

ANNUAL REPORT ON RESEARCH 2007 Asian Institute of Technology



AIT
Asian Institute of Technology

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PREFACE

The mission of AIT was and is to serve the region and beyond as a center of higher education, research and outreach activities. As a graduate school and knowledge center the institute is involved in capacity building, dissemination of knowledge from research activities and reaching out to industry, public institutions, local communities and other stake holders. This increasingly demands an interdisciplinary approach in all these activities. Besides this, the institute has to dynamically react and incorporate the needs of the market in developing new academic programs, tailor made training, research and consultancy as per the requests of our clients. Outreach activities take into account local traditional knowledge and the support of local agents.

The institute has been active both in advance technology while applying research to help in development at the local level. However it is clear that there is a need to consolidate research and focus on a few areas with a critical number of researchers. There was a continued debate within the institute as regards the identification of the thematic knowledge area in which we should put additional focus in an interdisciplinary manner. Considering our existing efforts in various areas of sustainable development like natural resources, food and aquatic systems, water resources and management, energy and environment, urban and rural development ICT for development, housing and built environments, ICT for development, public and private project management, transportation, robotics and sensor systems, etc. it was decided to integrate our research into an umbrella thematic areas of Climate change and sustainable development. The sub-areas in which we have knowledge and experience and in which we can make niche for clusters is being identified.

The Masters thesis competition of the best research theses work was once again held in year 2007. It has created an awareness of the type of work going on in various fields in the institute, gave students confidence in their research and presentation skills, exposed students to the appropriateness of their work thus paving the way to encourage excellence in graduate scholarly research and recognizing outstanding student accomplishments. As in previous years this led to student placements, further interactions with the institutions from the institutions and industries represented by the judges, etc. This year some of the projects also were covered by the local press which further helped in show casing some of the outstanding work carried out by our students under the guidance of AIT faculty.

Administrative Decision Meetings in 2006 were further streamlined procedures and further actions to rationalize and promote sponsored projects. Schemes were put in place for research projects sponsored by government and development agencies, as well as for training projects, conferences and personal consultancies. Decisions were also made on faculty/staff time recovery from sponsored projects while a system of incentives

Professor Sudip K Rakshit
Vice President for Research
July 2008



was built into the system. The benefit of these actions were clearly evident in year 2007.

In line with the plan to encourage continuously stimulate active discussions and debate among community members, an Extramural Lecture Series was initiated, and the Institute's Professorial Lecture Series was revived. **Prof Nurul Amin**, a senior and respected colleague presented his work and experience while making suggestions to link strategic directions we may need to take. The extramural lecture series definitely instigated more fora for special speakers, and opened the AIT community to different perspectives of the invited speakers. Extramural speakers in 2007 included **Mr. Tauhidul Anwar Khan** (WRE'80), Member (Hons.) of the Indo-Bangladesh Joint Rivers Commission, and Former Director General of the Water Resources Planning Organization (WARPO), Bangladesh; **Ambassador Mr. Jan Axel Nordlander**, Ambassador for Human Rights (Sweden to Thailand), Ministry of Foreign Affairs; **Lord Ronald Oxburgh KBE**, a very distinguished academician with extensive experience in the private sector, and is trained as a geologist/geophysicist (Oxford & Princeton) who gave a lecture on Energy after Oil.

The stress on collaborative research and the initiative taken by faculty and staff from the institute has continued with the year 2007 ending with about **220 ongoing projects** and **210 completed projects**. **All ongoing projects in 2007 is valued at about 1.55 Billion Baht**. Details of the projects initiated, ongoing and completed in the year 2007 and the publications resulting from research activities carried out in the institute are included in this document.

There is a considerable scope for working with the private sector, pro activity to asking and working towards obtaining sponsored projects and consultancy opportunities, highlighting our research in international and other media, developing and improving research infrastructure, etc. With the help of all stakeholders and with our own investments, it is hoped that AIT's research will continue to play a pioneering, supportive and effective role in the region.

INTRODUCTION

1.1 AIT Mission

The Asian Institute of Technology promotes technological change and sustainable development in the Asian-Pacific region through higher education, research and outreach. Established in Bangkok in 1959, AIT has become a leading regional postgraduate institution and is actively working with public and private sector partners throughout the region and with some of the top universities in the world.

Recognized for its multinational, multi-cultural ethos, the Institute operates as a self-contained international community at its campus located 40 km (25 miles) north of Bangkok, Thailand.

Besides the usual laboratories and academic buildings, the main campus includes housing, sports, and medical facilities, a conference center, and a library with over 230,000 volumes and 830 print and on-line periodicals. All serve to fulfill the AIT mission -

to develop highly qualified and committed professionals who play leading roles in the region's sustainable development and its integration into the global economy.



1.2 AIT Vision

To become a leading and unique regional multicultural institution of higher learning, offering state-of-the-art education, research and training in technology, management and societal development.

With this clear, timeless vision, the multi-skilled team of students, faculty and staff at AIT are set to continuously strengthen the institution by becoming

- A trailblazer in advanced education in the region, with leadership in IT and new types of multidisciplinary programmes.
- An exemplary institution, with an emphasis on academic quality in terms of courses and other aspects of the operation.
- A leader in professional development programmes.
- A hub for the implementation of regional/transnational research projects, and a research facility for academic professionals. The hub will network with other academic and research institutions in the region and the world.
- A model international citizen.
- A collaborator and partner of national postgraduate institutions.
- A financially viable, self-sustaining institution, able to draw support from donors, the private sector and individuals, with good governance and strong leadership.
- A strong partner to its alumni, who are principal stakeholders through the AIT Alumni Association (AITAA).



Chapter 2: SCHOOL OF ENGINEERING AND TECHNOLOGY



2.1 Mission

School of Engineering and Technology (SET) is the synergistic integration in November 2005 of the two former Schools, namely, the School of Civil Engineering (SCE) and the School of Advanced Technologies (SAT). Historically, these two schools came into existence only in January 1993 when the Institute reorganized the need to reform its academic structure from smaller-sized units called "Divisions" to larger bodies named "Schools".

The School of Civil Engineering (SCE) represents the legacy of AIT when it was established with a single field of study in Hydraulics Engineering. Subsequently, other civil engineering fields of study were launched to assist the recovery from the ravages of the Second World War. SCE emphasized on a learning process that combines theoretical problem-solving and real life application of engineering principles. Its research orientation was outward-looking, addressing the actual and anticipated needs of the built environment.

The School of Advanced Technologies (SAT) consisted of fields of study that were launched in response to the needs of the regional industrialization in the second and third decades of AIT's existence. The School was committed to being international, multidisciplinary centers of excellence in Information, Communications, Industrial Systems, and Space Technologies through education, research and outreach.

The new School of Engineering and Technology amalgamating the School of Civil Engineering (SCE) and the School of Advanced Technologies (SAT) will strive to create synergies between the activities of the two former schools to build up world-class multidisciplinary and cross-disciplinary education, research and outreach activities across the boundaries of traditional fields of knowledge. More interdisciplinary programs shall be launched so faculty members can work effectively across the disciplinary walls. The new school will enhance its academic portfolio by emphatically

injecting the "5I" features namely internationality, innovation, integration, information technology and industrial partnership.

In line with the mission of the Institute, the mission of the School of Engineering and Technology is:

To develop highly qualified engineers and technologists who play leading roles in promoting the region's industrial competitiveness in its integration into the global economy.

More information about school can be accessed at the SET's homepage <http://www.set.ait.ac.th/>.

2.2 Thematic Groups, Fields of Study and Multidisciplinary Programs

CIVIL AND INFRASTRUCTURE ENGINEERING GROUP

Since the founding of AIT, its civil engineering fields have promoted modern methodologies, emerging technologies and innovative materials for the design and

construction of safe and economical infrastructure in the region. The Civil and Infrastructure Engineering group includes the following field of studies:

- Construction, Engineering and Infrastructure Management (CEIM)
- Geotechnical and Geoenvironmental Engineering (GTE)
- Geosystem Exploration and Petroleum GeoEngineering (GEPG)
- Structural Engineering (STE)
- Transportation Engineering (TRE)
- Water Engineering and Management (WEM)

INDUSTRIAL SYSTEM ENGINEERING GROUP

For several decades, AIT has served in the development of the region by equipping young engineers with the high-tech knowledge required to work in complex industrial environments. Since its inception, the Industrial Systems Engineering (ISE) thematic group at AIT has contributed to this mission by focusing on industrial competitiveness and innovation for sustainable growth in the region. The ISE group is comprised of the following field of studies:

- Mechatronics (MEC)
- Microelectronics (MIC)
- Industrial and Manufacturing Engineering (IME)

INFORMATION AND COMMUNICATIONS GROUP

Information and communications enable access, connections and sharing in turn enable knowledge creation and economic opportunity. The fields in the Information and Communications group are:

- Computer Science (CS)
- Information Management (IM)
- Remote Sensing and Geographic Information Systems (RS-GIS)
- Telecommunications (TC)

Interdisciplinary Programs

- Offshore Technology and Management
- Information and Communications Technologies
- Disaster Preparedness, Mitigation and Management

2.3 Strategic Research Areas

The School of Engineering and Technology has identified broad research areas related to the strengths of its faculty, its curriculum and its existing facilities that are the building blocks for education niches in engineering and advanced technologies.

The following lists the information about the specific focal areas grouped by Fields of Study

Computer Science and Information Management (CSIM)

Software Engineering and Development; Information and Knowledge Management

Industrial Systems Engineering (ISE)

Design and development of devices and sensors; Automation and control of machines; Product design and integration of machines and processes; Planning, operation, control and logistics of Industrial engineering

Remote Sensing and Geographic Information Systems (RS&GIS)

Remote sensing (RS); Geographic information system (GIS); Global positioning system (GPS); Digital mapping technology; Digital photogrammetry

Telecommunications, Information and Communications Technologies (TC, ICT)

Mobile Communications; Teletraffic and Network Performance Analysis; Focal Area 3: Optical Networks

Advanced Infrastructure Development

- Application of new approaches and concepts in the development of infrastructure including innovative project financing
- PPP/PFI, integrated project management
- Infrastructure asset and valuation management, and infrastructure safety and security

Geotechnical and Geoenvironmental Engineering (GTE)

Sustainable geological exploitation for engineering activities; Design of safe structures; Disaster mitigation and rehabilitation

Transportation Engineering (TRE)

Transportation Logistics; Highway Pavement; Road Safety

Water Engineering & Management (WEM)

Integrated Water Resources Management (IWRM); Water Related Disaster Management (WRDM)

2.4 Academic Outreach Centers

The School of Engineering and Technology has a wealth of innovative and untapped knowledge database from its masters and doctoral research activities. Many outreach and research centers are set up to transform the knowledge into industrial needs. These centers also serve to transfer the practical aspects and the society impacts of the knowledge and technology back to the class room.

ACECOMS: Asian Center for Engineering Computations and Software

The prime mission of ACECOMS with 29 satellite centers in 21 cities in Asia and other regions carries out research in engineering computations, develops computer software tools for engineering applications, and conducts training in the effective use of latest computing technology. Visit ACECOMS: <http://www.acecoms.ait.ac.th/>

ACSIG: Asian Center for Soil Improvement and Geosynthetic

ACSIG provides a strategic location for advanced technological education, researches and outreach activities on the application and effective utilization of ground

improvement techniques. Visit ACSIG: <http://www.set.ait.ac.th/acsig/>

ACTS: Asian Center for Transportation Studies

ACTS activities include modules on intelligent transportation systems, traffic simulation, freight transport, urban road safety and road safety audit. Visit ACTS: <http://www.set.ait.ac.th/acts/>

Geoinformatic Center

Geoinformatic center is dedicated to development and promotion of remote sensing research and activities in Asia-Pacific by sharing satellite data, research results and experiences with researchers in the region. Visit Geoinformatic Center <http://www.geoinfo.ait.ac.th/>

Habitech Center

Habitech activities include research and outreach activities such as training in production and construction, provision of services associated with projects implemented by various organizations, agencies or the private sector. Visit Habitech: <http://www.habitech-international.com/index-thai.html>

International Ferrocement Information Center

IFIC coordinates the activities of the International Ferrocement Society (IFS) including publication of "Journal of Ferrocement", conducting continuing education courses and sponsored research projects in low-cost construction. Visit ACRoRS: <http://www.set.ait.ac.th/ific/>

Regional Network Office for Urban Safety

The Regional Network Office for Urban Safety (RNUS) is a collaborative center jointly operated by the AIT and the University of Tokyo for the promotion of urban safety engineering utilizing advanced engineering technologies including remote sensing and GIS. Visit RNUS: <http://www.set.ait.ac.th/rnus/>

Thailand Accident Research Center

The Accident Research Center is an offspring of MOTC's Road Safety Master Plan acknowledging the lack of information on accidents in Thailand and the need to establish TARC. TARC provides academic back up and a base for road safety research.

AIT Center of Excellence in Nanotechnology

The Center of Excellence in Nanotechnology is jointly supported by Thailand's Nanotechnology Center (NANOTEC) and AIT, to cultivate and foster multidisciplinary activities including research and education in the applications of Nanotechnology in Developing World. Visit RNUS: <http://www.nano.ait.ac.th>

2.5 School Governance

Dean of School

WORSAK KANOK-NUKULCHAI, BEng (Hon), Chulalongkorn Univ, Thailand; MEng, AIT, Thailand; PhD, Univ of California (Berkeley), USA. **Professor** (*Computational Mechanics; Finite Element Methods; Tall Building Static and Seismic Analysis; Bridge Engineering; Microcomputer Software for Structural*)

Engineering; Genetic Algorithms; Nonlinear Analysis of Structures and Continua; Plate/Shell Structures; Engineering Education; Nanomechanics)

Associate Dean

JOYDEEP DUTTA, PhD, IACS,
Calcutta Univ, India; BSc (Hon), MSc, North Eastern Hill Univ, India.
Associate Professor
(*Functional materials,*

nanomaterials, Nanoparticles, selforganisation, Biomimetic processes, Polyelectrolyte deposition, Gas sensors, Bio-sensors, optoelectronic devices)



Chapter 3: SET - COMPUTER SCIENCE and INFORMATION MANAGEMENT FIELDS OF STUDY

3.1 Introduction

Computer Science

This field of study fosters high level teaching and research in computer science and aims to meet the growing regional demand for persons skilled in various aspects of computing. One focus is on educating educators who can, in turn, effectively disseminate knowledge and skills to more people.

The core curriculum in computer science covers all aspects of computing, with the faculty particularly active in artificial intelligence, software engineering, networking and information systems. The field of study also endeavors to enhance teaching and research activities in computer architectures, object orientation, neural networks, multimedia and other rapidly-evolving areas in computer science.

The courses and research topics range from those addressing the practical problems of applications development, to those dealing with the abstract and theoretical issues of computer science and advanced computing. Students are also encouraged to take courses and conduct research in areas of Computer Science which interact with Information Management, Industrial Engineering, Manufacturing Systems Engineering, Telecommunications, Mechatronics and other fields of study covered at the Institute.

Information Management

This field of study is a strategic response to society's changing needs. It will continue to evolve as organizations cope with the proliferation and complexity of new information technologies and services. It is the first of its kind in Southeast Asia.

Information is an essential resource for academic excellence, competitiveness in business and industry, scientific progress, and national development. Like any other resource, information must be managed. High-quality sources must be located, and arrangements must be made for access to timely, accurate, appropriate, and cost-effective information. Technological advances in telecommunications and the hardware and software of computing can be utilized to provide the optimum access to information.

The need for information management skills in government and private organizations is increasingly recognized. People knowledgeable in methods of facilitating information collection, dissemination, and use are in demand. Such persons should also be skilled in identifying information needs and in accessing, repackaging, and presenting information in such a way that it can be utilized in support of the objectives of the users.

The Information Management curriculum is designed to prepare students to respond to four basic challenges confronting organizations today:

Planning the effective use of information and communication technologies within organizations;

Developing corporate and

government policies to maximize the benefits resulting from the widespread use of these technologies;

Improving the strategic management of information resources in business, government, and non-profit organizations; and

Increasing the productivity and creativity of managers and executives who work with information resources.

3.2 Research Facilities and Laboratories

Organized around ten Unix servers, some of them being multiprocessors, CSIM network comprise about 60 microcomputers, running desktop and engineering applications, scientific and research software and programming languages, with full access to the Internet. Through AI3 project, a broadband satellite link is available to Japan and other countries in the region. This link is primarily dedicated for research activities in the field of internetworking, like the new generation of Internet IPv6, distributed education, video conferencing, and unidirectional routing. Dedicated laboratories are set-up with specialized equipments. Full wireless coverage in the building allows students to conveniently work with their personal notebook computers.

3.3 Faculty and Research Staff

Full-time Faculty

PHAN MINH DUNG, MSc,
PhD, University of Technology,
Dresden, Germany.
Professor (*Computer and
Network Security,
Autonomous Computing, Logic
Programming, Artificial
Intelligence*)

PETER HADDAWY, BA,
Pomona College, Claremont,
USA; MSc, PhD, Univ of
Illinois, Urbana, USA.
**Professor and Vice President
for Academic Affairs**
(*Decision-Theoretic Problem
Solving, Probabilities
Reasoning, Modeling of User
Preferences, Electronic
Commerce, Medical Decision
Making*).

KANCHANA KANCHANASUT,
PhD, MSc,
Computer Science, University
of Melbourne, Australia;
Graduate Diploma, Computer
Science, BSc Mathematics,
University of Queensland,
Australia.
**Professor and IntERLab
Director** (*Networking and
Distributed Computing,
Algorithms, Programming
Languages*).

VILAS WUWONGSE, DEng
Systems Science, MEng
Control Engineering, BEng
Control Engineering, Tokyo
Institute of Engineering, Japan.
**Professor and Vice President
for External Relations**
(*Information Representation,
Semantic Web, Digital
Libraries*)

VATCHARAPORN ESICHAIKUL,
BAcc,
Chulalongkorn Univ, Thailand;
MBA, Oklahoma State Univ;
PhD, Kent State Univ, USA.
Associate Professor
(*Electronic
Commerce/Electronic
Business, Webbased
Information Systems,*

*Hypermedia, Electronic
Government*)

SUMANTA GUHA, MS, PhD,
University of Michigan, Ann
Arbor, USA; PhD, Indian
Statistical Institute, Calcutta,
India; BSc, MSc, University of
Calcutta, India.
Associate Professor
(*Algorithms, Computer
Graphics, Computational
Geometry, Robotics*)

MATTHEW N. DAILEY, BSc,
MSc, North Carolina State
University, PhD, University of
California, San Diego.
Assistant Professor
(*Machine learning, Machine
vision, Robotics, Systems
security*).

PAUL JANECEK, BSEE, US
Military Academy; MSc, Univ
of London, UK; PhD, Swiss
Federal Inst of Tech,
Switzerland.
Assistant Professor (*Human-
Computer Interaction; Analysis
and Design of Information
Visualization Systems,
Semantic Fisheye Views,
Software Engineering and
Open-source Software
Development, and Information
System Development*)

3.4 Grants and Sponsored Research Completed in 2007

Database Systems for Advanced Applications

Duration 1-Dec-06 - 31-May-07
Project Investigator Prof. Vilas Wuwongse
Sponsors Participants
Total Contracted Amount (Baht) 1,700,000

Ministry of Science and Technology Virtual Library

Duration 1-Dec-06 to 31-Dec-07
Project Investigator Prof. Vilas Wuwongse
Sponsors Thaksin University
Total Contracted Amount (Baht) 1,000,000

3.5 On-going Grants and Sponsored Research

Argumentation as Foundation for Semantic Grid

Duration 02-Jun-06 to 31-May-09
Project Investigator Prof. Pham Minh Dung
Sponsor European Commission
Total Contracted Amount (Baht)
10,000,000

Building an Integrated leading Euro-Asian higher Education and research community in the field of the Semantic Web

Duration 01-Oct-06 to 30-Sep-09
Project Investigator Prof. Vilas Wuwongse
Sponsor EU (Contract TH/Asia Link/010
(111084)
Total Contracted Amount (Baht) 2,960,964

Enhancement of Efficiency in Inventory Management of Currogated Paper Carton Manufacturer using RFID Technology

Duration 01-Jun-07 to 01-Aug-08
Project Investigator Dr Paul Janecek
Sponsor RTG and LIKOTIMO
Total Contracted Amount (Baht) 2,000,000

Improvement of Logistics and Planning for Fashion Merchandise

Duration 01-Jun-07 to 01-Aug-08
Project Investigator Paul Janecek
Sponsor RTG and BTNC Company
Total Contracted Amount (Baht) 1,500,000

Ministry of Science and Technology: Content Management Systems for Tourism

Duration 25-Nov-07 to 25-May-08
Project Investigator Prof. Vilas Wuwongse
Sponsor Thaksin University
Total Contracted Amount (Baht) 800,000

Video Surveillance using Face Detection and Human Behaviour Profiling

Duration 01-Apr-07 to 31-Mar-08
Project Investigator Dr Matthew Dailey
Sponsor RTG
Total Contracted Amount (Baht) 500,000

3.6 Publications

Refereed Journals

- Chaikoolvatana, A., and **Haddawy, P.** (2007). Evaluation of the Effectiveness of a Computer Based Learning (CBL) Program in Diabetes Management. In Journal of the Medical Association of Thailand, 90(7):1430-4.
- Chun, C., and **Guha, S.** (2007). DIP-MIP: Distributed Individual Paging Extension for Mobile IP in IP-Based Cellular Networks. Computer Communications, v. 30, 1178-1186.
- Chun, C., and **Guha, S.** (2007). Individual Profile Graphs for Location Management in PCS Networks. Submitted to Computer Communications.
- Dung, P.M.**, Mancarella, P., and Toni, F. (2007). Computing ideal sceptical argumentation. Artif. Intell. 171(10-15): 642-674.
- Guha, S.**, and Khanh, K. T. (2007). Recognizing Convex Polygons with Few Finger Probes using Range Trees. Accepted subject to revision by Pattern Analysis and Applications.
- Haddawy, P.**, **Dailey, M.N.**, Kaewruen, P., Sarakhet, N., and Hai, L.H. (2007). Anatomical sketch understanding: Recognizing explicit and implicit Structure. Artificial Intelligence in Medicine, 39(2): 165-177.
- Iwaihara, M., Hayashi, R., Chatvichienchai, S., Anutariya, C. and **Wuwongse, V.**, 2007, Relevancy-based Access Control and Its Evaluation on Versioned XML Documents, ACM Transactions on Information and System Security (TISSEC), Volume 10, Issue 1.
- Kanchanasut, K.**, Tunpan, A., Awal M.A., Das, D.K., Wongaardsakul, T. and Tsuchimoto, Y., DUMBONET: A Multimedia Communication System for Collaborative Emergency Response Operation in Disaster-affected Areas, International Journal of Emergency Management, Inderscience, Vol. 4, Number 4, pp. 670-681, 2007
- Leelapatra, W., **Kanchanasut, K.** and Lursinsap C., Displacement BDD and Geometric Transformation of BDD Encoded Image, Pattern Recognition Letters, Elsevier (accepted)
- Leelapatra, W., **Kanchanasut, K.** and Lursinsap C., Geometric Transformation of BDD Encoded Image, IAENG International Journal of Applied Mathematics (on-line), Vol. 36, Issue 1, pp 57-66, 2007
<http://www.iaeng.org/IJAM/issues_v36/issue_1/index.html>
- Namprempre, C. and **Dailey, M.N.** (2007). Mitigating Dictionary Attacks with Text-Graphics Character CAPTCHAs. IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences, E90-A(1): 179-186.
- Ratanajaipan, P., Nantajeewarawat, E. and **Wuwongse, V.**, 2007, OWL/XDD Application Profiles, IEICE Trans. Information and Systems, Vol. E90-D, No. 10, pp.1611-1620.
- Suebnuakarn, S., and **Haddawy, P.** (2007). COMET: A collaborative intelligent tutoring system for medical problem-based learning. In IEEE Intelligent Systems, 70-77, July/Aug 2007.
- Suebnuakarn, S., **Haddawy, P.**, and Rhiennora, P. (2007). A Collaborative Medical Case Authoring Environment Based on the UMLS. To appear in Journal of Biomedical Informatics.
- Theetranont, C., **Haddawy, P.**, and Krairit, D. (2007). Integrating Visualization and Multi-Attribute Utility Theory for Online Product Selection. In International Journal of Information Technology and Decision Making, 6(4):723-750, Dec 2007.
- Uddin, M.N., and **Janecek, P.** (2007). Faceted classification in web information architecture: A framework for using semantic web tools. The Electronic Library, Vol. 25, No. 2, pp. 219-233, Emerald.
- Uddin, M.N., and **Janecek, P.** (2007). Performance and usability testing of multidimensional taxonomy in website search and navigation. Performance Measurement and Metrics, Vol. 8, No. 1, pp. 18-33, Emerald.
- Uddin, M.N., and **Janecek, P.** (2007). The implementation of faceted classification in web site searching and browsing. Online Information Review, Vol. 31, No. 2, pp. 218-233, Emerald.
- Vacharasintopchai, T., Barry, W., **Wuwongse, V.** and Kanok-Nukulchai, W., 2007, Semantic Web Services Framework for Computational Mechanics, ASCE Journal of Computing in Civil Engineering, Vol. 21, Issue 2, pp. 65-77.
- Varavithya, W., and **Esichaikul, V.** (2007). Using the composite act frame technique to model 'Rules of Origin' knowledge representations in e-government services. Electronic Commerce Research and Applications 6(2): 128-138.
- Bhrammanee, T.** and **Wuwongse, V.** (2007). Towards a Unified Representation Framework for Modelbases and Databases, in Kulkarni, Power and Sharda (eds.), Decision Support for Global Enterprises (Annals of Information Systems, Vol.2), Springer, ISBN: 978-0-387-48136-4
- Guha, S.** (2007). Computer Graphics: Theory and Applications. Manuscript under review by major publishers for publication as text book.
- Varavithya, W. and **Esichaikul, V.** (2007). Dealing with Administrative Discretions in E-Government. Technologies for Business Information Systems, Springer, pp. 97-108.

Refereed Books / Chapters

Conference Proceedings

- Abbasi, A.R., Uno, T., **Dailey, M.N.**, and Afzulpurkar, N.V. (2007). Towards knowledge-based affective interaction: Situational interpretation of affect. In Affective Computing and Intelligent Interaction, volume 4738 of Lecture Notes in Computer Science, pages 455-466.
- Bo Bo, N., **Dailey, M.N.**, and Uyyanonvara, B. (2007). Robust hand tracking in low-resolution video sequences. In 3rd International Conference on Advances in Computer Science and Technology (ACST 2007).
- Chainchainirattisai, M., and **Janecek, P.** (2007). Design and Implementation of a Multidimensional Zoomable Electronic Catalog. Proceedings of 2nd International Conference on Computer Graphics, Imaging and Visualization (CGIV 2007) Thailand, IEEE Computer Society: 71-76.
- Guha, S.**, **Janecek, P.**, and Song, N. D. C. (2007). SimpliPoly: Curvature-based Polygonal Curve Simplification. Proc. 2nd International Conference on Computer Graphics Theory and Applications (GRAPP 2007), Barcelona, 2007, 166-171. Published software: SimpliPoly: polygonal curve simplification software, <http://www.cs.ait.ac.th/~guha/SimpliPoly.html>.
- Kazi, H., **Haddawy, P.**, and Suebnuakarn, S. (2007). Enriching Solution Space for Robustness in an Intelligent Tutoring System. In Proceedings of the 15th International

- Conference on Computers in Education. Hiroshima, Japan.
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- Khowaja, K., and **Guha, S.** (2007). Visual Agent Programming (VAP): An Interactive System to Program Animated Agents. Proc. 12th International Conference on Human-Computer Interaction (HCI International 2007), Lecture Notes in Computer Science No. 4557, Springer-Verlag, 2007, 650-658. Published software: "VAP: software to program animated agents," <http://www.cs.ait.ac.th/~b101650/>.
- Le Van Thanh and **Haddawy, P.** (2007). Deriving Financial Aid Optimization Models from Admissions Data, In Proc. 37th ASEE/IEEE Frontiers in Education Conf, Milwaukee, Oct 2007.
- Marikhu, R., **Dailey, M.N.**, Makhhanov, S., and Honda, K. (2007). A family of quadratic snakes for road extraction. In 8th Asian Conference on Computer Vision, volume 4843 of Lecture Notes in Computer Science, pages 85-94.
- Nakaguro, Y., **Dailey, M.N.**, and Makhhanov, S. (2007). SLAM with KLT point features. In International Workshop on Advanced Imaging Technology (IWAIT).
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- Nguyen Thi Ngoc Hien and **Haddawy, P.** (2007) A Decision Support System for Evaluating International Student Applications, In Proc. 37th ASEE/IEEE Frontiers in Education Conf, Milwaukee, Oct 2007.
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- Vacharasintopchai, T., **Wuwongse, V.** and Chalermsook, K., 2007, Semantic Web Services, Weblog, and Digital Library Approach to Computer-Aided Engineering Design, Proc. 8th Asia Pacific Industrial Engineering and Management System Conf. (APIEMS 2007), Kaohsiung, Taiwan, December 9-13, 2007.
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3.7 Doctoral Students' Dissertation

Computer Science

Geometric Transformations of Binary Decision Diagram Encoded Images
By: Watis Leelapatra
Supervisor: Prof. Kanchana Kanchanasut

3.8 Masters Students' Theses and Research Studies

Computer Science

An Interactive 3D Campus Navigator using Maya and Vrttools
By: Wang Jing
Supervisor: Dr. Sumanta Guha

Applications of MLS Surfaces
By: Nguyen Tan Khoa
Dr. Sumanta Guha

Automated Exudate Detection on Thai Diabetic Patients' Retinal Images
By: Khine Thet Nwe
Supervisor: Dr. Matthew Dailey

Chat Tracking for Medical Problem-based Learning
By: Long Hoang

Supervisor: Prof. Peter Haddawy

Face Detection for a Video Surveillance System

By: Khin Swe Nwe

Supervisor: Dr. Matthew Dailey

Machine Learning Approach to Automatic Exudate Detection in Retinal Images of Diabetic Patients

By: Yin Aye Moe

Supervisor: Dr. Matthew Dailey

Ontology and Reasoning for Decision Making in the Portfolio Approach to E-Procurement

By: Tran Cong An

Supervisor: Prof. Phan Minh Dung

Thai Voice Application Gateway

By: Dararat Kaitrungrit

Supervisor: Dr. Matthew Dailey

Workflow Composition for e-procurement

By: Vo Duy Khoi

Supervisor: Prof. Phan Minh Dung

Research Study: Federated Search over Distributed Content: A Case Study with Plone CMS for Searching External Sites and External Databases

By: Nguyen Viet Minh Quang

Supervisor: Dr. Paul Janecek

Research Study: Fingertip Tracking in a Video Sequence with a Complex Background

By: Punthip Paetyangkul

Supervisor: Dr. Matthew Dailey

Information Management

An Adaptive Model for Customer Targeting

By: Theechat Chatvijit

Supervisor: Dr. Vatcharaporn Esichaikul

Analysis of the Successes and Failures of E-Marketplaces for Small and Medium Size Enterprises in the Greater Mekong Sub-Region

By: Anjali Sharma

Supervisor: Dr. Paul Janecek

An Application Framework for Ubiquitous Supply Chain Management

By: Thanit Youruchatangern

Supervisor: Dr. Paul Janecek

An Integrated Complaint Management System for Thai E-Government

By: Patcharaporn Panwong

Supervisor: Dr. Vatcharaporn Esichaikul

An Ontology-Based Approach to Designing Information Architecture of Websites

By: Fedor Valentinovich Bakalov

Supervisor: Prof. Vilas Wuwongse

A Machine Vision System for Coral Reef Monitoring

By: Rassarin Chinnachoteeranun

Supervisor: Dr. Matthew Dailey

A Personal Ontology-based Content Management System

By: Khine Zaw Win Myint

Supervisor: Dr. Paul Janecek

A Stock Forecasting System for Supporting Investors' Decisions on the Stock Exchange of Thailand

By: Soontarin Nupap

Supervisor: Dr. Vatcharaporn Esichaikul

Business Intelligence for Supporting Online Business Decisions in Thailand

By: Anucha Thodsanit

Supervisor: Dr. Vatcharaporn Esichaikul

Case-based Reasoning for University Student Performance Prediction

By: Nguyen Thi Ngoc Hien

Supervisor: Prof. Peter Haddawy

Competitive Advantage of Online Service Desk for Customer Service: The Case of A Telecommunication Company

By: Zhu Jinbo

Supervisor: Dr. Vatcharaporn Esichaikul

Development of Wiki Collaboration Space for E-Learning

By: Win Myint Aung

Supervisor: Dr. Vatcharaporn Esichaikul

Faceted Folksonomy: Design and Evaluation of a Tool for Classifying and Sharing Documents

By: Nguyen Nhu Khai

Supervisor: Dr. Jaakko Kurhila

Implementing Cometvis: A Visual Tool for Evaluation of Student Contribution in Collaborative Medical Tutoring

By: Louie Julius Bagoyado

Supervisor: Dr. Paul Janecek

Intelligent Course Recommendation System: An Artificial Neural Network Approach

By: Cai Hui

Supervisor: Dr. Paul Janecek

Volume Cost Based Mesh Simplification

By: Tep Vuthy

Supervisor: Dr. Sumanta Guha

Research Study: A Governance Framework for Improving Information Flow in NGOs

By: Seow Yoke May

Supervisor: Dr. Paul Janecek

Research Study: An Ontology-based Course Catalog System

By: Nang Mo Phaung

Supervisor: Dr. Paul Janecek

Research Study: Aircraft Maintenance Management System for AEROTHAI

By: Pongsaree Buakant

Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Business Process Modeling: Case Study of AIT Admission Process

By: Le Tran Nguyen

Supervisor: Dr. Sumanta Guha

Research Study: Enhancing the Caller-Agent Relationship for Skill-Based Routing in Call Centres

By: Siddharth Arnab Sarkar

Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Implementation of an Intranet Portal: Case Study for LRC Web Portal Solution

By: Nguyen Van Bac

Supervisor: Dr. Sumanta Guha

Research Study: Product Recommendation System using Collaborative Filtering and an Association Rule

By: Waralee Wongsiri

Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Proposing a Government to Business Model for Administrative Management at the Ministry of Industry in Vietnam

By: Nguyen Ngoc Hai

Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Strategic Information Technology Planning: A Case Study of Electricity of Vietnam

By: Pham Ngoc Hien

Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Towards Smarter Supply Chains: Four Case Studies

By: Quratulain Naqvi

Supervisor: Dr. Matthew Dailey

Research Study: Truck's Crew Scheduling using a Multi-Agent Approach: A Case Study of

Sabeco Beverage Company, Vietnam

By: Tran Tan Chinh

Supervisor: Dr. Vatcharaporn Esichaikul

Chapter 4: SET - CONSTRUCTION, ENGINEERING AND INFRASTRUCTURE MANAGEMENT FIELD OF STUDY

4.1 Introduction

The Construction, Engineering and Infrastructure Management field trains professionals to play leading roles in the international construction industry and in infrastructure development and management. It offers courses in four levels - operations, project, strategic issues and corporate issues. It prepares students to become effective managers and decision-makers familiar with modern techniques of construction management, engineering management and infrastructure management.

