions of local people. Transect walks, field observations, social mapping and wealth ranking will be used. Furthermore, an empirical logit model will be used to assess the data collected.

Key words: Ahafo Ano South Ashanti, land tenure, natural resource, rural development, environmental degradation.

ポスターセッション B Poster Session B

A Study on Space Arrangement by Tray Landscape and its Intention in the Qing Dynasty, China

Shuanghong LI

Doctoral Program in Sustainable Environmental Studies

Abstract

Chinese tray landscape has a long history from 2000 years ago up to the present. Tray landscapes reached maturity during the Qing Dynasty of China. They were installed inside and outside the house. This paper aims to clarify the space arrangement and the intentions of tray landscape in the Qing Period and to elucidate the spatial characteristics of these miniature landscape gardens arranged on a tray. I matched historical sources; documents, materials and pictures during my research.. I compared these sources and consider the placement and placement method (combination method with furniture) and house room usage in combination with the miniature landscape garden arranged on a tray.

This study examines the spatial techniques used in miniature landscape gardens arranged on a tray landscape from China, and the intention of their maker. The order technique here means placement and the corresponding setting method. In other words, I review a combination of trees, stone, flower tray and various furniture methods and first clarify combination with placement of the miniature landscape garden with stones and sand between the inside and outside environment. For analysis, I use historical sources from this period such as pictures, old photographs and written records.

Key words: Tray landscape, Interior, Exterior, Placement, Space arrangement, historical materials

B-2

The Utilization of Medicinal Plants under the Influence of Medical Service: A Case in the Peruvian Amazon

Miki Toda

Doctoral Program in Sustainable Environmental Studies

Medicinal plants are generally recognized as an important source of medicine, especially in developing countries as 80% of people in developing nations rely on herbal medicine. Medicinal plants are also expected to be a source of income as a type of Non-Wood Forest Products (NWFPs), which have given great hope for poverty alleviation in rural forest areas. Although research on NWFPs has been extensive, there has not necessarily been a focus on the consideration of factors unique to each type of NWFP. Medicinal plants have been studied in various areas; however, utilization of medicinal plants from the viewpoints of both health care behavior and commercial activity has not yet been undertaken.

Focusing on this point, the study examines the use of medicinal plants in relation to medical services and commercialization of medicinal plants based on household surveys in a native community of Shipibo in the central Peruvian Amazon. The results show that although people use medicinal plants for health, usage is not necessarily as an alternative to medical drugs and services. A tendency towards knowledge loss and decreasing demand for medicinal plants use is also shown. In the community, medicinal plants are only sold in the form of remedies and their sale may require special skills and knowledge. In sum, although medicinal plants may be a minor income source for those who are already in business, it cannot be expected to support livelihoods in general.

Key words: tropical rain forest, livelihood, traditional knowledge, health, NTFP

Comprehensive Evaluation Approach of Current Situation in Kupang Municipality, NTT Province, Indonesia in Order to Achieve the CO₂e Target at Regional Level Based on a Kupang IO Table

Adrianus Amheka

Doctoral Program in Sustainable Environmental Studies

Indonesia's target is to reduce GHG emissions to between 26-41% (0.767-1.244) Gton CO₂e from base year 2010 to target year 2020. Kupang is one of the cities targeted to achieve this. This research begins by introducing current solid waste management, the development of a Kupang input output (IO) table, introduction of pollutant sectors and count amount of CO₂e caused by economic activity indicated in the IO table. The results are compared with global warming potential (GWP) for a ten and a hundred year period respectively which show 0.073 Giga Ton (Gton) CO₂e or 9.479% and 0.069 Gton CO₂e or about 9% emitted by economic activity without proper treatment. As a tool for the Kupang government, we outline a framework for future implementation as the best solution to integrate a number of natural resources and to treat wastes (in the form of CO₂, CH₄, N₂O, NO_x, SO_x, COD, BOD) before emission to the environment. This research is the first study that constructs an IO table at the municipal level and counts the amount of CO₂e emitted freely to environment in Kupang City for the year 2010.

Keywords: GHG Emission, CO₂e , IO Table, Kupang City

B-4

Hydrogeochemistry and Isotopic Signature of Groundwater Evolution in Jiaozuo Site, China

Liu Junping

Doctoral Program in Sustainable Environmental Studies

Groundwater plays a dominant role in the eco-environmental protection of arid/semi-arid areas. Understanding sources and mechanisms of groundwater recharge in Jiaozuo, which is located in an inland river basin in mid-southern China, is important for water resource planning in this ecologically sensitive area.

The elevated concentration of nitrate in groundwater is a serious problem in North China plain agricultural areas. The Jiaozuo site, a typical agricultural basin near Jiaozuo city (China), shows a rising concentration in nitrate and displays multiple $\text{NO}_3\text{-N}$ sources from non-point and point sources in shallow and deep groundwater systems. Because groundwater is the major source of potable water in the study area, groundwater quality protection is important. However, intensive agricultural activities in vegetable fields and manure disposal resulted in excessive levels of nitrate in many wells in the study area. The identification of a groundwater recharge system and the evaluation of the increased nitrate concentrations in this basin are important to control and manage groundwater quality.

In this study, 45 water samples were collected from rivers, springs and pumping wells in shallow and deep aquifers in 2013. Analysis of the aquifer system and hydrological conditions, together with hydrogeochemical and isotope techniques were used to investigate groundwater sources, associated recharge processes between shallow and deep aquifers, clarify the nitrate migration in different aquifers and evaluate the effects of shallow-deep groundwater interaction on the spatial distribution of nitrate contamination in this area.

Key words: groundwater recharge, hydrogeochemical evolution, isotopic tracers, nitrate

Community-Based Mangrove Management in Giao An commune, Giao Thuy District, Nam Dinh, Viet Nam

Vo Thi Thu

Master's Program in Environmental Sciences

Forest management policy in Viet Nam has changed to promote equity benefit sharing among stakeholders especially in communities, which are recognized as legal forest owners under the Land Law 2003 and the Forest Protection and Development Law 2004. Since then, many community-based management programs have been applied in production forest in many provinces. However, for protected forest, the first program was established in mangrove forest of Giao An commune - a buffer commune of Xuan Thuy National Park in 2012.

This research aims to (1) examine to what extent local people contribute to conservation of the mangrove forest; (2) compare policy and practices when applying the program; and (3) compare perceptions of different stakeholders.

Field survey was undertaken in July and August 2013 in a village of Giao An commune. 72 households were randomly interviewed using open structured questionnaires, of which 38 households are members of the program.

The results showed a high dependency of local people's livelihoods on mangrove resources, with 77.7% of main livelihoods dependent directly or indirectly on mangrove forest. A higher percentage was recorded in program members (78.9%) than non-members (52.9%) in evaluating the importance of mangrove forest. Members also participate in more activities of mangrove conservation (4 activities including planting, removing oyster, collecting mangrove fruits and patrolling) compared to the 2 activities that non-members contributed to. However, a decrease in mangrove resource benefits within 3 years affects the willingness of households to maintain and participate in the program.

Key words: Mangrove, community-based, livelihoods, conservation, perception

B-6

Toward Small-Scale Mangrove Conservation in Viet Nam Two Case Studies in Thua Thien Hue Province

Nguyen Thi Tam

Master's Program in Environmental Sciences

Supervisor: Prof. Misa Masuda

Mangrove forest plays a significant role in the whole environment ecosystem, especially in coastal areas. Therefore many studies on mangrove forest focus on or look at the large scale for understanding the values or characteristics of mangrove. Much attention was paid to mangrove forest conservation, particularly large-scale areas because of the “bigger is better” philosophy in conservation practitioners’ thinking in the 1990s. In Vietnam, despite many initiatives working on restoration, mangrove forest has been steadily decreasing for decades, from 408,500 ha in 1943 to 96,322 ha in 2009. Restoration efforts as well as studies tend to focus on large-scale concentrations, and less attention has been paid to small-scale mangrove conservation.

We focused on small-scale mangrove conservation and the characteristics of mangrove as well as its value in Thua Thien Hue province.

Primary data was collected from household surveys using questionnaires (76 of 420 households were selected). Based on secondary data and literature review, socioeconomic conditions and mangrove status of the study sites were analyzed.

From this data, we recognized that occupation and income are the most important factors, which affect local peoples' perception and attention to mangrove. Concurrently, religious and cultural values reflect the local peoples' interest in mangrove. Although local people have high understanding, and interest in the religious and cultural value of mangrove, their occupation has a big impact on mangrove conservation and as their income is not high, the extent to which they can become “effective conservationists” is unknown. We estimated the potential of community-based small-scale mangrove conservation in answering this question.

Key words: *mangrove, conservation, community-based conservation, small-scale conservation, Thua Thien Hue Province*

Biological Treatment of Tannery Wastewater by Using Salt Tolerant Bacteria

Nurymkhan MARJANGUL

Master's Program in Environmental Sciences

1. Introduction

The tanning industry is one of the oldest industries in the world and the problem of its waste and wastewater treatment is probably as old as the industry itself. Recently there has been a gradual increase in tanneries in Mongolia, and currently over 30 small, medium and large tanneries are present in the sector with a capacity for processing up to 9 million (pieces) hides and skins in Ulaanbaatar, the capital city of Mongolia. For the conversion of raw hides or skins into leather most tanneries use hexavalent chromium, which is illegal, and other tanneries don't have their own treatment facilities.

Chromium (Cr) is a heavy metal, which exists in the environment from -2 to +6 valence states with hexavalent chromium being more toxic, carcinogenic, and mutagenic to animals as well as humans. Conventional chemical and physical methods for removing toxic chromium are less beneficial compared to biological treatment, which has been widely used for domestic and industrial wastewater treatment. This study aims to investigate the feasibility of using some salt tolerant bacteria to remove Cr (VI) as well as other pollutants (COD, N and P).

2. Methods

Wastewater samples were collected using a tube from operations in the Mongolian tannery industry. Some physicochemical parameters of wastewater pH, heavy metals, COD, BOD etc. were measured. For isolation of chromium resistant bacteria, 100 μ L of wastewater sample was spread on Luria-Bertani agar plates containing 100mg of Cr (VI)/L as the medium. For optimum growth of the bacterial isolates, two parameters, pH and NaCl concentration were considered. Hexavalent chromium was determined with a spectrophotometer using the diphenylcarbazide method.

3. Results and discussion

Four salt tolerant bacterial strains were isolated from the tannery wastewater sample from Mongolia, which exhibited good resistance to hexavalent chromium and were designated as HT1, HT2, HT3 and HT4, respectively. Phylogenetic analyses based on 16S rRNA gene sequences show that HT1 and HT3 belong to the genus *Enterobacter* and HT2, HT4 could be grouped into the genus *Serratia*.

In addition, the optimum growth conditions of the four strains have been established on LB mediums supplemented, under 6% NaCl, pH 7.2 and at 30 °C. The bacterial isolates were checked for their resistance to chromium up to a concentration of 1-500 mg/L and well growths occurred from 1-100mg/L. In the preliminary experiments strain HT1 showed more capability of reducing hexava-

lent chromium from among other strains and therefore HT1 was chosen for all the future experiments.