The field's courses are delivered based on a hierarchical knowledge scale that considers principles and fundamentals, applications (tools and techniques), and emerging issues. In offering courses spanning fundamentals to advanced, the emphasis is on shifting from classical to innovative knowledge.

4.2 Faculty and Research Staff

Full-time Faculty

STEPHEN O OGUNLANA, BSc, MSc, Univ of Ife, Nigeria; PhD, Loughborough, Univ of Tech, UK. **Professor** (*Construction Economics; Project Management; Productivity Improvement, Dynamic Modeling and Simulation, Human Resources Management*)

CHOTCHAI CHAROENNGAM, BEng, King Mongkut's Inst of Tech, Thonburi, Thailand; MS, Univ of Kansas; PhD, Univ of Texas at Austin, USA
Associate Professor (*Project Planning, Scheduling, and Controls; Construction Productivity Improvement; Information Technology in Construction Management; Construction Disputes and Litigation*)

BONAVENTURA H W HADIKUSUMO, BEng, Univ of Diponegoro, Indonesia; MEng, AIT; PhD, Univ of Hong Kong.
Assistant Professor (*Construction Information Technology; Construction Site Safety, Virtual Reality application in construction; Web-based project design and management; Design for X-ability; Construction simulation; Construction site safety; Cost control*)

PANNAPA HERABAT, BS, MS, PhD,
Carnegie Mellon Univ, USA.
Assistant Professor (*Asset Management System; Pavement Management System; Bridge Management System (BMS); Infrastructure Economics; and Computer-Aided Engineering Management*)

4.3 Grants and Sponsored Research Completed in 2007

Construction Work Performance under Bovis Lend Lease Safety and Health Management System

Duration Dec-06 - Dec-07
Project Investigator Dr. B.H.W. Hadikusumo
Sponsors Bovis Lend Lease (Thailand) Ltd.
Total Contracted Amount (Baht) 100,000

EU-Asia Network of Competence Enhancement on Public-Private Partnerships (PPPs) in Infrastructure Development

Duration Apr-04 - Apr-07
Project Investigator Prof. Stephen O. Ogunlana
Sponsors The European Union
Total Contracted Amount (Euro) 400,000

Seminar on Dispute Prevention and Resolution on Mega Construction Projects

Duration 1-Oct-06 - 30-Sep-07
Project Investigator Prof. Stephen O. Ogunlana
Sponsors Warner/PPP
Total Contracted Amount (Baht) 418,689.70

4.4 On-going Grants and Sponsored Research

The Strategic Portfolio Program Management

Duration 1-Oct-05 - 30-June-08
Project Investigators Dr. Chotchai Charoenggam, Dr. B.H.W. Hadikusumo
Sponsors Ministry of Foreign Affairs
Total Contracted Amount (Baht) 4,978,000

Development Strategy for Professional Resources of Hong Kong's Construction and Related Engineering Service Sector

Duration 15-Nov-07 - 31-Dec-08
Project Investigator Dr. B.H.W. Hadikusumo

Sponsors Hong Kong University (HKU)
Total Contracted Amount (Baht) 250,000

Professional Masters in Project Management in Construction

Duration 23-Jul-07 - 20-Dec-08
Project Investigators Dr BHW Hadikusumo, Dr Chotchai Charoenggam, Prof Stephen

Ogunlana
Kovalainen, Dr Poompat Saengudomlert
Sponsors PetroVietnam Company, Vietnam
Total Contracted Amount (Baht) 11,856,100

4.5 Publications

Refereed Journals

Aksorn, T. and **Hadikusumo, B.H.W.** (2007). The Unsafe Acts and the Decision-to-ERR Factors of Thai Construction Workers, *Journal Of Construction In Developing Countries*, Vol 12, No 1, CIB Journal.

Aksorn, T., and **Hadikusumo, B.H.W.** (2007). Gap Analysis Approach for Safety Program Improvement. *Journal of Construction in Developing country*, 12, 1.

Prasertrungruang, T. and **Hadikusumo, B.H.W.** (2007) "Heavy equipment management practices and problems in Thai highway contractors", *Engineering, Construction and Architectural Management*, 14 (3), pp. 228-241.

Vorasubin, P. and **Charoenngam, C.** (2007) "Strategic assets driving financial capability of Thai construction firms," *Journal of Financial Management and Property and Construction*, Vol 12, No. 2, pp 87-94.

Yosia, R., **Hadikusumo, BHW. and Ogunlana, S.** (2007) Emotional Intelligence And Leadership Styles In Construction Project Management, *Journal Of Management In Engineering*, Vol 23 no 4, American Society Of Civil Engineer (ASCE).

Refereed Books/Chapters

Chowdhury, A. N. and **Charoenngam, C.** (2007) "Special purpose vehicles for infrastructure project financing through public-private partnerships" *Euro money Infrastructure Finance Book*, pp 265-281.

4.6 Doctoral Students' Dissertation

Construction Engineering and Management

An Examination of the Relationship between Risk Allocation and Project Success on PPP Project through Good Project Governance Assessment: Case Studies of Tollway Projects in Indonesia, Thailand and Vietnam

By: Martinus P. Abednego
Supervisor: Prof. Stephen Olu Ogunlana

Assessment of the Construction Industry Development Role of a Statutory Body from Customer Perspective: A Relational Exchange Approach
By: Oei, Fuk-Jin
Supervisor: Prof. Stephen O. Ogunlana

Development of KPIs for Local Government Infrastructure Development : The Case of Sub-District (Tambon) Administrative Organization
By: Suchanya Posayanant
Supervisor: Dr. Chotchai Charoenngam

Knowledge Management in the Construction Project Environment
By: Wasan Teerajetgul
Supervisor: Dr. Chotchai Charoenngam

Management of Strategic Assets for Sustainable Competitiveness of Construction Organizations
By: Piyanut Vorasubin
Supervisor: Dr. Chotchai Charoenngam

Construction, Engineering and Infrastructure Management

Factors in Power Purchase Agreements Affecting Investment Flows in Independent Power Production in the Nepalese Environment
By: Raju Bahadur Shrestha
Supervisor: Prof. Stephen O. Ogunlana

Safety Program Performance in the Thai Construction Industry
By: Thanet Aksorn
Supervisor: Dr. B. Harimurti W. Hadikusumo

4.7 Masters Students' Theses and Research Studies

Construction, Engineering and Infrastructure Management

A Study of Safety Management System and Audit in Oil and Gas Construction Projects in Ba Ria - Vung Tau, Vietnam
By: Phan Thanh Hai
Supervisor: Dr. B. Harimurti W. Hadikusumo

An Evaluation of Client Roles in Projects Procured Through the Traditional Construction Process in Ho Chi Minh City, Vietnam
By: Tran Tan Tin
Supervisor: Prof. Stephen O. Ogunlana

Analysis of the Office Market Demand and Supply Using Systems Dynamics Approach
By: Apinun Tantiviriyapan
Supervisor: Dr. B. Harimurti W. Hadikusumo

Application of Neuro-fuzzy Networks to Forecast Cost and Duration Variances for Building Projects in Vietnam
By: Pham Hiep Luc
Supervisor: Dr. Chotchai Charoenngam

Business Performance Measurement Framework for Construction Organizations
By: Le Phi Hai
Supervisor: Prof. Stephen O. Ogunlana

Case Study of Concession Contract in the Public Private Partnership: Financial Clauses Investigation of Don Muang Tollway and Second Stage Expressway in Thailand and Cipularang Tollway in Indonesia
By: Fredy Kurniawan
Supervisor: Dr. Chotchai Charoenngam

Cost Management Behavior under Cost Overruns of Japanese and Thai Construction Companies
By: Narumon Jongcharoensub
Supervisor: Dr. Chotchai Charoenngam

Effect of Globalization on the Supply Chain Competitiveness of Large Scale Contractors : A Case Study
By: Arasavindiran Mariappan
Supervisor: Dr. Chotchai Charoenngam

Evaluation of Effective Design in Architectural Process
By: Nguyen Kim The Anh
Supervisor: Dr. Chotchai Charoenngam

Factors Influencing the Financial Crisis that Affect Small and Medium-Sized Construction Enterprises in Thailand
By: Chanagarn Watanantachai
Supervisor: Dr. Chotchai Charoenngam

Integration of Capital Investment Analysis with Public Interest and Value for Money in Mass Rapid Transit Project in Thailand
By: Aut Thaitrong
Supervisor: Dr. Chotchai Charoenngam

Knowledge Sharing Process within Power Engineering and Consulting Company: A Case Study of Vietnam
By: Dinh Truong Giang
Supervisor: Dr. Chotchai Charoenngam

Making Construction Employment Decent Work: A System Dynamics Investigation
By: Ramya Kanaganayagam
Supervisor: Prof. Stephen O. Ogunlana

Quality Function Deployment Approach in Apartment Construction Project: A Case Study
By: Pham Nguyen Quynh Huong
Supervisor: Dr. B. Harimurti W. Hadikusumo

Risk Approaches for Making Go / No-Go Decisions by Thai Consulting Engineering Firms

By: Nang Kham Kyi Oo
Supervisor: Prof. Stephen O. Ogunlana

*Risk Management in Port and Waterway
Projects: A Case Study of the Southern
Focal*

Economic Area of Vietnam
By: Nguyen Viet Dung
Supervisor: Prof. Stephen O. Ogunlana

*Risks in the Construction of Hydropower
Tunnels In Vietnam*

By: Dau Xuan Thuy
Supervisor: Prof. Stephen O. Ogunlana

*Safety Communication in Construction
Projects*

By: Somjate Chatutewaprasit
Supervisor: Dr. B. Harimurti W.
Hadikusumo

*Strategies for Attracting Capital Investment
in Independent Power Producers (IPPs) in
Vietnam*

By: Nguyen Van Long
Supervisor: Dr. Chotchai Charoenngam

*Research Study: Technology Selection
Practises in Building Construction Projects
through the Perspectives of Design
Consultants*

By: James Suvanaphen
Supervisor: Dr. Chotchai Charoenngam

Chapter 5: SET – DESIGN & MANUFACTURING ENGINEERING AND INDUSTRIAL ENGINEERING & MANAGEMENT FIELDS OF STUDY

5.1 Introduction

Design and Manufacturing Engineering

Design and Manufacturing Engineering field of study prepares students to manage advanced manufacturing technologies, focusing on the selection, use, control, design and integration of computer controlled manufacturing systems. The Design and Manufacturing Engineering curriculum reflects the objective of imparting fundamental knowledge to develop the ability to address the complex interaction between manufacturing, computers and industry.

Industrial Engineering and Management

Industrial Engineering and Management field of study prepares students for manufacturing management and decision support positions in industry and public sector, by equipping them with a broad range of decision making skills for a variety of applications. The IE&M curriculum reflects the objective of imparting fundamental knowledge to develop the ability to address complex industrial issues, emphasizing on how to design, run, control, and optimize the production systems.

5.2 Research Facilities and Laboratories

IEM and DME fields share all the laboratory facilities with Mechatronics and Microelectronics fields of study. There are several well equipped laboratories with the primary function of supporting the students and faculty for teaching

and research and to conduct outreach programs.

Computer Integrated Manufacturing (CIM) Laboratory

The Computer Integrated Manufacturing (CIM) laboratory was officially inaugurated on September 23, 1991. It provides the hardware and software support for Industrial Systems Engineering. Many research activities have been undertaken in close collaboration with industry and government sectors in the area of Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), Computer Numerical Control (CNC), Rapid Prototyping (RP) and Medical Technology. The CIM Laboratory also provides specialized training and consultancy services in CAD, CAM, CNC Machining, Reverse Engineering, Rapid Prototyping, Packaging Technology, Flexible Manufacturing Systems [FMS], and Development of Postprocessor for 5-axis CNC.

The CIM Laboratory is equipped with production and training CNC machines including EMCO TURN242 industrial production CNC lathe, EMCO VMC200 CNC vertical machining center for universal production, MAHO MH600E2 5-axis universal milling and boring machine, an EMCO compact 5 CNC, an EMCO F1 CNC, a LVD CNC press brake, a LVD water-jet cutting CNC, ZOLLER tool presetting system, and a Mondiale Gallic G-420 Industrial CNC lathe, EMCO CNC training system. The available CAD/CAM software includes UNIGRAPHICS NX4, Master CAM 9.1, Mechanical Desktop 6, AutoCAD Inventor Series,

SolidWorks 2005, CAM 2000, Mimics 6.3 & Magic 5.4.

Metrology Laboratory

Metrology Laboratory provides the hardware and software support for Industrial Systems Engineering. Metrology Laboratory is equipped with Measuring Instruments (Zeiss CMM, Mitutoyo Profile Projector, Taylor Hobson Surface Roughness Tester, Lab View Hardware & Software).

Mechatronics and Automation Laboratory

The Mechatronics and Automation laboratory is well equipped with many PLC systems (S5, S7-200/300/400, INDRAMAT, BOSCH), distributed control systems (PCS7), operator panels (OP5, OP17/DP, OP35), PC-based human machine interface package (WINCC), and networked fieldbuses (PROFIBUS, INTERBUS, SERCOS).

The lab has mobile robots (NOMAD, PIONEER 2), Robot arms (CRS), Industrial Robot (KUKAKR15), a self-made Open Architecture CNC machine, CNC control systems (MTC200, SINUMERIK 81 00/8400), image processing systems (DVT, MATROX), and FPGAs (XILINX-1i VIRTEX PRO, ALTERA). Software packages such as SYNOPSIS IC Design, ANYSIM, ANSYS, ADAMS, and many types of special sensors and actuators are also available for the research use.

Many research activities have been undertaken in close collaboration with industry and government sectors in the area of industrial automation, robotics,

control, system design and integration. Some examples of the research are: medical teleanalyzer, automated visual inspection systems, MEMS design, autonomous flying robot, automating centrifuge machines, autonomous underwater robot, automating crystallization process, etc.

Simulation Laboratory

This lab is equipped with networks of Pentium PC for general applications and internet access, high end CAD/CAM & Simulation software such as ARENA and AutoMOD. In addition, a high performance computer facility with parallel cluster is also available for research use.

Microelectronics Laboratory

The microelectronics facilities consist of two main laboratories:

IC Design Lab
Nanotechnology

The Integrated Circuit Design laboratory gives students access to a wide variety of professional software applications including ANSYS, Orcad, ModelSim SE, Xilinx ISE, Synopsys, Leonardo Spectrum LS, Tanner (S-Edit for Schematic Capture, T-Spice and W-Edit for Simulation and L-Edit for Physical Layout) are some of the software which are available. All the computers are networked through a high end (Intel XEON) server which is secure from external attacks. The laboratory facilities are used for Analog and digital circuit design, Microchip design and fabrication, MEMS, Microactuators and micro-sensors design, Computational electronics, etc. The fabrication is done in cooperation with National Electronics Technology Center (NECTEC) and the National Science and Technology Development Administration (NSTDA) located in the nearby

Science Park.

The Nanotechnology Laboratory consists of a chemistry lab, instrumentation room and an electronics laboratory. The chemistry laboratory is equipped with standard chemical tables and hood for carrying out wetchemical processing. The instrumentation room consists of equipments like optical spectrophotometer, microscope etc. The electronics laboratory is equipped with digital oscilloscopes, signal generators, power supplies, standard voltage and current meters as well as stocked with discrete devices for testing and research. This laboratory is used for teaching and research especially in the processing related subjects.

5.3 Faculty and Research Staff

Full-time Faculty

MARIO T TABUCANON, BSEE, BSME, Cebu Inst of Tech, Philippines; MEng, DEng, AIT, Thailand. **Professor** (Multiple Criteria Decision Making; Operations and Production Management; Operations Research; Project Management; Systems Modeling)

ERIK L J BOHEZ, Burgerlijk WerktuigKundig Electro-Technisch Ingenieur, Rijks Universiteit Gent (State University Ghent, Belgium); Kandidatuur Burgerlijk Ingenieur, Rijks Universiteit Gent (State University Ghent, Belgium); Technisch Ingenieur Electro-Mechanica, Hoger Technisch Instituut Sint Antonius Gent, (High Technical Institute Saint Antonius Ghent; Belgium). **Associate Professor** (Computer Aided Design; Computer Aided Manufacturing; Computer Graphics; Computer Numerical

Control; Five Axis Machining; Fractal and Holistic Manufacturing; Robust Control; Simulation of Metal Removal; Virtual Axis Machine) [CNC/CAD/CAM; Five Axis Machining; Holonic and Fractal Manufacturing; Mold and Die Design, Eco-Design]

VORATAS

KACHITVICHYANUKUL,

BS, Natl Taiwan Univ; MEng, AIT, Thailand; PhD, Purdue Univ, Indiana, USA. **Associate Professor** (Simulation; ERP; Scheduling, Metaheuristics; Parallel Computing) [Planning and Scheduling Systems; Enterprise Resource Planning Systems; Supply Chain Modeling and Analysis; Discrete Event Simulation Software Development; Manufacturing System Simulation; Manufacturing Decision Support Systems; Just-in-Time Manufacturing System]

PISUT KOOMSAP, BEng,

Thammasat Univ, Thailand; MSc, Univ of Louisville; PhD, Pennsylvania State Univ, USA **Assistant Professor** (Sensing and Control for Manufacturing Processes and Systems; Laser Applications in Manufacturing; Rapid Prototyping; Condition-Based Maintenance; Continuous Improvement) [Rapid Prototyping; Sensing and Control for Manufacturing Processes and Systems; Laser Applications in Manufacturing; Condition-Based Maintenance; Continuous Improvement]

HUYNH TRUNG LUONG, BEng, Ho

Chi Minh City Univ of Tech, Vietnam; MEng; DEng, AIT, Thailand. **Assistant Professor** [Emergency inventory policies and inventory policies for perishable products; Supply

chain design; Measures of bullwhip effect in supply chains; Availability-based and reliability-based maintenance; Fuzzy quality control charts; Statistical design of experiments; Network flows related problems]

5.4 Grants and Sponsored Research Completed in 2007

Biodegradable Polylactide and Natural Rubber for Multicolor Articles Rapid Prototyping

Duration Dec-05 - Dec-07
Project Investigator Dr. Pisut Koomsap
Sponsors Royal Thai Government
Total Contracted Amount (Baht) 785,000

Development of an Automatic Tide Sensing Unit for Tsunami Early Warning System

Duration 1-Nov-05 – 30-June-07
Project Investigator Dr Manukid Parnichkun
Sponsors RTG Joint Research Project FY 2005
Total Contracted Amount (Baht) 1,000,000

Evaluation of the Modernization of Technical Education in Production Technology

Duration Jul-01 - Dec-07
Project Investigator Assoc. Prof. Erik L.J. Bohez
Sponsors EMCO/RIT
Total Contracted Amount (Baht) 450,000

Product Design and Development for CCC Polyolifins Co.

Duration 1-Feb-07 – 30-Nov-07
Project Investigator Dr. Pisut Koomsap
Sponsors CCC Ployolefins Co. Ltd, Thailand
Total Contracted Amount (Baht) 175,480

5.5 On-going Grants and Sponsored Research

Asia-Pacific Industrial Engineering and Management Systems Conference 2006

Duration 1-Jul-05 - 30-Jun-08
Project Investigator Dr Voratas Kachivichyanukul
Sponsors Participants
Total Contracted Amount (Baht) 8,200,000

Decision Support System for Beverage Industry

Duration 1-Jul-07 - 31-Aug-08
Project Investigator Dr Voratas Kachivichyanukul
Sponsors Royal Thai Government and Green Spot Company Ltd. Thailand
Total Contracted Amount (Baht) 900,000

Design and Construction of Online Biochemical Oxygen Demand Sensors as Rapid BOD Assay Devices for Monitoring the Quality of Natural Waters and Wastewater Effluents

Duration 1-May-07 - 30-Apr-08
Project Investigator Dr Pisut Koomsap
Sponsors Royal Thai Government
Total Contracted Amount (Baht) 900,00

Development of Rapid Prototyping System for Sanitary Ware Product

Duration 1-Jun-07 - 30-Jun-09
Project Investigator Dr Pisut Koomsap
Sponsors Royal Thai Government and Siam Sanitary Ware Industry, Thailand
Total Contracted Amount (Baht) 2,500,000

Hot End and Cold End Online Monitoring and Communication System

Duration 1-Jun-07 - 31-May-08
Project Investigator Dr Erik Bohez
Sponsors Royal Thai Government and Bangkok Glass Company, Thailand
Total Contracted Amount (Baht) 2,000,000

PET-Recycling

Duration 20-Aug-07 - 20-Feb-08
Project Investigator Dr Erik Bohez and Prof Sudip Rakshit
Sponsors Indorama Thailand
Total Contracted Amount (Baht) 200,000

Product Design and Development for Thai Acrylic Fibre Co. Ltd

Duration 1-Jun-07 - 30-Apr-08
Project Investigator Dr Pisut Koomsap
Sponsors Thai Acrylic Fibre Co. Ltd
Total Contracted Amount (Baht) 235,400

Project on Human Resource Development in Multi-Axis CNC Machine for EGAT

Duration 1-Feb-07 - 31-Dec-08
Project Investigator Dr Erik Bohez
Sponsors EGAT Public Company, Thailand
Total Contracted Amount (Baht) 750,000

Thai 5-Axis Open Architecture Small CnC

Duration 1-May-07 - 30-Apr-08
Project Investigator Dr Erik Bohez
Sponsors Royal Thai Government and

Grand Spar Company, Thailand
Total Contracted Amount (Baht) 1,400,000

5.6 Publications

Refereed Journals

Campanelli, S.L., Cardano, G., Giannoccaro, R., Ludovico, A.D., **Bohez, E.L.J.** (2007). Statistical Analysis of the Stereolithographic Process to Improve the Accuracy. Computer-Aided Design, Vol. 39, Issue 1, 80-86.

Bohez, Erik L.J., Ariyajunya, B., Sinlapecheewa, C., Shein, T.M.M., Lap, D.T., Belforte, G. (2007). Systematic Geometric Rigid Body Error Identification of 5-axis Milling Machines. Computer-Aided Design, Vol. 39, Issue 4, 229-244.

Duc, T.T.H., **Luong, H.T.**, Kim, Y-D. (2007). A Measure of Bullwhip Effect in Supply Chain with Stochastic Lead Time. The International Journal of Advanced Manufacturing Technology, accepted for publication.

Luong, H.T. & Phien, N.H. (2007). Measure of Bullwhip Effect in Supply Chain: The Case of High Order Autoregressive Process. European Journal of Operational Research, Vol. 183(1), 197-209.

Nirangsee, P. & **Bohez, E. L.J.** (2007). Optimal Electric Energy Subscription Policy for Multiple Plants with Uncertain Demand. Industrial Engineering and Management Systems (IEMS), Vol.6, No.2, 106-118.

Tang, T.D., **Bohez, E.L.J.**, Koomsap, P. (2007). The Sweep Plane Algorithm for Global Collision Detection with Workpiece Geometry Update for Five-axis NC Machining. Computer-Aided Design, Vol. 39, Issue 11, 1012-1024.

Ullah, H. & **Bohez, E.L.J.** (2007). Mathematical Modeling of Feature Conversion. International Journal of Industrial and Systems Engineering, accepted for publication, April 2007.

Ullah, H., **Bohez E.L.J.** (2008). A Petri Net Model for Sequence Optimization and Performance Analysis of Flexible Assembly Systems, Journal of Manufacturing Technology Management (JMTM), Vol. 19, No. 8.

Wannarumon, S., **Bohez, E.L.J.**, Annanon, K. (2008). Aesthetic Evolutionary Algorithm for Fractal-Based User-Centered Jewelry Design, Artificial Intelligence for Engineering Design, Analysis and Manufacturing, 22, 19-39. Cambridge University Press 0890-0604/08

Conference Proceedings

Lin, T., Lee, J.-W., **Bohez, E.L.J.**, Makhanov, S.S., Munar, A.C., Sinh, M. (2007). CAM for NC Machining of 5-axis Free-form Surfaces, Proceeding of the 2007 International CAD Conference CAD07 and Exhibition, Honolulu, Hawaii, June 25-29.

Munar, A.C., **Bohez, E.L.J.**, Singh, M., Lin, T., Makhanov, S.S. (2007). Computer Aided Geometric Modeling and 5-Axis Milling of a Screw Propeller in a Single Setup: A Case Study, In Proceeding of the 19th International Conference of Production Research (ICPR19), 29 July-2 August, Chili.

Phattanaphibul, T., Opaprakasi, P., **Koomsap, P.**, Tangwarodomnukun, V. (2007). Preparation of Biodegradable PLA for Powder-Based Rapid Prototyping, APIEMS Conference.

Rianmora, S., **Koomsap, P.**, Van Hai, D.P. (2007). A Concept of Adaptive Reverse Engineering and its Application for Automotive Part Design, Third National Conference on Automotive Engineering.

Risdiyono & **Koomsap, P.** (2007). Toward a Design by Customers for Automotive Accessories, Third National Conference on Automotive Engineering.

Singh, M., **Bohez, E.L.J.**, Munar, A.C., Lin, T., Makhanov, S.S. (2007). 5-Axis Computer Aided Manufacturing of Stamping Die Insert: A Case Study, In Proceeding of the 19th International Conference of Production Research (ICPR19), 29 July-2 August, Chili.

Soonanon, P., **Koomsap, P.**, Chansri, N. (2007). Identifying Contour(s) for Layer-Base Geometrical Reconstruction, APIEMS Conference.

Sukromsai, S. Wannarumol, S., **Bohez, E. L.J.** (2007). A New 5-Axis Haptic Jewelry Design and Manufacturing system Concept, Proceeding of the 19th International Conference of Production Research (ICPR19), 29 July-2 August 2007, Chili,

Tangwarodomnukun, V., **Koomsap, P.**, Opaprakasi, P., Phattanaphibul, T. (2007). Coloring Polylactide Powder for Multicolor Rapid Prototyping, APIEMS Conference.

Tuong, N.L., **Koomsap, P.**, Soonanon, P. (2007). Preliminary Study on Driver Response for Driver Based Collision Avoidance System. Third National Conference on Automotive Engineering.

Other Publications

Bohez, Erik L.J., Rakshit, S.K., Yiangkamolsing, C., Wongwikkorn, P. (2007). Recycling of PET Thailand, Commissioned by Indorama Public Company Ltd., Thailand, December 2007.

5.7 Doctoral Students' Dissertation

Design and Manufacturing Engineering

A New Geometric Modeling Approach of Anisotropic Yarn Structure
By: Keartisak Sriprateep
Supervisor: Assoc. Prof. Erik L. J. Bohez

Aesthetic Evolutionary Approach for Jewelry Design based on IFS Fractals
By: Somlak Wannarumon
Supervisor: Assoc. Prof. Erik L.J. Bohez

Feature-based Sequence Planning and Assembly System Design Using Petri Net
By: Hamid Ullah
Supervisor: Assoc. Prof. Erik L. J. Bohez

Intelligent Collision Detection and Avoidance for Five-Axis NC Machining
By: Tran Duc Tang
Supervisor: Assoc. Prof. Erik L. J. Bohez

MIMO Nonlinear Process Using Neuro-fuzzy system
By: Nguyen Quoc Dinh
Supervisor: Dr. Nitin Afzulpurkar

5.8 Masters Students Theses and Research Studies

Design and Manufacturing Engineering

Design and Control of a Filling Head Nozzle for SVM Rapid Prototyping
By: Syed Azkar-UI-Hasan
Supervisor: Dr. Pisut Koomsap

Design and Manufacturing of a Two Axis Servo Table Abrasive Waterjet Machining
By: Nguyen Van Ut
Supervisor: Dr. Pisut Koomsap

Error Identification and Compensation Due to Elastic Deformation in CNC Milling Machines
By: Shoukat Nawaz
Supervisor: Assoc. Prof. Erik L. J. Bohez

Rules of Mixtures for Utilizing Natural Rubber in Color Rapid Prototyping
By: Risdiyono
Supervisor: Dr. Pisut Koomsap

Chapter 6: SET – GEOTECHNICAL AND GEOENVIRONMENTAL ENGINEERING

FIELD OF STUDY

6.1 Introduction

Beside the traditional areas of foundation engineering, earth structures, underground excavations, land subsidence, and landslide mitigations, geotechnical engineers and researchers are increasingly involved in new and dynamic areas of ground improvement, geosynthetic engineering, land reclamation, lightweight materials, forensic engineering and the effective recycling of waste materials.

Furthermore, geotechnical engineers are increasingly challenged to solve environmental problems related to the reduction of construction wastes, provision of efficient waste disposal facilities, clean-up of contaminated sites as well as geological related hazards such as landslides and soil erosion. The GTE field of study also includes onshore and offshore exploration. In accommodating these requirements, the courses in the field have been enhanced to equip geotechnical engineers not only with traditional knowledge of soil mechanics and geology but also with skills in hydrogeology, geochemistry, biological processes, petroleum engineering, resource exploration, and geophysics. Students in the field are exposed to geomaterials, continuum mechanics and particulate/discontinuous media.

6.2 Research Facilities and Laboratories

The Geotechnical and Geoenvironmental Laboratory can be boasted as one of the most equipped geotechnical laboratories

in the region with more than 30 years of experience in both soil and rock testing. The laboratory, which offer technical services on testing and research on the engineering behavior and properties of soil and rock; geologic mapping; environmental geophysical surveys; and testing of geosynthetic materials conducted by ACSIG, consists of five (5) sections - Soil Mechanics, Rock Mechanics, Engineering Geology, Geophysics, and Geoenvironmental Engineering.

Soil Mechanics Laboratory

The Soil Mechanics Laboratory has facilities for testing and research on the engineering behavior and fundamental properties of soil. It is equipped to test compaction, seepage, compressibility, deformation and shear strength, soil dynamics, and ground improvement.