Batch experiments were carried out on hexavalent chromium removal on 10, 20, and 30 mg/L of Cr (VI) added as potassium dichromate ($K_2Cr_2O_7$), at pH 7 and $30^{\circ}C$ using pure culture of *Enterobacter sp.*-HT1 as inoculum. *Enterobacter sp.*-HT1 could reduce almost all the Cr (VI) ions added in 10mg/L of Cr (VI) within 24 hours. Particularly, 1%, 18%, 60%, 89%, 90%, 97%, and 99% of Cr (VI) from the medium could be reduced after 0, 4, 8, 12, 16, 20 and 24hrs, respectively. When the concentration of Cr (VI) was increased to 20 and 30mg/L, a complete reduction of Cr (VI) could be achieved after 48, 72, and 96 hours. A longer reduction time is necessary for complete Cr (VI) reduction at higher Cr (VI) levels, mainly due to an increased inhibition effect of high Cr (VI) level on bacterial growth.

The present results indicate that indigenous bacterial strains are able to reduce hexavalent chromium and these bacterial strains can be further exploited for lab-scale degradation of tannery wastewaters.

Key words: *Bacteria; Hexavalent chromium; Wastewater; Tannery industry*

Evaluation of Surface Water and Groundwater Resources in Quality and Quantity at Binh Chanh District in Ho Chi Minh City, Vietnam

Bui Thi Tuyet Van

Master's Program in Environmental Sciences

Supervisor: Prof. Maki Tsujimura

Binh Chanh district is one of the suburban districts in Ho Chi Minh City, Vietnam with a high population density and rapid urban – industrial development. In the context of the increase in water demand, groundwater is the best alternative source of water supply for domestic and industrial activities for some areas without piped water. However, under the effect of climate change and polluted surface water, the quantity and quality of groundwater has degraded. Therefore, it is important to clarify the mechanism of interaction between surface water and groundwater and understand the groundwater flow system, which is fundamental for the sustainable management of water resources.

The objectives of this study are to (1) investigate the groundwater flow system, (2) consider the stable isotopic composition and ion concentration in surface water and groundwater in dry and rainy seasons in 2013 and (3) clarify the interaction between surface water and groundwater as well as among aquifers.

Field surveys and samplings were carried out in March and August 2013. The main water parameters including electrical conductivity, pH, temperature, and groundwater level were measured directly in the field. Major anions were determined using Ion chromatography (IC), and major cations and stable isotopes were analyzed by Inductively Coupled Plasma Spectrometers (ICP) and a Mass Spectrometer (MAT 252) respectively in the laboratory.

The relationship between groundwater flow system, its chemical characteristics and also its stable isotopic composition is determined. The dominant hydro-chemical facieses of groundwater are Na-Cl and Ca- HCO₃ types. The chemical quality of water is related to water-rock interaction, ion exchange and seawater intrusion. Some groundwater samples demonstrate high Cl⁻ and Na⁺ concentrations in both shallow and deep aquifers, suggesting marine sediment dissolution. Analytical results and stable isotopes show that some groundwater samples are recharged by the same source because of the residual stable isotopic signature and the same chloride contents. These findings should be useful for effective management and sustainable use of water resources in the future.

Key words: Binh Chanh, interaction, groundwater, surface water, stable isotope.

B-9

Effect of pH and Surface Proteins on Biofilm Formation of *Lactobacillus Plantarum*

Nika Koyama

Master's Program in Environmental Sciences

Lactic acid bacteria (LAB) are well known as food spoilage bacteria as well as beneficial bacteria. LAB biofilm formation is one of the stress responses and survival strategies in stressful conditions, such as low pH. We previously showed that isolated *Lactobacillus plantarum* form raw materials from biofilms and that the biofilm cells had greater resistance to acetic acid (1, 2). Here, we investigated the effect of pH and surface layer (S-layer) proteins on LAB biofilm formation and stress resistance.

L. plantarum JCM1149 biofilm formation was observed by continuous optimizing confocal reflection microscopy (COCRM), which allows the visualization of biofilms without fluorescent labeling and fixation (3). *L. plantarum* biofilm formation was dependent on pH and could not form biofilms at pH 8 although this condition did not affect planktonic cell growth. In contrast, at pH 4, it formed robust biofilms and had increasing acetic acid resistance.

In addition, proteinase K treatment weakened the biofilm, suggesting that extracellular proteins are a major component of the biofilm matrix. S-layer proteins were considered to be involved in cell adherence and recognition of LAB. We found that *L. plantarum* S-layer proteins are released from the cell surface by Tris-HCl (pH 8) treatment and that dissociation of S-layer proteins reduced resistance to acetic acid. These results suggest that pH and S-layer proteins contribute strength and stress resistance to *L. plantarum* biofilms.

1. Kubota et al. (2008) J. Biosci. Bioeng.
2. Kubota et al. (2009) Food Microbiol.
3. Yawata et al. (2010) J. Biosci. Bioeng.

Groundwater Flow System Revealed by Stable Isotopes and Solute Constituents Tracers in a Semi-Arid Region, Northern Tunisia

Mariko Furukawa and Maki Tsujimura

Master's Program in Environmental Sciences

Groundwater and surface water are major water resources for every sector in Tunisia, North Africa, as this region seems to be vulnerable to a decrease in precipitation. Therefore, we investigated the spatial and seasonal distributions of trace elements in surface water and groundwater to clarify the hydrological processes of the groundwater-surface water continuum system in northern part of Tunisia.

Intensive field surveys were undertaken in Siliana, an inland area, and Sousse, a coastal area of northern Tunisia, in March and July in 2012 and June in 2013. Physico-chemical components were observed in situ, and oxygen-18 and deuterium and ion concentrations were determined from water samples taken at approximately 80 dam, river, deep well, shallow well and spring sites.

The oxygen-18 isotopic ratio of the water sampled in Sousse was higher compared with those in Siliana, showing the amount effect and inland effect of stable isotopes in precipitation.

In Siliana, the oxygen-18 isotopic ratio observed at higher elevation showed a lower value than that of lower elevation values in both seasons. Also, a geochemical evolution of groundwater and river water was observed from upstream to downstream regions, thus there might be multiple groundwater-surface water cycle systems combining on a local scale and regional scale in Siliana.

The stable isotopic compositions and ion concentrations of shallow groundwater taken from the Khairat aquifer, southern Sousse, showed a middle value for groundwater in the surrounding mountainous area and Khairat Dam water. A contribution ration of the dam and the mountainous groundwater to the shallow groundwater was estimated to be 44% and 56% using end-member mixing analysis, which indicates the importance of the recharge from the dam to the aquifer.

Key words: groundwater, stable isotopic composition, ion concentration, semi-arid area, northern Tunisia

B-11

Impact on Forest Recreation Activities due to Forest Ownership and Management

Aleksejeva Jelena

Master's Program in Environmental Sciences

Introduction

Latvia is a north European country and one of the three Baltic States and as such, it borders the Baltic Sea. The population of Latvia is about 2.2 million people (January 2012 data, Latvian Statistics Agency), and since the 1st of May 2004, the country has been a member of the European Union. Forests account for 42% of the total area of Latvia, with wood exports being the highest among the rest. On the other hand recreation activities that occur in the forest have always been an important part of Latvian tradition.

Problem Statement

Latvia's forests are used by the locals for various recreational activities that include, mushroom gathering, berry gathering, camping, trekking, hunting, cutting of Christmas trees etc. However, given the fact that Latvia's forests are exploited, changes in the management of forested areas by their owners are very common, and when these occur there is an impact on the recreational activities of the locals, as they need to adjust the way they enjoy the forest due to changing conditions.

Purpose

The purpose of this research is to assess the current trend in forest recreation activities in Latvia, in order to identify the impact that management changes by owners has on the location and frequency of the recreational activities of locals, by using interviews and questionnaires.

Methodology

During its initial phase, this research will aim to capture the current forest management situation in Latvia, such as the major owners and players in the forestry industry. In the second phase, by conducting interviews and preparing questionnaires for the locals, it will attempt to capture and understand their perception of forest recreation activities and the impact on their activities by changes in forest management. The questionnaires will focus on the types of recreation in connection with location, frequency, season of the recreation activities, as well as the knowledge that locals have of the ownership of their recreation sites, their actions when the management changes, and its impact on their enjoyment of the forest. The responses will determine if the changes in forest management have a negative or positive effect, while identifying the main reasons that lead to this situation.

Research significance

This research will provide critical information on the impact that forest management and its exploitation has on the recreational activities of Latvian people in forests, a matter that has not yet been investigated thoroughly. Should the changes in forest management inhibit recreation in the forests, policies must be introduced to allow locals to enjoy the forest as before. While on the other hand, if recreation goes unhindered despite forest management, then the reasons that this happens must be promoted and secured as successful policies.

References

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The Simulation of the Effect of Su Zhou River Comprehensive Policy

Ding Jieli

Master's Program in Environmental Sciences

Su Zhou River is the second longest river in Shanghai. The source of Su Zhou River is Tai Hu River. Su Zhou River runs through Shanghai city and finally runs into the Huang Pu River. The length of the Su Zhou River is 125 Km and the average width is 50-70m. Its extent in Shanghai is 53.1Km. The slope of Su Zhou River is very small, so current speed is slow and the average flow is $10\text{m}^3/\text{s}$. The main function of Su Zhou River is to provide living water to people who live in or around Shanghai, and to function as a major water transport medium.

Since 1920, Shanghai began to develop its economy and many factories were built on both sides of the Su Zhou River. A lot of sewage from people, industry and agriculture flowed into the Su Zhou River. However pollution is not limited to these; its function as a water artery, polluted water and fuel from boats also flowed into Su Zhou River directly. Solid garbage and slurry were poured into the River. So, after being largely polluted, the water of Su Zhou River changed to black, and smelt very bad.

In 1996, the government of Shanghai city decided to execute the Su Zhou River environment comprehensive renovation plan. Until now, total investments have already exceeded 15 billion RMB. After engineering remediation the water quality greatly improved. For example, the COD of Su Zhou river was 61.93 in 1998, however this decreased to 17.65 in 2011. As well as the improvement in water quality, the environment around Su Zhou River is greatly improved. However, according to the standards of normal rivers, the water quality of Su Zhou River is not very good, and purification of Su Zhou River itself is also limited.

Hence, the purpose of my research is to create a policy using computer simulation, a policy that cannot only assist with economic development but also protect our environment. I will use these results to improve Su Zhou River water quality and the policies, which are now being implemented.

The research method is divided into four parts. First, I will read some reports and papers about water protection, and study how to write a paper. Second, I will investigate the pollution and pollution source of Su Zhou River, to define the reason for its pollution. Third, I will find problems in current policy and I will also undertake fieldwork on the Su Zhou River to see the current situation. Finally, I will suggest some policy improvements, and in order to make sure this policy can be utilized. I will create a mathematical model to check these policies using computer simulation.

Through this research, first, I prefer to improve the water quality and management policy of Su Zhou River, to promote the economic development and city construction. The second aim is to understand the relationship between environment, city and human behavior clear, and the final target is to facilitate a sustainable society.

Key Word: Su Zhou River, water quality, simulation, policy, sustainable society

■ EDL 修了生・履修生紹介

Self Introduction of EDL Graduates and Candidates

Educational Path from Entrance to Post-graduation



Anis Chekirbane (Tunisia)

Senior EDL from 2010 to 2013

MEXT Scholarship

- Improvement of my discussion and negotiation skills
- Team working
- Awareness about the global environmental problems



2004, August	Diploma of National Engineer in Rural Engineering, Water and Forests from the National Institute of Agronomy (INAT), Tunisia
2004, December	Principal Engineer in the Water Researches and Technologies Center, Tunisia
2008, November	Master Degree in Natural Resources Management from the High School of Agriculture of Mograne (ESAM), Tunisia
2013, March	Ph.D. in Sustainable Environmental Studies & Certificate of Senior Environmental Diplomatic Leader from the University of Tsukuba, Japan
2013, October	Assistant Professor in Groundwater Hydrology in the Water Researches and Technologies Center, Tunisia



Career after Graduation



Name: Anis CHEKIRBANE

Degree: Doctor of Environmental Studies in March 2013

Certificate: Senior Environmental Diplomatic Leader

Job Title: Assistant Professor

Affiliation: Water Researches and Technologies Center, Borj Cedria Technopark, Tunisia



1. Studied for three years in the Doctoral Program in Sustainable Environmental Studies, receiving MEXT scholarship
2. Obtained Doctoral Diploma in 2013
3. Started to work at Borj Cedria Technopark as a Principal Engineer in hydrogeology
4. Became an Assistant Professor in groundwater hydrology in October 2013
5. Currently involved in two projects:
 - Integrated management of a hydraulic system composed of Dam - Wadi - Aquifer in Serrat basin, Northwest of Tunisia
 - Artificial recharge of groundwater by treated wastewater in CapBon region, northeast of Tunisia

Educational Path from Entrance to Post-graduation



Yudi Setiawan (Indonesia)

Senior EDL from April 2010 to March 2013
MEXT Scholarship

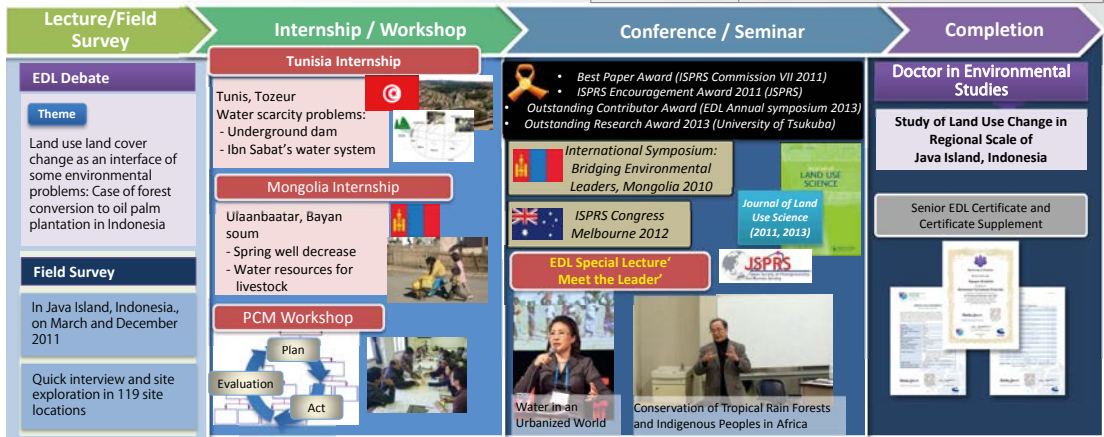
The EDL has given me a set of skills:

- Knowledge about sciences and technologies
- Professional working and relationships
- Problem solving

A strong ethic in study and research, and personal effectiveness for a wide range of challenging possibilities



Year, Month	Activity
2010, April	Started as a PhD student in Sustainable Environmental Studies, Univ. of Tsukuba and joined in the Environmental Diplomatic Leader (EDL) Program
2010 July; October	International Internship to Tunisia and Mongolia
2010, August	Research Presentation in ISPRS Commission VII, Kyoto, Japan
2011, October	Domestic Internship to Minamata, Kumamoto
2012, September	Research Presentation in ISPRS Congress, Melbourne, Australia
2013, March	Completion for PhD and Senior EDL
2013, April	Researcher in ERC, IPB Bogor, Indonesia



Career after Graduation



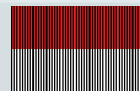
Name: Yudi SETIAWAN

Degree: Doctor of Environmental Studies
in March 2013

Certificate: Senior Environmental Diplomatic Leader

Job Title: Executive Secretary / Post-Doctoral Researcher

Affiliation: a. Center for Environmental Research (CER)
Bogor Agricultural University, INDONESIA
b. Remote Sensing of the Earth's Environment and
Resources Laboratory, College of Bioresource Sciences,
Nihon University, JAPAN



1. Studied for three years in the Doctoral Program in Sustainable Environmental Studies, University of Tsukuba, JAPAN due to the MEXT scholarship (Monbukagakusho)
2. Obtained Doctoral Diploma in March, 2013
3. April 2013, returned back to Indonesia, to continue as a researcher in CER
4. June 2013, elected as the Head of Environmental Spatial Analysis Laboratory, CER
5. September 2013, elected to be the Executive Secretary of CER
6. Doing a research project in Nihon University, Kanagawa, Japan, as a Post-Doctoral Researcher, since October 2013
7. Currently involved in two projects:
 - Exploring the links between land-use change and environment in Sumatra, Indonesia.
 - Funded by the Osaka Gas Foundation of International Cultural Exchange (OGFICE), Japan
 - Spatiotemporal variation of carbon budget in Alaska Arctic ecosystem related to climate change
 - Funded by the Environment Research and Technology Development Fund (ERTDF), Ministry of Environment, Japan (Project Number: 2-1304)

Educational Path from Entrance to Post-graduation



Yingxin ZHAO (China)

Senior EDL from 2010.9 to 2013.7

China Scholarship

- Inter-disciplinary knowledge
- Organization and negotiation abilities
- Environmental problem recognition and solving skills
- Improvement of English communication and writing ability
- Multi-cultural traditions and etiquette



Year, Month	Affiliation / Title
2008.9-2010.7	China University of Geosciences, Master
2010.8-2013.7	University of Tsukuba, Japan, Ph.D.
2013.8-present	Tianjin University, China, Assistant professor

Lecture/Seminar Field Survey	Internship / Workshop	Conference / Publication	Completion
<div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">Special lectures</div> <ul style="list-style-type: none"> • Technology for Water Treatment • Global Warming Issues • Humanity and Civilizations • The explosion of world population : towards the end? <div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">Field studies</div> <p>Shimoda city, 2010</p>	<div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">Mongolia Internship, 2011</div> <ul style="list-style-type: none"> • Genghis Khan Statue complex • Production well and spring in Sanzai area <div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">Kumamoto Internship, 2010</div> <ul style="list-style-type: none"> • Minamata disease center • Aso mountain <div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">PCM Workshop, 2012</div>	<div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">EDL Annual Symposium</div> <p>Best Poster Award in 2012</p> <div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">The 5th Japan-china-Korea Graduate Student Forum</div> <p>Best Oral Award in 2012</p> <div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">International publication</div>	<div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">Doctor in Sustainable Environmental Studies</div> <p>Adsorption of Chromium (VI) from Wastewater Using Natural and Modified Akadama Clay</p> <div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">Senior EDL Certificate and Certificate Supplement</div>

Career after Graduation



Name: Yingxin ZHAO

Degree: Doctor of Environmental Studies
in July 2013

Certificate: Senior Environmental Diplomatic Leader

Job Title: Assistant Professor

Affiliation: School of Environmental Science and Engineering ,
Tianjin University, China



1. Studied for three years in the Doctoral Program in Sustainable Environmental Studies, receiving CSC scholarship
2. Obtained Doctoral Diploma in July 2013
3. Became an assistant professor in Environmental Engineering in September 2013
4. Major research field: wastewater/drinking water treatment
5. Currently involved in one project:
 - Natural Science Foundation of China: "Nitrifying bacteria structure evolution and strategy control in the process of nitrification inhibition and recovery"

Educational Path from Entrance to Post-graduation

Otgonbayar Zagdragchaa
Mongolia



EDL program gave me wider knowledge and understanding on different environmental aspects. Most important thing is under the program, my intelligence is improved that now I can think about not only one thing, it should be considered wider and deeper approach. And another significant thing is that to decide any environmental problem, it is needed diplomatic manner using leadership role.

To Aug 2009	Officer, Mongolian Agency for Standardization and Metrology
Sept 2009	Entrance to Master program in the University of Tsukuba
	Entrance to EDL program
July 2010	Graduation, Master in Environmental Sciences and EDL, returned to job
now	Head of division, Mongolian Agency for Standardization and Metrology

Lecture / Field Study

Introduction to Water Environment	Integrated Water Science and Technology
Introduction to Cycle-oriented Environmental Studies	Environmental Ethics
Utilization and Recycling of Bio-resources	Environmental Health Perspective
Introduction to Environmental Symbiotic Studies	Introduction to Environmental Policy
Introduction to Environmental Policy	Introduction to English Presentation and Debate
Environmental Policy Appraisal	Cultural Ecology
EDL Debate	
• How deal with nuclear waste?	
Field and Laboratory Practices	
Kasumigaura Lake Minamata	Waste Treatment Plant NIES

Internship / Workshop

Tunisia Internship 2010

Japan Accreditation Board

PCM Workshop

Conference / Seminar

EDL annual symposium- poster presentation

EDL Special Lecture

- Global Warming Issues - Mitigation and Adaptation -
- Membrane, Leading-edge Technology for Water treatment
- A wide spectrum of health effects of methylmercury: from Minamata Disease to low-dose fetal exposure

Completion

Master in Environmental Sciences

EDL Certificate

Master in Environmental Sciences

Removal of chromium from water by adsorption onto akadama mud and its application to tannery waste water handling

Career after Graduation



Name: Otgonbayar Zagdragchaa
 Degree: Master of Environmental Sciences in July 2011
 Certificate: Environmental Diplomatic Leader
 Job Title: Head of division
 Affiliation: Mongolian Agency for Standardization and Metrology

1. Studied for two years in the Master's Program in Environmental Sciences, receiving JDS scholarship
2. Obtained Master Diploma in 2011
3. Continued to work at MASM as an officer (water quality, environment and food safety)
4. Appointed as an head of division of MASM in September 2013
5. Currently involved in projects:
 - The Joint Crediting Mechanism of GHG emission reduction (Japan and 10 Host Countries)
 - Negotiation of Economic Partnership Agreement between Mongolia and Japan
 - Trainee peer-evaluator of Pacific Accreditation Cooperation (AB's in the region)

Educational Path from Entrance to Post-graduation



Takuya Shiraishi (Japan)



EDL from April 2010 to March 2012

What I learned at EDL

- Diverse viewpoints on environmental issues
- Application of knowledge acquired into practice
- Leadership to inspire people

Year	Affiliation / Title
2012-Present	Consultant, IC Net Limited.
2012	M.S. in Environmental Sciences, University of Tsukuba
2011-2012	Part-Time Staff, Ramsar Center Japan
2007	B.S. in Biology, Chiba University, Chiba, Japan