Among other equipment, it has an automatic Central Data Acquisition System (CDAS) and two temperature-controlled rooms that house triaxial and consolidation equipment. Its field operation unit has a full range of tools for sampling soils and rocks and field test equipments for vane tests, Dutch cone tests, piezocone tests, pressuremeter tests, screw plate tests, electric logging, and vibration measurements.

Rock Mechanics Laboratory

The Rock Mechanics Laboratory has facilities to determine a variety of the physical and mechanical properties of rocks and rock aggregates required for research and practice.

Moreover, the laboratory is

capable of determining hardness, swelling and slake durability index properties of weak rocks. The laboratory has provided testing services to a large number of infrastructure projects in the region.

Engineering Geology Laboratory

The Engineering Geology Laboratory has facilities for research on the engineering behavior and fundamental properties of rocks and minerals.

It provides classification and characterization tests for rock and minerals including petrographic and X-ray diffraction studies. It has stereoscopes, radial line planimetric plotter, stereo-sketch and sketch masters for analysis and interpretation of airphotos as applied to mineral explorations, transportation route studies, forestry, and civil engineering.

Geophysics Laboratory

The Geophysics Laboratory is being developed for training and researches in Geosystem Exploration and Petroleum Geoengineering. It has a number of seismic, electric, magnetic and radiometric instruments, including some of the most advanced equipment such as DAS-1 (OYO), a multipurpose hi-performance seismic data acquisition system, or SYSCAL R1 Plus (IRIS Instruments), an all-in-one multi-electrode resistivity and induced polarization (IP) imaging system.

The Laboratory is capable of conducting and assisting in geophysical field surveys for engineering, environmental, mineral resources, oil and gas exploration as well as in

performing analysis, interpretation and visualization of geophysical data acquired.

Geoenvironmental Laboratory

The Geoenvironmental Laboratory provides a variety of equipment for geoenvironmental engineering research. It has equipment for geotechnical and chemical analysis that supports research in fundamental processes related to soil, water and chemical interactions that are applied to site and risk assessment, waste containment systems, and remedial technology. The chemical analysis equipment, spectrophotometer, from which the ion concentration can be determined with good accuracy and precision, enables research on soil-contaminant interaction.

Flexible wall permeameter, rigid wall permeameter and consolidation cell with permeameter are used to analyze water and chemical migration through waste containment systems. While the electrokinetic cell with advanced monitoring and controlled system is utilized for research in site reclamation and site remediation.

6.3 Faculty and Research Staff

Full-time Faculty

DENNES T BERGADO, BSCE, Mindanao State Univ, Philippines; MEng, AIT, Thailand; PhD, Utah State Univ, USA **Professor** (Soil/Ground Improvement Techniques, Geosynthetic Engineering, Landfill Liners, In-Situ Testing, and Geotechnical Engineering for Mitigation of Natural Hazards) [Ground improvement techniques and

geosynthetics, In-situ testing, Geotechnical disaster mitigation, and Probabilistic/numerical methods in geotechnical engineering]

ULRICH GLAWE, Dipl-Geol, Univ of

Erlangen-Nuremberg, Germany; MSc, Imperial College, UK; PhD, Univ of Erlangen-Nuremberg, Germany. **Associate Professor** (Geoenvironmental Engineering; Engineering Geology) [Geological hazards; Ground improvement using electrochemical stabilization; Contaminant transport in fine-grained soils; Landfill design for developing countries and in wet lands; Tsunami deposits]

NOPPADOL PHIEN-WEJ, BEng, Chulalongkorn Univ, Thailand; MS, PhD, Illinois at Urbana-Champaign, USA. **Associate Professor** (Tunnelling and other underground excavations in rocks and soils; Slope stability and retaining structures; Landslides; Earth structures and dams; Pile foundations; Buried pipes and culverts) [Soft ground tunnelling; Underground excavations in rock; Deep excavations; Land subsidence from deep well pumping; Rock properties]

KYUNG-HO PARK, BEng, MEng, Korea Univ; DEng, SUNY at Buffalo, USA. **Assistant Professor** (Geotechnical Engineering; Geomechanics; Computational Mechanics; Boundary Element Methods)

Research Staff

PHAM HUY GIAO, DEng, MEng, Asian Institute of Technology, Thailand; Dipl Ing (MSc), Bucharest University, Romania **Senior Research Engineer** (Exploration and Engineering Geophysics; Geotechnical Engineering;

Computer-Aided Analysis in Geoengineering)

6.4 Grants and Sponsored Research Completed in 2007

An Engineering Geophysical Study on Ground Penetration Radar (GPR) and Electric Imaging (EI) Responses to Detect of Voids beneath and/or inside a Concrete Pavement Model with Reference to Roadways Maintenance

Duration 1-Sep-06 - 15-Dec-07

Project Investigator Dr. Pham H. Giao
Sponsors Bureau of Road Research and Development, Department of Highways, Thailand

Total Contracted Amount (Baht) 199,919

Application of Stiffened Deep Cement Mixed Column in Ground Improvement of Soft Bangkok Clay

Duration 1-Nov-05 - 31-Dec-07

Project Investigator Prof Dennes T. Bergado

Sponsors Royal Thai Government
Total Contracted Amount (Baht) 1,000,000

Thailand-Korea-Japan Symposium on Tunneling and Underground Space Technology for Urban Environment

Duration 19-Mar-07 - 31-Dec-07

Project Investigators Dr Khung-Ho Park and Dr Noppadol Phien-wej
Sponsors RTG-AIT, International Tunneling Assoc., Thailand, Institute of Underground Space Technology (Korea University), Korean Tunneling Association, participants
Total Contracted Amount (Baht) 500,000

6.5 On-going Grants and Sponsored Research

Building Human Resources in the Development of Academic

Programs in Sustainable Geosystem Exploration and Engineering

Duration 1-Nov-05 - 30-Nov-08
Project Investigator Dr. Pham Huy Giao
Sponsors Asia Link / European Commission
Total Contracted Amount (Baht) 238,706

Construction Supervision for Mechanically Stabilized Earth of Bridge Approach Project

Duration 1-Oct-07 - 30-Sep-08
Project Investigator Prof Dennes Bergado
Sponsors Nawarat Pattakarn Public Co Ltd Thailand
Total Contracted Amount (Baht) 1,400,000

Geotechnical Study Hutgyi Hydropower Project (Additional Work)

Duration 1-Apr-06 - 30-June-08
Project Investigator Dr. Noppadol Phien-wej
Sponsors EGAT Public Company, Thailand
Total Contracted Amount (Baht) 1,416,680

Geotechnical Advice in Construction Supervision on Foundation and Tunnel, Kawenoi Dam Project

Duration 1-Mar-06 - 30-Mar-08
Project Investigator Dr. Noppadol Phien-wej
Sponsors P&C Management, Co., Ltd., Thailand
Total Contracted Amount (Baht) 321,000

Ground Deformations and effects on Adjacent Structures caused by Subway Tunneling in Bangkok

Duration 25-Apr-07 - 25-Apr-08
Project Investigator Kyung-Ho Park
Sponsors Royal Thai Government
Total Contracted Amount (Baht) 900,000

Initial Near-surface Geophysical Investigation of the Suvarnabhumi International Airport (SBIA)

Duration 1-Sep-07 - 30-Apr-08
Project Investigator Dr Pham Huy Giao
Sponsors IMMS Company Limited Thailand
Total Contracted Amount (Baht) 1,343,381

Research on the Damages on the North East Reef of Male, The Maldives

Duration 1-May-06 - 30-Apr-09

Project Investigator Dr. Ulrich Glawe/ Dr Khung Ho Park
Sponsors Environment Research Center Male, MV
Total Contracted Amount (Baht) 1,563,109

Safe and Sustainable Water Management of Municipal Solid Wastes in Bangladesh through the Practical Approach of WasteSafe Proposal

Duration 1-Jan-07 - 31-Dec-09
Project Investigator Dr Ulrich Glawe/ Dr Kyung-Ho Park
Sponsors European Commission
Total Contracted Amount (Baht) 3,731,684

6.6 Publications

Refereed Journals

Abuel-Naga, H.M., **Bergado, D.T.** and Bouzza, A. (2007), Thermally Induced Volume Change and Excess Pore Water Pressure of Soft Bangkok Clay, *Engineering Geology*, Vol. 89, pp. 144-154.

Abuel-Naga, H.M., **Bergado, D.T.** and Lim, B.F. (2007), Effect of Temperature on Shear Strength and Yielding Behavior of Soft Bangkok Clay, *Soils and Foundations*, Vol. 47, No. 3, pp. 423-436.

Abuel-Naga, H., **Bergado, D.T.**, Bouzza, A. and Ramana, G.V. (2007), Volume Change Behavior of Saturated Clay Under Drained Heating Conditions: Experimental Results and Constitutive Modeling, *Canadian Geotechnical Journal*, Vol. 44, pp. 942-956.

C. Pothiraksanun, **Bergado, D.T.**, Abuel-Naga, H.M., Hayashi, S. and Du, Y.J. (2007), Novel Thermo-PVD Consolidation Techniques for Soft Soils, *Lowland Technology International Journal*, Vol. 9, No. 2.

Giao P. H. and D. H. Hien (2007), Geotechnical Characterization of Soft Clay along a highway in the Red River Delta, *Lowland Technology International*, Vol. 9 (1), p. 18-27, IALT.

Giao P. H. and D. H. Hien (2007), Shallow Exploration of Bangkok Clay using Multiple Square Arrays, *Proc. of the 11th Int'l Symp. on Recent Advances in Exploration Geophysics*, in Kyoto (RAEG2007), p. 99-106, Kyoto, Japan;

Giao P. H., C. Vichalai and D. H. Hien (2007), A Study on Geotechnical and Geophysical Properties of

Styrofoam Material for Construction of a Concrete Pavement Model, *Proc. Intl' Symp. Hanoi Geoengineering 2007*, November 2007, Hanoi, Vietnam, p. 11-17.

Giao P. H., M.T. Nhuan, F. van der Meer, H. Ohtsu (2007), New Challenges in Geosystem Engineering and Exploration, *Proc. Intl' Symp. "Hanoi Geogineering 2007"*, Vietnam National University Publishing House, 258 p.

Giao P. H., Prinya Putthapiban and C. Vichalai (2007), Geophysical Investigation of Wangkanai and Hindat Hot spring Sites with Reference to Development of Tourism Industry in Kanchanaburi, Thailand, *Proc. Intl' Conference on Geology of Thailand: Towards Sustainable Development and Sufficiency Economy*, 21-22 November 2008, Bangkok, Thailand

Long, P.V., **Bergado, D.T.** and Abuel-Naga, H. (2007), Geosynthetics Reinforcement Application for Tsunami Reconstruction: Evaluation of Interface Parameters with Silty Sand and Weathered Clay, *Geotextiles and Geomembranes*, Vol. 25, Nos. 4-5, pp. 311-323.

Park, K.H. and Banerjee, P.K. (2007), "A new BEM formulation for transient axisymmetric poroelasticity via particular integrals", *International Journal of Solids and Structures*, 44(22-23), pp. 7276-7290.

Phienwej, N., Thakur, P.K. and Cording, E.J. "Time-Dependent Response of Tunnels Considering Creep Effect" *International Journal of Geomechanics*, American Society of Civil Engineers (ASCE), Vol. 7, no. 4, 1 April 2007, pp 296-306.

Refereed Books/Chapters

Guest Editor, Special Issue on Tsunami Reconstruction with Geosynthetics Containment Systems, *Geotextiles & Geomembranes Journal*, Vol.25, No., 4-5, August- October 2007.

Conference Proceedings

Bergado, D.T. (2007), Pavement Failures at the Second Bangkok International Airport, Invited Lecture, Saga Soft Ground Research Group, Saga, Japan.

Bergado, D.T. and Abuel-Naga, H.M. (2007), Thermo-Mechanical Behavior and Stabilization of Soft Bangkok Clay, Keynote Lecture, *Proc. 16th Southeast Asian Geotechnical Conference*, Kuala Lumpur,

- Malaysia.
- Bergado, D.T.** and Tanchaisawat, T. (2007), Performance of Lightweight Geomaterials Reinforced with Geogrid on Soft Ground, Invited Lecture, Proc. 3rd National Geotechnical and Geosynthetics Specialty Conference, Quezon City, Philippines.
- Bergado, D.T.**, Lai, Y.P., Tanchaisawat, T., Hayashi, S. and Yu, Y.J. (2007), Combined Technology with Other Techniques – Current Innovations on Earth Reinforcement Technique, Keynote Lecture, Proc. IS-Kyushu 2007, Fukuoka, Japan.
- Bergado, D.T.**, Long, P.V., Lai, Y.P. and Piyaboon S. (2007), Geosynthetic Applications for Sustainable Infrastructures and for Mitigations of Natural Disasters Caused by Climate Change, Keynote Lecture, Proc. Annual Conference of Korean Geosynthetics Society, Seoul, Korea.
- Bergado, D.T.**, Tanchaisawat, T., Voottipruex, V. and Kanjananak, T. (2007), Reinforced Lightweight Tire Chips-Sand Mixtures for Bridge Approach Utilization, Special Lecture, Proc. International Workshop on Tire Derived Geomaterials, Yokosuka, Japan.
- Bergado, D.T.** and Sramoon, W. (2007), Enhancement of PVD Performance on Soft Bangkok Clay by Thermal and Electro-Osmotic Consolidation, Prof. 16th Southeast Asian Geotechnical Conference, Kuala Lumpur, Malaysia.
- Bergado, D.T.** and Voottipruex, P. (2007), Compressibility and Flow Parameters of Soft Bangkok Clay Improvement with PVD, Panelist Lecture, Academe-Industry Session, Proc. 13th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering, Kolkata, India
- Jamsawang, P., Bhandari, A., **Bergado, D.T.** and Montalbo, S. (2007), Laboratory Investigation of Stiffened Deep Mixing Piles, Proc. 16th Southeast Asian Geotechnical Conference, Kuala Lumpur, Malaysia.
- Phienwej, N.** (2007). The observational method in the design and construction of powerhouse cavern of Lam Ta Khong Pumped Storage Project, Proceedings of Seafco-AIT-EIT Special Seminar on Value of the Observational Method in Geotechnical Engineering in Major Construction Projects. Bangkok, Thailand, 16 May, pp. 1-10
- Phienwej, N.** (2007), Roles and practice of rock mechanics in Thailand, Keynote lecture, Proceedings of First Thailand Symposium on Rock Mechanics, Nakorn Ratsima, Thailand, September 13-14, pp. 57-66.
- Phienwej, N.** (2007), Rock engineering practice in Thailand, Special Lecture, Proceedings of EIT-JSCE Joint Seminar on Rock Engineering 2007, Bangkok, 19 September, pp. 1-7.
- Phienwej, N.** (2007), Underground construction for Bangkok infrastructure development, Proceedings of International Symposium-Hanoi Geoengineering 2007: New Challenges in Geosystem Engineering and Exploration, Hanoi, Vietnam, 22-23 November, pp.216-227.
- Phienwej, N.** (2007), Thirty five years of soft ground tunnel construction in Bangkok, Keynote lecture, Proceedings of International Symposium on Tunneling for Urban Development-IS Pattaya 2007, Pattaya, Thailand, 14-15 December, pp. 1-12.
- Phienwej, N.** (2007), Bangkok land subsidence and its effect on the function of Suvarnabhumi airport, Proceedings of the International Conference on Geology of Thailand: Toward sustainable Development and Sufficiency Economy, Bangkok Thailand, 21-22 November, pp 13
- Phienwej, N.**, Sirivachiraporn, A. Suwansawat, S. and Zaw Zaw Aye (2007), Ground movements associated with the underground excavations of the first Bangkok MRT Line, Proceedings of the 16th Southeast Asian Geotechnical Conference, Subang Jaya, Malaysia, 8-11 May, pp. 181-188.
- Phienwej, N.** and Suwanishwong, T. (2007), A prediction method for time dependent land subsidence area over room-and-pillar mining, Proceedings of First Thailand Symposium on Rock Mechanics, Nakorn Ratsima, Thailand, September 13-14, pp. 119-142.
- Tanchaisawat, T., **Bergado, D.T.**, Kanjananak, T. and Voottipruex, P. (2007), Lightweight Geomaterials for Bridge Approach Utilization, Proc. 16th Southeast Asian Geotechnical Conference, Kuala Lumpur, Malaysia.
- Tanchaisawat, T., **Bergado, D.T.** Saowapakpiboon, J., Kovittayanon, N., de Zwart, T.P. (2002), Enhancement of PVD Performance on Soft Bangkok Clay by Thermal, Electro-Osmotic and Vacuum Techniques, Proc. 13th Asian Regional Conference, Vol. 1, pp. 803-812.

Other Publications

- Bergado, D.T.** (2007), Proceedings of the International Symposium on Geotechnical Engineering, Ground Improvement and Geosynthetics for Environmental Protection and Human Security, Bangkok, Thailand.
- Fact Finding Report: Investigation on the crack damages of the Airfield pavements of Suvarnabhumi Airport, Thailand. Report of the Special Committee, AOT, Ministry of Transport, 13 February 2007.
- Final Report of Geological and Geotechnical Study for Feasibility Study of Hutgyi Hydropower Project, Consulting Services by AIT Submitted to Electricity Generating Authority of Thailand (EGAT), October 2007.
- Final Report on Lightweight Tire Chips-Sand Mixtures Reinforced with Geogrids for Royal Thai Government (RTG) (Thailand, 2007).
- Lecture Notes: EIT Workshop on Tunnel Construction Technics, Lopburi, Thailand, 26-27 July 2007. Tunneling Technology and Design
- Lecture Notes: Short Course on Rock Slope Engineerings, Nakorn Ratsima, Thailand. 22-23 March, Design Criteria for Rock Slope Excavation and Rock Slope Stabilization in Civil Engineering Projects
- Proceedings of EIT-JSCE Joint Seminar on Rock Engineering 2007, Bangkok, Editors: Ohtsu H. and **Phienwej, N.**
- Proceedings of First Thailand Symposium on Rock Mechanics, ISBN 9789745336131, 323 p. Editors: Fuenkajorn K. and **Phienwej, N.**
- Proceedings of Seafco-AIT-EIT

Special Seminar on Value of the
Observational Method in Geotechnical
Engineering in Major Construction
Projects. Bangkok, Thailand. Editors:
Phienwej N. and Zaw Zaw Aye

6.7 Masters Students' Theses and Research Studies

*A Study on Aquifer Storage Transfer and
Recovery (ASTR) in a Fractured Aquifer,
Khon Kaen, Thailand*
By: Thamrongsak Suwanishwong
Supervisor: Dr. Pham Huy Giao

*Application of Bentonite Slurry and
Polymer-Based Slurry to Wet-Process
Bored Piles Construction in Bangkok Multi-
Layered Soil*
By: Ong Chin Yee
Supervisor: Prof. Dennes T. Bergado

*Application of the Ground Penetration
Radar in Geotechnical Engineering*
By: Wattana Maneechot
Supervisor: Dr. Pham Huy Giao

*Application of the Magnetic Susceptibility
Method in Geoengineering*
By: Chatree Chumpoo
Supervisor: Dr. Pham Huy Giao

*Boulder Transport Caused by the 1883
Krakatau Tsunami*
By: Claudia Maxcia
Supervisor: Dr. Noppadol Phien-wej

*Effects of Incompetent Inclusion on
Properties of Rockfills for Dam Construction*
By: Moet Moet Lwin
Supervisor: Dr. Ulrich Glawe

*Review and Analysis of Hanoi Land
Subsidence Monitoring Data*
By: Nguyen Ngoc Minh
Supervisor: Dr. Pham Huy Giao

*Thermo-PVD Improvement of Soft Bangkok
Clay: Microstructure Evaluation and
Analysis of Consolidation Behaviour*
By: Roque C. Alea, Jr.
Supervisor: Prof. Dennes T. Bergado

Chapter 7: SET – MECHATRONICS AND MICROELECTRONICS

FIELD OF STUDY

7.1 Introduction

Mechatronics

At present, most academic institutions and industries in the Asian region are only system integrators. Components are procured from more developed countries (e.g. computer numerically controlled machines, robots, and automated guided vehicles) and are integrated as a system (e.g. flexible manufacturing system). To support the growth of the region's economy, expertise not only as system integrators but also as builders of components of advanced technologies must be developed. The growing number of electronic devices and the strong interactions between mechanical and electronic parts no longer permit separate investigations of these components.

Mechatronics provides new insights through an integrated consideration of mechanics, electronics and information technology. The curriculum is designed to provide multidisciplinary knowledge and to develop the ability to design mechatronics systems.

Microelectronics

The region's growing industrial sector and the increasing demand for high technologies have brought the need for expertise in microelectronics to a critical level. The students are prepared to cope with the needs of the electronics industry in the region. The curriculum is equally balanced between the analog and digital design of circuits as well as the processing related topics including failure analysis, suitable for this electronics industrial sector in the

region. The curriculum has been designed and constantly adapted in partnership with microelectronics industries and collaborating universities overseas. Miniaturisation of IC and the possibilities of completely new technologies like nanotechnology have also been introduced.

7.2 Research Facilities and Laboratories

Mechatronics and Microelectronics fields of study share all the laboratory facilities with IEM and DME fields of study. There are several well equipped laboratories with the primary function of supporting the students and faculty for teaching and research and to conduct outreach programs.

Mechatronics and Automation Laboratory

The Mechatronics and Automation laboratory is well equipped with many PLC systems (S5, S7200/300/400, INDRAMAT, BOSCH), distributed control systems (PCS7), operator panels (OP5, OP17/DP and OP35), a PCbased human machine interface package (WINCC) and networked field buses (PROFIBUS, INTER-BUS and SERCOS). The lab has mobile robots (NOMAD, PIONEER 2), robot arms (CRS), an industrial robot (KUKAKR15), a self-made open architecture CNC machine, CNC control systems (MTC200, SINUMERIK 8100/8400), image processing systems (DVT, MATROX) and FPGA's (XILINX-1i VIRTEX PRO, ALTERA). Software such as SYNOPSIS IC Design, ANYSIM, ANSYS, ADAMS and many types of special sensors and actuators are also available for

research use.

The Integrated Circuit Design laboratory gives students access to a wide variety of professional software applications including ANSYS, Orcad, ModelSim SE, Xilinx ISE, Synopsys, Leonardo Spectrum LS and Tanner (S-Edit for Schematic Capture, T-Spice and W-Edit for Simulation and LEdit for Physical Layout). The laboratory's facilities are used for analog and digital circuit design, microchip design and fabrication, MEMS, microactuators and micro-sensors design, computational electronics, and so on. Fabrication facilities are available through the National Electronics Technology Center and the National Science and Technology Development Administration located in nearby Science Park.

Mechatronics faculty and students work in close collaboration with industry and government sectors in the areas of industrial automation, robotics, control, system design and integration. Some examples of ongoing projects include a medical tele-analyzer, automated visual inspection systems, MEMS design, an autonomous flying robot, automating centrifuge machines, an autonomous underwater robot and automating crystallization processes.

Simulation Laboratory

This lab is equipped with networks of Pentium PC for general applications and internet access, high end CAD/CAM & Simulation software such as ARENA and AutoMOD. In addition, a high performance computer facility with parallel cluster is also available for research use.

Microelectronics Laboratory

The microelectronics facilities consist of two main laboratories:

- (1) IC Design Lab
- (2) Nanotechnology

The Integrated Circuit Design laboratory gives students access to a wide variety of professional software applications including ANSYS, Orcad, ModelSim SE, Xilinx ISE, Synopsys, Leonardo Spectrum LS and Tanner (S-Edit for Schematic Capture, T-Spice and W-Edit for Simulation and LEdit for Physical Layout). The laboratory's facilities are used for analog and digital circuit design, microchip design and fabrication, MEMS, microactuators and micro-sensors design, computational electronics, and so on. Fabrication facilities are available through the National Electronics Technology Center and the National Science and Technology Development Administration located in nearby Science Park.

The Nanotechnology laboratory consists of a chemistry lab, an instrumentation room and an electronics laboratory. The chemistry laboratory is equipped with standard chemical tables and hoods for carrying out wetchemical processing. The instrumentation room consists of equipment such as optical spectrophotometers and microscopes. The electronics laboratory is equipped with digital oscilloscopes, signal generators, power supplies and standard meters, and it is stocked with a variety of discrete devices for testing and research.

Computer Integrated Manufacturing (CIM) Laboratory

The Computer Integrated Manufacturing (CIM) laboratory provides hardware and software support for Industrial Systems

Engineering. Many research activities have been undertaken in close collaboration with industry and government sectors in the area of Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), Computer Numerical Control (CNC), Rapid Prototyping (RP) and Medical Technology. The CIM laboratory also provides specialized training and consultancy services in CAD, CAM, CNC machining, reverse engineering, rapid prototyping, packaging technology, flexible manufacturing systems (FMS), and development of a postprocessor for 5-axis CNC. The CIM laboratory is equipped with production and training CNC machines including an EMCO TURN242 industrial production CNC lathe, an EMCO VMC200 CNC vertical machining center for universal production, a MAHO MH600E2 5-axis universal milling and boring machine, an EMCO compact 5 CNC, an EMCO F1 CNC, a LVD CNC press brake, a LVD water-jet cutting CNC, a ZOLLER tool presetting system, a Mondiale Gallic G-420 Industrial CNC lathe and an EMCO CNC training system. The available CAD/CAM software includes UNIGRAPHICS NX4, Master CAM 9.1, Mechanical Desktop 6, AutoCAD Inventor Series, SolidWorks 2005, CAM 2000, Mimics 6.3 and Magic 5.4. The Metrology laboratory also provides hardware and software support for Industrial Systems Engineering. The Metrology Laboratory is equipped with measuring instruments including Zeiss CMM, Mitutoyo Profile Projector and a Taylor Hobson surface roughness tester, as well as LabVIEW hardware and software.

Metrology Laboratory

The Metrology laboratory also provides hardware and software support for Industrial Systems Engineering. The Metrology Laboratory is equipped with measuring instruments including Zeiss CMM, Mitutoyo Profile

Projector and a Taylor Hobson surface roughness tester, as well as LabVIEW hardware and software.

7.3 Faculty and Research Staff

Full-time Faculty

NITIN V AFZULPURKAR, BEng, Univ of Poona, India; PhD, Univ of Canterbury, New Zealand **Associate Professor** [Computer vision (pattern recognition and image processing); MEMS design, fabrication for electronic and bio medical applications; Soft computing algorithms for robotics and automation applications; Mechatronics applications for industrial use]

JOYDEEP DUTTA, BSc (Hons), St Edmund's College; MSc (Physics), North Eastern Hill Univ; PhD, IACS, Calcutta Univ, India. **Associate Professor** [Functional materials, nanomaterials, Nanoparticles, selforganisation, Biomimetic processes, Polyelectrolyte deposition, Gas sensors, Biosensors, optoelectronic devices]

MANUKID PARNICHKUN, BEng, Chulalongkorn Univ, Thailand; MEng, PhD, Univ of Tokyo, Japan **Associate Professor** [Robotics, control, and measurement (involves with design and development of hardware and software of mechatronics devices); New robot mechanism, novel control algorithm, and innovative measurement concept are investigated]

Visiting Faculty

LERTSAK LEKAWAT, BE King Mongkut's Institute of Technology Ladkrabang, Thailand; MSc., George

Washington University USA;
PhD Carnegie Mellon
University, USA **Visiting
Lecturer** [Data Storage
System, Analog design, digital
design, mixed signal design]

DENIS SWEATMAN, B.Sc. ;
Ph.D.,

the University of Queensland,
Australia. **Visiting Lecturer**
[Analog and Digital Devices,
Circuits, Sensors and Optic
Communications]

UDUPI SRIPATI, B.Eng. ,
Mangalore

University; M.Tech. ; NITK
Surathkal; and Ph.D., Indian
Institute of Science. **Visiting
Senior Lecturer** [Linear Ics
and applications; antennas
and propagation; advanced
digital communications, signal
detection and estimation, error
control coding, information
theory, transmission lines and
wave-guides, RF circuit
techniques]

7.4 Grants and Sponsored Research Completed in 2007

Automated Pick and Place of Concrete Roof Tile at the Pressing Machine Operation

Duration 1-Jun-06 - 31-Dec-07
Project Investigator Dr. Nitin Afzulpurkar
Sponsor CPAC Roof Tile Co. Ltd, Thailand
Total Contracted Amount (Baht) 1,350,000

Fabrication and Properties of Nanoparticles Array

Duration 11-Jan-06 - 31-Dec-07
Project Investigator Dr. Joydeep Dutta
Sponsor KIST
Total Contracted Amount (Baht) 1,150,000

Inline OCR Yield Improvement

Duration 1-Jan-07 – 30-Apr-07
Project Investigator Dr. Nitin Afzulpurkar
Sponsor Western Digital Co. Ltd., Thailand
Total Contracted Amount (Baht) 160,000

Nanotechnology-based Pressure Sensors for Tsunami Detection

Duration 1-Dec-05 – 31-Dec-07

Project Investigator Dr. Joydeep Dutta
Sponsor RTG Joint Research Project FY
2005
Total Contracted Amount (Baht) 875,000

7.5 On-going Grants and Sponsored Research

Automated Inline Foam Sheet Placement and Adhesion

Duration 1-Jun-07-31-May-08
Project Investigator Dr Nitin Afzulpurkar
Sponsor Royal Thai Government and-
CPAC Roof Tile Co. Ltd
Total Contracted Amount (Baht) 1,500,000

Brain-Machine Interface for Robo-Animal Control Project

Duration 31-Jul-06 - 30-Jul-09
Project Investigator Dr. Manukid
Parnichkun
Sponsor Thailand Research Fund
Total Contracted Amount (Baht) 1,200,000

Development of a Medical Tele- Analyzer by Force- Displacement-Hybrid Tactile Sensor and Actuator for Abdominal Mass Analysis (Phase 2) Project

Duration Aug-04 - Dec-08
Project Investigator Dr. Manukid
Parnichkun
Sponsor NECTEC
Total Contracted Amount (Baht) 1,674,200

Development of an Automatic Steering Cruise Control System for Passenger Cars

Duration 1-Nov-07-31-Oct-10
Project Investigator Dr Manukid Parnichkun
Sponsor National Electronics and
Computer Technology Center, Thailand
Total Contracted Amount (Baht) 1,988,000

Development of an Exoskeleton Robot for Handicapped People Project

Duration 1-Jul-06 - 30-Jun-09
Project Investigator Dr. Manukid
Parnichkun
Sponsor National Electronics and
Computer Technology Center (NECTEC),
Thailand
Total Contracted Amount (Baht) 2,043,100

Development of Generic Smart MEMS based Control System

Duration 23-Feb-04-30-Jun-08
Project Investigator Dr Nitin Afzulpurkar
Sponsor National Electronic and Computer
Technology Center, Thailand
Total Contracted Amount (Baht) 3,880,800

Inorganic Particle Nanocomposite for Sensor Applications

Duration May-05 - 30-Apr-08
Project Investigator Dr. Joydeep Dutta
Sponsor Sida Research Grant, Sweden
Total Contracted Amount (Baht) 2,018,500

Master Degree in HDD Engineering Technology

Duration 1-Jul-07-01-Jul-09
Project Investigators Dr Nitin Afzulpurkar,
Prof Worsak Kanok-Nukulchai, Dr Huynh
Truong Luong, Dr Joydeep Dutta, Dr
Lertsak Lekawat, Dr. Manukid Parnichkun
Sponsor Western Digital Co. Ltd.
Total Contracted Amount (Baht) 10,528,000

Nanotechnology Center of Excellence (CoEN)

Duration May-06 - 2010
Project Investigator Dr. Joydeep Dutta
Sponsor NANOTEC, NSTDA & Royal Thai
Government - AIT
Total Contracted Amount (Baht) 5,000,000

Photocatalytic Thin Film Coating Technology Program Research

Duration 2006-2008
Project Investigator Dr. Joydeep Dutta
Sponsor NECTEC/NSTDA
Total Contracted Amount (Baht) 3,402,000

Printed Electronics Using Direct Writing Technology

Duration 30-Mar-05- 30-Mar-08
Project Investigator Dr. Joydeep Dutta
Collaborator Dr. Apinunt Thanachayanont,
KMIT-Ladkrabang, Thailand
Sponsor NANOTEC/NSTDA
Total Contracted Amount (Baht) 2,498,776

Sputtering Deposition, Atmospheric CVD-like Deposition and Characterization

Duration 2006-2009
Project Investigator Dr. Joydeep Dutta
Sponsor NECTEC/NSTDA
Total Contracted Amount (Baht) 198,000

Training Program on IC Packaging Testing and Assembly

Duration 1-Oct-07-01-Apr-08
Project Investigator Dr Nitin Afzulpurkar
Sponsor Manpower Department, Ministry
of Human Resources, RTG]
Total Contracted Amount (Baht) 1,772,703

7.6 Publications

Refereed Books/Chapters

Abbasi, A.R., **Afzulpurkar, N.V.**,
Uno, T. (2007). Exploring the Implicit
Affect: Analyzing Un-Intentional Body
Gestures for Affective System Design.
Affective Computing: Emotion

Modeling, Synthesis and Recognition, Publishers: I-Tech/ARS (Advanced Robotic Systems) Publishing, ISBN: 978-3-902613-23-3.