Lecture / Field Study	Internship / Workshop	Conference / Seminar	Completion
<div style="font-size: small;"> <p>Introduction to Water Environment</p> <p>Introduction to Cycle-oriented Environmental Studies</p> <p>Utilization and Recycling of Bio-resources</p> <p>Introduction to Environmental Symbiotic Studies</p> <p>Policy and Planning for Forest Conservation</p> <p>Vegetation and Landscape Ecology</p> <p>Introduction to Environmental Policy</p> <p>Introduction to Environmental Governance</p> <p>EDL Debate</p> <ul style="list-style-type: none"> • Integrated Water Resource Management • Future of Nuclear Power Generation and Energy Issues <p>Field and Laboratory Practices</p> <div style="display: flex; justify-content: space-around; font-size: x-small;"> <div style="text-align: center;"> <p>Kasumigaura Water Plant</p> <p>Central Research Institute of Electric Power Industry</p> </div> <div style="text-align: center;"> <p>Waste Treatment Site</p> <p>Ashio Copper Mine Site</p> </div> </div> </div>	<div style="font-size: small;"> <p>Bhutan Internship 2010</p> <ul style="list-style-type: none"> • Jigme Dorji National Park • Royal Society of Protection of Nature • Taktsang Temple <p>JICA Beijing Office</p> <p>Survey Assistant in Forestry and Ecological Areas in China</p> <ul style="list-style-type: none"> • Daning, Shanxi • Yang, Shaanxi • Xinjiang Uyghur Autonomous Region <p>PCM Workshop</p> <div style="display: flex; justify-content: center; align-items: center; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">Plan</div> <div style="border: 1px solid black; padding: 2px;">Act</div> </div> <div style="display: flex; justify-content: center; align-items: center; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">Evaluation</div> <div style="border: 1px solid black; padding: 2px;">Act</div> </div> </div>	<div style="font-size: small;"> <p>3rd prize: Oral presentation 4th China-Japan Graduate Student Forum 2011</p> <p>Asahi Beer Research Foundation Research Grant: Global Environmental Science 2011</p> <p>58th Annual Meeting Ecological Society of Japan 2011</p> <p>EDL Annual Symposium</p> <p>'Meet the Leader' EDL Special Lecture</p> <p>Thinking environmental issues for children with a "Equity" lens Kunihiko Hirabayashi</p> <p>Population and the Environment - A Growing Problem in a Shrinking World - Kiyoko Ikegami</p> </div>	<div style="font-size: small;"> <p>Master in Environmental Sciences</p> <p>EDL Certificate</p> <p>Master in Environmental Sciences</p> <p>Grazing Impact on Above-Ground Biomass and Species Diversity along Altitudinal Gradient in Alpine Meadow on the Qinghai-Tibetan Plateau</p> </div>

Career after Graduation



Name: Takuya Shiraishi

Degree: Master of Environmental Sciences in March 2012

Certificate: Environmental Diplomatic Leader

Job Title: International Development Consultant

Affiliation: IC Net Limited (Consultancy firm)



1. Studied for two years in the Master's Program in Environmental Sciences (specialized in Terrestrial Ecology)
2. Obtained Master's diploma in March 2012
3. Past projects at IC Net Limited:
 - JICA "Preparatory Survey for Northern Region Rural Development and Local Governance Improvement Project in **Bangladesh**" (Environmental and Social Considerations Specialist)
 - Ministry of Foreign Affairs "Survey for Possible Application of Japanese Industrial Automation Technology in **Kazakhstan**" (Human Development/Project Management Specialist)
 - ILO (International Labour Organization) "Research on Employment and Labour Measures in the Post-Great East Japan Earthquake Recovery Process in **Japan**" (Research Assistant)
4. Current projects at IC Net Limited:
 - Ministry of Foreign Affairs "Project Formulation Survey for Strengthening Water Supply System for Communities during Emergencies through Application of Electric Power-free Water Purification Tank in **Peru**" (Water/Disaster Prevention Specialist)
 - JICA "Project of Integrated Approach Development in order to Promote Environment Restoration and Rural Development in Morarano Chrome, **Madagascar**" (Project Coordination Specialist)
 - JICA "Project for Strengthening Public Investment Management System in **Bangladesh**" (Environmental and Social Considerations Specialist)

Educational Path from Entrance to Post-graduation



Pham Tien Dat (Vietnam)

EDL member from 2010 to 2012
JDS Scholarship, JICE-JICA



What I have learned at EDL program

- Think globally, Act logically
- Sustainable Development
- Environmental Protection and Management for Human and Biodiversity

Time	Position
Nov 2006 – Jul 2010	Research fellow Centre for Agricultural Research and Ecological Studies (CARES), Hanoi University of Agriculture (HUA), Vietnam
Aug 2010 – Jul 2012	Master student and EDL member at GS of Life and Environmental Sciences, University of Tsukuba
Aug 2012 - present	Senior Researcher, Consultant CARES, HUA, Vietnam



Career after Graduation



Name: PHAM Tien Dat
Degree: MSc. of Environmental Studies in July 2012
Certificate: Environmental Diplomatic Leader
Job Title: Senior Researcher
Affiliation: Centre for Agricultural Research and Ecological Studies (CARES), Hanoi University of Agriculture (HUA).



1. Studied for two years in the Master program in Environmental Sciences, receiving JDS scholarship
2. Obtained Master Diploma in July 2012
Returned to work at Centre for Agricultural Research and Ecological Studies (CARES), Hanoi University of Agriculture (HUA).
3. Currently involved in three projects:



- I-REDD+ (Impact of Reducing Emission from Deforestation and Forest Degradation and Enhancing Carbon stocks). A case study : Con Cuong district, Nghe An, Vietnam (the 7th Framework Program of the European Union)
- Biodiversity investigation and mapping for Hai Duong province, Vietnam (Hai Duong province)
- A multi-site research initiative to improve nutrition and food security in Southeast Asia through nutrition-sensitive agricultural interventions. (IDRC, Canada)

Educational Path from Entrance to Post-graduation



Kazuyo NAGAHAMA (Japan)
 Master of Environmental Sciences (March, 2013)
 Before Graduation: Teacher at Nakagawa-Higashi Elementary School in Tokyo

Present :
 Ph.D Student, Tokyo University, Frontier Sciences
 Earthwatch Japan (NPO), Member,
 Hands-on-Math group, Faculty member,

Lecture/Field Survey	Internship / Workshop	Conference / Seminar	Completion																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Chemical Ecological Interaction</td><td>Natural Areas Planning</td></tr> <tr><td>Statistical Analysis</td><td>Water Environment</td></tr> <tr><td>Env. Microbiology</td><td>Health Perspective</td></tr> <tr><td>Int. Research Project</td><td>Ecosystem Ecology</td></tr> <tr><td>Policy/Planning for Forest</td><td>International Law</td></tr> <tr><td>Global Communication</td><td>International Research</td></tr> <tr><td>Environmental Policy</td><td>English Presentation</td></tr> <tr><td>International governance</td><td>Cultural Ecology</td></tr> <tr><td colspan="2" style="text-align: center;">EDL Debate</td></tr> <tr><td colspan="2">• Future of nuclear electricity and green/clean energy</td></tr> </table> <p>Visit Institutes and examine Field Survey</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">CRIEPI </td> <td style="text-align: center;">NPO </td> </tr> <tr> <td style="text-align: center;">NIES </td> <td style="text-align: center;">Ashio Copper mine </td> </tr> </table>	Chemical Ecological Interaction	Natural Areas Planning	Statistical Analysis	Water Environment	Env. Microbiology	Health Perspective	Int. Research Project	Ecosystem Ecology	Policy/Planning for Forest	International Law	Global Communication	International Research	Environmental Policy	English Presentation	International governance	Cultural Ecology	EDL Debate		• Future of nuclear electricity and green/clean energy		CRIEPI 	NPO 	NIES 	Ashio Copper mine 	<p style="text-align: center; background-color: #e91e63; color: white; padding: 2px;">2011 Mongolia Internship</p> <p>National Mongol University, Baganul Copper Mining, Gel stay in Teregi Lodge, Terumo Power Plant, Genghis Khan Museum...etc.</p> <p style="text-align: center; background-color: #e91e63; color: white; padding: 2px;">Oversea's Activity</p> <p>Field survey of Van Panchayat in India Supported by Tsukuba Univ. General subject in 2011/2012 and JSPS in 2012</p> <p style="text-align: center; background-color: #e91e63; color: white; padding: 2px;">Domestic Activity</p> <p>Hands-on Math Group (Study of mathematics educational materials) Organizing OJT for teachers and science workshop children and parents Earthwatch Japan(NGO) Implementation of "Picture Contest" and "Science Talk" in Tokyo and Nagoya</p>	<p>Japan-China-Korea Student Forum Best Poster presentation Award Title: Towards Sustainable Forestry in India: Prospects of Van Panchayat in Uttarakhand for Community-based Forest Management</p> <p>➢ The Japanese Society of Environmental Education, 2012 (Aomori), Oral presentation Trend of Environmental conservation movement in Northern India</p> <p>➢ Environment Diplomatic Leader Program, 2012 oral presentation (Ulaanbaatar) Prospect of Success in Afforestation: Forest Management in India</p> <p style="background-color: #e91e63; color: white; padding: 2px; text-align: center;">Oral resnetation in EDL Annual Session</p> <p style="background-color: #e91e63; color: white; padding: 2px; text-align: center;">'Meet the Leader' EDL Special Lecture</p> <p style="text-align: center;">Environmental Ethics -Sustainability and Ethics-</p> <p style="text-align: center;">Population Explosion and Future</p>	<p style="background-color: #0056b3; color: white; padding: 2px; text-align: center;">Master (Environmental Sciences)</p> <p style="background-color: #4a4a8a; color: white; padding: 2px; text-align: center;">Master Thesis</p> <p>Forest Management, Utilization and People's Perception of a Van Panchayat in Garhwal, Uttarakhand, India</p> <p style="background-color: #0056b3; color: white; padding: 2px; text-align: center;">Senior EDL Certificate and Certificate Supplement</p>
Chemical Ecological Interaction	Natural Areas Planning																										
Statistical Analysis	Water Environment																										
Env. Microbiology	Health Perspective																										
Int. Research Project	Ecosystem Ecology																										
Policy/Planning for Forest	International Law																										
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EDL Debate																											
• Future of nuclear electricity and green/clean energy																											
CRIEPI 	NPO 																										
NIES 	Ashio Copper mine 																										

Career after Graduation



Name: Kazuyo NAGAHAMA
 Degree: Master of Environmental Sciences in March 2013
 Certificate: Environmental Diplomatic Leader
 Status: Ph. D Student, first year
 Affiliation: The University of Tokyo



My field in Uttarakhand state, India, 2013

1. Studied for four years in the Master's Program in Environmental Sciences
2. Obtained Master's diploma in March 2013, March
3. Worked full time as a teacher at a primary school in Tokyo for 7 years before graduation
4. RA (research assistant) in Tokyo University and TA (teaching assistant) at a SSH (super science high school) in Kanagawa
5. Organizing science workshop for children with their parents and reviewing educational mathematics material for teachers
6. Supporting an environmental NGO Earthwatch (<http://earthwatch.org/>)
 - organizing science talk of researchers and volunteers
 - conducting Earthwatch Japan Picture Contest 2012 and 2013 with Nikon Limited.