Sugunan, A. & **Dutta, J.** (2008). Pollution Treatment, Remediation, and Sensing. Nanotechnology, Vol. 2: Environmental Aspects, Harald Krug (ed.). Wiley-VCH, Weinheim, ISBN-13: 978-3-527-31735-6, July 2008, in Press

Warad, H. & **Dutta, J.** (2007). Nanotechnology for Agriculture and Food Systems - A View. The Age of Nanotechnology, Nirmala Rao Khadpekar (ed.). The ICFAI University Press, Hyderabad, India (ISBN: 81-314-0828-0)

Refereed Journals

Abbasi, A.R., Uno, T., Dailey, M.T., **Afzulpurkar, N.A.** (2007). Towards Knowledge-Based Affective Interaction: Situational Interpretation of Affect. Lecture Notes in Computer Science, Vol. 4738, 452-463, DOI 10.1007/978-3-540-74889-2_40. Impact Factor 0.474

Baruah, S. & **Dutta, J.** (2008). Growth of Zinc Oxide Nanowires on Polyethylene Fibers. Science & Technology of Advanced Materials, in Press [JCR 2006 Impact Factor ~ 1.124]

Baruah, S., Warad, H.C., Tumchareen, G., **Dutta, J.** (2008). Studies on Chitosan Stabilised ZnS:Mn²⁺ Nanoparticles. Journal of BioNanoScience, in Press [JCR 2006 Impact Factor ~ new journal]

Dinh, N.Q. & **Afzulpurkar, N.V.** (2007). Neuro-fuzzy MIMO Nonlinear Control for Ceramic Roller Kiln. Simulation Modelling Practice and Theory, Vol. 15, Issue 10, 1239-1258, November 2007. Impact Factor 0.474

Minh, V.T. & **Afzulpurkar, N.V.** (2007). A Comparative Study on Computational Schemes for Nonlinear Model Predictive Control. Asian Journal of Control, Vol. 8, No. 4, 324-331. Impact Factor 0.466

Minh, V.T., **Afzulpurkar, N.V.**, Muhamad, W.M.W. (2007). Fault Detection and Control of Process Systems. Mathematical Problems in Engineering, Vol. 2007, Article ID 80321, 20 pages, doi:10.1155/2007/80321.

Navalertporn, T. & **Afzulpurkar, N.A.** (2007). Optimizing Process Parameters for Ceramic Tile Manufacturing Using an Evolutionary

Approach. Lecture Notes in Computer Science, Springer Berlin / Heidelberg, ISSN 0302-9743, Vol. 4493, DOI 10.1007/978-3-540-72395-0, ISBN 978-3-540-72394-3, pp.252-260. Impact Factor 0.402

Nisar, A., **Afzulpurkar, N.V.**, Mahaisavariya, B., Tuantranont, A. MEMS Based Micropumps in Drug Delivery and Biomedical Applications. Sensors & Actuators: B. Chemical, doi:10.1016/j.snb.2007.10.064, Elsevier, In press, Impact Factor 2.30.

Sugunan, A., Melin, P., Schnürer, J., Hilborn, J.G., **Dutta, J.** (2007). Nutrition Driven Colloidal Self-assembly: Growing Fungi Assembles Gold Nanoparticles as Micro-wires. Advanced Materials, 19, 77-81 TOP25 Journal in Nanotechnology-ISI. [JCR 2006 Impact Factor ~ 7.896]

Ullah, R. & **Dutta, J.** (2008). Photocatalytic Degradation of Organic Dyes with Manganese Doped ZnO Nanoparticles. J. Hazardous Materials, in Press [JCR 2006 Impact Factor ~ 1.855]

Conference Proceedings

Aphiratsakul, N. & **Parnichkun, M.** (2007). Preliminary Study and Design of an Exoskeleton, Proceedings of 2007 TRS Conference on Robotics and Industrial Technology, Nakorn Pathom, Thailand, pp.2-7.

Deelertpaiboon, C. & **Parnichkun, M.** (2007). Low-pass Filtering Fuzzy Logic Based Steering Control of an Unmanned Vehicle on Unmarked Road, Proceedings of 2007 National Conference on Automotive Engineering, Thailand, Bangkok, Thailand.

Deelertpaiboon, C. & **Parnichkun, M.** (2007). Waypoint Navigation Control for an Intelligent Vehicle using Fuzzy Logic Technique, Proceedings of 2007 TRS Conference on Robotics and Industrial Technology, Nakorn Pathom, Thailand, pp.26-31.

Islam, N.U., Ahmed, K.F., Sugunan, A., **Dutta, J.** (2007). Forensic Fingerprint Enhancement using Bioadhesive Chitosan and Gold Nanoparticles. Nano/Micro Engineered and Molecular Systems, 2007 (NEMS '07). 2nd IEEE International Conference on Nano/Micro Engineered and Molecular Systems. 16-19 January 2007, pp. 411-415.

Jafri, S.H.M. & **Dutta, J.** (2007). DC Analysis of Layer by Layer Devices Fabricated by Nanotechnology, ICEE '07, IEEE International Conference on

Electrical Engineering, 11-12 April 2007, DOI 10.1109/ICEE.2007.4287323, pp.1-6

Kaitwanidvilai, S. & **Parnichkun, M.** (2007). Genetic-Algorithm-based Fixed-Structure Robust H[∞] Loop-Shaping Control for a MIMO System, Proceedings of the 2007 Thailand Research Fund Conference, Chonburi, Thailand, pp.420.

Limprasert, W., Israsena, P., **Afzulpurkar, N.V.**, Lekawat, L. (2007). On An Approach in Implementing DSP Algorithms for Digital Hearing Aids; A Noise Reduction Core Case Study, International Convention for Rehabilitation Engineering & Assistive Technology (i-CREATE 2007), Singapore.

Nisar, A., **Afzulpurkar, N.V.**, Mahaisavariya, B., Tuantranont, A. (2007). Design Optimization of MEMS Micropump for Drug Delivery Applications, IEEE-NANOMED 2007, Macau, China.

Promnimit, S., Pratontep, S., Thanachayanont, C., Park, J-K, **Dutta, J.** (2007). Growth Process of Novel Thin Films by Directed Self Organization of Nanoparticles. Nano/Micro Engineered and Molecular Systems, 2007 (NEMS '07), 2nd IEEE International Conference on Nano/Micro Engineered and Molecular Systems. 16-19 January 2007, pp. 347-352.

Puntunan, S. & **Parnichkun, M.** (2007). Development and Control of an Autonomous Flying Robot, Proceedings of 2007 National Conference on Automotive Engineering, Bangkok, Thailand.

Sugunan, A., Melin, P., Welch, K., Hilborn, J.G., **Dutta, J.** (2007). Colloidal Self-Assembly by Living Fungi for Conducting Micro-wires. Nano/Micro Engineered and Molecular Systems (NEMS '07). 2nd IEEE International Conference on Nano/Micro Engineered and Molecular Systems. 16-19 January 2007.

Sugunan, A., Desai, A.A., **Dutta, J.** (2007). Tailoring the Anisotropic Growth of Gold Nanoparticles. Nano/Micro Engineered and Molecular Systems (NEMS '07). 2nd IEEE International Conference on Nano/Micro Engineered and Molecular Systems. 16-19 January 2007.

Sukontanakarn, V. & **Parnichkun, M.** (2007). Development of a Real-Time Control System by Using xPC Target: Solution to Rotary Inverted Pendulum System, Proceedings of 2007 TRS Conference on Robotics and Industrial Technology, Nakorn Pathom,

Thailand, pp.84-90.

Sweatman, D., Eamchotchawalit, C.,
Dutta, J. (2006). Pyrosol Generation of ZnO Nanoparticles and Structured Thin Films, Proceedings of the European Radar 2006 International Conference on Nanoscience and Nanotechnology, IEEE Cat. No. 06EX1411C, ISBN 1-4244-0453-3, Library of Congress 2006925599, pp. 190-193.

Tuantranont, A., Mamanee, W.,
Afzulpurkar, N.V., Porntheerapat, N., Lomas, T. Wisitsoraat, A. (2007). PDMS-Based Thermo-Pneumatic Peristaltic Micropump, International Conference on Materials for Advanced Technology, July 2007, Singapore.

Ullah, R. & **Dutta, J.** (2007). Synthesis and Optical Properties of Transition Metal Doped ZnO Nanoparticles, IEEE International Conference on Emerging Technology (ICET-2007), 13-14 November 2007, 1-4244-1494-6/07 IEEE, pp. 306-311

Warad, H.C., Tumchareen, G.,
Dutta, J. (2007). Chitosan Clad Manganese Doped Zinc Sulphide Nanoparticles as Biological Labels, Nano/Micro Engineered and Molecular Systems (NEMS '07). 2nd IEEE International Conference on Nano/Micro Engineered and Molecular Systems. 16-19 January 2007, pp. 342-346.

7.7 Doctoral Students' Dissertation

Development and Control of an Autonomous Flying Robot

By: Sukon Puntunan

Supervisor: Dr. Manukid Parnichkun

7.8 Masters Students' Theses and Research Studies

MECHATRONICS

A PC-104 Implementation of Object Finding and Mobile Robot Gripper Control using Machine Vision

By: Phyu Phyu Sandar Htay

Supervisor: Dr. Nitin V. Afzulpurkar

Automatic Obstacle Recognition for a

Mobile Robot

By: Thanan Rueankhong

Supervisor: Dr. Nitin V. Afzulpurkar

Control of a Rat by an External Stimulator

By: Bui Dinh Vuong

Supervisor: Dr. Manukid Parnichkun

Control of pH level by PLC in a Waste Water Treatment Plant

By: Ngo Viet Thang

Supervisor: Dr. Manukid Parnichkun

Design and Analysis of One DOF Haptic Device for Telerobotic Control

By: Le Xuan Huy

Supervisor: Dr. Nitin V. Afzulpurkar

Design and Control of a Leg Exoskeleton

By: Ngo Quang Hieu

Supervisor: Dr. Manukid Parnichkun

Design and Development of Jumping Mechanisms

By: Dian Artanto

Supervisor: Dr. Manukid Parnichkun

Design and Implementation of Cruise Control System in a Passenger Car

By: Saranakom Cheecharoen

Supervisor: Dr. Manukid Parnichkun

Design of an Automatic Transmission for a Bicycle

By: Nguyen Trong Thuong

Supervisor: Dr. Pisut Koomsap

Developing a Speech Recognition System for the Sinhala Language

By: Mudunkotuwa Sidath Pragharatna

Supervisor: Dr. Matthew Dailey

Development of a Parallel Robot

By: Ly Tan Huy

Supervisor: Dr. Manukid Parnichkun

Development of a PLC Based Fuzzy Logic Process Control System using Profibus DP Asic Chip

By: Huynh Thanh Vu

Supervisor: Dr. Nitin V. Afzulpurkar

Development of a Rescue Robot

By: Doan Thanh Son

Supervisor: Dr. Manukid Parnichkun

Development of Soccer Robot using Vision and Potential Field Technique

By: Prashanta Man Shrestha

Supervisor: Dr. Manukid Parnichkun

Development of Vision Service in Robotics Studio for Road Sign Recognition and Control of Lego Mindstorms Robot

By: Pham Dinh Trung

Supervisor: Dr. Nitin V. Afzulpurkar

Fingerprint Identification

By: Dao Thi Phuong

Supervisor: Dr. Nitin V. Afzulpurkar

Formation Control of Multiple Mobile Robots using Vision Feedback

By: Muhammad Musharraf Nadeem

Supervisor: Dr. Manukid Parnichkun

GPS and Map Based Navigation System for an Intelligent Vehicle

By: Keeradit Angsutornrangsi

Supervisor: Dr. Manukid Parnichkun

New Approach for Hard Disk Drive Servo Control using Composite Nonlinear Feedback

Control and Compensator for Improving the Accuracy of Track Seeking and Track Following

By: Ngo Hoang Tung

Supervisor: Dr. Nitin V. Afzulpurkar

Path Planning for a Mobile Robot in a Dynamic Environment

By: Nguyen Truong Thanh

Supervisor: Dr. Nitin V. Afzulpurkar

Pick and Place Machine for Biscuit Production

By: Ruwan Manjula Weerasinghe

Supervisor: Dr. Nitin V. Afzulpurkar

Position Control of a Pneumatic System by Multimode PID-Sliding Mode Controller

By: Nguyen Tung Lam

Supervisor: Dr. Manukid Parnichkun

Remote Control of an Underwater Robot

By: Vu Minh Hung

Supervisor: Dr. Manukid Parnichkun

Road Tracking Control for an Intelligent Vehicle

By: Nguyen Le Minh Thu

Supervisor: Dr. Manukid Parnichkun

Robotic Spray Coating using Stereo Vision

By: Huynh Ngu Tuan Kiet

Supervisor: Dr. Nitin V. Afzulpurkar

Signal Recognition for a Brain Machine Interface

By: Dang Ngoc Anh

Supervisor: Dr. Manukid Parnichkun

Static and Dynamic Objects Recognition for an Intelligent Vehicle

By: Nguyen Chanh Nghiem

Supervisor: Dr. Manukid Parnichkun

System Identification of an Electrical Car for Steering and Speed Control

By: Chaiyaporn Silawatchananai

Supervisor: Dr. Manukid Parnichkun

Theoretical Study and Design for Image Formation through Walls using a Distributed Radar Sensor Network Design

By: Theppharit Chuenchokesant

Supervisor: Dr. Nitin V. Afzulpurkar

Towards Real-time Terrain Modeling for Robot Navigation using a Monocular Camera

By: Muhammad Tufail

Supervisor: Dr. Matthew Dailey

Traffic Sign Recognition System for Intelligent Vehicles

By: Doan Nguyen Huy Khoi

Supervisor: Dr. Manukid Parnichkun

Using the S60 Mobile Phone Platform for SCADA SQL Database Access and Process Control

By: Tran Dinh An

Supervisor: Dr. Nitin V. Afzulpurkar

MICROELECTRONICS

1 Volt Based Frequency Synthesizer Design for 2.4 GHZ ISM Band

By: Md. Hasan

Supervisor: Dr. Lertsak Lekawat

Design of Low-power Temperature Sensor for Wireless Telemetry Using 0.35

Micrometer CMOS Technology

By: Tanipporn Rujiraapa

Supervisor: Dr. Lertsak Lekawat

Designing Ink Jet Printer for Microfabrication of Electronic Devices using Nanoparticles

By: Rungrot Kitsomboonloha

Supervisor: Dr. Nitin V. Afzulpurkar

Fabrication of Dye Sensitized Solar Cell (DSSC) Focusing on Improvement in Cell Performance

By: Naveed UI Islam

Supervisor: Dr. Joydeep Dutta

Innovative Filtration Media for Particulate and VOC Reduction in Hard Disk Drives

By: Sunandan Baruah

Supervisor: Dr. Joydeep Dutta

Noise Reduction System for a Digital Hearing Aid

By: Wasit Limprasert

Supervisor: Dr. Lertsak Lekawat

Optimization and Authentication using XTEA for Low Power Hardware Encryption for Secure RFID

By: Kasorn Galajit

Supervisor: Dr. Nitin V. Afzulpurkar

Package Construction Analysis in Ultra Small IC Packaging

By: Rojalin Pradhan

Supervisor: Dr. Joydeep Dutta

Fabrication and Properties of Nanoparticles Array Project



Chapter 8: SET – REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEMS FIELD OF STUDY

8.1 Introduction

Geoinformatics comprising **Remote Sensing (RS), Geographic Information System (GIS) and Global Positioning System (GPS)** provides extremely useful tools for environmental and natural resources management. They are widely recognized as supporting tools for the planning, monitoring, and management of the appropriate utilization of resources at the country, regional and global levels.

While they represent multidisciplinary backgrounds, students in RS&GIS share a common interest, that is, to use remote sensing, GIS, GPS and other space technologies as tools in pursuing their academic work as well as in developing new technologies that are applicable to the region. Because of the complexity of the technologies together with the heavy dependence on advanced computer skills, application specialists need to have a sound knowledge of the theoretical aspects and practical approaches to integrate many resources of information that address different applications.

Furthermore, scientists, planners or engineers interested in these technologies should be familiar with past, present and future satellite systems, their appropriate usage, data acquisition and handling and integration with other data sources.

The curriculum well covers the theoretical aspects and application of space technology, especially in Remote Sensing and GIS. It provides students ample time to gain application know-how through laboratory sessions. Students are free to use satellite data received by the NOAA, AVHRR and MODIS Satellite Receiving Stations for their theses or research studies.

The demand for RS&GIS graduates is very high as there is lack of professionals in these disciplines, particularly those with a vast knowledge of the practical utilization of these technologies. Employment opportunities are available in a wide range of areas, including agriculture, forestry, coastal development and management, urban planning and development, medical technology, mapping and planning, disaster mitigation and environmental management.

Major areas covered in the coursework are fundamentals of remote sensing and GIS, earthenergy interaction, atmospheric correction, application potential in various disciplines, GIS data sources, map projection, geostatistics, spatial modeling, automated mapping, digital terrain model, GPS data acquisition, and integration of GIS, remote sensing and GPS.

8.2 Research Facilities and Laboratories

The RS&GIS field of study provides excellent facilities for teaching, research and projects which consists of the Digital Image Processing laboratory, Institute-wide GIS laboratory, Asia e-learning project experiment room, meeting rooms, and the Geoinformatics Center laboratory. The RS&GIS field of study has a policy of maintaining the best working environment for students, staff and faculty. Apart from the Institute-provided access to the Internet and electronic mail, each student of the RS&GIS field of study is allocated computer space for individual use of about 1-2 Gb (extendible). The space for personal web pages to be hosted on RS&GIS network, can also be provided upon request.

The RS&GIS LAN Network can also be monitored in real time. Besides, it has a very good archive of over 600 scenes of satellite imagery of SPOT, Landsat-TM, NOAA, ADEOS, ERSSAR, and JERS-SAR to serve the students in their research and thesis studies. Other data, such as topographic, landuse, soil, geology maps of Thailand and some aerial photographs, are also available. The RS&GIS library also provides students with more specialized books, journals, and computer manuals. Some equipment in its laboratory available for academic activities include: Trimble geoexplorer; Garmin GPS Series III and V; laptop computer; digital camera; wireless hub/switch; wireless USB; network switch; network hub; black/white and color laser printers; A4 and A0 scanners; table and personal stereoscopes; and an LCD projector.

8.3 Faculty and Research Staff

Full-time Faculty

XIAOYONG CHEN, BS, MS, PhD, Wuhan Technical Univ of Survey and Mapping, People's Republic of China. **Associate Professor** (*Automated Mapping, GIS, Photogrammetry, Remote Sensing, Mathematical Morphology and Database Management System*)

KIYOSHI HONDA, BAg, DEng, Tokyo Univ, Japan **Associate Professor** (*Image Processing, Erosion control, Terrain modeling*)

NITIN KUMAR TRIPATHI, BTech, National Institute of Technology, Warangal, India; MTech, IIT; PhD, IIT, Kanpur,

India. **Associate Professor,**(
*GIS, Remote Sensing,
Environment, Socioeconomic
Impact, Agriculture, Health,
Applications*)

Visiting Faculty

MICHIRO KUSANAGI, BS, MS,
Univ

of Tokyo, Japan; MS, Ph.D,
Univ of California, USA.

Visiting Professor
*(Aerospace System
Engineering, Space System
Engineering)*

SEISHIRO KIBE, BEng, MEng,
Deng, University of Tokyo,
Japan **Visiting Professor**
*(Aerospace System
Engineering)*

JUNICHI SUSAKI, BEng, MEng,
DEng, Univ of Tokyo, Japan
Visiting Assistant Professor
*(Environmental Information
Extraction and Validation,
Social Environmental Change
detection, Automatic Pattern
Recognition, Remote Sensing
and GIS development)*

Research Staff

MANZUL KUMAR HAZARIKA,
PhD,

University of Tokyo, Japan;
MEng, Asian Institute of
Technology, Bangkok,
Thailand; MTech, Indian
Institute of Technology,
Kharagpur; BTech, J N Krishi
Vishwa Vidyalaya (J. N.
Agriculture University), India
**Senior Research and
Training Specialist (RS and
GIS Applications to Global
Environment, Terrestrial
Carbon Cycle and NPP)**

SURAT LERTLUM, BS, Norwich
University; MS, The George
Washington University, USA;
DTechSc Computer Science,
Asian Institute of Technology,
Thailand **Research Scientist**
(GIS, RS, Digital Image

*Processing, Surveying,
Mapping)*

LAL SAMARAKOON, PhD
**Visiting Senior Scientist;
Director, ACRORS and GAC**
*(GIS, RS, Digital Image
Processing, Surveying,
Mapping)*

MARC SOURIS, PhD, Université
de

La Rochelle, France **Visiting
Research Scientist (Remote
Sensing and GIS
development)**

TARAVUDH TIPDECHO, BSc,
MSc,
Chiangmai Univ, Thailand;
DTechSc, Remote Sensing &
GIS, Asian Institute of
Technology, Thailand
Research Specialist I
*(Advanced Mapping,
Terrestrial Scanning)*

8.4 Grants and Sponsored Research Completed in 2007

**Applying Parallel Computing on
Cluster and Grid Systems for
Agricultural Monitoring Based
on Crop Model and Remote
Sensing**

Duration 18-Oct-04- 31-Jan-07
Project Investigator Dr. Honda Kiyoshi
Sponsor RTG Joint Research Project FY
2004
Total Contracted Amount (Baht) 970,000

Geoinformatics for Development

Duration 17-Mar-07-31-Dec-07
Project Investigator Dr Ntin Kumar Tripathi
Sponsor Self-paid Participants
Total Contracted Amount (Baht) 246,370

Global Irrigation Mapping

Duration Dec-02 - Apr-07
Project Investigator Dr. Honda Kiyoshi
Sponsor International Water Management
Institute
Total Contracted Amount (Baht) 1,825,031

**International Conference on
Health GIS**

Duration 1-Oct-07-31-Jul-08
Project Investigator Dr Nitin Kumar Tripathi
Sponsor Self-paid

Total Contracted Amount (Baht) 360,000

**Japan Science and Technology
2006-2007**

Duration 1-Apr-06 - 31-Mar-07
Project Investigator Dr. Lal Samarakoon
Sponsor Japan Science and Technology
Agency
Total Contracted Amount (Baht) 831,750

JAXA Mini Project 2006-2007

Duration 1-Apr-06 - 1-May-07
Project Investigator Dr. Lal Samarakoon
Sponsor Japan Aerospace Exploration
Agency
Total Contracted Amount (Baht) 12,308,800

**New Technologies for Urban
Safety of Mega Cities in Asia**

Duration 1-Aug-06 - 31-Mar-07
Project Investigator Dr.Raktipong
Sahamitmongkol
Sponsor JAXA
Total Contracted Amount (Baht) 950,000

**Remote Sensing and GIS for
Development**

Duration 1-Feb-07-31-Dec-07
Project Investigator Dr Ntin Kumar Tripathi
Sponsor Self-paid Participants
Total Contracted Amount (Baht) 438,000

**Remote Sensing Images
Analysis around the
Mesopotamia Marsh**

Duration Jan-04 - Jun-07
Project Investigator Dr. Honda Kiyoshi
Sponsor Digital Service international Co.,
Ltd. (DSI)
Total Contracted Amount (Baht) 1,092,530

**Spatial Analysis of Malaria Risk
to the Determination
Epidemiological Surveillance in
an Endemic Region of Thailand
and the effectiveness of a New
Control strategy**

Duration 18-Oct-04- 31-Jan-07
Project Investigator Dr. Honda Kiyoshi
Sponsor RTG Joint Research Project FY
2004
Total Contracted Amount (Baht) 1,000,000

**Strengthening Capacity on
Multi-Hazard Risk Assessment
in Tsunami**

Duration 15-Aug-06 - 1-Aug-07
Project Investigator Dr. Manzul Hazarika
Sponsor USAID
Total Contracted Amount (Baht) 3,604,702

**The GIS Component in Tsunami
Early Warning System of AIT**

Duration Nov-05 - Apr-07
Project Investigator Dr. Honda Kiyoshi
Sponsor Royal Thai Government

Total Contracted Amount (Baht) 875,000

Water Storage Development Planning for Flood Water Retention for Dry Season Requirements in Chi River Basin

Duration 20-Oct-05 – 3-Jul-07

Project Investigator Dr Nitin Kumar Tripathi
Sponsor RTG Joint Research Project FY 2005

Total Contracted Amount (Baht) 970,000

8.5 On-going Grants and Sponsored Research

An Innovative Capacity Development Program for Extreme Flood Risk Assessment

Duration 1-Oct-07-30-Apr-08

Project Investigator Dr. Lal Samarakoon
Sponsor United Nations University (UNU)
Total Contracted Amount (Baht) 2,040,000

Business and Logistics Management using Integrated RFID and InternetGIS

Duration 1-Aug-07-01-Nov-08

Project Investigator Dr Ntin Kumar Tripathi
Sponsor RTG/CARACAD
Total Contracted Amount (Baht) 1,800,000

Capacity Building in Poverty Mapping in ASEAN

Duration 1-Jan-07-31-Dec-08

Project Investigator Dr. Lal Samarakoon
Sponsor ASEAN Foundation
Total Contracted Amount (Baht) 9,519,545

Digital Asian Network 2006-2009

Duration 1-Mar-06 - 31-Mar-09

Project Investigator Dr. Lal Samarakoon
Sponsor Keio Research Institute at SFC, Keio University, Japan
Total Contracted Amount (Baht) 362,835

GIS and Remote Sensing for Solid Waste Management and Internet GIS

Duration 10-Aug-07-29-Feb-08

Project Investigator Dr Ntin Kumar Tripathi
Sponsor MNNIT India
Total Contracted Amount (Baht) 268,000

International Conference on Health GIS

Duration 1-Oct-07-31-Jul-08

Project Investigator Dr Nitin Kumar Tripathi
Sponsor Self-paid
Total Contracted Amount (Baht) 360,000

Japan Aerospace Exploration Agency (JAXA) Capacity Building 2007-2008

Duration 29-Aug-07-28-Aug-08

Project Investigator Dr. Lal Samarakoon
Sponsor Japan Aerospace Exploration Agency (JAXA)
Total Contracted Amount (Baht) 8,700,000

Models and Simulations for Natural Disasters

Duration 1-Apr-07-01-Apr-09

Project Investigator Dr Xiaoyong Chen
Sponsor French Ministry of Foreign Affairs
Total Contracted Amount (Baht) 209,318

NOAA AVHRR and Terra/ Aqua MODIS

Duration 1-Apr-07-31-Mar-11

Project Investigator Dr Lal Samarakoon
Sponsor Vision Tech/Japan
Total Contracted Amount (Baht) 783,000

Sensor Net Visualization 2007

Duration 13-Aug-07-31-Mar-09

Project Investigator Dr Honda Kiyoshi
Sponsor Elabo Experience Company Limited
Total Contracted Amount (Baht) 1,418,150

Spatial pattern of avian influenza in Thailand

Duration 1-Mar-07-01-Jan-08

Project Investigator Dr Marc Souris; Dr Nitin Kumar Tripathi
Sponsor IRD France (ANR Ecoflu)
Total Contracted Amount (Baht) 160,000

UNIGIS Online Masters and Professional Program

Duration 1-Aug-07-31-Jul-10

Project Investigator Dr Ntin Kumar Tripathi
Sponsor Self-paid Students
Total Contracted Amount (Baht) 1,089,000

8.6 Publications

Refereed Journals

Hung, N. Q., Babel, M. S., and **Tripathi, N.K.**, 2008. An artificial neural network model for rainfall forecasting in Bangkok, Thailand, *Hydrol. Earth Syst. Sci.*, 5, 183-218. (In Press)

Muttitanon, W., Souris, M., and **Tripathi, N.K.**, 2008. An Indoor Positioning System (IPS) using Grid Model, *Journal of Computer Scienc, x (x): xx-x; ISSN 1549-3636 (In Press)*

Sarawut, N. and **Tripathi, N.K.**, 2007, Mapping of coral reef condition in Phi Phi Island, Thailand using image fusion and Mahalanobis distance classifier, *International Journal of Geoinformatics*, Vol. 3, No. 1, 67-74.

Tripathi, N.K., and Soomro, A. S., 2007. A GIS Approach to Tsunami Disaster Risk Zonation, Krabi,

Thailand, *International Journal of Geoinformatics*, Vol. 3, No. 3, 70-79.

Refereed Books / Chapters

Jeefoo, P., **Tripathi, N.K.**, and Souris, M., 2008. Exploring geospatial factors contribution to Malaria prevalence in Kanchanaburi, Thailand, *Geoinformation Technology for Better Health*, Published by: Geoinformatics International, ISBN: 978-974-1369-768, P. 130-133.

Nakarin, C., **Tripathi, N.K.**, and Souris, M., 2008. Point pattern analysis of Malaria Incidence in Chiang Mai, Thailand, *Geoinformation Technology for Better Health*, Published by: Geoinformatics International, ISBN: 978-974-1369-768, P. 137-140.

Roongrasamee, B., and **Tripathi N.K.** 2007. *Electronic Policing: A Framework for Crime Control and Citizen Services, Social Implications and Challenges of E-Business*, Book Editor: Dr. Feng Li, Idea Group Publishing. PA 17033-1240, USA

Sharma, A., Gupta, A., **Tripathi, N.K.**, 2007, *Urban Sprawl Assessment an Entropy Approach*, Geospatial Crossroads@GI_Forum, Published by Herbert Wichmann Verlag, Heidelberg, Austria.

Tripathi N.K. 2007. *GIS Applications for Environmental Planning and Management, Environmental Management Tools*, Editor: Dr. J.K. Routray, Published: AIT, Thailand, ISBN: 978-974-8257-43-3, P. 47-62.

Conference Proceedings

Pawatna, C., **Tripathi, N.K.**, Sutat, W., 2007. Siting Potential Water Harvesting Location using Remote Sensing and GIS: a case study in Chi River Basin, Thailand, *Proc. of USPAM Conference*, 6-8 March, 2007, Hanoi, Vietnam

Teerawong, L., **Tripathi, N.K.**, 2007. Potentiality of data fusion techniques for flood identification. *Proc. of USPAM Conference*, 6-8 March, 2007, Hanoi, Vietnam

8.7 Masters Students' Theses and Research Studies

A GIS-Based Approach for Locating Suitable Sites for Cassava Plantation and Biofuel Industry
By: Naruemon Phongaksorn

Supervisor: Dr. Nitin K. Tripathi

Directional Spectrum Analysis for Spatial Objects in 2D GIS

By: Duan Minyan

Supervisor: Dr. Xiaoyong Chen

Error Propagation Modeling in GIS Polygon Overlay

By: Jinda Sae-Jung

Supervisor: Dr. Xiaoyong Chen

GIS Application to Decision Making for Aquaculture Planning: A Case Study in Six Provinces of the Inland Mekong River Area, Vietnam

By: Nguyen Xuan Trinh

Supervisor: Dr. Xiaoyong Chen

GIS Based Application in Mobile Cellular Network: A Study of Microcell Propagation in Urban Areas

By: Tran Minh Tri

Supervisor: Dr. Xiaoyong Chen

GIS Based Earthquake Vulnerability

Assessment: A Case Study of Lalitpur Sub-Metropolitan City, Nepal

By: Diva Malla

Supervisor: Dr. Manzul Kumar Hazarika

GIS - Based Planning for Sustainable Shrimp Farming: A Case Study in Thanh Phu, Ben Tre Province, Vietnam

By: Nguyen Khac Thanh

Supervisor: Dr. Nitin K. Tripathi

Integration of a Flood Simulation Model with GIS and Remote Sensing for Hazard Mapping in the Lower Mekong Subcatchment in Cambodia

By: Arnob Bormudo

Supervisor: Dr. Xiaoyong Chen

Implementation of OpenGIS Sensor Observation Service for Remote Field Operation

By: Aadit Shrestha

Supervisor: Dr. Kiyoshi Honda

Mapping Forest Canopy Changes and Planning Afforestation: A Case Study of Siem Reap Province, Cambodia

By: Heng Bauran

Supervisor: Dr. Nitin K. Tripathi

Modeling Glacier Mass Balance by Comparing In Situ Measurements with Remote Sensing

Derived Parameters: A Study of Chhota Shigri Glacier, Western Himalaya, India

By: Niti Mishra

Supervisor: Dr. Kiyoshi Honda

Monitoring of Forest Degradation at Near Real Time Using Multi-Temporal and Multi-Spatial

Resolution Satellite Imageries (Myanmar)

By: Khun San Aung

Supervisor: Dr. Kiyoshi Honda

Real Time Observation and Simulation of Soil Moisture using Agro-hydrological Model and Field Sever

By: Jagvijay Pratap Singh Gill

Supervisor: Dr. Kiyoshi Honda

Ubiquitous GIS for Optical Fiber Cable Network Management at Ho Chi Minh City Posts and Telecommunications

By: Dang Thi Phuong Dung

Supervisor: Dr. Kiyoshi Honda

Use of Geospatial Technologies in the Assessment of Coral Reefs and Abalone Distribution in Sagay Marine Reserve, Central Philippines

By: Armi May Mineza Torrechilla

Supervisor: Dr. Nitin K. Tripathi



Capacity Building in Poverty Mapping in ASEAN Project

Chapter 9: SET – STRUCTURAL ENGINEERING FIELD OF STUDY

9.1 Introduction

Structural engineering has always been seen as one of the few fields of study where one can combine real technical skills with artistic flair. Structural engineers are known to be people who enjoy innovation, opportunities, responsibility and excitement, whilst working within a creative profession. Structural engineers plan and design various structures such as buildings, bridges, sport stadiums, towers, and underground structures.