Field note, 2013

Educational Path from Entrance to Ph.D. study

 	Mahdi K. Ikhlal (Jordan) www.mahdik.com <i>Senior EDL from December 2011 to July 2013.</i> Learned from EDL: <ul style="list-style-type: none"> • Learned how to be a team player • Learned how to be a leader • Improved my critical thinking skills • Improved my ability to debate different scientific topics • How to think out of the box 	October 2007- January 2010	IT Systems Engineer (Amman, Jordan) Ocean Infrastructure & Investment Co. Ltd.
		April 2011- July 2013	Masters Student at University of Tsukuba
		October 2013- Present	Ph.D. student at the university of Tokyo
	Research theme: Proposal for Sustainable and Integrated Waste Management in Amman Jordan Based on Life Cycle Method (LCA)		

Lecture/Field Survey	Internship / Workshop	Conference / Seminar	Completion
Meet the leader 	Internship to Vietnam 	Conferences 3 Proceeding Papers. 1 Full paper under publishing (Tokyo, Yokohama and Indonesia)	Certificates Environmental Diplomatic Leader EDL Educational Program. Japan Global 30 Waste Management Expert Course. International Collaborative Environmental Program (ICEP).
Field Work 	PCM Workshop 	Awards Outstanding Paper Presentation Award from the Japan Section of the Regional Science Association International (JRSRAI). For the contribution made to the association as a young scientist.	

Career after Graduation



Name: Mahdi K. Ikhlal

Affiliation: Ph.D. student at the University of Tokyo, Graduate School of Frontier Sciences, Global Program in Sustainability Science, Global Leadership Initiative GPSS-GLI

Research theme: E-Waste Management and recycling in Jordan

Career Path after graduation:

An academic career after I am awarded a doctorate from The University of Tokyo. I plan to join the efforts of other academics focusing particularly on the issue of sustainable development.

www.mahdik.com

Educational Path from Entrance to Post-graduation



Syeda Masuma Khanam
(Bangladesh)
EDL from **August 2011 to July 2013**



What I learned in EDL program:

- ✓ Reasons and solutions of Environmental problems both in developed and developing co
- ✓ Dealing with Environmental governance
- ✓ to deal with environmental governance that encourages the active participation of various stakeholders;

Year, Month	Affiliation
2011	Deputy Director, BPATC, Savar
2011-2013	JDS fellow/MS student in the Graduate School of Life and Environmental Sciences, UT, Japan
2013	Achieved MS degree/ EDL degree
2013--	Senior Assistant Secretary, MoPA, Bangladesh Secretariat, Dhaka; Resource Person at Bangladesh Civil Service Administration Academy, Dhaka

Lecture / Field Study

Lectures

- Introduction to Sustainability Studies
- Biodiversity and Bio-Resources
- Introduction to Environmental Governance
- Water Resources, Water Treatment, Water Environmental Policy
- Public Health, epidemiology and medical policy
- Cultural Ecology
- Introduction to International Law
- Introduction to English Presentation and Debate

EDL Debate

Participated on debates on animal right and food waste management
Field Survey
Dohar subdistrict, Bangladesh, 2011, 2012 and 2013

Internship / Workshop

Kenya Internship

- Amboseli National Park
- Karura Forest
- National Park
- Kibara Slum area



PCM Workshop

Conference / Seminar

EDL Annual Symposium

'Meet the Leader' EDL Special Lecture



Environmental Ethics

My MS thesis is on the way to be published from Lambert Academic Publishers, Germany

Completion



Career after Graduation

Name: Syeda Masuma Khanam

Degree: Master of Environmental Sciences in July, 2013

Certificate: Environmental Diplomatic Leader

Job Title: Senior Assistant Secretary, Ministry of Public Administration, Bangladesh Secretariat.



1. Studied for two years in the Master's Program in Environmental Sciences
2. Obtained second Master's diploma in 2014; First one is in Anthropology
3. Working in the MoPA at Internal Training section
4. Conducting sessions at Bangladesh Civil service Administration Academy as resource person

Educational Path from Entrance to Present



Miki Toda (Japan)



2nd year Doctoral Program in Sustainable Environmental Studies

EDL from April 2012 - Present

- Living in diversity
- Keeping million facets of glasses
- Balancing bird's eye and ant's eye

May. 2005 – Mar. 2012	Alternative medicine practitioner and instructor in medicinal plant and other plant and forest based modalities, estyle
Dec. 2002 – Sep. 2004	General Manager, Product Strategy/Life Cycle Management, Japan Telecom, Co., Ltd.
Mar. 2000 – Dec. 2002	Deputy Director, Product Development and Management, Global Crossing Japan Inc.
Oct. 1997 – Feb. 2000	Manager, Business Planning, Global One Communications, Inc.

Lecture / Field Survey	Internship / Workshop	Conference / Seminar	Present
<p>Policy and Planning for Forest Conservation (TA/TF) Terrestrial Ecology (listener) Cultural Ecology (listener) Introduction to International Health (TA)</p> <p>Introduction to International Law Introduction to Environmental Policy (TF) Introduction to Environmental Governance</p> <p>Field Trip / Survey International Research Project Jul. 9th-26th, 2012 • Universidad Nacional de Trujillo • Native communities in Southern Peruvian Amazon</p> <p>Forum on Sustainable Environmental Studies III Nov. 8th-10th, 2012 • Toyama Environmental Model City • Teyama Sabo (Mud-Slide) Dam</p>	<p>Vietnam Internship 2012</p> <ul style="list-style-type: none"> • Thang Long Industrial Park • JICA second Hanoi drainage project • WHO Vietnam office • Bach Mai Hospital • Nha Trang Bay Marine Protect Area • Pasteur Institute • Ngu My Thanh hamlet at Tam Giang Cau Hai Lagoon • Office of Genetic Counseling and Disabled Children <p>PCM Workshop</p> <p>Plan Evaluation Act</p>	<p>EDL Annual Symposium Best Poster Award in 2012</p> <p>EDL Annual Symposium 2012 Joint Congress of Environmental Leader Program 2013</p> <p>第125回日本森林学会大会</p> <p>IUFRO</p> <p>'Meet the Leader' EDL Special Lecture</p> <p>Environmental Ethics</p> <p>Water in Urbanized World</p>	<p>Doctoral Research in Sustainable Environmental Studies</p> <p>Assessing the contribution of medicinal plants to health and livelihoods in the Peruvian Amazon</p> <p>Progress Report</p>

Current Status



Name: Miki Toda

Program: Doctor's Program in Sustainable Environmental studies
April 2012 - Present

Degree: Master of Regional Planning
Master of Arts in Communication



Research Theme:
Assessing the contribution of medicinal plants to health and livelihoods in the Peruvian Amazon



Current Status:

- Progress report: submitted
- The 2nd and 3rd field survey: planned in Feb and Aug in 2014



graphics left: Central Intelligence Agency: <https://www.cia.gov/library/publications/cia-maps-publications/index.html>

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所要経費

(単位：百万円)

補助対象経費	21年度	22年度	23年度	24年度	25年度	備考
1. 人件費	5.8	39.2	45.9	47.4		
教授・准教授・助教授（専任）	2.9	29.8	30	28.6		
補助者・事務補助者他	2.9	9.4	15.9	18.8		
2. 備品、試作品費等	14.9	-	-			
(1) 教育環境の整備						
・大判プリンタ	0.5	-	-	-	-	学術成果の公開
・テレビ会議システム	1.3	-	-	-	-	海外機関打合せ、遠隔講義の実施
・プレゼンテーション (E-learning 作成機材)	1.5	-	-	-	-	各種セミナーの復習機会提供、情報公開推進
(2) 実験用機器類						
・リアルタイム PCR システム	4.3	-	-	-	-	ウイルス・微生物簡易測定能力の向上
・多項目水質計	1.6	-	-	-	-	野外での水質測定機材
・高速液体クロマトグラフシステム	5.7	-	-	-	-	水中汚染物質濃度測定
3. 旅費	2.1	8.0	11.0	14.9		
・受講生インターンシップ	-	4.5	6.4	7.5		
国内	-	-	1.0	1.5		
海外	-	4.5	5.4	6.0		
・担当教員事業実施	2.1	3.5	4.6	7.4		
国内	1.2	0.7	1.1	1.4		
海外	0.9	2.8	3.5	6.0		
4. 消耗品費	8.4	5.6	2.3	3.4		
・事業実施費	8.4	5.6	2.0	3.0		
・環境改善費	-	-	0.3	0.4		
5. その他	6.9	2.7	2.1	2.5		
(1) シンポジウム開催	1.4	0.5	0.3	0.8		
(2) 講演会開催	0.8	1.1	1.5	1.1		
(3) 広報活動	4.7	1.1	0.3	0.6		
6. 間接経費	11.4	16.7	-	-	-	23年度より廃止
計	49.5	72.2	61.3	68.2	69.4	総計 320.6
(内、自己資金)	(0)	(0)	(0)	(0)	(0)	(0)
補助対象外経費	4.0	1.9	1.9	2.5	2.2	総計 12.5