The built environment which is designed and constructed by structural engineers has an enormous impact on our everyday lives. In order to design and construct safe and economic structures, they need to keep abreast with the latest methods of structural analysis, modeling concepts for computation, advanced design, material technology, and improved knowledge in structural loadings. The field educates professionals who will be at the forefront of advanced research in Structural Engineering. They are trained to respond creatively to the industrial requirements of infrastructure development.

9.2 Faculty and Research Staff

Full-time Faculty

WORSAK KANOK-NUKULCHAI, PhD, Univ of California (Berkeley), USA. ; MEng, AIT, Thailand; BEng (Hon), Chulalongkorn Univ, Thailand. **Professor** [Computational Mechanics; Finite Element Methods; Tall Building Static and Seismic Analysis; Bridge Engineering; Microcomputer Software for Structural Engineering; Genetic Algorithms; Nonlinear

Analysis of Structures and Continua; Plate/Shell Structures; Engineering Education; Nanomechanics]

PICHAJ NIMITYONGSKUL, DEng, MEng, AIT, Thailand; BEng, Chulalongkorn Univ, Thailand. **Associate Professor** [Concrete Engineering; Building Design; Construction Materials; Prestressed Concrete Structures; Plate Structures; Advanced Reinforced Concrete; Advanced Concrete Technology; Materials and Products for Construction; Experimental Methods in Structural Engineering]

PENNUNG WARNITICHAI, DEng, MEng, University of Tokyo, Japan; BEng (Hon), Chulalongkorn Univ, Thailand. **Associate Professor** [Structural Dynamics; Earthquake Engineering; Wind Effects of Structures; Bridge Engineering and Control of Structural Vibration]

Emeritus Professor

PISIDHI KARASUDHI, PhD, Northwestern Univ., USA.; MEng, AIT, Thailand; BEng, Chulalongkorn Univ, Thailand. [Solid Mechanics]

Visiting Faculty

YOSHITAKA KATO, DEng, MEng, BEng, University of Tokyo, Japan. **Visiting Assistant Professor** [Concrete material and maintenance management, specifically in maintenance management of concrete structures based on risk evaluation, evaluating environmental impacts on concrete structures; estimating concrete quality of existing structure using multiple NDT

(Non- Destructive Test) and modeling of diffusion of substances in concrete]

Adjunct/Affiliated Faculty

THANAKORN PHEERAPHAN, PhD and MSc, Massachusetts Institute of Technology, USA., BSc., Virginia Military Institute, USA. **Adjunct Assistant Professor** [Concrete Technology; Structural Analysis; Engineering Materials; Composite Materials; Advanced Concrete Technology; Mechanics of Materials]

RAKTIPONG SAHAMITMONGKOL, DEng, MEng, University of Tokyo, Japan; BEng, Sirindhorn International Institute of Technology, Thailand. **Adjunct Instructor** [Cracking Resistance of Expansive Concrete; Chemically Prestressed Concrete; Inspection on Concrete Structures & Performance Based Design; Non-Destructive Testings for Concrete Structures; Tension Stiffening Effect and Bonding Characteristic of Reinforced Concrete]

PRUETTHA NANAKORN, DEng, University of Tokyo, Japan; MEng, AIT, Thailand; BEng (Hon), Chulalongkorn Univ, Thailand. **Adjunct Faculty** [Computational Mechanics; Finite Element Analysis; Meshless Methods; Structural Optimization]

NAVEED ANWAR, DEng, MEng, AIT, Thailand; BScEng., Univ. of Engineering & Tech., Lahore, Pakistan. **Affiliated Faculty** [Structural Analysis and Design; Computational Mechanics; Computer

Application; Bridge Engineering; Tall Buildings; Software Development]

Research Staff

SUN SAYAMIPIUK, DEng, MEng, AIT, Thailand; BEng, Kasetsart Univ., Thailand. **Senior Laboratory Supervisor**

9.3 Grants and Sponsored Research Completed in 2007

International Ferrocement Information Center 2005

Duration 1-Feb-05-31-Dec-07
Project Investigator Dr. Pichai Nimityongskul
Sponsor IFIC membership fees
Total Contracted Amount (Baht) 500,000

Investigation of Structural Integrity of Eua Arthorn Housing

Duration 10-May-04 – 31-Dec-07
Project Investigator Dr. Pichai Nimityongskul
Sponsor National Housing Authority, Thailand
Total Contracted Amount (Baht) 3,750,000

Load test for the Second Mekong International Bridge

Duration 6-Nov-06 -31-Dec-07
Project Investigators Dr. Pichai Nimityongskul, Dr. Sun Sayamipuk
Sponsor Sumitomo Mitsui-Vichitbhan-Siam Syntech-Krung Thon JV (SVSK JV)
Total Contracted Amount (Baht) 962,000

Reconstruction and Development in the Tsunami-Hit Phangnga Province, Thailand

Duration 1-Dec-05-31-Dec-08
Project Investigator Dr. Bernard Levebre
Sponsor EU-Asia Pro Eco IIB Post Tsunami Programme
Total Contracted Amount (Baht) 3,021,700

Seismic Behaviour of Steel Beam-Column Connection with Knee Brace

Duration 1-Nov-05 – 1-Nov-07
Project Investigator Dr Pennung Warnitchai
Sponsor RTG Joint Research Project FY 2005
Total Contracted Amount (Baht) 996,000

Testing of Structural Integrity of Concrete Structure for Hopewell's column

Duration 1-Apr-05- 31-Dec-07
Project Investigator Dr. Pichai Nimityongskul
Sponsor North Bound Train System in Bangkok (Bang Sue_Rangsit) and Bang Sue Train Station Project, Thailand
Total Contracted Amount (Baht) 3,000,000

9.4 On-going Grants and Sponsored Research

Adjustment to the the Building Energy Code

Duration 1-Jan-01-31-Dec-08
Project Investigator Prof Worsak Kanok-Nukulchai
Sponsor Dansk Energi Management A/S, Denmark
Total Contracted Amount (Baht) 14,040,001

Application of the state of the art seismic design and modeling to major dam in Southeast Asia

Duration 1-Apr-07-30-Apr-09
Project Investigator Dr Pennung Warnitchai, Dr Noppadol Phien-wej, Dr Kyung Ho Park
Sponsor Royal Thai Government , K-Water, Dodam E&C
Total Contracted Amount (Baht) 2,000,000

Development of Precast Concrete Frame Buildings for Seismic Regions

Duration 20-Aug-07-19-Aug-08
Project Investigator Dr Pennung Warnitchai
Sponsor National Housing Authority, Thailand
Total Contracted Amount (Baht) 3,090,000

Development of Seismic Design Code for Buildings and Structures in Thailand

Duration 19-Sep-07-01-Mar-09
Project Investigator Dr Pennung Warnitchai
Sponsor Siridhorn Institute of Technology (SIIT), Thailand
Total Contracted Amount (Baht) 2,380,000

Finite Element Modeling of Tsunami Propagation on the Coast of Thailand

Duration 1-Nov-05 31-Oct-08
Project Investigator Prof Worsak Kanok-Nukulchai
Sponsor RTG Joint Research Project FY 2005
Total Contracted Amount (Baht) 875,000

Independent Inspecting and Testing Agency for Concrete

Sleeper Manufacturing

Duration 1-Nov-07-31-Jul-08
Project Investigator Dr. Sun Sayamipuk
Sponsor Italian Thai Development PCL, Thailand
Total Contracted Amount (Baht) 993,600

Investigation of Structural Integrity of Flat Din Daeng 1

Duration 1-Jan-07-13-Mar-08
Project Investigators Dr. Pichai Nimityongskul, Dr. Sun Sayamipuk
Sponsor National Housing Authority, Thailand
Total Contracted Amount (Baht) 4,500,000

Investigation of Structural Integrity of Flat Din Daeng 1 Phase II

Duration 1-Jul-07-31-Mar-08
Project Investigators Dr. Pichai Nimityongskul, Dr. Sun Sayamipuk
Sponsor National Housing Authority, Thailand
Total Contracted Amount (Baht) 1,500,000

Investigation and Design for Rehabilitation of Wat Borvomives Chedi, Bangkok

Duration 1-Jan-07-31-Mar-08
Project Investigator Prof Worsak Kanok-Nukulchai
Sponsor Wat Borvomives, Thailand
Total Contracted Amount (Baht) 1,250,000

Mix design of RCC for Nam Ngum 3 Dam

Duration 6-Nov-06 -31-Dec-08
Project Investigators Dr. Pichai Nimityongskul, Dr. Sun Sayamipuk
Sponsor MDX Lao Co., Ltd
Total Contracted Amount (Baht) 695,328

TMD Earthquake Damage Assessment

Duration 1-Aug-07 24-Sep-08
Project Investigator Dr Pennung Warnitchai; Dr Kiyoshi Honda
Sponsor Chula Unisearch, Chulalongkorn University
Total Contracted Amount (Baht) 2,411,667

9.5 Publications

Refereed Journals

T. Vacharasintopchai, W. Barry, V. Wuwongse, and **W. KANOK-NUKULCHAI**, Semantic Web Services Framework for

Computational Mechanics,
Journal of Computing in Civil
Engineering, 21, 2 (2007), pp.
65-77.

Supaviriyakit, T., Pimanmas, A.,
and **Warnitchai, P.** (2007),
“Cyclic Response of Non-
seismically Detailed Interior RC
Beam-column Connection With
Varying Column Tributary
Area”, *Magazine of Concrete
Research*, Vol. 59, No. 5, June,
351-365. (Impact Factor =
0.379; Publisher: Thomas
Telford)

Muljati, I. and **Warnitchai, P.**
(2007), “A Modal Pushover
Analysis on Multi-Span
Concrete Bridges to Estimate
Inelastic Seismic Responses”,
Civil Engineering Dimension,
Vol. 9, No. 1, pp. 33-41

Other Publications

W. KANOK-NUKULCHAI,
Distress in the Tarmac, ICUS
Newsletter, International Center
for Urban Safety Engineering,
University of Tokyo, Tokyo, 7, 2
(2007), pp. 1-3.

9.6 Doctoral Students’ Dissertation

*A Meshless Analysis for Shell Structures
Based on Moving Kriging Interpolation*
By: Vilaysak Sayakoummane
Supervisor: Prof. Worsak Kanok-Nukulchai

*A Quasi-Conforming Shell Element for
Geometric and Material Nonlinearity*
By: Gilson Rescober Lomboy
Supervisor: Prof. Worsak Kanok-
Nukulchai / Dr. Kidu Kim

*A Structural Engineering Support System
Using Semantic Computing*
By: Thiti Vacharasintopchai
Supervisor: Prof. Vilas Wuwongse/Prof.
Worsak Kanok-Nukulchai

Fire Resistance of Ferrocement
By: Mr. Vatwong Greepala
Supervisor: Dr. Pichai Nimityongskul

9.7 Masters Students’ Theses and Research Studies

*A Survey of Configuration Irregularities in
Typical Multi-story Concrete Buildings in
Thailand*
By: Chaiyapat Suesuttajit
Supervisor: Dr. Pennung Warnitchai

*Aerodynamic Interference Effects of
Neighbouring Buildings on the
Characteristics of Wind Forces on Tall
Buildings*
By: Thapana Thanatsang
Supervisor: Dr. Pennung Warnitchai

*Creep and Shrinkage of High Strength and
Durable Concrete Containing High Volume
Fly Ash*
By: Samrerng Thongton
Supervisor: Dr. Pichai Nimityongskul

*Detection of Rebar’s Corrosion by
Ultrasonic Wave*
By: Anawat Chotesuwan
Supervisor: Dr. Yoshitaka Kato

*Development of Hybrid Ferrocement I-
Beams*
By: Mongkol Eamkijkarn
Supervisor: Dr. Pichai Nimityongskul

Development of Steel Bomb Basket

By: Chat Tharnpanich
Supervisor: Dr. Pichai Nimityongskul

*Effects of Beam-Column Joint Damage on
Inelastic Seismic Responses of RC Frame
Buildings*
By: Sarawat Rungrattanaubon
Supervisor: Dr. Pennung Warnitchai

*Estimation of Dielectric Property of
Concrete and Determination of
Reinforcements Size by Radar Method*
By: Direk Kruaysiriwong
Supervisor: Dr. Yoshitaka Kato

*Feasibility Study of Using Natural
Pozzoloans from Democratic People’s
Republic of Lao as Partial Replacement of
Cement in Roller Compacted Concrete*
By: Mandar Jadhav
Supervisor: Prof. Worsak Kanok-Nukulchai

*Finite Element Analysis of Repaired
Reinforced Concrete Beam*
By: Porntep Phoothong
Supervisor: Dr. Pichai Nimityongskul

Influence of Pozzoloans on Mechanical
Properties of Cement Column
By: Hussain Lirar
Supervisor: Dr. Pichai Nimityongskul

*Nonlinear Modeling of Gravity Load
Designed Reinforced Concrete Buildings
for Seismic Performance Evaluation*
By: Matrin Suthasit
Supervisor: Dr. Pennung Warnitchai

*Repair of Concrete Cracks Using Stitching
Technique*
By: Le Quoc Khanh
Supervisor: Dr. Pichai Nimityongskul

*Seismic Retrofitting of Low-Rise Nonductile
Reinforced Concrete Buildings by Buckling-
Restrained Braces*
By: Ekkachai Yooprasertchai
Supervisor: Dr. Pennung Warnitchai

*Structural Behavior of Repaired Reinforced
Concrete Beams*
By: Siam Suwathanangkul
Supervisor: Dr. Yoshitaka Kato

*Technical Feasibility of Baling Vetiver
Grass (Vetiveria Zizanioides Nash) for Use
as Load-Bearing Walls*
By: Cory Michael Vitt
Supervisor: Dr. Pichai Nimityongskul

Chapter 10: SET – TELECOMMUNICATIONS FIELD OF STUDY

10.1 Introduction

The Telecommunications program offers areas of specialization in transmission systems; switching systems; telematics; network planning, and in collaboration with the School of Management, telecommunications management. The courses offered emphasize modern telecommunications skills in systems planning and engineering, telecommunications software development, and administrative and financial aspects of telecommunications management.

Graduates from the master's program form the nucleus for effective high-level technical planning and management operations at their employer organizations. Some of the graduates are engaged in planning, development, and service activities leading to the installation, commissioning, management, design etc. of value-added systems. Given the important role of our graduates in the development of the telecommunications sector, the learning is of significant benefit to the users of telecommunications services within the region.

Graduates of the doctoral program play key roles in enhancing the level of education and research in the national universities of the region, and promote and strengthen the R&D potential of emerging regional manufacturing industries. Research covers a wide variety of topics at the cutting edge of research and development. Specific issues addressed in the broad fields of transmission and switching systems are, for example, coherent optical communications, multipleaccess strategies for cellularmobile and cabled networks, as well as questions of congestion control and new services in ISDN and future B-ISDN networks.

10.2 Research Facilities and Laboratories

Today's fast-booming world of Telecommunications and Computer networking plays a significant leadership role. To support this achievement the

Telecommunications field of study puts the effort to continue the development of telecommunications technologies and systems. It covers a wide variety of research in telecommunications ranging from modeling, analysis wire line and wireless systems to application and protocol development. Its research subjects are in coherent optical communications; congestion control, ATM, and B-ISDN networks; error correction and detection methods; nobile and Internet traffic studies; multipleaccess strategies for cellularmobile, satellite systems, and cabled networks; network performance analysis, planning and design; and speech processing. Its research specialisations are in broadband networks; network planning; awitching systems; telecommunications management in collaboration with the School of Management; telematics; and transmission systems.

Transmission and Switching Lab (TSL)

The Transmission and Switching lab is equipped with Nokia Digital Switching Exchange DX200 (DX220, DX210) that supports PSTN and ISDN. There are also several telephone switches, traffic simulators, protocol analyzer, PDH/SDH (STM1 & STM4) transmission systems, fiber optic line equipment, transmission line analyzer, error rate meter which are available for experiment in switching, transmission and internetworking. The switching and transmission

systems are integrated as real telecommunications network. Among the applications whose study has been made possible by these systems are Operation and Maintenance, performance measurements of real narrowband and broadband telecommunication networks, as well as new services.

Network Planning Lab (NPL)

High performance computer aided network planning tools are supported by several workstations at the Network Planning lab. This lab provides hands-on experience design and optimization in radio network, fixed network and fiber optical network.

Wireless Lab (WL)

The main purpose of the Wireless laboratory is for measurement and performance analysis. It is equipped with Modulation and Error rate measurement meters, Simulation software like SATSIM, which was developed by the students, is a simulation package to calculate the subsatellite points of a LEO/ MEO/ GEO and its orbital parameters. It also displays graphically on a twodimensional earth map the instantaneous position and path traced by the satellite (Multi orbit and Multi satellite). Another is NMS/X, is a measurement system for GSM, DCS and NMT networks tracing, capable of measuring up to four networks simultaneously. The results are used for benchmarking service quality of operational cellular networks. These results can be analyzed and can be used for tuning the network parameters in NPS/X.

Communications Labs (CL)

The Communications lab is used to perform experiments courses under Signal and Systems,

Communications Electronics, Digital Transmission Technology and Digital Signal Processing. Test bench equipment includes analog and digital oscilloscopes, function generators, analog and digital Spectrum analyzers, Digital sampling oscilloscopes and DSP cards and workstations which have simulation applications like MATLAB.

Computer Laboratory (PCL)

There are two Computer Laboratories in Telecommunications Program. One is for Senior students and one is for Junior Students. All computers are latest powerful computers.

TC Library

In Telecommunications Program, there is a small library, from where students can borrow telecommunication related journals, manuals and reference books.

10.3 Faculty and Research Staff

Full-time Faculty

KAZI MOHIUDDIN AHMED, MSc, Inst of Communications, Leningrad, USSR; PhD, Univ of Newcastle, Australia.

Professor

(Telecommunication Networks; Digital Modulation Techniques; Satellite Communications; Cellular Mobile Communications; Digital Transmission and Communications)

R M A P RAJATHEVA, BSc, Moratuwa Univ, Sri Lanka; MSc, PhD, Univ of Manitoba, Canada. **Associate Professor** *(Equalization Algorithms for Frequency Selective Channels)*

TEERAPAT

SANGUANKOTCHAKORN, BEng, Chulalongkorn Univ, Thailand; MEng, DEng, Tokyo Institute of Technology, Japan. **Associate Professor** *(Data Communications; Broadband Integrated Services Digital Networks; Multimedia Communications and Systems; Network Quality of Service)*

POOMPAT SAENGUDOMLERT, BSE, Princeton Univ; MS, PhD, Massachusetts Inst of Tech, USA **Assistant Professor** *[Communication theory, optical networks, resource allocation problems, and array processing; Recent research activities have focused on optical network designs based on existing infrastructure networks and communications for disaster management]*

Visiting Faculty

A B SHARMA, BSc, Univ of Newcastle-upon Tyne, UK; LicTech, DTech, Helsinki Univ of Tech, Finland. **Visiting Professor** *(Fiber- Optic Systems; Digital Transmission Technologies; Signals and Systems; Modulation Techniques; Coding Theory)*

TAPIO J ERKE, MSc, Helsinki Univ of Tech, Finland. **Visiting Associate Professor** *[Traffic measurements, modeling, and performance in various telecommunication networks, PSTN, Cellular, Internet, ATM, and optical networks; Resource allocation for different services, network dimensioning and optimization, and switching structures]*

Research Staff

MIKKO KOVALAINEN, PhD

Visiting Senior Researcher *[Knowledge management, Project management, HighTech management, Software business, Technology strategies]*

10.4 Grants and Sponsored Research Completed in 2007

Training in RF Planning and Optimization for Cellular Networks

Duration 22-Jan-07-26-Apr-07

Project Investigator Dr Poompat Saengudomlert

Sponsor True Corporation, Thailand
Total Contracted Amount (Baht) 315,650

Training in RF Planning and Optimization for Cellular Networks-DTAC

Duration 18-Jul-07-14-Sep-07

Project Investigator Dr Teerapat Sanguankotchakorn

Sponsor Total Access Communications Plc (DTAC), Thailand
Total Contracted Amount (Baht) 379,850

10.5 On-going Grants and Sponsored Research

AIT Nokia Workshop on Mobile Internet and Applications

Duration 7-Dec-07-30-Jun-08

Project Investigator Dr Nandana Rajatheva
Sponsor Nokia Corporation, Finland
Total Contracted Amount (Baht) 500,000

Professional Masters in Telecommunications

Duration 23-Jul-07-20-Dec-08

Project Investigator Dr R.M.A.P. Rajatheva, Prof Kazi Ahmed, Dr Tapio Erke, Dr Teerapat Sanguankotchakorn, Dr Mikko Kovalainen, Dr Poompat Saengudomlert
Sponsor EVN Telecom, Vietnam
Total Contracted Amount (Baht) 8,534,000

10.6 Publications

Conference Proceedings

A. Hossain and P. Saengudomlert, "Beamforming using tap delay line filters for broadband CDMA systems,"

Proceedings of International Conference on Engineering, Applied Sciences, and Technology (ICEAST) 2007, Thailand, 21-23 November 2007.

A. Sripetch and **P. Saengudomlert**, "Topology design of optical networks based on existing power grids," Proceedings of Annual Conference on Communication Networks and Services Research (CNSR) 2007, Canada, 14-17 May 2007.

Atapattu, Saman; **Rajatheva, Nandana**, "Exact SER of Alamouti code transmission through amplify-forward cooperative relay over Nakagami-m fading channels", Communications and Information Technologies, 2007, ISCT'07, International Symposium on, 17-19 October 2007, Page(s): 1429-1433.

Dharmawansa, K.D.P.; **Rajatheva, R.M.A.P.**; Tellambura, C., "Infinite Series Representations of the Trivariate and Quadrivariate Nakagami-m Distributions", Communications, 2007, ICC'07, IEEE International Conference on, 24-28 June 2007, Page(s): 1114-1118.

P.K. Choudhury and **P. Saengudomlert**, "Queue based dynamic bandwidth algorithm for Ethernet passive optical networks," Proceedings of IEEE GLOBECOM 2007, USA, 26-30 November 2007.

R. Puengpholpool and **P. Saengudomlert**, "Performance study of multi-period network planning under traffic uncertainty," Proceedings of ICEAST 2007, Thailand, 21-23 November 2007.

Saman Atapattu and **Nandana Rajatheva**, "Exact SER of Alamouti Code Transmission through Amplify-and-Forward Multiple-Relay Network over Nakagami-m Fading Channels", 10th International Symposium on Wireless Personal Multimedia Communications (WPMC '07) held in Jaipur, India, November 2007.

Saman Atapattu and **Nandana Rajatheva**, "PEP Bound for Multiple Relay Transmission over Nakagami-m Fading Channels", Second International Conference on Industrial and Information Systems (ICIIS 2007), University of Peradeniya, Sri Lanka on 9th August 2007.

Saman Atapattu and **Nandana Rajatheva**, "Performance Evaluation of Alamouti STC through Amplify-Forward Cooperative Relay Network over Nakagami-m Fading Channels",

International Workshop on Cooperative Wireless Communications and Networking (CoNET-07) held in Jeju Island, Korea from 6th to 8th December 2007. (website: <http://home.simula.no/yanzhang/CoNET07/>)

Tubtim Sanguanwongthong and **Teerapat Sanguankotchakorn**: "Performance of IPngLS and MPLS", Proceeding of IAENG International Conference on Communication System Applications (ICCSA'07), Hong Kong March 21-23, 2007.

K. D. P. Dharmawansa, R. M. A. P. Rajatheva and Hlaing Minn, "An Exact Error Probability Analysis of OFDM Systems with Frequency Offset", accepted for publication in IEEE Transactions on Communications. **15 July 2007**.

P.C. Weeraddana, R.M.A.P. Rajatheva, "Probability of Error Analysis of BPSK OFDM Systems with Random Residual Frequency Offset", accepted for publication in IEEE Transactions on Communications **16 January 2008**

P. Dharmawansa, R.M.A.P. Rajatheva, C. Tellambura, "Envelope and phase Distributions of Two Correlated Gaussian Variables", accepted for publication in IEEE Transactions on Communications **07 December 2007**

P. Dharmawansa, R.M.A.P. Rajatheva, C. Tellambura, "On the Trivariate Rician Distribution", accepted for publication in IEEE Transactions on Communications, **29 November 2007**.

P. Dharmawansa, R.M.A.P. Rajatheva, C. Tellambura, "New Series Representations for the Trivariate Non-Central Chi-Squared Distribution", accepted for publication in IEEE Transactions on Communications, **10 December 2007**

Y. Li, H. Minn, T. Jacobs, and R.M.A.P. Rajatheva, "Synchronization, Channel Estimation, and Equalization in MB-OFDM Systems", accepted for publication in IEEE Transactions on Wireless Communications. **06 November 2007**.

Refereed Journals

Dharmawansa, P.; **Rajatheva, P.**; Ahmed, P.; "On the Distribution of the Sum of Nakagami-m Random Variables" Communications, IEEE Transactions on, Volume 55, Issue 7, July 2007

Page(s):1407 – 1416

Dharmawansa, P.; **Rajatheva, N.**; Tellambura, C.; "Infinite series representations of the trivariate and quadrivariate Nakagami-m distributions" Wireless Communications, IEEE Transactions on. Volume 6, Issue 12, December 2007 Page(s):4320 – 4328

P. Dharmawansa, N. **Rajatheva and K. Ahmed**, "On the Exact BER of BPSK OFDM Systems over Frequency Selective Fading Channels", Applied and Computational Mathematics, Special Issue on Information Technologies and Applications, Volume 6, No. 2, 2007, pp 227- 235.

Poonlap Lamsrichan and **Teerapat Sanguankotchakorn**: "Embedded Image Coding Using Context Adaptive Wavelet Difference Reduction", IEICE Trans. of Information and Communications, Special Section on Advanced Image Technology, Vol. E90-D, No. 1, pp. 81-89, January 2007.

Refereed Books/ Chapter

"Asynchronous Transfer Mode (ATM)" in *Thai Telecommunications Encyclopedia 2007*, **Teerapat Sanguankotchakorn**.

"Quality of Service (QoS) in Telecommunication Networks" in *Thai Telecommunications Encyclopedia 2007*, **Teerapat Sanguankotchakorn**.

Other Publications

National Conference on Information Technology: Present Practices and Challenges, Delhi, India, August 31-2007- **Invited Talk**

10.2 Doctoral Students' Dissertation

Design of DWDM Networks for Power Utilities

By: Areeyata Sripetch

Supervisor: Dr. Poompat Saengudomlert

10.3 Masters Students' Theses and Research Studies

A Network Link Dimensioning Model for Aggregated Traffic in Differentiated Services IP-based Networks

By: Vo Minh Thanh

Supervisor: Assoc. Prof. Tapio J. Erke

Antenna Processing Applied to SIMO/OFDM Systems at the Receiver for PMR Applications: Uplink transmission (MS-BTS) Case

By: Folly Ayivi-Amah

Supervisor: Prof. Kazi Mohiuddin Ahmed

Bit-Interleaved Space-Time Coded Modulation with Iterative Decoding over Correlated Fading Channels

By: Iqbal Shahid

Supervisor: Dr. R.M.A.P. Rajatheva

Capacity and Performance Analysis of Space-time Block coded MIMO-OFDM Systems in Rician Fading

By: Imran Khan

Supervisor: Dr. R.M.A.P. Rajatheva

Design of LDPC based DVC Codec for a Noisy Channel

By: Satya Krishna Joshi

Supervisor: Dr. R.M.A.P. Rajatheva

Distributed Video Coding and Transmission over MIMO Wireless Channel

By: Thambu Kuganeswaran

Supervisor: Dr. R.M.A.P. Rajatheva

Dynamic Resource Allocation for WiMAX Systems

By: Nguyen Chi Quang

Supervisor: Dr. Poompat Saengudomlert

Performance Analysis of an LDPC-Space Time Block Coded MB-OFDM UWB System over a Log Normal Fading Channel

By: Jawaad Ullah Khan

Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of Cooperative

Communications Network with TDMA-Based Protocols

By: A.M.S.U.B. Atapattu

Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of OFDM Systems with Random Residual Frequency Offset

By: Pradeep Chathuranga Weeraddana

Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of Space-Time Block Coded MIMO-OFDM Multiband UWB Systems over Nakagami Fading Channel

By: Junaid Ali Qureshi

Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of Wireless Indoor OCDMA Transmissions Using Multi-PPM

By: Suradash Chungpaiboonpatana

Supervisor: Dr. Poompat Saengudomlert

Performance Evaluation of a FON Network

By: Asheralieva Alia Esenjanovna

Supervisor: Assoc. Prof. Tapio J. Erke

Speed Adjustment Algorithm for Mobile RFID Readers Performing Dynamic Framed Slotted Aloha

By: Laurent Simon

Supervisor: Dr. Poompat Saengudomlert

Research Study: Application of Low-Density Parity Check Codes to Data Storage Systems

By: Ratna Bahadur Budhathoki

Supervisor: Dr. R.M.A.P. Rajatheva

Research Study: Performance Analysis of 3G and WiMAX as Cellular Mobile Technologies

By: Sadia Murawwat

Supervisor: Prof. Kazi Mohiuddin Ahmed

Research Study: Performance Comparison of RFID Tag Anti-Collision Algorithm using Simulation and Real Testing Based on ISO 15693

By: Md.Razu Ahmed

Supervisor: Dr. Poompat Saengudomlert

Research Study: Performance Evaluation and Network Planning for Personal Handyphone System: A Case Study of Ho Chi Minh City, Vietnam

By: Nguyen Thai Son

Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Performance of Single Carrier Modulation for an Integrated System Between Power Line and White-LED Communications

By: Raveewan Faninkaew

Supervisor: Dr. Poompat Saengudomlert

Research Study: Performance Study of Integrated Power Line and Optical Wireless Communications

By: Weerapong Ujarean

Supervisor: Dr. Poompat Saengudomlert

Research Study: Push-to-Talk over Cellular and Modelling of PTT Traffic

By: Mickael Glaud

Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Study of IP Traffic Monitoring Technologies

By: Emmanuel Giraud

Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Traffic Analysis and Planning for Development of the CDMA2000 1x Wireless Local Loop Network: a Case Study of HoChiMinh City, VietNam

By: Nguyen Huu Nghi

Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Traffic Measurement and Analysis of Fixed Telephone Network in Rural Area: A Case Study of Tra Vinh Province, Vietnam

By: Bui Quoc Trung

Supervisor: Assoc. Prof. Tapio J. Erke

Chapter 11: SET – TRANSPORTATION ENGINEERING FIELD OF STUDY

11.1 Introduction

Industrialization and population growth have tremendous impacts in the movement of people and goods. Everyday, movement is hampered by congestion, insufficiency of public transport facilities, traffic accidents, and other conditions. Moreover, as manufacturing expands globally, businesses want to reduce transportation costs by limiting the number of distribution nodes. Concerns over congestion on highways, increasing pollution and hazardous materials all emphasize the need to effectively maximize transportation systems. Thus, the issue of transportation is obviously crucial, not only now but in the future.