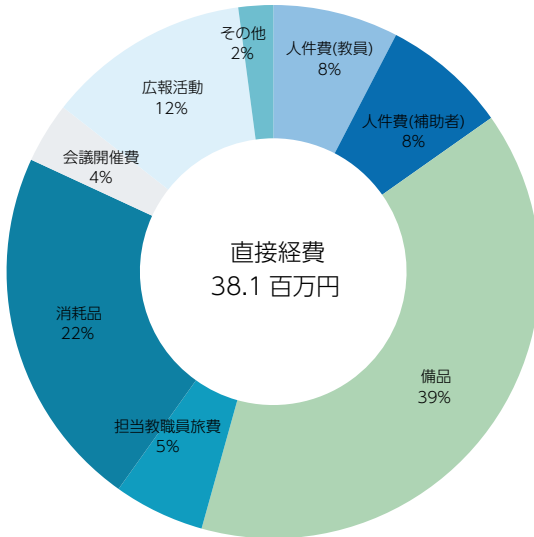
所要経費・費目ごとの割合

平成21年度

予算総額49.5百万円

直接経費38.1百万円

間接経費11.4百万円

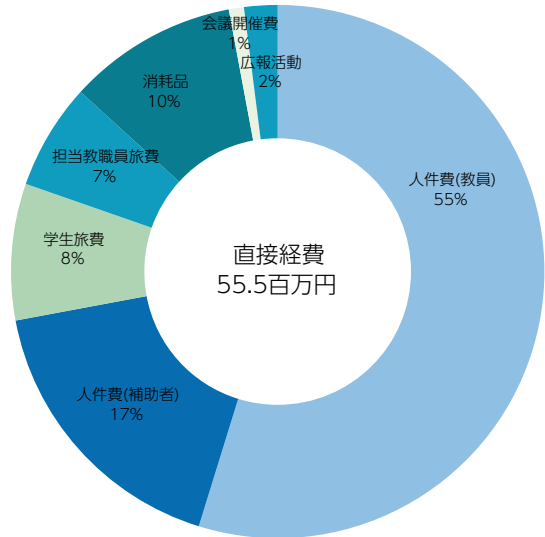


平成22年度

予算総額72.2百万円

直接経費55.5百万円

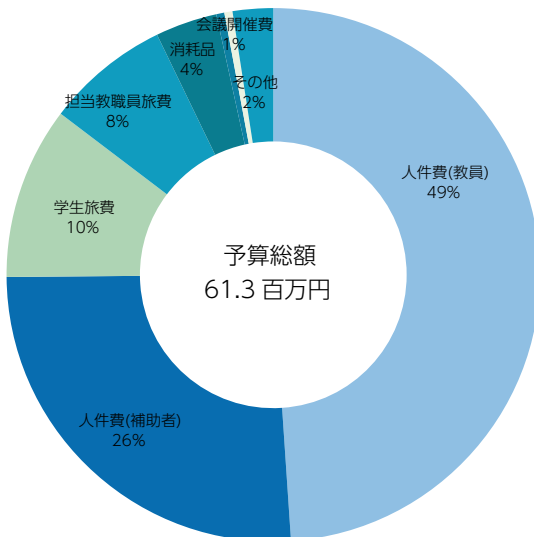
間接経費16.7百万円



平成23年度

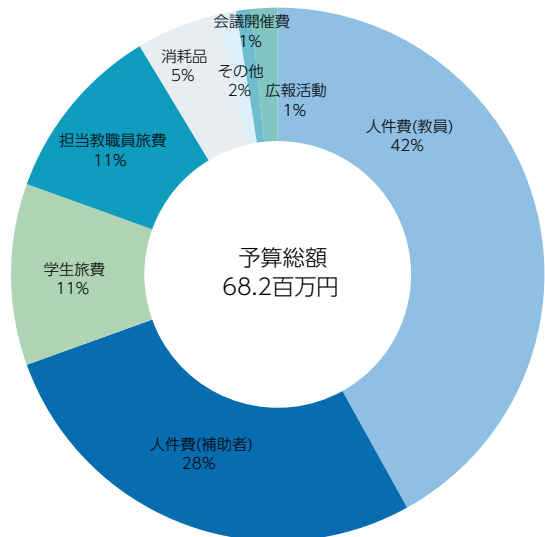
予算総額61.3百万円

※間接経費は平成23年度より廃止



平成24年度

予算総額68.2百万円



所要経費－筑波大学公募型教育研究経費等支援経費－

年度	執行額	執行内容
H22	190万円	・国内実習学生旅費 ・短期雇用 ・教育資料 ・消耗品・備品（教員居室エアコン等）
H23	140万円	・短期雇用 ・教育資料（Environmental Ethics等） ・消耗品（ipad等） ・旅費（環境リーダー会合出席のため） ・その他（インターンシップ航空券キャンセル料）
H24	250万円	・短期雇用 ・教育資料 ・消耗品（暖房器具、実験器具） ・旅費（SUSTEP会議学生参加、修士学生会参加等） ・印刷物（専攻英語パンフ） ・その他（人件費等）
H25	219万円（予算）	統括シンポジウム開催費 他
合計	1199万円	

人材育成実績

< 育成状況 3年目 >

人材育成の 카테고리 (コース等)		育成者数（3年目）			
		受入者数		修了者数	
		目標	実績	目標	実績
修士コース	国外	12人	34人	6人	11人
	国内	8人	11人	4人	3人
博士コース	国外	8人	13人	0人	1人
	国内	4人	0人	0人	0人
合計		32人	45人	10人	15人
目標達成率		141%		150%	

< 育成状況 5年目 >

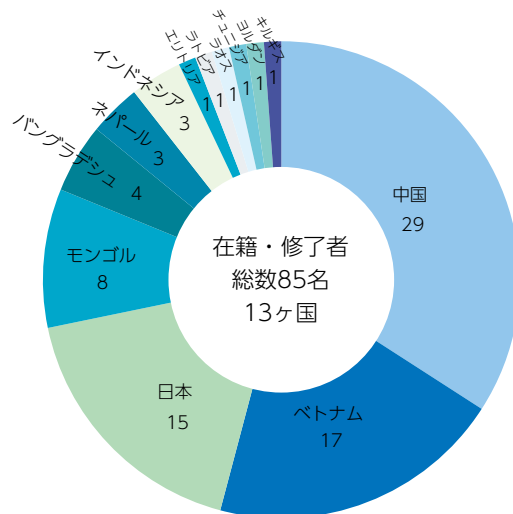
人材育成の 카테고리 (コース等)		育成者数（5年目）			
		受入者数		修了者数	
		目標	実績	目標	実績*
修士コース	国外	24人	55人	18人	38人
	国内	16人	18人	12人	8人
博士コース	国外	16人	21人	8人	9人
	国内	8人	2人	4人	0人
合計		64人	93人	42人	47人
目標達成率		145%		112%	

* H26年3月修了予定者を含む

国別学生数

	出身国	入学者数	在籍者数	修了者数*
修士コース (博士前期課程)	バングラデシュ	4	1	3
	エリトリア	1	1	0
	日本	18	6	8
	ヨルダン	1	0	1
	ガーナ	1	0	0
	インドネシア	1	0	1
	キルギス	1	0	1
	ラオス	1	1	0
	ラトビア	1	1	0
	モンゴル	9	2	6
	ネパール	3	0	3
	ベトナム	17	5	12
	中国	15	3	11
博士コース (博士後期課程)	エジプト	1	0	0
	インドネシア	2	1	1
	日本	2	1	0
	チュニジア	1	0	1
	中国	14	7	7

*H26年3月修了予定者を含む



プログラムの応募者及び合格者

	H22			H23			H24		H25	合計
	4月	9月	12月	4月	9月	12月	4月	9月	4月	
修士コース	15 (20)	6 (7)	-	14 (15)	9 (11)	1 (1)	10 (20)	7 (9)	11 (11)	73 (94)
博士コース	4 (4)	4 (4)	1 (3)	2 (2)	3 (3)	-	4 (5)	3 (4)	-	21 (25)
合計	19 (24)	10 (11)	1 (3)	16 (17)	12 (14)	1 (1)	14 (25)	10 (13)	11 (11)	94 (119)

※ 括弧内は応募者数

プログラムの育成対象者の国籍と職業

	政府職員	教育機関	研究者	国際機関	民間 NGO	学生	合計
バングラデシュ	3					1	4
エリトリア		1					1
中国					3	24	27
日本					1	12	13
ヨルダン							
インドネシア			2			1	3
キルギス	1						1
ラオス							
ラトビア						1	1
モンゴル	5		3				8
ネパール						2	2
チュニジア			1				1
ベトナム	4	2	8		2	1	17

修了後の活動状況

< 修士コース >

2011年7月卒業

国籍・性別・年齢 平成25年12月時点	帰国後勤務先 (勤務内容等)
ベトナム・男・35歳	Cityneon Vietnam Company Limited, Vietnam
ベトナム・男・35歳	ベトナム自然資源環境省・ベトナム環境局 (水質汚染のモニタリングと管理のための規制や法整備に関する調査と検討。ベトナム政府への報告と政策提言。)
モンゴル・女・40歳	モンゴル品質標準局 -MASM- (国の法律や規制の運用、規制遵守の監視、国際基準の導入および関連する行政業務。)
キルギス・女・35歳	キルギス政府・環境森林保護機関・生物多様性・自然保護区と環境教育部局 (自然保護区の管理と生物多様性保全のための科学研究のモニタリングと指導)

2012年3月卒業

国籍・性別・年齢 平成25年12月時点	帰国後勤務先 (勤務内容等)
日本・男・29歳	アイ・シー・ネット(株)(ODA 案件形成基礎調査等)

国籍・性別・年齢 平成25年12月時点	帰国後勤務先 (勤務内容等)
日本・男・31歳	筑波大学大学院生命環境科学研究科持続環境学専攻 博士課程
中国・男・28歳	Beijing Foreign Enterprise Human Resources Service Co.,Ltd (公社)
中国・男・28歳	日立システムズ (株)
バングラデシュ・男・28歳	(株) システムエグゼ
中国・女・32歳	筑波大学大学院生命環境科学研究科持続環境学専攻 博士課程
中国・女・28歳	Lidyarich Financial Group, Shanghai

2012年7月卒業

国籍・性別・年齢 平成25年12月時点	帰国後勤務先 (勤務内容等)
モンゴル・男・36歳	ADRA-Mongolia (MEAL project specialist)
モンゴル・女・36歳	モンゴル国家水文気象研究所
モンゴル・女・31歳	モンゴル地生態学研究所
ベトナム・男・29歳	Center for Agricultural Research and Ecological Studies (CARES) - Hanoi University of Agriculture (HUA), Vietnam
バングラデシュ・男・38歳	バングラデシュ人事省
ベトナム・男・34歳	Center for Agrarian Systems Research and Development, Vietnamese Academy of Agriculture Sciences (ベトナム農業科学アカデミー)

2013年3月卒業

国籍・性別・年齢 平成25年12月時点	帰国後勤務先 (勤務内容等)
日本・女・44歳	東京大学大学院 博士課程
日本・男・25歳	日立製作所 (株)
日本・女・25歳	水ing (株)
日本・男・27歳	岡山大学歯学部編入
ベトナム・女・28歳	筑波大学大学院生命環境科学研究科持続環境学専攻 博士課程
中国・女・26歳	Chongqing Municipal Administration Commission, China
インドネシア・女・26歳	筑波大学大学院生命環境科学研究科持続環境学専攻 博士課程
中国・女・28歳	(独) 物質・材料研究機構 (研究補助)
ネパール・男・30歳	東京大学大学院 博士課程

2013年7月卒業

国籍・性別・年齢 平成25年12月時点	帰国後勤務先 (勤務内容等)
ヨルダン・男・32歳	東京大学大学院 博士課程
ベトナム・男・30歳	Vietnam Institute of Meteorology Hydrology and Environment, (Researcher)
バングラデシュ・女・38歳	Ministry of Public Administration as senior assistant secretary; Bangladesh Secretariat, (senior assistant secretary)
ベトナム・女・26歳	Centre for Agriculture and Forestry Planning and Designation (技術者)
ベトナム・女・29歳	Vietnam Institute of Meteorology, Hydrology and Environment, Ministry of Natural Resources and Environment (研究者)
ベトナム・女・28歳	Vietnam Ministry of Natural Resources and Environment (Officer)
ベトナム・女・29歳	Ministry of Agriculture and Rural Development (Officer)
ベトナム・男・28歳	Faculty of Fisheries Hue university of Agriculture and Forestry (Lecturer)
モンゴル・女・37歳	Eastern Mongolian Protected Area Administration.