The **Transportation Engineering** field exposes students to the process of alleviating transportation problems. The coursework and research in the area provide advanced knowledge in transportation planning and economics, traffic engineering and safety, and the design of highways/pavements and other transportation facilities. Transportation Engineering students acquire advanced skills concerning the planning, design, operations, maintenance, rehabilitation, performance, and evaluation of transportation systems, including their economic and public policy aspects. The field imbibes in each student the development of analytic, problem-solving, design, and management skills suitable for public and private sector professional work.

11.2 Faculty and Research Staff

Full-time Faculty

JOHN HUGH JONES, B.S., B.Eng.,

University of California, USA
Emeritus Professor (*Highway Engineering, Transportation Engineering*)

SHINYA HANAOKA, D Info Sc, M Info Sc, BEng, Tohoku University; Japan. **Assistant Professor** [*Transport planning and logistics; air transport, which includes evaluation of the air traffic distribution policies in multiple-airport region and the activity of low-cost carriers in Asia; transport logistics, which includes city logistics, intermodal logistics, maritime transport, air cargo and so on; Public transport market and the environmental impact of transport, such as air pollution and noise*]

KUNNAWEE KANITPONG, PhD, University of Wisconsin-Madison; MS, University of Maryland at College Park, USA; BS, Chulalongkorn University, Thailand. **Assistant Professor** [*Highway pavements with emphasis on several major aspects including: highway materials and construction, pavement design and analysis, pavement management system, asphalt rheology, and asphalt concrete mixture design*]

Adjunct Faculty

TAKASHI NAKATSUJI, D. Eng., M. Eng., B. Eng., Hokkaido University; Japan. **Associate Professor** (*Traffic Engineering, Traffic Flow Simulation, Winter Maintenance, Traffic Accident Reconstruction*)

PRAPANSAK BURANAPRAPA, PhD, Oklahoma State University, USA, M. Eng.,

SEATO Graduate School of Engineering; B. Eng., Chulalongkorn University; Thailand. **Adjunct Associate Professor** (*Road and Pavement Design; Highway and Pavement Engineering*)

Research Staff

ANJALI KUMARI, M. Sc, B .Sc, University of Bihar, India. Research Assistant (Logistic Management Project)

KRITSDA TANGKAVACHIRANON, D.Eng., M. Eng., (T r a n s p o r t a t i o n Engineering), Asian Institute of Technology, Thailand; B. Eng. (Civil Engineering), King Mongkut's Institute of Technology Thonburi, Thailand. Assistant Manager (TARC Project)

MOINUL HOSSAIN, M. Eng. (Transportation Engineering), Asian Institute of Technology, Thailand; B.Sc.Eng. (Civil), Bangladesh University of Engineering & Technology, Dhaka, Bangladesh. Research Associate (TARC Project)

MOUYID BIN ISLAM, M. Eng. (Transportation Engineering), Asian Institute of Technology, Thailand; B.Sc. Eng. (Civil), Bangladesh University of Engineering & Technology, Dhaka, Bangladesh. Research Associate (TARC Project)

NUTTAPONG BOONTOB, M. Eng. (Transportation Engineering), Asian Institute of Technology; B. Eng. (Civil Engineering), King Mongkut's Institute of Technology Ladkrabang, Thailand. Research Associate (TARC Project)

PARAMET LUATHEP, M.Eng.
(Transportation Engineering),
Asian Institute of Technology;
B.Eng. (Civil Engineering),
King Mongkut's Institute of
Technology Ladkrabang,
Thailand
Research Associate (TARC
Project)

PAWINEE IAMTRAKUL, Ph.D
(Major
in Urban and Transportation
Planning, Civil Engineering),
Saga University, Japan; M.
Eng (Infrastructure and
Transportation Engineering),
Asian Institute of Technology,
Thailand; B.Eng. (Civil
Engineering), Thammasat
University.
Project Researcher (Road
Safety Audit Project, CSUR
Project and Fatigue Driving
Project)

SATTRAWUT PONBOON, M.
Eng.
(Transportation Engineering),
Asian Institute of Technology,
Thailand; B.Eng.
(Transportation Engineering),
Suranaree University of Tech.,
Nakhon Ratchasima, Thailand.
Research Associate (TARC
Project)

SUPATTRA KACHATHONG, M.A.
(Library and Information
Science), Ramkhamhaeng
University; B.A.
(Communication Arts)
Bangkok University.
Research Associate (TARC
Project)

YAOWARET JANTAKAT, M. Sc.
(Transportation Engineering),
Asian Institute of Technology,
Thailand; M.Sc.
(Forestry), Kasetsart University,
Thailand.
Research Associate (TARC
Project)

11.3 Grants and Sponsored

Research Completed in 2007

Analysis of the Causes of School Bus Accident and Study of School Bus Management in Thailand

Duration 15-Dec-06 - 30-Apr-07
Project Investigator Dr. Kunnawee
Kanitpong
Sponsor National Health Foundation
Total Contracted Amount (Baht) 220,000

Logistics Management at the Intermodal Terminals

Duration 1-Nov-05 - 28-Feb-07
Project Investigator Dr. Shinya Hanaoka
Sponsor Royal Thai Government
Total Contracted Amount (Baht) 876,000

Road Safety Audit on the 20th Km Petchakasem Road, Patthalung Province

Duration 18-Jan-07 - 30-May-07
Project Investigator Dr. Kunnawee
Kanitpong
Sponsor Toyota Motor Company
(Thailand) Ltd.
Total Contracted Amount (Baht) 173,982

11.4 On-going Grants and Sponsored Research

Dual Degree Master Program in Transportation Engineering in Indonesia

Duration 1-Dec-07-31-Dec-08
Project Investigator Dr. Kunnawee
Kanitpong and Dr Pichai
Sponsor MPW-Indonesia
Total Contracted Amount (Baht) 9,776,000

Evaluation of Performance of Porous Asphalt Pavement

Duration 1-May-07-30-Apr-08
Project Investigator Dr Kunnawee
Kanitpong
Sponsor RTG Visiting Scholar Program
Total Contracted Amount (Baht) 765,000

Road Safety Audit Project on Hazardous Locations in National Highways

Duration 1-Jul-07-28-Feb-08
Project Investigator Dr Kunnawee
Kanitpong
Sponsor Toyota Motor Company
(Thailand) Ltd.
Total Contracted Amount (Baht) 1,958,100

Road Safety Improvement on Vibhavadi Rangsit Road (Don

Muang Airport Route)

Duration 15-May-07-31-Mar-08
Project Investigator Dr Kunnawee
Kanitpong
Sponsor Toyota Motor Company
(Thailand) Ltd.
Total Contracted Amount (Baht) 729,312

Thailand Accident Research Center

Duration 1-Jul-05 - 30-Jun-08
Project Investigator Dr. Kunnawee
Kanitpong
Sponsor Department of Highways,
Thailand
Total Contracted Amount (Baht)
14,000,000

11.5 Publications

Refereed Journals

Boontob, N., Tanaboriboon, Y.,
Kanitpong, K., and Suriyawongpaisal,
P., "Impact of Seatbelt Use to Road
Accident in Thailand," Transportation
Research Record, Journal of the
Transportation Research Board, 2007.
(in press)

Hanaoka, S. (2007) "The impact of
low-cost carriers entry and passengers
attributes in Thailand", Transport
Policy Studies' Review, Vol.10, No.1,
pp.38-46.

Islam, M.B., Ponboon, S., Boontob,
N., and **Kanitpong, K.**, "Is It a Timely
Approach for Bus Accident
Investigation in Thailand," the Journal
of Eastern Asia Society for
Transportation Studies, Vol.6, 2007

Islam, M.B., Tanaboriboon, Y., and
Kanitpong, K., "Identification of
Factors in Road Accidents through In-
Depth Accident Analysis," Submitted
to the ASCE Journal of Transportation
Engineering, 2007

Kanitpong, K., Atud, T.B., and
Martono, W., "Application Process of
Hydrated Lime to Resist Moisture
Damage and Rutting in Asphalt
Mixture," the Journal of Eastern Asia
Society for Transportation Studies,
Vol.6, 2007

Kanitpong, K., Nam, K., Martono,
W., and Bahia, H.U., "Laboratory
Study on Warm Mix Asphalt
Additives," the International of
Construction Materials, 2007 (in
press).

Leopairojna, S. K. and **Hanaoka, S.**
(2007) "Reconsidering the public
transport regulations: A case of the
passenger vans in Bangkok", Asian
Profile, Vol. 35, No.5, pp.429-442.

Refereed Books / Chapters

Hanaoka, S. and Chiamsiri, S. (2007) "Strategic entry and impact of low-cost carriers in Southeast Asia", In Jayachandran, C., Ali, J. H., Chatterjee, S. and Chiamsiri, S. (eds.), *Services Management in Asia Pacific: Issues and Challenges*, pp.163-185, Universiti Utara Malaysia Press, Malaysia.

Conference Proceedings

Atud, T.J., **Kanitpong, K.**, and Martono, W., "Laboratory Evaluation of Hydrated Lime Application Process in Asphalt Mixture for Moisture Damage and Rutting Resistance," The 86th Annual Meeting of the Transportation Research Board, Washington, D.C., 2007

Boontob, N., Ponboon, S., Tanaboriboon, Y., **Kanitpong, K.**, Islam, M.B., "An Impact Study of Seat Belt and Helmet Use in Thailand," the 14th International Conference on Road Safety in Four Continents, Bangkok, Thailand, November 2007

Charnkol, T., **Hanaoka, S.** and Tanaboriboon, Y. (2007) "Emergency trip destination of evacuation as shelter analysis for Tsunami disaster: A case study in Phuket, Thailand", *Journal of the Eastern Asia Society for Transportation Studies*, Vol.7, pp. 853-868.

Habib Pathan, A. F and **Hanaoka, S.** (2007) "Traveller response towards Advanced Traveller Information Systems (ATIS) in Bangkok", 39th Annual Universities' Transport Study Group (UTSG) Conference, Leeds.

Hanaoka, S. (2007) "Comparative analysis of the business model in Asian low-cost carriers through North American and European LCC", *Proceedings of Infrastructure Planning*, No.35.

Hanaoka, S. (2007) "Review of urban transport policy and its impact in Bangkok", *Proceedings of the Eastern Asia Society for Transportation Studies*, Vol.6, Dalian.

Hanaoka, S. and Leopairojna, S. K. (2007) "Public transport in Bangkok: A case of the passenger vans", 6th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA 2007), Dhaka.

Islam, M. B. and Hanaoka, S. (2007) "The contribution of a dedicated professor and researcher - Yordphol Tanaboriboon in Thailand", *Proceedings of the Eastern Asia*

Society for Transportation Studies, Vol.6, Dalian.

Islam, M.B. and **Kanitpong, K.**, "An In-Depth Study of Road Crashes in Thailand," the 14th International Conference on Road Safety in Four Continents, Bangkok, Thailand, November 2007

Islam, M.B., Tanaboriboon, Y., **Kanitpong, K.**, and Suriyawongpaisal, P., "Application of Event Analysis in In-depth Study of Road Accidents," The 86th Annual Meeting of the Transportation Research Board, Washington, D.C., 2007

Kanitpong, K., "Laboratory Study on Warm Mix Asphalt Technology," The Special ICPT Symposium 2007, Beijing, China, March 2007

Kanitpong, K., Sonthong, S., Nam, K., Martono, W., and Bahia, H.U., "Laboratory Study on Warm Mix Asphalt Additives," The 86th Annual Meeting of the Transportation Research Board, Washington, D.C., 2007

Leopairojna, S. K. and **Hanaoka, S.** (2007) "Market analysis of passenger vans in Bangkok", In Macario, R., Viegas, J. and Hensher, D. A. (eds.) *Competition and Ownership in Land Passenger Transport: Selected Papers from the 9th International Conference on Competition and Ownership of Land Passenger Transport* (Thredbo 9), pp.303-329, Elsevier.

Ponboon, S., Tanaboriboon, Y., **Kanitpong, K.**, Islam, M.B., and Boontob, N., "Motorcycle Crash Characteristics in Thailand," the 14th International Conference on Road Safety in Four Continents, Bangkok, Thailand, November 2007

Shrestha, P.K., Tanaboriboon, Y. and **Hanaoka, S.** (2007) "Study of travel factors through structural equation modeling approach in Bangkok", *Journal of the Eastern Asia Society for Transportation Studies*, Vol.7, pp. 556-569.

Other Publications

Hanaoka, S. (2007) "Sustainable Transport Infrastructure", In United Nations Economic and Social Commission for Asia and Pacific (UNESCAP), *Sustainable Infrastructure in Asia –Overview and Proceedings-*, pp.37-51, United Nations Publication.

Hanaoka, S. (2007) "Sustainable Transport Infrastructure", In United Nations Economic and Social Commission for Asia and Pacific

(UNESCAP), *Sustainable Infrastructure in Asia –Overview and Proceedings-*, pp.37-51, United Nations Publication.

Hanz, A., Bahia, H., **Kanitpong, K.**, and Wen, H., "Test Method to Determine Aggregate/Asphalt Adhesion Properties and Potential Moisture Damage," WHRP 0092-05-12, Wisconsin Highway Research Program (WHRP), Wisconsin Department of Transportation, 2007

11.6 Doctoral Students' Dissertation

Evaluation of Logistics Performance for Intermodal Transportation: A Fuzzy-Based Approach

By: Pichet Kunadhamraks
Supervisor: Dr. Shinya Hanaoka

Market Structure of Passenger Vans for Commuters in Bangkok

By: Supaporn Kaewko Leopairojna
Supervisor: Dr. Shinya Hanaoka

11.7 Masters Students' Theses and Research Studies

Assessment of Warm Mix Asphalt Application in Thailand

By: Ma. Bernadeth Borleo
Supervisor: Dr. Kunnawee Kanitpong

Calibration of a Car-Following Model for Use in Bangkok

By: Chanida Anurakamolkul
Supervisor: Dr. Kunnawee Kanitpong

Injury Mechanism in Road Crash through Accident Investigation

By: Pakorn Aniwattakulchai
Supervisor: Dr. Kunnawee Kanitpong

Input Output Analysis for Transportation Economy and Logistics in Thailand

By: Hideo Fukuishi
Supervisor: Dr. Shinya Hanaoka

Laboratory Study on Functional and Performance-Based Properties of Porous Asphalt Mix in Thailand

By: Somyonk Untama
Supervisor: Dr. Kunnawee Kanitpong

Life Cycle Cost Analysis of Polymer Modified Asphalt Pavement in Thailand

By: Soe Soe Win
Supervisor: Dr. Kunnawee Kanitpong



Thailand Accident Research Center Field Visit

Chapter 12: SET – WATER ENGINEERING AND MANAGEMENT FIELD OF STUDY

12.1 Introduction

Today's major challenges for water engineers and managers include securing water for people and for food production; protecting vital ecosystems; and dealing with variability and uncertainty of water in space and time. The Water Engineering and Management (WEM) field imparts education and training toward an understanding of the complexity of water cycle utilization and management. It offers a balanced curriculum, covering both engineering and management aspects of water resources. Students are trained to acquire knowledge and hands-on practice in tools and techniques to come up with viable and sustainable solutions within the framework of the integrated water resources management at the river basin scale.

The WEM field of study covers five focal areas: Agricultural Water, Coastal Water, Urban Water, Water Resources, and Extreme Events and Risk Management. The courses are designed in such a way that students can specialize according to their interests. Courses on Watershed Hydrology, Hydrodynamics, Water Resources Systems, and Concepts in Water Modeling provide the solid foundation to the advanced courses. The curriculum emphasizes tools and techniques in water resources planning and management.

Agricultural Water courses impart knowledge and skills necessary for the development and management of water resources for agriculture. They address various multi-disciplinary issues in the planning, design, implementation, operation and maintenance of irrigation and drainage projects and land and water conservation programs. Current researches in the area include irrigation and drainage system management, cropping systems, erosion and water quality problems,

soil conservation and land-use, and watershed management. The management and design of sound engineering works for the control and effective use of coastal zones require in-depth knowledge of hydrodynamics and the understanding of coastal zone phenomena. Coursework and research in Coastal Water cover studies of wave characteristics and their action on beaches, coastal sedimentation, estuarine hydraulics and the applied aspects of coastal zone engineering and management.

Urban Water courses relate to water supply and sanitation, storm water, and domestic wastewater and urban drainage for sustainable management of urban areas. The research in relation to urban water focuses on application of state-of-the-art theory in water demand forecasting and management, design and management of water distribution systems in urban and rural areas, real-time hydrological information systems for urban flooding and drainage. Given the ever-growing importance of water quality, an integrated water quantity-quality approach is essential. Courses in Water Resources focus on techniques to assess the occurrence and availability of surface and groundwater. Students acquire a sound understanding of basic principles in river engineering and modeling, water resources planning, conjunctive use of surface and groundwater; integrated water resources management and social and environmental impact assessment of water resources projects. In-depth knowledge and hands-on practice on mathematical modeling of water resources systems is provided. Flooding is a natural phenomenon and various human activities as well as climatic changes have aggravated the problem causing economic losses. Students are exposed to an understanding of the behavior of rivers, and to design

appropriate structural and non-structural alternatives for the effective management of rivers and waterways. Research in the area of Extreme Events and Risk Management includes river flow analysis, and flood control and mitigation, flood modeling and forecasting, flood plain development and management.

12.2 Faculty and Research Staff

Full-time Faculty

ASHIM DAS GUPTA, BEng, Gauhati Univ, India; MEng, DEng, AIT, Thailand. **Professor** (Integrated Water Resources Management; Groundwater Development and management; Modeling and monitoring)

TAWATCHAI TINGSANCHALI, BEng, Chulalongkorn Univ, Thailand; MEng, DEng, AIT, Thailand. **Professor** [Flood Control Engineering and Management; Flood Forecasting, Warning and Flood Disaster Management; River Engineering and Hydropower; Water Resources Project System Optimization]

MUKAND S BABEL, BEng, Rajasthan Agr Univ, India; MEng, DEng, AIT. **Associate Professor** [From hydrologic and water resources modeling to integrated water resources management; particularly in watershed modeling and management; drought analysis, forecasting and management; water resources allocation and management at river basin level; and water resources and socio-economic development; Research related to groundwater resources management and water supply

system and management]

ROBERTO CLEMENTE, BSAE, Univ of the Philippines at Los Baños; MSc, AIT, Thailand; PhD, McGill Univ, Canada. **Associate Professor** [Focal areas related to irrigation/ drainage, and land and water resource assessment and management; Studies on the impacts of fertigation on water quality, modeling surface/subsurface transport of water and solutes, performance evaluation of irrigation and drainage systems, and assessment of soil erosion hazard and soil quality dynamics in agricultural watersheds; Joint research on water harvesting and management and soil hydraulic characterization in sloping agricultural lands; Future research focuses on evaluation and optimization of soil, water, chemical and crop management schemes to enhance agricultural productivity without jeopardizing environmental quality]

Visiting Faculty

HIROKAZU IKEDA, BEng, Dibrugarh Univ, India; MEng, AIT, Thailand; PhD, Univ of Tokyo, Japan. **Visiting Associate Professor**

Affiliated Faculty

SUTAT WEESAKUL, DEng, MEng, Asian Institute of Technology; BEng, Chulalongkorn University, Thailand
[Numerical computation in sea and coastal area including flood propagation using developed computer programs; Application in solving urban drainage problem using both engineering and management approaches; By collaboration with Dr. Ole Mark from DHI, the on-line urban flood warning system at Sukumvit, Bangkok, Thailand providing useful information in daily life during rainy season are disseminated in

<http://www.wap.ait.ac.th>;
Improvement of hydraulic design using physical hydraulic model test in hydropower; hydropower development projects in Lao and Myanmar and improvement in design of intake, diversion tunnel, riparian outlet, energy dissipater, spillway and head pond]

12.3 Grants and Sponsored Research Completed in 2007

AIT Regional Network Office for Center of Excellence of University of Yamanashi

Duration 15-Jun-05-31-Dec-07
Project Investigator Prof Tawatchai Tingsanchali
Sponsor University of Yamanashi, Japan
Total Contracted Amount (Baht) 347,500

An ecological approach to water and sanitation assessment and management in Panglao Island, Philippines

Duration 1-Oct-06 - 31-Dec-07
Project Investigator Dr. Roberto S. Clemente
Sponsor SEA-UEMA / CIDA
Total Contracted Amount (Baht) 150,800

Development of Operational Flood Forecasting System Case Study: Chao Phraya River Basin

Duration 1-Jul-04 – 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor National Electronic and Computer Technology Center (NECTEC), Thailand
Total Contracted Amount (Baht) 5,027,400

Development of River Basin Flood Management System by Optimal Reservoir Operation and Real Time Flood Forecasting and Warning: A Case Study of Pasak River Basin

Duration 1-Aug-06 - 31-Dec-07
Project Investigator Prof. Tawatchai Tingsanchali
Sponsor National Research Council of Thailand
Total Contracted Amount (Baht) 2,000,000

Experimental Investigation of Hyper-concentrated Tsunami Run-Up

Duration 1-Nov-05- 30-June-07
Project Investigator Dr. Sutat Weesakul
Sponsor Royal Thai Government
Total Contracted Amount (Baht) 875,000

Hydraulic and Leakage

Investigation in Pipe Networks for Water Supply Distribution in Bangkok

Duration 28-Feb-05- 31-Dec-07
Project Investigator Prof. Tawatchai Tingsanchali
Sponsor ISONET Company Ltd.
Total Contracted Amount (Baht) 1,400,000

Hydraulic Model Study of Diversion Tunnel Nam Ngum 2 Hydroelectric Project

Duration 1-Sept-05 – 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor Team Consulting Engineering and Management Co.,Ltd, Thailand
Total Contracted Amount (Baht) 3,132,193

Hydraulic Model Study on Overflow Spillway for Nam Ngum 2 Hydroelectric

Duration 1-Feb-06 - 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor Team Consulting Engineering and Management Co.,Ltd, Thailand
Total Contracted Amount (Baht) 6,300,000

IGES Freshwater Resource Management Project

Duration 1-Sept-04- 30-Sept-07
Project Investigator Dr Mukand S. Babel, Prof Ashim Das Gupta (ret)
Sponsor Institute for Global Environmental Strategies (IGES), Japan
Total Contracted Amount (Baht) 462,500

MTERM International Conference

Duration 1-Jan-05 - 31-Dec-07
Project Investigator Dr. Mukand Singh Babel, Prof. Ashim Das Gupta
Sponsor Participants
Total Contracted Amount (Baht) 1,000,000

The 6th Research Meeting of the Research on Sustainable Water Management Policy

Duration 1-Feb-07-31-May-07
Project Investigator Dr. Mukand Singh Babel
Sponsor IGES, Japan
Total Contracted Amount (Baht) 352,990

The Study of Water Resources Management Review

Duration 1-Jan-06 – 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor Hydro and Agro Informatics Institute (HAI)
Total Contracted Amount (Baht) 1,120,00

Workshop on Sediment Management in South and Southeast Asia

Duration 1-Apr-06 -30-June-07
Project Investigator Dr. Mukand Singh Babel
Sponsor UNESCO, Paris
Total Contracted Amount (Baht) 874,000

12.4 On-going Grants and Sponsored Research

Asian Infrastructure Research Center (AIRC) Phase I

Duration 1-Jan-07-31-Dec-08
Project Investigator Dr. Mukand Singh Babel, Dr Noppadol Phienwej, Dr Kyung Ho Park, Dr BHW Hadikusumo, Dr Kunrawee Kanitpong
Sponsor Konkuk University, South Korea
Total Contracted Amount (Baht) 4,472,153

Development of Flood Forecasting and Management System in Chao Phraya Tachin River Basins

Duration 1-Oct-07-30-Sep-08
Project Investigator Dr Sutat Weesakul; Dr Noppadol Phienwej
Sponsor Royal Irrigation Department (RID)
Total Contracted Amount (Baht) 17,769,706

E-learning Program on IWRM for self pay Student

Duration 6-Sep-06-30-Aug-08
Project Investigator Dr. Mukand Singh Babel
Sponsor Self Pay Students
Total Contracted Amount (Baht) 190,000

E-learning Program on IWRM for UCC-Water

Duration 1-Sep-06 - 3-Aug-08
Project Investigator Dr. Mukand Singh Babel
Sponsor UCC-Water
Total Contracted Amount (Baht) 1,242,500

Groundwater Quality Management Research in Bangkok

Duration 1-Aug-07 31-Mar-08
Project Investigator Dr Mukhand S. Babel
Sponsor Institute for Global Environmental Strategies, Japan
Total Contracted Amount (Baht) 540,000

Regional Center of the UN Water Virtual Learning Center (WVLC) Project

Duration 1-Nov-04-31-Dec-09
Project Investigator Dr. Mukand Singh Babel, Prof Ashim Das Gupta
Sponsor UNU-INWEH, Canada
Total Contracted Amount (Baht) 2,346,000

Spillway Hydraulic Model Tests Nam Ngum 3 Hydropower Project

Duration 1-Dec-07-30-Apr-08
Project Investigator Dr Sutat Weesakul
Sponsor GMS Lao Company Ltd
Total Contracted Amount (Baht) 4,800,000

Support to Capacity Building at the Water Resources University, Hanoi, Vietnam

Duration 1-Sep-01-31-Aug-08
Project Investigator Dr. Mukand Singh Babel,

Prof Ashim Das Gupta
Sponsor Danish International Development Assistance (Danida)
Total Contracted Amount (Baht) 3,801,000

Tha Chin River Basin Development Project: The King of Thailand's Initiative

Duration 1-Aug-07-31-May-08
Project Investigator Dr Sutat Weesakul
Sponsor Royal Irrigation Department (RID), Thailand
Total Contracted Amount (Baht) 17,388,570

UNEP Water Vulnerability Assessment in South and South East Asia

Duration 1-Jan-06 - 30-Apr-08
Project Investigator Dr Mukhand S. Babel
Sponsor UNEP ROAP
Total Contracted Amount (Baht) 3,600,000

UNEP Water Vulnerability Assessment in South and South East Asia: Sub-regional synthesis for Africa-Asia Report Phase II

Duration 1-Sep-07-31-Mar-08
Project Investigator Dr Mukhand S. Babel
Sponsor UNEP RRC.AP
Total Contracted Amount (Baht) 1,650,000

Verification of ATTA System with Laboratory Tsunami Waves

Duration 1-Apr-07-31-Mar-08
Project Investigator Dr Sutat Weesakul
Sponsor Royal Thai Government
Total Contracted Amount (Baht) 1,000,000

12.5 Publications

Refereed Journals

Babel, M. S., Das Gupta, A. and P. Pradhan (2007). A Multivariate Econometric Approach for Domestic Water Demand Modeling: An Application to Kathmandu, Nepal, *Water Resources Management*, 21, 573-589.

Halim, R., **Clemente, R.** Routray, J., and Shrestha, R. 2007. Integration of biophysical and socio-economic factors to assess soil erosion hazard in upper Kaligarang watershed, Indonesia. *Journal of Land Degradation and Development Journal* Vol. 18, Issue 4 (July-Aug. 2007) pp 453-469. Published online Jan. 22 2007.

Perret, S. & Geysler, M. (2007) The full financial costs of irrigation services: a discussion on existing guidelines and implications for smallholder irrigation in South Africa. *Water SA*, 33(1): 67-78

Piman, T., **Babel, M. S.,** Das Gupta, A., and S. Weesakul (2007). Development of a window correlation matching method for improved radar

rainfall estimation, *Hydrology and Earth System Sciences*, 11(4), 1361-1372.

S. Wahid, **MS. Babel,** A. Das Gupta and **R. S. Clemente.** 2007. Spatial assessment of groundwater use potential for irrigation in Teesta Barrage Project in Bangladesh. *Hydrogeology Journal* 15:365-382.

Sharma, D., A. Das Gupta and **M. S. Babel** (2007) Spatial Disaggregation of Bias-corrected GCM Precipitation for Improved Hydrologic Simulation: Ping River Basin, Thailand, *Hydrology and Earth System Sciences*, 11(4), 1373-1390.

Wahid, S. M., **Babel, M. S.,** Das Gupta, A. and R. S. Clemente (2007). Spatial Assessment of Groundwater Use Potential for Irrigation in Teesta Barrage Project in Bangladesh, *Hydrogeology Journal*, 15, 365-382.

Wahid, S. M. and **M. S. Babel** (2007). Land Degradation from Socio-Environmental Perspective: A Causal Chain Analysis from Thailand, *Agricultural Journal* 2(4), 487-494.

Wahid, S. Md., **Babel, M. S.** and A. R. Bhuiyan (2007). Hydrologic Monitoring and Analysis in the Sundarbans Mangrove Ecosystem, Bangladesh, *Journal of Hydrology*, Vol. 332, Issues 3-4, 381-395.

Refereed Books / Chapters

Desalegn Ch. E., S. B. Awulachew, R. E. Namara, **M. S. Babel** and A. Das Gupta (2007). Indigenous Systems of Conflict Resolution in Oromia, Ethiopia. In Van Koppen, B., Giordano, M. and Butterworth, J. (eds.) (2007). *Community-based Water Law and Water Resource Management Reform in Developing Countries. Comprehensive Assessment of Water Management in Agriculture Series 5.* CAB International, Wallingford, UK.

Conference Proceedings

Babel, M. S., M. S. Islam, and A. Das Gupta (2007). Leakage Analysis and Management in a Low Pressure Water Distribution Network of Bangkok, *Proceedings of 2nd IWA – ASPIRE, Conference and Exhibition (CD-ROM)*, 29-31 October.

Babel, M. S., Wahid, S. M. and A. Rivas (2007). Vulnerability Assessment of Freshwater Resources in Mekong River Basin, University of Yamanashi The 21st Century COE Program, International Symposium on Implementation of Research & Education on Integrated River Basin Management and International River Basin Scholarly Collaboration, 5– 6 October, 2007,

University of Yamanashi, Japan.

Chaminda, G. G. T., Aramaki, T., Amarasekara, T., Herath, G.B.B and **M. S. Babel** (2007). Modeling and Assessment of Water Quality in the Kelani River, Sri Lanka, Proceedings of the International Conference on Water Management and Technology Applications in Developing Countries, Kuala Lumpur, 14-16 May.

Clemente, R.S, Aung, H. Babel, M.S, and Peralta, G. 2007. Water and Sanitation in Urban poor districts: A case study of Panglao island, Bohol province, Philippines. Poster paper presented at World Water Day Conference, Bangkok Thailand. March 22,2007

Clemente, R.S., and Roa, A.G. 2007. Water harvesting and Management in the cultivated uplands of Dhading watershed, Nepal. Poster paper presented at World Water Day Conference, Bangkok Thailand, March 22, 2007

David L Caloza, **Roberto Clemente**, Elizabeth Ventura, and Genandrialine L Peralta. 2007. Water Resources Assessment and Management in Panglao Island, Bohol. Paper presented at the UNESCO-IHP Conference in Manila Philippines Nov. 19-20, 2007

Perret, S. (2007) Action-research on water governance: overview of issues and options. In: M-Power annual meeting, 16-18 May, 2007, Chiang Mai, Thailand, pp55-57. Proceeding at: http://www.mpower.net.org/download_public.php?doc=3673

Piman, T., **Babel, M. S.**, and A. Das Gupta (2007). Runoff Prediction in An Un-gauged Basin Using Radar Rainfall and Regionalization Technique. 4th Annual Meeting of Asia Oceania Geosciences Society (AOGS) held in Bangkok, 31 July - 4 August.

Shrestha, S., Nakamura, T., Chapagain, S. K., Wichakul, S., **Babel, M. S.** and F. Kazama (2007). Collaborative studies on surface water and groundwater in selected basins of Nepal and Thailand. University of Yamanashi The 21st Century COE Program, International Symposium on Implementation of Research & Education on Integrated River Basin Management and International River Basin Scholarly Collaboration, 5– 6 October, 2007, University of Yamanashi, Japan.

Other Publications

Babel, M. S., Das Gupta, A., Domingo, N. D. Sto., and G. K. Ambili (2007). Sustainable Groundwater Management in Bangkok, Case Study Report submitted to Institute for Global

Environmental Strategies (IGES), Japan.