< 博士コース >

国籍・性別・年齢 (平成25年12月現在)	帰国後勤務先 (勤務内容等)
中国・男・3歳	ハイケム株式会社
チュニジア・男・33歳	Water Researches and Technologies Center at Borj Cedria Technopark, Tunisia
インドネシア・男・35歳	日本大学生物資源科学部生物環境工学科 (博士研究員)
中国・女・27歳	Chinese Academy of Sciences, Research Center on Fictitious Economy and Data Science
中国・女・28歳	School of Environmental Science and Engineering, Tinjin University (assistant professor)

EDL 特別講義 I・EDL セミナー [Meet the Leader]

平成22年度

1	開講日	平成22年9月17日
	演題	地球温暖化問題：緩和と適応
	講師	丸山 康樹
	所属・職位	東京大学客員教授、電力中央研究所 主席研究員
2	開講日	平成22年11月4日
	演題	水処理を革新する膜分離技術、基礎と実例
	講師	田村 真紀夫
	所属・職位	膜分離技術振興協会
3	開講日	平成22年11月5日
	演題	Water, Cultural Diversity and Global Environmental Changes
	講師	Dipak GYAWALI
	所属・職位	国連大学高等研究所 / UNESCO 客員教授
4	開講日	平成22年11月19日
	演題	メチル水銀の健康影響：水俣病から低濃度ばく露の影響まで
	講師	佐藤 洋
	所属・職位	東北大学医学系研究科環境保健医学 教授
5	開講日	平成22年12月18日
	演題	世界の人口問題：終焉へと向かうか？
	講師	Yves Charbit
	所属・職位	パリ第5大学人口・開発研究所所長
6	開講日	平成23年1月20日
	演題	子どもたちにとっての環境問題—公平性という観点から考える—
	講師	平林 国彦
	所属・職位	UNICEF 東京事務所 代表
7	開講日	平成23年2月15日
	演題	霞ヶ浦の市民型公共事業～アサザプロジェクト～
	講師	飯島 博
	所属・職位	NPO 法人アサザ基金 代表理事

平成24年度

1	開講日	平成24年 6 月 1 日
	演題	気候変動交渉と日本の外交
	講師	中村 浩平
	所属・職位	外務省国際協力局気候変動課気候変動交渉官
2	開講日	平成24年 9 月27日
	演題	地球温暖化：現在、将来
	講師	丸山 康樹
3	所属・職位	東京大学客員教授、電力中央研究所 主席研究員
	開講日	平成24年11月15日
	演題	環境と企業－日立グループの環境への取り組み－
	講師	伊藤 裕理
4	開講日	平成24年12月14日
	演題	都市化する世界の水問題－現状と未来への挑戦－
	講師	Sarantuyaa Zandaryaa
	所属・職位	ユネスコ国際水環境プログラム 専門家
5	開講日	平成25年 1 月18日
	演題	世界マラリア対策のリーダーとして－WHO での経験から－
	講師	古知 新
	所属・職位	元 WHO 本部世界結核対策部長、マラリア対策部長
6	開講日	平成25年 2 月 1 日
	演題	変貌する世界で生きる子どもたち
	講師	平林 国彦
	所属・職位	UNICEF 東京事務所 代表

EDL 特別講義 II・PCM ワークショップ

平成22年度

開講日	平成22年12月21日, 22日
演題	環境プロジェクト計画立案 PCM ワークショップ
講師	大迫 正弘 林 泰子
所属・職位	NPO 法人 PCM Tokyo 理事長 開発コンサルタント(フリー)

平成23年度

開講日	平成23年12月 2 日, 3 日
演題	都市廃棄物処理
講師	大迫 正弘 高橋 佳子
所属・職位	NPO 法人 PCM Tokyo 理事長 Y's コンサルティングオフィス

平成24年度

開講日	平成25年1月11日、12日
演題	PCM ワークショップ： 飲料水の安全と安心 - つくば市を例に -
講師	大迫 正弘 石渡 文子
所属・職位	NPO 法人 PCM Tokyo 理事長 ピコーズインスティテュート シニアコンサルタント

平成25年度

開講日	平成25年12月26日、27日
演題	自然災害と気候変動
講師	大迫 正弘 砂原 美佳
所属・職位	NPO 法人 PCM Tokyo 理事長 名古屋大学大学院法学研究科 特任講師

EDL 特別講義 III・EDL セミナー [Meet the Leader]

平成23年度

1	開講日	平成23年5月6日
	演題	日本の環境外交
	講師	加納 雄大
	所属・職位	外務省国際協力局気候変動課課長
2	開講日	平成23年9月30日
	演題	人類と文明
	講師	松浦 晃一郎
	所属・職位	第8代 UNESCO 事務局長
3	開講日	平成23年10月28日
	演題	人口と環境 - 増大する人口、縮小する世界 -
	講師	池上 清子
	所属・職位	国連人口基金東京事務所 所長
4	開講日	平成23年11月10日
	演題	地球規模課題としてのエイズ - 世界の現状と展望 -
	講師	François Dabis
	所属・職位	ボルドー第2大学・公衆衛生・疫学・開発研究所 教授
5	開講日	平成23年11月24日
	演題	持続可能な地球社会と国際環境協力
	講師	松岡 俊二
	所属・職位	早稲田大学大学院アジア太平洋研究科教授
6	開講日	平成24年1月20日
	演題	アフリカにおける熱帯雨林保護と先住民の生活
	講師	市川 光雄
	所属・職位	日本モンキーセンター所長 京都大学名誉教授

7	開講日	平成24年2月14日
	演題	National University of Mongolia (NUM) Its Research and Education Activities
	講師	BYAMBAKHUU Ishgaldan
	所属・職位	Engineer & Hydro Ecologist, National University of Mongolia

平成25年度

1	開講日	平成25年6月28日
	演題	人口と環境 狭まる世界と拡大する課題
	講師	池上 清子
	所属・職位	日本大学大学院総合社会情報研究科・教授、前国連人口基金東京事務所・所長
2	開講日	平成25年6月29日
	演題	水俣病の科学
	講師	西村 肇
	所属・職位	東京大学 名誉教授
3	開講日	平成25年7月11日
	演題	人類と文明
	講師	松浦 晃一郎
	所属・職位	第8代 UNESCO 事務局長
4	開講日	平成25年10月2日、8日
	演題	地球規模課題としてのエイズ—過去、現在、未来 エイズの終焉は可能か？
	講師	François Dabis
	所属・職位	ボルドー第2大学・公衆衛生・疫学・開発研究所 教授
5	開講日	平成25年10月5日
	演題	国際環境問題と日本外交
	講師	堀江 正彦
	所属・職位	地球環境問題担当大使
6	開講日	平成25年11月14日
	演題	アフリカにおける熱帯雨林保護と先住民の生活
	講師	市川 光雄
	所属・職位	京都大学名誉教授、日本モンキーセンター所長

EDL 特別講義 IV

開講日	平成24年2月15日、16日 平成26年1月17日、24日
演題	Environmental Ethics – Sustainability and Ethics – 持続可能性と倫理 – Part 1: A context for environmental ethics Part 2: Basic concepts of environmental ethics Part 3: Policies and controversies in environmental ethics Part 4: Philosophy and theory of environmental ethics Part 5: The philosophy and ethics of sustainable development
講師	Joseph R. DesJardins
所属・職位	Vice Provost, Department of Philosophy, College of St. Benedict and St. John's University

インターンシップ実績（海外・国内）

< 海外インターンシップ >

派遣先	期間	人数	訪問機関	重点領域
チュニジア	2010.7.26 -8.5	教員 2 名 学生 10 名	国立農業研究所 保健省 JICA 事務所	水資源・乾燥地の水問題 保健衛生 国際協力
フランス チュニジア	2011.7.11 -7.22	教員 4 名 学生 12 名	フランス： ユネスコ本部科学部 バスツール研究所 チュニジア： 国立農業研究所 保健省	環境問題への国際機関の取り組み 感染症、公衆衛生対策 水資源問題 保健衛生問題
	2013.9.19 -9.27	教員 1 名 学生 9 名	ユネスコ本部科学部 パリ市水道局 バスツール研究所 国立農業研究所 保健省 保健・環境保護局 地域病院施設	環境問題への国際機関の取り組み 都市化に伴う水問題 世界の公衆衛生対策 水資源問題 保健衛生問題 世界遺産 エコシステム
モンゴル	2010.10.25 -11.1	教員 4 名 学生 6 名	モンゴル地質生態研究所 ウランバートル市西部下水処理場 ウランバートル市保健衛生局 バヤチャンドマニ村役場	水処理、浄化問題 保健衛生問題 農村開発、地下水、水資源、水源保全
	2011.8.27 -9.3	教員 5 名 学生 11 名	モンゴル科学アカデミー地生態学研究所 モンゴル自然環境省気象水文研究所 ウランバートル第 3 火力発電所 バガヌール炭鉱	水資源問題 生物多様性 保健衛生問題 エネルギー問題
	2012.7.28 -8.4	教員 2 名 学生 5 名	モンゴル国立大学 第 3 火力発電所 Ikh Nart in Chuluu 自然保護区 遊牧民のゲル地区	鉱山開発にともなう水資源問題や保健衛生問題 自然保護区における生物多様性の保全 モンゴルの文化多様性と現状
ケニア	2012.7.8 -7.21	教員 1 名 学生 10 名	日本学術振興会ナイロビ研究連絡センター Karura 森林地区 ケニア野生動物公社 アンボセリ国立公園 ケニア国立博物館	文化多様性と民族問題 地域住民による森林管理 生物多様性と侵略的外来種の管理 NGO の野生動物保護活動
	2013.8.26 -9.7	教員 2 名 学生 9 名	日本学術振興会ナイロビ研究連絡センター Karura 森林地区 Kuku group ranch UNEP マサイ族村 ケニア野生動物公社 アンボセリ国立公園	文化多様性と民族問題 地域住民による森林管理 生物多様性と侵略的外来種の管理 NGO の野生動物保護活動
インドネシア	2010.7.3 -7.16	教員 1 名 学生 2 名	ボゴール農科大学 インドネシア科学院 公共事業省バンドン支社	水資源・森林利用 地下水利用 地盤沈下 洪水予防
	2013.9.1 -9.12	教員 2 名 学生 4 名	ガジャマダ大学 メラピ火山 ウォノギリ貯水池	火山噴火、土砂災害河川形態、河川水理学 地下水資源、河川水質
ベトナム	2012.8.5 -8.12	教員 3 名 学生 8 名	ベトナム天然資源環境省 JICA ベトナム事務所 フエ大学 WHO ベトナム事務所 バスツール研究所	水資源問題 海洋生態保全 エコツーリズム 感染症、公衆衛生問題

派遣先	期間	人数	訪問機関	重点領域
中国	2010.7.23 -8.6	教員 2 名 学生 3 名	雲南大学生命環境学院 開遠市汚水処理工場 大開山国立保護区 個旧船、精製工場 異竜湖保護区	連携国際研究 都市化、下水処理 生物多様性保全 レアメタル鉱山開発に伴う環境問題 水資源、水浄化問題
ブータン	2010.8.20 -8.30	教員 1 名 学生 1 名	農務省森林局ジグメドルジ国立公園 ガサ県庁	生物多様性 持続可能な観光資源利用 伝統文化保存

< 国内インターンシップ >

派遣先	期間	人数	訪問機関	重点領域
国内実習 (水俣)	2010.12.2 -12.4	教員 3 名 学生 15 名	国立水俣病研究センター 水俣市立水俣病資料館 南阿蘇村	毛髪水銀検査実験実習 公害問題の歴史と現在 生物多様性、日本の農山村問題
	2011.11.27 -12.1	教員 4 名 学生 15 名	長崎原爆資料館 土石流被災家屋保存公園 長崎県諫早湾干拓事務所 有明海漁民・市民ネットワーク 水俣市立水俣病資料館 環境省国立水俣病総合研究センター 熊本大学	戦争と放射線が人体に与える影響 諫早湾干拓問題 公害問題の歴史と現在 毛髪水銀検査実験実習 環境リーダー合同シンポジウム
	2012.11.26 -11.29	教員 3 名 学生 16 名	長崎原爆資料館 軍艦島 長崎県諫早湾干拓事務所 有明海漁民・市民ネットワーク みなまたエコタウン 水俣病資料館 国立水俣病研究センター	戦争と放射線が人体に与える影響 日本の近代化を支えた産業の盛衰 諫早湾干拓問題 公害問題の歴史と現在 毛髪水銀検査実験実習 水俣市の取り組み
	2013.7.7 -7.10	教員 3 名 学生 12 名	長崎原爆資料館 軍艦島 長崎県諫早湾干拓事務所 有明海漁民・市民ネットワーク 熊本県庁環境生活部水俣病保健課 相思社 水俣病資料館 国立水俣病研究センター	戦争と平和 日本の近代化を支えた産業の盛衰 公害問題の歴史と現在 毛髪水銀検査実験実習
水俣 UNIT	2012.11.21 -11.26	教員 1 名 学生 5 名	相思社 御所浦島 遠見の家 水俣病患者連合会	水俣病の過去、現在患者組織からの聞き取り調査
	2013.11.23 -11.27	教員 2 名 学生 5 名	水俣病資料館 国立水俣病総合研究所 遠見の家 相思社 愛林館 産業団地	水俣病の過去、現在患者組織からの聞き取り調査

EDL Cafe and Debate

実施日	テーマ
2010.5.12	オリエンテーション
2010.6.9	懇談
2010.7.1	議論の課題について
2010.9.6	水資源に関する総合的マネジメントについて
2010.11.12	懇談
2010.12.17	土地利用の変化：経済性、エコシステムおよび人間の健康への影響に注目する
2010.4.19	EDL 活動の紹介および新入生歓迎
2011.5.11	原子力発電とエネルギー問題の将来
2011.6.10	福島原発事故に対する EDL 生出身国の報道のあり方と各国の人々の反応
2011.6.17	原発廃棄物の処理問題：モンゴルの原発廃棄物処理場の建設計画
2012.4.10	懇談
2012.5.25	食糧・貧困問題「飢餓と肥満のバランスをどう取るか」
2012.6.20	自然保護と資源の利用における「動物の権利」
2012.9.26	懇談
2012.10.31	エコタウン事業は地元住民にとって本当に必要か
2012.11.7	諫早干拓事業の水門は開門すべきか
2012.11.14	水俣病問題を引き起こしたチソは倒産させるべきか
2013.4.8	懇談
2013.6.5	原子力発電はやはり必要か
2013.11.13	環境問題の解決における「共通だが差異ある責任（CBDR）」の有効性を問う

外部評価委員

外部評価委員：

- 佐藤 洋氏（国立環境研究所理事、東北大学医学部名誉教授）
- 松浦晃一郎氏（ユネスコ第8代事務局長）
- 丸山 康樹氏（財団法人電力中央研究所首席研究員、東京大学客員教授）
- 塩尻 和子氏（東京国際大学特命教授、国際交流研究所長）
- Dr. Joseph DesJardins, Professor, College of Saint Benedict and St. John's University, USA

委員会日程：

- ・2011年9月6日
- ・2011年9月30日
- ・2012年2月16日
- ・2013年7月11日

主な評価コメント

- ・カリキュラムの構成が途上国のニーズに対応し、環境問題の解決につながる構成になっている
- ・海外拠点等を活用して、海外インターンシップを通して実践的なリーダー育成が達成されている
- ・育成対象者の質が高く、また育成対象者の本プログラムに対する評価が高い
- ・育成されたリーダーとのネットワークが構築され、継続的な支援と交流の維持が期待される
- ・海外での認知度も向上し、学生の出身国・地域が多様化してきている
- ・プログラムの継続を強く期待する

参考資料 被育成者による研究業績 (実線下線は育成された人材氏名、破線下線は育成従事者名) (日付順)

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3. 学位論文

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平成23年 7月 (4件)

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AIZAWA Naoto, Possibility of Inland Aquaculture Development in the Northeast Pará, Brazil

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Background of Deforestation and Forest Degradation in the Whykong Forest Range of Bangladesh

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SHIMIZU Tatsuki, Study on the Effectiveness of Windbreak Trees for Reduction of Evaporation in an Agricultural Land in the Nile-Delta, Egypt

TAKAHASHI Mizuho, Groundwater Flow System in an Irrigated Coastal Watershed, Cap-Bon, North-East

YAMADA Wataru, Spatial Distribution of Isotopic Compositions in Terrestrial Water, Northern Region of Tunisia

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VU Van Minh Minh, Assessment of the Impacts of Climate Change on Water Allocation in the Upper Cau River Basin-Vietnam

KHANAM Syeda Masuma, The Empowerment of Rural Women in Bangladesh for Environmental Conservation: Integrating Traditional Knowledge and Environmental Education

NGUYEN Thi My Quynh, Mapping of Soil Erosion in the Binh Dien Reservoir Watershed using the RUSLE Model in GIS and Remote Sensing

NGUYEN Tu Anh, Policy Options for REDD+ Implementation and Enhancing the Participation of Local People in Ba Be National Park, Bac Kan Province, Viet Nam

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DANG Nguyet Anh, Economic Valuation of the Nha Trang Bay Marine Protected Area (MPA): A Willingness to Pay Survey for MPA Conservation Programs

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- WANG Wenlong, Effect of Mg^{2+} on Nitrification Capability of Aerobic Cranules When Treating Synthetic Wastewater
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- TIAN Xiaojie, Informal Learning and Practices of Indigenous Ecological Knowledge among Maasai Children in Kajiado County, Southern Kenya
- BANU Yasin, Kathmandu's Attempts to Improve the Water Supply System : A Historical Analysis
- LIU Yu, In vitro and in vivo Anti-Diabetic Activity of Extracts from *Actinidia kolomikta*

博士論文（計9件）

平成24年3月（4件）

- WANG Shuozhi, Interactions between Fungi and Bacteria Associated with Degradation of PAHs
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- SETIAWAN Yudi, Study of Land Use Change in Regional Scale of Java Island, Indonesia
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- ZHANG Wanjun, Genetic analysis of chloral hydrate dechlorination in *Pseudomonas putida*. LF54
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平成26年3月（1件）

- Shuhong Li, Utilization of Soybean Curd Residue for Polysaccharides Production by *Morchella esculenta* and Evaluation of its Biological Activity

4. 著作・出版物（2件）

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6. 国外会議での口頭報告（12件）

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10. 研究助成金獲得（1件）

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EDL および上級 EDL 修了生／EDL and Senior EDL Graduates



Dr. Zhao Yingxin (Senior EDL)
China / Completed in July 2013
Assistant Professor, School of Environmental
Science and Engineering, Tianjin University



Takuya Shiraishi / 白石 拓也 (EDL)
Japan / Completed in March 2012
International Development Consultant, IC Net
Limited



Dr. Anis Chekirbane (Senior EDL)
Tunisia / Completed in March 2013
Assistant Professor Water Researches and
Technologies Center, Borj Cedria Technopark,
Tunisia



Otgonbayar Zagdraguchaa (EDL)
Mongolia / Completed in July 2011
Head of Product and System Certification Division,
Mongolian Agency for Standardization and
Metrology



Dr. Yudi Setiawan (Senior EDL)
Indonesia / Completed in March 2013
Postdoctoral fellow, College of Bioresource
Sciences, Nihon University



Kazuyo Nagahama / 長濱 和代 (EDL)
Japan / Completed in March 2013
Graduate Student, Department of Natural
Environmental Studies, The University of Tokyo



Syeda Masuma Khanam (EDL)
Bangladesh / Completed in July 2013
Senior Assistant Secretary, Ministry of Public
Administration, Bangladesh Secretariat



Pham Tien Dat (EDL)
Vietnam / Completed in July 2012
Senior Researcher, Center for Agricultural Research
and Ecological Studies - Hanoi University of
Agriculture



Mahdi Khalil IKHLAYEL (EDL)
Jordan / Completed in July 2013
Graduate Student, Graduate Program in
Sustainability Science, Global Leadership
Initiative, The University of Tokyo

上級 EDL 履修生 / Senior EDL Candidates - Doctoral Program in Sustainable Environmental Studies



Zhang Jie
(China)



Shi Wansheng
(China)



Li Shuhong
(China)



Miki Toda
(Japan)



Zhou Qian
(China)



Li Shuanghong
(China)



**Amheka
Adrianus**
(Indonesia)



Yang Wei
(China)



Liu Junping
(China)

EDL 履修生 / EDL Candidates - Master's Program in Environmental Sciences



**Kohsuke
Tomimatsu**
(Japan)



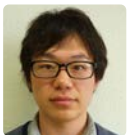
**Koichi
Sakakibara**
(Japan)



**Miah Md.
Tofail**
(Bangladesh)



**Bui Thi
Tuyet Van**
(Vietnam)



**Wang
Wenlong**
(China)



**Singh Rajeev
Kumar**
(Nepal)



**Pham Thi
Thanh**
(Vietnam)



**Dinh Thu
Hang**
(Vietnam)



Tian Xiaojie
(China)



Banu Yasin
(Nepal)



Liu Yu
(China)



Vo Thi Thu
(Vietnam)



**Erdenebadrakh
Munkhjargal**
(Mongolia)



**Nguyen Thi
Tam**
(Vietnam)



**Tran An
Dang**
(Vietnam)



**Nurymkhan
Marjangul**
(Mongolia)



**Nika
Koyama**
(Japan)



**Naoyuki
Shibayama**
(Japan)



**Furukawa
Mariko**
(Japan)



**Yurisa
Miki**
(Japan)



**Aleksejeva
Jelena**
(Latvia)



**Khonsavanh
Vilaysack**
(Laos)



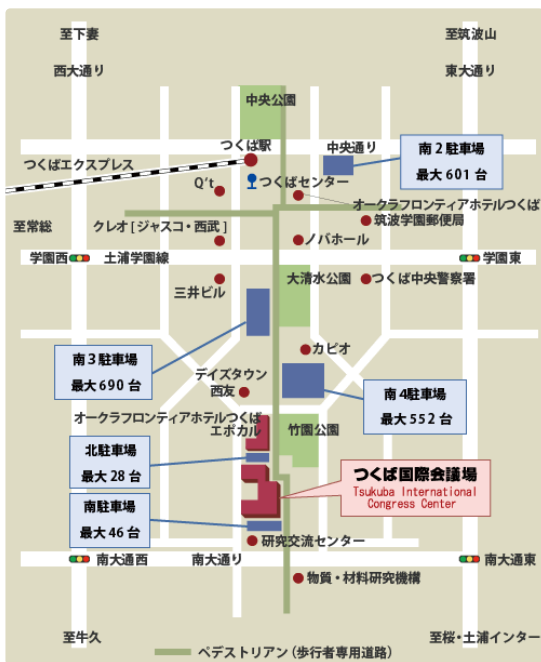
Ding Jieli
(China)



**Michael
Assefaw
Gebreslassie**
(Eritrea)



**Lu
Mengqian**
(China)



- TX つくば駅からつくば国際会議場へのアクセス (徒歩 8 分)

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