Babel, M. S., Das Gupta, A., Domingo, N. D. Sto., and G. K. Ambili (2007). Sustainable Groundwater Management in Bangkok, In Sustainable Groundwater Management in Asian Cities: A Final Report of Research on Sustainable Water Management Policy, Institute for Global Environmental Strategies (IGES), Japan.

Clemente, R. S. 2007. Non-point Source Pollution Assessment and Management in Laguna Lake Basin. A Terminal Report Submitted to the Department of Science and Technology, (DOST) Manila, Philippines as part of the Balik Scientist Project with the Laguna Lake Development Authority (LLDA). Submitted July 6, 2007

Peralta, G. and **Clemente, R.** 2007. Completion Report of the AIT-UPD joint project on Ecological approach to water sanitation and management: A case study of urban poor districts of Panglao island, Bohol, Philippines which was sponsored by CIDA through the JAR-SEA-UEAM program of AIT

Perret, S. (2007) Agriculture et développement durable: approches historiques. In : Module introductif 'Institutions, acteurs, sociétés et territoires', Ensemble numérique en Sciences de l'Environnement et du Développement Durable de l'Université Virtuelle Environnement et Développement Durable (UVED). <http://www.uved.fr/index.php?id=299>

Pollard, S., **Perret, S.**, Kotze, D., Lorentz, S. Ridell, E. & Ellery, W. (2007) Investigating interactions between biophysical functioning, usage patterns, and livelihoods in a wetland agro-ecosystem of the Sand River Catchment through dynamic modeling. Final research report, Challenge Programme Water & Food, Wetland project, Award and lwmi publ., Pretoria, South Africa, 52p.

12.6 Doctoral Students' Dissertation

Improvements in Radar Rainfall Estimation for Hydrological Modeling
By: Thanapon Piman
Supervisor: Dr. Mukand S. Babel

12.7 Masters Students' Theses and Research Studies

Application of AnnAGNPS in a Selected Sub-basin of Ping Watershed for Soil and Water Quality Assessment

By: Sarayuth Punbune
Supervisor: Dr. Roberto S. Clemente

Application of SWAT to Assess Reservoir Sedimentation in Song Hinh Hydropower Project, Vietnam
By: Truong Hoai The Tuyen
Supervisor: Dr. Roberto S. Clemente

Assessment of Electricity for Water Supply Systems in Hatay Province, Vietnam
By: Bui Phuong Nam
Supervisor: Dr. Mukand S. Babel

Effect of Reservoir Sedimentation on Hydropower Plants: Case Study of Son La Hydropower Project
By: Khuong The Anh
Supervisor: Prof. Tawatchai Tingsanchali

Estimation of Safe Groundwater Yield for Bangkok Aquifer System
By: Supattana Wichakul
Supervisor: Dr. Mukand S. Babel

Hydraulic Performance of Nam Ngum 2 Spillway
By: Anawat Suppasri
Supervisor: Dr. Roberto S. Clemente / Dr. Sutat Weesakul

Impact Assessment of the Existing Ham Thuan and Da Mi Hydropower Projects, Vietnam
By: Do Quang Khai
Supervisor: Dr. Mukand S. Babel

Operation of a Pumped Storage Hydropower Plant: Case Study of Bac Ai Pumped Storage Hydropower Plant, Vietnam
By: Huynh Minh Quang
Supervisor: Prof. Tawatchai Tingsanchali

Optimization of Hydropower Reservoir Operation with Due Consideration to Environmental Flow Requirement
By: Nguyen Dinh Chien
Supervisor: Dr. Mukand S. Babel

Prediction of Inflow to Buon Tua Srah Reservoir, Vietnam
By: Vo Trong Son
Supervisor: Prof. Tawatchai Tingsanchali

Radar-Based Rainfall Forecasting in the North of Thailand
By: Natapon Apinontano
Supervisor: Dr. Sutat Weesakul

Vulnerability of Freshwater Resources: A Case Study of Bagmati River Basin, Nepal
By: Vishnu Prasad Pandey
Supervisor: Dr. Mukand S. Babel / Prof. Ashim Das Gupta

Water and Sanitation in Urban Poor Districts: A Case Study of Panglao Island, Bohol, Philippines
By: Htet Htet Aung
Supervisor: Dr. Roberto S. Clemente

Water Poverty Index for Mekong Delta, Vietnam
By: Nguyen Duy Du
Supervisor: Dr. Mukand S. Babel

Chapter 13: SET – INFORMATION AND COMMUNICATIONS AREA OF STUDY

13.1. Introduction

Information and Communications Technologies field is a newly established area of study in response to the needs for the offering of a curriculum selectively drawn from the curricula of Telecommunications (TC), Computer Science, and Information Management (CSIM). With strong emphasis on communications aspects - rather than on the aggregation of hardware, software, networks, equipment and related industries - ICT recognizes the important role of information services and applications in the creation of a complete ICT infrastructure.

13.2. Research Facilities and Laboratories

There is a rapidly growing and constantly evolving interest in ICT throughout the academia and society. To support this, the evolution and the benefits of ICT in our lives, the ICT field of study at AIT continues to research and develop of ICT. The field of study covers a wide variety of research supported by the body of faculty consisting of a multi-professional team of international experts in telecommunication, computer science, educational technology and related fields.

The faculty has a strong academic background ranging from wireless and optical networks, through hardware and software, to web education and other e-services.

Research subjects include those on ICT applications (e-services such as e-learning, e-health, egovernance, rural development, knowledge creation and knowledge dissemination); on the information technologies (e.g. operating systems, programming languages, information storage and retrieval); on the

communication infrastructure (e.g. networks, transmission technologies, switching and routing). Research specializations are in adaptive technologies; computer-supported collaboration; Home networking; ICT security; Online communities; and voice over IP.

The ICT area of study shares the research facilities and laboratories of the Telecommunications field of study.

13.3. Faculty and Research Staff

The ICT Field of Study draws from the faculty and research staff of the Computer Science, Information Management, Remote Sensing & Geographic Information Systems, and Telecommunications Fields of Study.

Faculty Members

From Telecommunications Field of Study

A B SHARMA BSc, Univ of Newcastle upon Tyne, UK; LicTech, DTech, Helsinki Univ of Tech, Finland.

KAZI MOHIUDDIN AHMED MSc, Inst of Communications, Leningrad, USSR; PhD, Univ of Newcastle, Australia.
Professor

R M A P RAJATHEVA BSc, Moratuwa Univ, Sri Lanka; MSc, PhD, Univ of Manitoba, Canada. **Associate Professor**
ICT-Joint Coordinator

TEERAPAT SANGUANKOTCHAKORN , BEng, Chulalongkorn Univ, Thailand; MEng, DEng,

Tokyo Institute of Technology, Japan.
Associate Professor

POOMPAT SAENGUDOMLERT , BSE, Princeton Univ; MS, PhD, Massachusetts Inst of Tech, USA
Assistant Professor

From ICT Field of Study

ERKE TAPIO , M.Eng., Helsinki University of Technology, Finland
Associate Professor

KURHILA JAAKO , Ph.D., M.Sc., Helsinki, Finland
Assistant Professor

KOVALAINEN, MIKKO Ph.D., M.Econ., University of Jyväskylä, Finland

From Computer Science and Information Management Field of Study

DUNG, PHAN MINH , Ph.D., M.Sc., University of Technology, Germany
Professor

HADDAWY, PETER Ph.D., M.Sc., University of Illinois-Urbana
Professor

KANCHANASUT, KANCHANA Ph.D., M.Sc., University of Melbourne
Professor,

WUWONGSE, VILAS D.Eng., M.Eng., Tokyo Institute of Technology
Professor,

GUHA, SUMANTA , Ph.D., Indian Statistical Institute, M.Sc., Ph.D., University of Michigan, M.Sc., University of Calcutta

**Associate Professor &
Joint Coordinator
ICT-Joint Coordinator**

ESICHAIKUL, VATCHARAPORN
, Ph.D., Kent State
University, M.B.A.,
Oklahoma State University
Associate Professor

JANECEK, PAUL , Ph.D.,
Swiss Federal Institute of
Technology, Advanced
M.Sc., Queen Mary and
Westfield College, University
of London
Assistant Professor

DAILEY, MATTHEW N. , Ph.D.,
University of California, San
Diego M.Sc., North Carolina
State University
Assistant Professor

**From Remote Sensing and
Geographic Information
Systems Field of Study**

NITIN KUMAR TRIPATHI ,
BTech, National Institute of
Technology, Warangal, India;
MTech, IIT; PhD, IIT,
Kanpur, India.
Assistant Professor

XIAOYONG CHEN BS, MS,
PhD, Wuhan Technical Univ
of Survey and Mapping,
People's Republic of China.
**Associate Professor
ICT-Joint Coordinator**

KIYOSHI HONDA BAg, DEng,
Tokyo Univ, Japan
Associate Professor

Research Staff

Manzul Kumar Hazarika, Senior
Research and Training
Specialist

Mikko Kovalainen, Visiting Senior
Researcher

Surat Lertlum, Research
Scientist

Lal Samarakoon, Visiting Senior
Scientist

Marc Souris, Visiting Research
Scientist

13.4. Doctoral Students' Dissertation

*Analysis of Multivariate Generalized Gaussian
Fading Distributions with Applications to
Diversity Receivers*
By: Kaluwa Davage Prathapasinghe
Dharmawansa
Supervisor: Dr. R.M.A.P. Rajatheva

13.5. Masters Students' Theses and Research Studies

*A Framework for Reliable Reputation
Management in Online Auctions*
By: Ami Shrestha
Supervisor: Prof. Phan Minh Dung

*A Radio Aware Routing Metric for WLAN
Mesh Networks*
By: Ranil Santhish Gamage
Supervisor: Dr. Poompat Saengudomlert

*A Semantic Web-based Framework for
Adaptive Authoring of E-Learning Objects*
By: Anusha Joshi
Supervisor: Prof. Vilas Wuwongse

*An Agent-based Architecture to Support
Pervasive Context-Aware Applications*
By: Sanjil Shrestha
Supervisor: Dr. Paul Janecek

Building a Rating Model for Weblogs
By: Nguyen The Manh
Supervisor: Dr. Jaakko Kurhila

*Building Trust in Social Software: A Special
Case "The Discussion Board"*
By: Pallavi Mohapatra
Supervisor: Dr. Sumanta Guha

Data Mining for Financial Aid Optimization
By: Le Van Thanh
Supervisor: Prof. Peter Haddawy

*Development of an Automated Real-time
Performance Measurement and Visualization
Framework for Mobile Ad-hoc Networks*
By: Shuprabha Shakya
Supervisor: Prof. Kanchana Kanchanasut

*Dynamic-Address-Allocation Based Routing
for Scalability Support in Wireless Mesh
Networks*
By: Satish Chandra Jha
Supervisor: Prof. Kazi Mohiuddin Ahmed

*Dynamic Bandwidth Allocation Algorithm for
QoS-Aware Per-Queue EPON with Overhead
Control*

By: Pallab Kumar Choudhur
Supervisor: Dr. Poompat Saengudomlert

*Electronic Service Deployment in Ho Chi Minh
City, Vietnam: Supplying Personal Certificates
for Citizens*
By: Dinh Trieu Duong
Supervisor: Dr. Jaakko Kurhila

*Evaluation of DHT Optimized DSR for Mobile
Ad hoc Networks*
By: Archana Bhattarai
Supervisor: Prof. Kanchana Kanchanasut

*Expertise Finding Based on Task and User
Modelling*
By: Nguyen Duc Nghia
Supervisor: Dr. Jaakko Kurhila

*Multi-User Detection on Uplink Asynchronous
DS-CDMA Relay Channel in Rayleigh Fading*
By: Eranda Harshanath Jayatunga
Supervisor: Dr. R.M.A.P. Rajatheva

*Outdoor Mobile Robot Localization and
Environment Mapping using a Single Camera*
By: Akash Dev Nakarmi
Supervisor: Dr. Matthew Dailey

*Performance Analysis of Space Time Coded
MIMO Systems with Precoding*
By: Suranga Saman Bandara
Supervisor: Dr. R.M.A.P. Rajatheva

*Performance Analysis of Two Routing
Protocols for Mobile Ad Hoc Wireless
Networks*
By: Shumawa May Thin
Supervisor: Dr. R.M.A.P. Rajatheva

*Performance Study of Multi-Period Network
Planning under Traffic Uncertainty*
By: Rithinart Puengholpool
Supervisor: Dr. Poompat Saengudomlert

*Road Extraction from Satellite Imagery using
Quadratic Snakes*
By: Ramesh Marikhu
Supervisor: Dr. Matthew Dailey

*Social Navigation for EDUCO E-learning Web-
based System*
By: San Thida Aung
Supervisor: Dr. Jaakko Kurhila

*Study of User Behavior and Network
Characteristics in a Multi-Operator
Telecommunications Environment*
By: Sunisa Luang
Supervisor: Assoc. Prof. Tapio J. Erke

Trend Template for Intrusion Detection
By: Md. Ahsan Habib
Supervisor: Prof. Phan Minh Dung

*User Population Mobility Based Analysis of
Cellular Networks*
By: Mohamed Shahalan Cassim
Supervisor: Assoc. Prof. Tapio J. Erke

*Using Wikis as a Collaboration Medium in
Public Schools of Rural Nepal for Teachers
and Students to Help and Support Students in
their Learning Behavior to Pass the SLC
Board Exam*

By: Sandeep Dhungel
Supervisor: Dr. Jaakko Kurhila

Research Study: Analyzing Security Features of Mobile Operating Systems

By: Dhruva Adhikary
Supervisor: Prof. Phan Minh Dung

Research Study: Application of WiMAX: A Case Study of Wireless DSL in Hochiminh City

By: Do Phi Son
Supervisor: Prof. Kazi Mohiuddin Ahmed

Research Study: Building an Integrated Environment Information Service

By: Sanjeet Amatya
Supervisor: Prof. Phan Minh Dung

Research Study: Development of a Personal Learning Environment (PLE) to Support a Distance Teacher Education Programme (DTEP) for Samtse College of Education, Bhutan

By: Pema Tshering
Supervisor: Dr. Paul Janecek

Research Study: Ontology-based Semantic Job Matching

By: Krishna Prasad Paudel
Supervisor: Prof. Phan Minh Dung

Research Study: Performance, Traffic Measurement and Expansion Network Planning in CDMA2000-1X: A Case Study of EVN Telecom CDMA2000-1X Network in Gialai Province

By: Do Anh Tuan
Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Study of Triangular Routing in Mixed IPV4/IPV6 Networks

By: Preeda Jaiton
Supervisor: Dr. Teerapat Sanguankotchakorn

Research Study: Trust Ontology for Online Business

By: Le Van Tuan
Supervisor: Prof. Phan Minh Dung

Chapter 14: SCHOOL OF ENVIRONMENT, RESOURCE AND DEVELOPMENT



14.1 Mission, Vision, and Core Values

SERD Mission

The School of Environment, Resources and Development is committed to excellence in graduate education as well as research and outreach activities. Through its academic programs and outreach units, SERD has been working towards capacity building and human resource development in the areas of resource management, development studies, and energy and environmental management.

SERD responds to regional needs by mobilizing and enhancing capacities for socially, economically and environmentally sound development in partnerships with public and private sectors. The School's interdisciplinary approach integrates

technological, natural and social sciences.

SERD Vision

SERD will continue its leadership role in offering excellent academic programs relevant to regional needs.

SERD research will be concentrated toward focal areas and are to be conducted by core teams.

SERD outreach will be community service-oriented.

SERD Programs will be consolidated and financially viable. The School activities including the students, staff, faculty and curricula, will be subject to quality assessment.

SERD Core Values

- Interdisciplinarity
- Innovativeness

- Excellence
- Responsiveness

14.2 Field of Study and Multidisciplinary Programs

Fields of Study

- Agricultural Systems and Engineering
- Aquaculture and Aquatic Resources Management
- Energy
- Environmental Engineering and Management
- Food Engineering and Bioprocess Technology
- Gender and Development Studies
- Natural Resources Management
- Pulp and Paper Technology
- Regional and Rural Development Planning

- Urban Environmental Manage

Inter-university Program

- Environmental Toxicology, Technology and Management

Interdisciplinary Programs

- Cleaner Production
- Integrated Tropical Coastal Zone Management
- Sustainable Development
- Disaster Prevention, Mitigation and Management

14.3 Research Facilities and Laboratories

SERD provides laboratory, computer and information technology (IT) facilities for education and learning for graduate students, and research activities of graduate students, faculty, and sponsored and contracted projects.

SERD has six research laboratories in Agricultural Systems and Engineering, Aquaculture and Aquatic Resources Management, Food Engineering and Bio-process Technology, Environmental Engineering and Management,



Energy, and Pulp and Paper Technology, and each laboratory is unique with modern equipments, excellent guidance and assistance, and provides safe working facilities and environments to carry out experimental studies and research.

IT facilities are provided for everyone to attend their academic and research related activities. There are three computer centers maintained by the SERD at the SERD Main building (two computer laboratories), Agriculture and Food Engineering building and Energy Building which provides convenient working environment, with all the necessary facilities. These are open twenty four hours a day for use by students, staff and faculty. Full internet access is available to these PCs through a high speed network backbone which connects all academic buildings including the residence halls. A large number of PC software packages for applications such as word-processing, spreadsheets, network communications, multimedia and file transfer utilities are available. High quality laser printers, scanning and CD writing facilities are available for students' uses.

Furthermore, laboratories also have computer facilities, which enhance the productivity of the teaching and research activities of the school.



14.4 School Governance

Dean of School

SIVANAPPAN KUMAR,
BE, Univ of Madras, India;
MEng, AIT, Thailand; PhD,
Inst Natl Polytechnique,
Toulouse, France. **Professor**
[Solar Energy (Radiation,
Thermal and Photovoltaics);
Green house gas mitigation
and climate change, Cleaner
Production; energy and
sustainable development]

Associate Dean

KYOKO KUSAKABE,
BA, Sophia Univ, Tokyo,
Japan; MSc, PhD, AIT,
Thailand. Associate Professor
[Women's employment under
macro-economic changes;
Gender issues in trade and
migration; Women and
microvendors/informal sector;
Borderland studies, Gender
issues in organizations,
Gender and development
policy and planning]



Chapter 15: SERD – AGRICULTURAL SYSTEMS AND ENGINEERING

FIELD OF STUDY

15.1 Introduction

This field of study is emphasizes on sustainable agricultural and related technologies development through holistic approach for efficient food production from small holder agriculture.

15.2 Research Facilities and Laboratories

Agricultural Systems and Engineering (ASE) Laboratory caters to researchers, which address sustainability in agricultural production. The facilities are capable for implementing excellent agronomic and engineering researches on soils, water and plant, such as, plant growth, soil fertility and management, integrated pest management, plant water requirement, etc. Facilities to conduct researches on terramechanics, ergonomics and tillage are also available. The engineering aspects of agricultural production are dealt with through innovations and development of machines and equipment to enhance productivity and reduce human drudgery. These innovations are constructed at the ASE workshop.

Major laboratory equipment include a Soil bin carriage system; Porometer; Sony CXC- 390 1/3" 3 CCD Camera; Spider 8: data logger; Dynamic strain amplifier; and an SC-900 Soil compaction meter.

The SERD Computer Lab III in the Agricultural and Food Engineering Building has various kinds of software packages for system

analysis and simulation, including DSSAT (Decision Support System for Agrotechnology Transfer), ArcView etc. A Computer-Aided Design (CAD) workstation is also available for training the design of agricultural equipment. There is a machine workshop with facilities for fabricating various types of laboratory and experimental apparatus and models. Consultation and fabrication of different types of transducers can be provided. About 20 high-end PCs connected to the campus-wide Ethernet and ATM network and a high quality laser printer, scanning and CD writing facilities are available for students' uses.

15.3 Faculty and Research Staff

Full-time Faculty

GANESH P SHIVAKOTI,
BS, MS, Udaipur Univ, India;
PhD, Michigan State Univ,
USA. **Associate Professor**
(*agricultural economics;*
resource development;
farming systems)

HEMANTHA P W JAYASURIYA,
BScEng, Univ of Peradeniya,
Sri Lanka; MEng, DEng, AIT,
Thailand. **Assistant**
Professor (*Agricultural*
Systems Analysis; Design
and Development of
Agricultural and Processing
Equipment; Instrumentation
and data acquisition
systems; Power and Energy
in Agriculture; Precision
Agriculture; Controlled
Environment Agriculture;
Soil-Tool Interactions;

Terramechanics; Agricultural
Engineering; Measurement
Techniques)

S L RANAMUKHAARACHCHI
BSc, Univ of Peradeniya, Sri
Lanka; MSc, PhD,
Pennsylvania State Univ,
USA. **Associate Professor**
(*Agronomy; Crop*
Ecophysiology; Cropping
Systems; Farming Systems;
Pest Management;
Soil Fertility Management;
Agricultural Systems; Weed
Science and Management)

VILAS M SALOKHE,
BTech, Mahatma Phule
Agricultural Univ., India;
MEng, Univ of Sukhdia,
India; DEng, AIT, Thailand.
Professor (*Agricultural*
Machinery; Ergonomics;
Protected Cultivation &
Greenhouse Technology;
Terramechanics, Agricultural
Systems Analysis)

Visiting Faculty

PETER AUN-CHUAN OOI
PhD **Adjunct Lecturer**
(*cropprotection, integrated*
pest management;
agricultural systems)

Research Staff

EMMANUEL C CANILLAS,
DEng Senior **Laboratory**
Supervisor (*supervises*
instrumentation and data
acquisition; calibration and
testing of agricultural
equipment; soil testing and
other laboratory sessions)

WATTANAPORN MESKUNTAVON,

DTechSc Senior Laboratory
Supervisor (*manages
researches on farm and crop
management and other
laboratory sessions including
soil analysis*)

JOHANNES MAX

Dip-Ing **Project staff** (*plant
nutrition, root-research,
protected cultivation,
horticulture*)

PRABHAT KUMAR

Dip-Ing **Project staff**
(*entomology and integrated
pest management*)

LIANG HENGTONG

MEng **Project staff** (*food
and bioprocess engineering*)

15.4 Grants and Sponsored Research Completed in 2007

Hannover-AIT Greenhouse Project – Phase-II

Duration: 2004-2007

Project Investigator: Prof Vilas M Salokhe
Sponsor: German Research Grant - DGF
Total Contracted Amount (Baht): 15,550,000

International Forestry Resources and Institutions Training

Duration: 1-May-07-31-Dec-07

Project Investigator: Prof Ganesh Shivakoti; Dr
Edward Webb
Sponsor: Michigan State University, USA and
Indiana University
Total Contracted Amount (Baht): 199,500

Protected Cultivation – An Approach to Sustainable Vegetable Production in the Humid Tropics- Phase II

Duration: 1-Aug-04-31-Dec-08

Project Investigator: Prof Vilas M Salokhe
Sponsor: German Research Grant - DFG
Total Contracted Amount (Baht): 10,000,000

Upgrading of Green House Facility

Duration: 1-Aug-04-31-Dec-07
Project Investigator: Prof. V. M. Salokhe
Sponsor: Hanover University, Germany
Total Contracted Amount (Baht): 986,995
Duration: 2004-2007
Project Investigator: Prof Vilas M Salokhe
Sponsor: German Research Grant - DGF
Total Contracted Amount (Baht): 15,550,000

International Forestry Resources and Institutions Training

Duration: 1-May-07-31-Dec-07

Project Investigator: Prof Ganesh Shivakoti; Dr
Edward Webb
Sponsor: Michigan State University, USA and
Indiana University
Total Contracted Amount (Baht): 199,500

Upgrading of Green House Facility

Duration: 1-Aug-04-31-Dec-07

Project Investigator: Prof. V. M. Salokhe
Sponsor: Hanover University, Germany
Total Contracted Amount (Baht): 986,995

15.5 On-going Grants and Sponsored Research

Asian Governance and Leadership Training and Observation Tour

Duration: 1-Apr-05-31-Dec-08

Project Investigator :Prof Ganesh Shivakoti
Sponsor: Graduate School of Governance at
Sungkyunkwan University, South Korea
Total Contracted Amount (Baht) 820,000

Assessment of the Risk of Climate Change on Rain-Fed Rice Cropping in the Northeast of Thailand

Duration: 15-Oct-07-15-Aug-08

Project Investigator: Dr Kishore C Swain and
Dr H.P.W. Jayasuria
Sponsor: Provention Consortium, ADPC
Total Contracted Amount (Baht) 119,000

Development of a Small Rice Combine Harvester

Duration: 1-May-07-30-Apr-08

Project Investigator: Prof. Vilas Salokhe
Sponsor: RTG Visiting Scholar
Total Contracted Amount (Baht) 900,000

Development of an Efficient Sugarcane Transportation System for Sugar Mill

Duration: 1-Jun-07-31-May-08

Project Investigator: Prof. Vilas Salokhe
Sponsor: RTG and Buriram Sugar

Total Contracted Amount (Baht) 2,000,000

Increasing Water Use Efficiency by Using Mulch Under SRI (System of Rice Intensification) Management Practices in Northeast Thailand

Duration: 1-Jan- 06 - 29-Feb-08

Project Investigator: Prof. Vilas Salokhe
Sponsors: International Water Management
Institute
Total Contracted Amount (Baht) 2,925,000

Linking Thai Jasmine Rice Farmers with Markets using Participatory action research for sustainability of rain-fed lowland rice-based system in Northeast Thailand

Duration: 1-Jan-08-31-Dec-10

Project Investigator: Dr Prabhat Kumar and
Prof S Rakshit
Sponsor: Consultative Group on International
Agricultural Research CGIAR World Bank
Total Contracted Amount (Baht) 8,262,000

Protected cultivation- An Approach to Sustainable Vegetable Production in Humid Tropics- Phase II

Duration: 1-Aug-04-31-Dec-08

Project Investigator: Prof. Vilas Salokhe
Sponsor: Hannover University, Germany
Total Contracted Amount (Baht) 10,000,000

Training of Officers and Training of Manual Preparation for Department of Agrarian Development-Sri Lanka

Duration: 19-Aug-07-31-Dec-09

Project Investigator: Dr S.L.
Ranamukaarachchi
Sponsor: Department of Agrarian
Development-Sri Lanka
Total Contracted Amount (Baht) 763,000

15.6 Publications

Refereed Journals

Borpit Tangwongkit, Ratana

Tangwongkit, V. M. Salokhe, H. P.
W. Jayasuriya and Hiroshi
Nakashima (2007). Field evaluation
of a variable rate herbicide
applicator. J. Agricultural Information
Research, Published by Japanese
Society of Agricultural Informatics

- Cochard R., Ranamukharachchi S.L., Shivakoti, G.P., Shipin, O.V., Edwards, P.J. and Seeland, K.T., "The 2004 tsunami in Aceh and Southern Thailand: a review on coastal ecosystems, wave hazards and vulnerability", *Perspectives in Plant Ecology, Evolution and Systematics*. (accepted for publication), 2007.
- Doi, R. and Ranamukhaarachchi, S.L., "Integrative evaluation of rehabilitative effects of *Acacia auriculiformis* on degraded soils", *J. of Tropical Forest Science, Malaysia*, Vol 19(3): 150-163, 2007.
- Doi, R. and Ranamukhaarachchi, S.L., "Soil color designation using Adobe Photoshop TM in estimating soil fertility restoration by *Acacia auriculiformis* plantation on degraded land", *Current Sci.*, 19 (11): 1604-1609, 2007
- Haque, A. A. M., H. P. W. Jayasuriya, V. M. Salokhe, N. K. Tripathi, and P. Parkpian, (2007). Assessment of Influence and Inter-Relationships of Soil Properties in Irrigated Rice Fields of Bangladesh by GIS and Factor Analysis. *Agricultural Engineering International: The CIGR E-journal*. Manuscript LW 07 022, December, 2007.
- Haque, A. A. M., Jayasuriya, H.P.W., Salokhe, V. M., Tripathi, N. K. and Parkpian, P., "Assessment of Influence and Inter-Relationship of Soil Properties in Irrigated Rice Fields of Bangladesh by GIS and Factor Analysis", *Agricultural Engineering International: the CIGR E-journal*, Manuscript LW 07-22, Vol. IX, December 2007.
- Haque, A. A. M., Thwe, H. M., Jayasuriya, H. P. W., Hossian, M. Z., Rahman, M., M. Harun-ur-Rashid and K. Matsumura, (2007). Groundwater arsenic contamination: Food safety and human health hazards in Bangladesh, *Chiang Mai University Journal*, Vol. 6 (2) July-Dec, (Ref. No. 0515 (35)/275).
- Karoonboonyanan, R., Salokhe, V. M., Niyamapa, T. and Nakashima, H., "Vibration Effects on the Performance of a Single-Shank Sub-soiler", *Agricultural Engineering International: the CIGR E-journal*, Manuscript PM 07 018. Vol. IX. September, 2007.
- Karoonboonyanan, S., Salokhe, V. M. and Niranatumpom, P., "Wear resistance of thermally sprayed rotary tiller blades", *Wear*, 263(1-6): 604-608, 2007.
- Kianmatee, S. and Ranamukhaarachchi, S.L., "The pest repellent plants for management of insect pests of Chinese kale", *International Journal of Agriculture and Biology*, Vol. 9 (1): 64-67, 2007.
- Lungkapin, J., Salokhe, V.M., Kalsirisilp, R. and Nakashima, H., "Development of a Stem Cutting Unit for a Cassava Planter", *Agricultural Engineering International: The CIGR E-journal*, Manuscript PM 07 008. Vol. IX, July, 2007.
- Mishra, A. and Salokhe, V.M., "Seedling characteristics and the early growth of transplanted rice under different water regimes", *Experimental Agriculture* (in press), 2007.
- Nalawade, P. P., Salokhe, V. M. and Nakashima, H., "Development of a wide tractor mounted spray boom for increased efficiency", *Journal of Food, Agriculture and Environment* (in press), 2007.
- Patil, S. L., Tanau, H. J. and Salokhe, V.M., "Modeling of tropical greenhouse temperature by auto regressive and neural network models", *Bio-systems Engineering* (in press), 2007.
- Ranamukhaarachchi, S.L. and Wickramarachchi, K.S., "Color preference and sticky traps for field management of thrips [*Ceratothripoides Claratris* (Shumsher) (Thysanoptera: Thripidae)] in tomato in central Thailand", *International Journal of Agriculture and Biology*, Vol. 9 (3): 392-397, 2007.
- Sharmin, F., Rakshit, S.K. and Jayasuriya, H.P.W., "Enzyme immobilization on glass surfaces for the development of phosphate detection biosensors", *Agricultural Engineering International: The CIGR E journal*, Manuscript FP 06 019.
- Soni, P., Salokhe, V. M., and Nakashima, H., "Modification of a mouldboard plough surface using arrays of polyethylene protuberances", *Journal of Terramechanics* (in press), 2007.
- Swain, K. C., Jayasuriya, H. P. W. and Salokhe, V.M., "Suitability of low-altitude remote sensing images for estimating nitrogen treatment variations in rice cropping for precision agriculture adoption", *J. Appl. Remote Sens.* Vol. 1, 013547 (Nov. 21, 2007).
- Swain, K.C. and Jayasuriya, H.P.W., "Land-use suitability evaluation criteria for precision agriculture adoption in a moderately yielding soybean cropping area in Thailand", *Asia Pacific Journal of Rural Development*, CIRDP publication, 17(1): 113-125, 2007.
- Swain, K.C., Jayasuriya, H. P. W. and Salokhe, V.M., "Suitability of LARS images for estimating nitrogen treatment variations in rice cropping for precision agriculture adoption", *Journal of Applied Remote Sensing*, Vol.1, 013547, Nov 12, 2007.
- Swain, K.C., Jayasuriya, H.P.W. and Salokhe, V.M., "Low-altitude remote sensing with unmanned radio-controlled helicopter platforms: A potential substitution to satellite-based systems for precision agriculture adoption under farming conditions in developing countries", *Agricultural Engineering International: The CIGR E journal*, Invited Overview No. 12. Vol. IX. Sept. 2007.
- Thai Thi Minh, Ranamukhaarachchi, S.L. and Jayasuriya, H.P.W., "Linear Programming-based optimization of the productivity and sustainability of the productivity and sustainability of Crop-livestock-compost manure integrated farming systems in midlands of Vietnam", *Science Asia* 33(2): 187-195, 2007.
- Tongwongkit, B., Tongwongkit, R., Salokhe, V. M., Jayasuriya, H.P.W. and Nakashima, H., "Field evaluation of a variable rate herbicide applicator", *Agricultural Information Research* (in press), 2007.

Yugi, R.A. and Ranamukhaarachchi, S.L., "Effects of Tillage and Intercropping with Grass on Soil Properties and Yield of Rainfed Maize", (Accepted for publication in the International J. of Agriculture and Biology on 12 March 2007).

Yugi, R.A. and Ranamukhaarachchi, S.L., "Effect of Preceding Soil Tillage and Maize + Grass Intercropping followed by Grass Management on Soil Properties and Yield of Rainfed Maize", (Accepted for publication in the International J. of Agriculture and Biology on 19 June 2007).

Refereed Books/Chapters

Patil, S. L. and Salokhe, V.M., "Application of distinct element method to large soil deformation modeling", Modeling of Soil-Tillage Interaction in Tillage, Ed. Dr. Subrata Karmarkar, Research Signpost, India, 2007.

Ranamukhaarachchi, S.L. and Wickramasinghe, S., "Biology, Ecology and Management of rice black bug in some Asian countries", Rice Black Bugs: Taxonomy, ecology and management of invasive species, Eds. Ravindra C. Joshi, Alberto T. Barrion and Leocardio S. Sebastian, Science City of Munoz, Nueva Ecija, Philippines Rice Research Institute, 2007.

Soni, P. and Salokhe, V.M., "Traction and trafficability of off-road operations in soft terrains", Recent Research Development in Soil Tillage, Ed. Prof. Ph.D. Andrew Formato, Research Signpost, India, 2007.

Yakupitiyage, A., Ranamukhaarachchi, S.L., Yi, Yang and Mizanur, R., "Nutrient accumulation in Tilapia pond sediment and its agricultural uses", Fishponds in farming systems, Eds. A.J. van der Zijpp, J.A.J. Verreth, Le Quang Tri, M.E.F. van Mensvoort, R.H. Bosma and M.C.M. Beveridge, Waeningen Academic Publishers, The Netherlands, pages 89-96, 2007.

Conference Proceedings

Dnyandeo, K. M., Jayasuriya H. P.

W., Swain, K. C. and Nalavade, P.P., "Management zone based irrigation scheduling and soil moisture conservation practice for precision agriculture using GIS", Proceedings of the 2nd Asian conference on Precision Agriculture, Pyeongtaek, Korea, August 2-4, 2007.

Haque, A. A. M. and Jayasuriya, H.P.W., "Assessment of influential soil properties in irrigated rice domain of Bangladesh by GIS: a case study". Proceedings of the International Agricultural Engineering Conference, Bangkok, Thailand, IAEC paper 529, December 3-6, 2007.

Jayasuriya, H.P.W., "Advancement of Precision Agriculture in Thailand: Current Trends and Future Prospects", International Conference of Precision Conservation of Soil and Water, Shijiazhuang, China, October 22-24, 2007.

Jayasuriya, H.P.W., "Current status and future directions of Precision Agriculture in Thailand", 2nd Asian Conference on Precision Agriculture, Pyeong Taek, Korea, August 3-5, 2007.

Jayasuriya, H.P.W. and Soni, P., "Does precision farming hold valid for developing countries?" Proceedings of the 2nd Asian conference on Precision Agriculture, Pyeongtaek, Korea, August 2-4, 2007.

Md. Al-Amin Sadek and Jayasuriya, H.P.W., "Nanotechnology prospects in agricultural context: An overview". Proceedings of the International Agricultural Engineering Conference, Bangkok, Thailand, IAEC paper 548, December 3-6, 2007.

Mwumvaneza, V., Jayasuriya, H.P.W. and Tripathi, N.K., "Evaluation of agricultural mechanization potential in Rwanda: A multi-location spatial approach by GIS techniques", Proceedings of the 2nd Asian conference on Precision Agriculture, Pyeongtaek, Korea, August 2-4, 2007.

Munkhjargal, B. and Jayasuriya, H.P.W., "Evaluating the trends of mechanization in Mongolia

using GIS techniques", Proceedings of the 2nd Asian conference on Precision Agriculture, Pyeongtaek, Korea, 2-4, August 2007.

Swain, K.C. and Jayasuriya, H.P.W., "IAS Mounted LARS System for Estimating the Nitrogen-Effects in Rice Crop Using Leaf Reflectance Values", Proceedings of the 2nd Asian conference on Precision Agriculture, Pyeongtaek, Korea, August 2-4, 2007.

Swain, K.C. and Jayasuriya, H.P.W., "Estimation of rice yield and protein content using remote sensing g images obtained through a radio controlled unmanned helicopter platform". Proceedings of the International Agricultural Engineering Conference, Bangkok, Thailand, IAEC paper 543, December 3-6, 2007.

V. M. Salokhe, H. P. W. Jayasuriya, and P. Soni, (2007). Book of Abstracts of the International Agricultural Engineering Conference, Dec 3-6 2007, Bangkok, Thailand. "Agricultural Engineering – Technologies and Future Trends", ISBN 974-93752-6-2.

V. M. Salokhe, H. P. W. Jayasuriya, and P. Soni, (2007). Proceedings of the International Agricultural Engineering Conference, Dec 3-6 2007, Bangkok, Thailand., "Cutting Edge Technologies and Innovations on Sustainable Resource for World of Food Sufficiency". ISBN 978-974-8257-49-5.

Other Publications

Bhujel, R.C. and Shrestha, M.K., "Women in Aquaculture project: a model for the development of small-scale aquaculture in Nepal", Aquaculture News, Institute of Aquaculture, University of Stirling, UK, 2007.

Bhujel, R.C. and Stewart, J., "Sustainable tilapia culture in Thailand", Fish Farmer, 38-39, November/December 2007.

Stewart, J. and Bhujel, R.C., "Aquaculture and environmental sustainability in Thailand: food or financial security?", Aquaculture Asia Magazine Vol. XII, No. 2, April-

June 2007.

sugarcane milling process: Planting to cogeneration.

Ranamukhaarachchi, S.L.,
"Crop water requirement, factors influencing and calculation of crop water requirement and field water requirement", Paper presented at the training program on On-farm Water Management, Asian Institute of Technology, Thailand, November 12-16, 2007.

Ranamukhaarachchi, S.L.,
"Bio-physical characteristics and functions of watersheds", Paper presented at the training program on Sustainable Watershed Management, Asian Institute of Technology, Thailand, September 12-21, 2007.

Ranamukhaarachchi, S.L.,
"Causes of degradation of watersheds, potential impacts and protection measures", Paper presented at the training program on Sustainable Watershed Management, Asian Institute of Technology, Thailand, September 12-21, 2007.

Patents

Burin Tinnangwattana and H. P. W. Jayasuriya (2007) "Detachable Sugarcane Loader"
Thai Petit-patent – Ref. No.07033001215, October 31, 2007.

Keynote lectures

October 22, 2007: Keynote Speaker
International Conference of Precision Conservation of Soil and Water. October 22-24, 2007, Shijiazhuang, China. Topic: Advancement of Precision Agriculture in Thailand: Current Trends and Future Prospects.

August 3, 2007: Keynote Speaker –
2nd Asian Conference on Precision Agriculture, August 3-5, Pyeongtaek, Korea. Topic: Current status and future directions of Precision Agriculture in Thailand

Invited Lectures – E-teaching, in Seminars, Workshops

March 12-13, 2007: Seminar and Workshop: Training on and transfer of efficient EU technologies in the sugar sector in Thailand. Topic: Energy conservation potentials in

E-teaching: May 22, 2007: 10.00 – 12.00 hrs

E-Teaching connected to 8 countries; Japan, Myanmar, Bangladesh, Nepal, Indonesia, Laos, Cambodia, Vietnam – UNESCO Funded E-Learning Course on Bio-energy for achieving Millennium Development Goals. Topic: Biomass resources potential and estimation techniques.

Workshop: January 23-25, 2008

Attended the workshop jointly organized by UN ESACAP, Asian and Pacific Centre for Agricultural Engineering and Machinery (APCAEM) and the Ministry of Agriculture and Cooperatives of the Royal Government of Thailand, titled "Regional Forum on Bio-energy Sector Development: Challenges, Opportunities and Way forward"

15.7 Doctoral Students' Dissertation

Agricultural Mechanization Status and Energy Consumption for Crop Production in Thailand
By: Anuchit Chamsing
Supervisor: Prof. Vilas M. Salokhe

Development of a Cassava Planter
By: Jaturong Lungkapin
Supervisor: Prof. Vilas M. Salokhe

Development of a Low-cost Soil and Crop Data Mapping System for Precision Agriculture Using and Unmanned, Low-altitude Remote Controlled Helicopter
By: Kishore Chandra Swain
Supervisor: Dr. Hemantha P. Jayasuriya

Effects of Tillage, Intercropping with Grasses and Grass Management on Soil Physical Properties and Grain Yield of Double-cropped Rainfed Maize in Metro District, Lampung Province, Indonesia
By: Ahadiyat Yugi Rahayu
Supervisor: Dr. S. L. Ranamukhaarachchi

Soil Fertility Influence on Sustainable Irrigated Rice Production in Bangladesh: A Precision Agriculture Approach
By: Abu Ahmed Mokammel Haque
Supervisor: Dr. Hemantha P. Jayasuriya

15.8 Masters Students' Theses and Research Studies

Effects of Tyre Inflation Pressure and Surface Conditions on the Vibration Characteristics of Agricultural Tractors
By: Teerawat Laonapakul
Supervisor: Prof. Vilas M. Salokhe

Modeling Drying Kinetics of Red Chillies in a Combined Infrared and Hot Air Rotary Dryer
By: S.D.F. Mihindukulasuriya
Supervisor: Dr. Hemantha P. Jayasuriya

Study of the Trends of Agricultural Mechanization in Mongolia
By: Batdorj Munkhjargal
Supervisor: Dr. Hemantha P. Jayasuriya

Development of a 15-M Tractor Mounted Spray Boom for Increased Field Efficiency
By: Nalavade Parish Prakash
Supervisor: Prof. Vilas M. Salokhe

Status and Potentiality of Biofuel Production in Thailand
By: Sroysuda Thangkusonchit
Supervisor: Dr. Hemantha P. Jayasuriya

Development of a Rice Transplanter Suitable for Northern Vietnam
By: Tran Duc Tuan
Supervisor: Prof. Vilas M. Salokhe

Agricultural Mechanization in Phnom Penh and Kandal Provinces of
By: Seng Tuy
Supervisor: Prof. Vilas M. Salokhe

Photocatalytic Degradation of Methomyl for Amelioration of the Agricultural Environment
By: Sasiwong Akkisopa
Supervisor: Dr. S. L. Ranamukhaarachchi

Studies on the Traceability and Data Recording System for Developing Good Agricultural Practices in Thailand
By: Sunattha Attisilwet
Supervisor: Dr. S. L. Ranamukhaarachchi

Assessment of the Contribution of Legumes in the Farming System of Bhutan: A Case Study in Punakha District, Bhutan
By: Gyem Bidha
Supervisor: Dr. S. L. Ranamukhaarachchi

Exploration of Potential Biocontrol Agents against Fusarium Wilt (Fusarium oxysporum f. sp. lycopersici) of Tomato (Lycopersicon esculentum)
By: Steve Kebasen
Supervisor: Dr. S. L. Ranamukhaarachchi

Effect of Pod Growth Stage at Harvest on the Yield of Yard Long Bean (Vigna unguiculata, subsp. sesquipedalis)

By: Kuenzang Peldon

Supervisor: Dr. S. L. Ranamukhaarachchi

Comparative Studies of Protein Bait for Effective Management of Fruit Fly in Thailand

By: Marlar Soe

Supervisor: Dr. S. L. Ranamukhaarachchi

Rice Yield Constraints of Lowland Farms in Vientiane, Lao PDR

By: Nouansy Thiphaxay

Supervisor: Prof. Ganesh P. Shivakoti

Development of a Detachable Sugarcane Loader

By: Burin Tinnangwattana

Supervisor: Dr. Hemantha P. Jayasuriya

Color Preference of Insect Pests of Chinese Kale (Brassica oleracea var. acephala)

By: Prom Visal

Supervisor: Dr. S. L. Ranamukhaarachchi

Vibration and Noise Characteristics of a Brush Cutter

By: Piyapong Wongkhunkeaw

Supervisor: Dr. Hemantha P. Jayasuriya

An Assessment of Farmer's Responses to Government Policy Implementation on Pesticide Use and its Effects on Environment Pollution: A Case Study of Rice Cultivation in Karawang District, West Java Province, Indonesia

By: Asep Setiawan

Supervisor: Prof. Ganesh P. Shivakoti

An Impact Assessment of Farmers' Acceptability of Farming Systems Research Activities in

Namo District, Udomxay Province, Lao PDR

By: Chanphasouk Tanthaphone

Supervisor: Dr. S. L. Ranamukhaarachchi

Development of a Coconut Oil Extraction System using Direct Micro Expelling (DME) Method

By: Somwang Hleekar

Supervisor: Dr. Hemantha P. Jayasuriya

Protected cultivation- An Approach to Sustainable Vegetable Production in Humid Tropics



Chapter 16: SERD – AQUACULTURE AND AQUATIC RESOURCES MANAGEMENT FIELD OF STUDY

16.1 Introduction

AARM promotes development through aquaculture and smallscale capture fisheries. The Field of Study has a wide spectrum of activities enabling it to address poverty, constraints facing the promotion of sustainable management and utilization of aquatic resources. The central theme is capacity building; the advancement of individuals and institutions creating indigenous capacity in education, research and development within the region.

16.2 Research Facilities and Laboratories

Aquaculture Laboratory serves the academic and research programs of aquaculture and aquatic resources management (AARM) field of study. It is equipped with modern equipment to analyze water quality, nutrients in food and feedstuffs, and soil classification and their problems identification. Some of its major laboratory equipment include a Distillation Unit; Extraction Unit; Incubator; UV/Vis Spectrophotometer; and a Flame Photometer

The SERD Computer Lab III in the Agricultural and Food Engineering Building has various kinds of software packages for system analysis and simulation, including DSSAT (Decision Support System for Agrotechnology Transfer), ArcView etc. A Computer-Aided Design (CAD) workstation is also available for training the design of agricultural equipment. There is a machine workshop with facilities for fabricating various types of laboratory and

experimental apparatus and models. Consultation and fabrication of different types of transducers can be provided. About 20 high-end PCs connected to the campus-wide Ethernet and ATM network and a high quality laser printer, scanning and CD writing facilities are available for students' uses.

16.3 Faculty and Research Staff

Full-time Faculty

AMRIT BART, BA

Earlham College, USA; MA, MS, PhD, Auburn Univ, USA. Associate Professor (*Aquatic Resource Management; Cryopreservation; Reproductive Physiology; Seed Production*)

AMARARATNE YAKUPITIYAGE,

BSc, Univ of Kelaniya, Sri Lanka; MSc, AIT, Thailand; PhD, Univ of Stirling, Scotland. Associate Professor (*Aquaculture; Bioenergetics; Database Systems Development; Fish Nutrition*)

KO IKEJIMA

BSc, Univ of Agriculture and Tech; MSc, PhD, Univ of Tokyo, Japan. Assistant Professor (*Coastal Aquaculture; Coastal Ecology and management; Fisheries Biology and Ecology; Molecular Phylogeny*)

RAM C. BHUJEL

BSc, Institute of Agriculture and Animal Sciences, IAAS, Chitwan, Nepal; MSc and PhD, AIT, Thailand; Affiliated Faculty (*Biostatistics and Research Design, Curriculum Development, Women in Aquaculture, Broodstock Nutrition/Management and Fry Production, Technology Transfer/ Extension*)

WENRESTI G GALLARDO

PhD, MSc, Nagasaki University, Japan; Master of Aquaculture, University of the Philippines in the Visayas; BSc, University of the Philippines, Diliman, Philippines. Assistant Professor (*Aquaculture; Aquatic Resources Management*)

YANG YI

BSc, Sichuan Univ, PRC; MSc, DTechSc, AIT, Thailand. Associate Professor (*Aquaculture; Integrated Systems; Modeling; Pond Dynamics; Water Quality*)

16.4 Grants and Sponsored Research Completed in 2007

Capacity building of coastal communities on coastal mitigation

Duration: 1-Nov-06 - 30-Apr-07

Project Investigator: Dr. Wenresti G. Gallardo, Dr. Animesh Dutta, Dr. Kou Ikejima, Dr. Mokbul Morshed Ahmad, Prof. Dennes T. Bergado
Sponsor: USAID

Coastal Institute Asia 2007

Duration: 15-May-07-30-Sep-07

Project Investigator: Dr. Wenresti Gallardo

Sponsor: Multi donors
Total Contracted Amount (Baht) 884,000

Development of Marine and Coastal Resources Database in Thailand

Duration: 20-Aug-05 - Jun-07
Project Investigator: Dr. Kou Ikejima
Sponsor: UNEP ROAP
Total Contracted Amount (Baht) 2,460,000

Impact Study on Wooden Trail Construction in Mangroves Eco-system

Duration: 1-May-06 - 31-Dec-07
Project Investigator: Dr. Kou Ikejima
Sponsor: The University of Tokyo, Japan
Total Contracted Amount (Baht) 264,880

Regional Studies of Aquaculture Systems and Impacts in South East Asia, and Management Considerations for Non-Traditional Aquaculture Systems in Vietnam (CRSP Workplan 11)

Duration: Aug-01 - Jun-07
Project Investigators: Dr. Yang Yi, Dr. Amrit Bart
Sponsor: CRSP
Total Contracted Amount (Baht) 46,665,752

16.5 On-going Grants and Sponsored Research

AARM Training and Consultancy Services in Aquaculture

Duration: 1-Nov-07-01-Nov-08
Project Investigator: Dr Amara Yakupitiyage and Mr Yuan Derun
Sponsor: Multi donors
Total Contracted Amount (Baht) 1,388,130

AIT-Coca Cola for Sustainable Coastal Livelihoods Project in Ranong

Duration: 1-Oct-05 - 31-Mar-08
Project Investigator: Dr. Amrit N. Bart
Sponsor: Coca Cola (Thailand) Ltd.
Total Contracted Amount (Baht) 8,000,000

An Exit and Outgoing Capacity Building Plan for Thailand and Bangladesh

Duration: 1-Jul-07-31-Jan-08
Project Investigator: Dr. Amrit N. Bart
Sponsor: USAID-CRSP

Total: 2,370,996

Capacity building of small-scale shrimp farmers on adoption of best management practices (BMPs) to promote Thai Shrimp export to the EU.

Duration: 1-Sep-06 - 31-Jan-08
Project Investigator: Dr. Dharendra Prasad Thakur
Sponsor: European Commission
Total Contracted Amount (Baht) 8,034,639

Development of Release Strategies for Stock Enhancement of the Tropical Abalone *Haliotis Asinina*

Duration: 1-Oct-05 - 30-Jun-08
Project Investigator: Dr. Wenresti Gallardo
Sponsor: International Foundation for Science
Total Contracted Amount (Baht) 239,663

Improving Master's Degree Level Education in AARM in Cambodia, Nepal and Vietnam

Duration: 1-Sep-05-31-Aug-08
Project Investigator: Dr. Amrit N. Bart
Sponsor: Asia Link-European Commission
Total Contracted Amount (Baht) 14,425,150

Linking the Post-graduate Education in Aquaculture and Aquatic Resources Management with its Industry through Internship

Duration: 1-Sep-07-31-Aug-10
Project Investigator: Dr. Ram Bhujel
Sponsor: European Commission
Total: 31,939,965

National Capacity and Training Needs Assessments for Different Stakeholder Groups in order to Identify Gaps, Needs, Strengths and Opportunities for Building Capacity in Integrated Coastal Zone Management (ICM)

Duration: 15-Jul-07-31-Mar-08
Project Investigator: Dr. Amaratne. Yakupitiyage
Sponsor: International Union for Conservation of Nature.(IUCN)
Total: 5,288,250

Perturbation and Coastal Zone Systems in Asia Pacific Region: Holistic Approaches and Tools for

Vulnerability Assessment and Sustainability Management Strategy

Duration: 1-Sep-07-31-Aug-08
Project Investigator: Dr. Dharendra Prasad Thakur
Sponsor: Asia Pacific Network (APN) for Global Change Research, Monash University
Total: 59,400

Post-Tsunami Sustainable Coastal Livelihoods Program

Duration: Mar-05 - Mar-08
Project Investigator: Dr. Amrit N. Bart
Sponsor: US Agency for International Development (USAID)
Total Contracted Amount (Baht) 12,760,605

Resources Management in Cambodia, Nepal and Vietnam

Duration: 1-Sep-05 - 31-Aug-08
Project Investigator: Dr. Amrit N. Bart
Co-Investigator: Dr. Ram Bhujel
Sponsor: Asia-Link, European Union
Total Contracted Amount (Baht) 14,425,150

Testing of Pond Aerators- Brackishwater Shrimp Pond Aerators- Comparative Testing of Efficiency of Oxygen Transfer Performance and Pond Water Body Mixing

Duration: 1-Jul-07-15-Feb-08
Project Investigator: Dr Amara Yakupitiyage
Sponsor: GTZ
Total Contracted Amount (Baht) 981,600

16.6 Publications

Refereed Journals

Bhujel, R.C., Little, D.C. and Hossain, A., "Reproductive performance and the growth of stunted and normal Nile tilapia (*Oreochromis niloticus*) broodfish at varying feeding rates", *Aquaculture*, 273:71-79, 2007.

Hasan, M. and Bart, A.N., "Effects of capture, loading density and transport stress on the mortality, physiological responses, bacterial density and growth of rohu *Labeo rohita* fingerlings", *Fish Physiology and Biochemistry*, DOI: 10.1007/s10695-007-9136-7 (on-line publication), 2007.

- Hasan, M. and Bart, A.N.,
"Improved survival of Rohu, Labeo Rohita and Silver Carp, Hypophthalmichthys molitrix fingerlings using low dose quinaldine and benzocaine during transport", *Aquaculture Research*, 38: 50-58, 2007
- Kaewnern, M. and Yakupitiyage, A.
"Shrimp and Mollusc culture in Bandon Bay in Thailand: A Situation Analysis", *Asian Fisheries Science*, Vol. 20, No. 4, 2007.
- Okuzawa K., Maliao R.J., Quintio E.T., Buen-Ursua S.M.A, Lebata M.J.H.L. Gallardo W.G., Garcia L.M.B. and Primavera, J.H.
"Stock enhancement program for threatened species in Southeast Asia", *Reviews in Fisheries Science* (in press), 2008.
- Saengsupavanich, C.,
Seenprachawong U., Gallardo W.G., Shivakoti G.P.,
"Port-induced erosion prediction and valuation of a local recreational beach", *Ecological Economics*, (accepted for publication), November 24, 2007.
- Somamihardtja, A. and Bart, A.N.,
"Characterization of Small Size Egg-Bearing Thai ss-strain rotifer *Brachionus rotundiformis* and Their First Offspring", *J. of the World Aquaculture Society*, (accepted for publication), 2007.
- Tantawanich T., Gallardo W.G., Ikejima K., Ganmanee M., and Jayarabhand P., "Effect of stocking density and shelter surface on growth and survival of the tropical abalone *Haliotis asinina* in a semi-flow through system", *Journal of Fisheries Technology Research*, 1 (2): 101-111, 2007.
- Trung, D.V. and Bart, A.N.,
"Controlled reproduction of an important indigenous species, *Spinibarbus denticulatus*, in Southeast Asia", *Aquaculture Research*, 38: 441- 451, 2007.
- Tsadik, G. G. and Bart A.N.,
"Characterization and comparison of variations in reproductive performance of Chitralada strain Nile tilapia, *Oreochromis niloticus* (L.)", *Aquaculture Research*, 38: 1076-1083, 2007.
- Tsadik, G. G. and Bart A.N.,
"Effects of feeding, stocking density, and water-flow rate on fecundity, spawning frequency and egg quality of Nile tilapia, *Oreochromis niloticus* (L.)", *Aquaculture Research*, 38: 1066-1073, 2007.
- Conference Proceedings**
- Bhujel, R.C., Shrestha, M.K. and Pant, J., "Ethnic women in aquaculture in Nepal: a model for participatory research and development", In: *Fisheries and Aquaculture: Strategic Outlook for Asia*, Book of Abstracts- 8th Asian Fisheries Forum, Asian Fisheries Society (Indian Branch), Kochi, India, p. 6, November 20-23, 2007.
- Bhujel, R.C. and Bart, A.N.,
"Meeting the needs for higher education and research in less developed countries: aquaculture and fisheries case study", In: *Fisheries and Aquaculture: Strategic Outlook for Asia*, Book of Abstracts- 8th Asian Fisheries Forum, Asian Fisheries Society (Indian Branch), Kochi, India, p. 399, November 20-23, 2007.
- Borin, C., Visalsok, T. and Bhujel, R.C., "Status of Fisheries / Aquaculture in Cambodia", In: *Fisheries and Aquaculture: Strategic Outlook for Asia*, Book of Abstracts- 8th Asian Fisheries Forum, Asian Fisheries Society (Indian Branch), Kochi, India, p. 401, November 20-23, 2007.
- Shrestha, M.K and Bhujel, R.C.,
"Aquaculture and Fisheries Education in Nepal", In: *Fisheries and Aquaculture: Strategic Outlook for Asia*, Book of Abstracts- 8th Asian Fisheries Forum, Asian Fisheries Society (Indian Branch), Kochi, India, p. 400, November 20-23, 2007.
- Singappuli M.S, Thakur D.P., Yi Y.,
"Effects of pure oxygen injection on shrimp *Litopenaeus vannamei* growth performance and water quality in closed intensive culture system", Paper presented at AQUACULTURE 2007 Conference and Exposition, San Antonio, Texas, USA, February 26 - March 2, 2007.
- Thakur D.P.,**
"Farm management and adoption of good practices: A case study based on shrimp farm survey in Rayong and Nakhorn Sri Thammarat, Thailand", Paper presented at workshop on Best Management Practices for Small-scale Shrimp Farmers, Asian Institute of Technology, Thailand, May 28 – 30, 2007.

16.7 Doctoral Students' Dissertation

Feeding Behavior of Marble Goby (Oxyeleotris Marmorata Bleeker 1852) Fingerlings Reared with Different Types of Prey
By: Nguyen Phu Hoa
Supervisor: Dr. Yang Yi

Impact of Coastal Eutrophication from Shrimp Farming on Mollusc Culture in Surat Thani Province, Thailand
By: Methee Kaewnern
Supervisor: Dr. Amaratne Yakupitiyage

Integrated Coastal Zone Management for An Industrial Port: A Case Study of Map Ta Phut Port, Rayong, Thailand
By: Cherdvong Saengsupavanich
Supervisor: Dr. Wenresti Gallardo

Wastewater Management in the City of Manado, North Sulawesi, Indonesia
By: Markus Talintukan Lasut
Supervisor: Prof. Ganesh P. Shivakoti

16.8 Masters Students' Theses and Research Studies

An Evaluation of the Benefits of Rice and Rice-Fish Culture with and without Integrated Pest Management in Kirivong District, Takaev Province, Cambodia
By: Te Rithy
Supervisor: Dr. Amaratne Yakupitiyage

Triploidy Induction and Growth Performance of Hybrid Catfish (Clarias macrocephalus × C. gariepinus)
By: Afshana Parven
Supervisor: Dr. Wenresti Gallardo

Chau Thi Da
Environmental Impacts from Feeds used in Aquaculture Systems in the Vicinity of the Mekong River, Vietnam
Dr. Amaratne Yakupitiyage

Mst. Muslima Khatun

Comparisons of Growth and Economic Performance among Monosex and Mixed-sex Culture of Mud Crab (Scylla olivacea) in Pens using Locally-Available Supplemental Feeds in the Tidal Flats of Mangrove Forests, Bangladesh

Dr. Yang Yi

Ubonrat Limtipsuntorn

Evaluation of Feed Attractants to Improve Feeding Response and Growth of Marble Goby (Oxyeleotris marmorata) Fingerlings

Dr. Amaratne Yakupitiyage

Syhton Phetdaoheuang

Development of Seed Production Technique for Green Catfish (Hemibagrus filamentus)

Dr. Wenresti Gallardo

Watcharaporn Tripanichkul

Sea Cucumber Fishery in Yao Islands, Phang Nga, Thailand and Recommendations for Integrated Management

Dr. Kou Ikejima

Bounthong Sengvilaykham

Developing an Appropriate System of Participatory Planning for Local Offices and Officers on Aquatic Resources and Wetland Management in the Southern Provinces of Lao PDR: A Case Study from Nong-Lom Wetland, Samakkixay District of Attapeu Province

Dr. Amaratne Yakupitiyage

Chapter 17: SERD – ENERGY FIELD OF STUDY

17.1 Introduction

Energy related academic program at AIT was established in 1979. So far over 800 students have graduated in the Energy related studies. As of March 2007, about hundred students are enrolled in Energy Field of Study. About thirty percent of the current students are at doctoral level. Apart from regular teaching and student research, Faculty at Energy FoS carry out a larger number of regional research projects. Some of the current research focuses of Energy FoS are Energy, environment and climate change, Energy for sustainable development, Renewable Energy and Energy efficiency, Electric power system management, and Energy economics planning.

Student admitted to Energy FoS can specialize in one of the three areas.

- Electric Power System Management (EPSM)
- Energy Technology (ET)
- Energy Economics and Planning (EEP)

17.2 Research Facilities and Laboratories

Energy Laboratory serves as a facility for course experiments, research, testing and hands-on training in the Energy Field of Study. Laboratory functions are focused mainly on solar thermal energy, photovoltaics, biomass energy, energy management, thermodynamics and heat transfer, and electrical measurement and analysis. The laboratory facilities include two indoor laboratories, an energy park and a meteorological station. The indoor laboratories are equipped with experiment setups,

testing apparatus and measuring equipment for thermal and electrical management studies, thermodynamics, fluid mechanics and heat transfer, and electrical power supply management. Energy Park covers 3980-m² outdoor research and demonstration facility equipped with photovoltaic systems, solar thermal (air and water) systems, biomass research and daylighting setups. The meteorological station measures and records different solar radiation and other meteorological data. Energy laboratory continues to carry out testing services such as fuel quality tests, gas composition tests, tests for heating value of fuels, solar thermal collector performance tests, solar water heater system performance tests and stove efficiency tests.

Among its major equipment include a Gas Analyzer; Campbell data logger; Ultrasonic flow-meter; Bomb colorimeter; and a Gas chromatography.

The SERD Computer Lab IV in the Energy Building has a large number of computer modeling software for energy planning and policy analysis. These include Model for Analysis of Energy Demand and Environmental Impacts (MAED, MEDEE-S/ENV, LEAP), Electricity System Planning (WASP-III Plus, ENPEP, DECPAC), Energy-Environmental Flow Optimization Model (EFOM-ENV), Wood Energy Planning Models, Energy-Environmental Models for estimation of impacts of energy externalities, air pollution emission and dispersion and climate change (CO₂ DB, RAINS, TEMIC, ECOSENS, ISC) and Energy-Environmental Database Management Software (DBAVOID).

An energy-environment database for Asia is maintained in this computer lab. About 20 highend PCs connected to the campus-wide Ethernet and ATM network and a high quality laser printer, scanning and CD writing facilities are available for students' uses.

17.3 Faculty and Research Staff

MITHULANANTHAN NADARAJAH
BScEng, MEng, Univ of Peradeniya, Sri Lanka; PhD, Univ of Waterloo, Canada. **Assistant Professor** (*Application of FACTS controllers; Controller Interactions; Power System Oscillation; Voltage Stability*)

NIMESH DUTTA
PhD, Dalhousie University, Canada; MEng, Asian Institute of Technology, Thailand; BSc(Eng), Bangladesh University of Engineering and Technology, Bangladesh. **Assistant Professor** (*Biomass Energy 72 Annual Report on Research 2006 Boiler Design; Emission Control Technologies; Heat Transfer; Thermo/ Fluids*)

RAM M SHRESTHA
BE, Univ of Baroda; LL Tribhuvan Univ, Nepal; MEng, DEng, AIT, Thailand. **Professor** (*Energy and Environmental Policy; Energy Economics*)

SURAPONG CHIRARATTANANON
BEng, Univ of New South Wales; MEng, Monash Univ; Ph. D., Newcastle, Australia.

Professor (*Electrical Energy Management; Energy Conservation in Buildings*)

SIVANAPPAN KUMAR

BE, Univ of Madras, India; MEng, AIT, Thailand; PhD, Inst Natl Polytechnique, Toulouse, France.

Professor(*Cleaner Production; Rational Use of Energy; Solar Energy*)

WEERAKORN ONGSAKUL

BEng, Chulalongkorn Univ, Thailand; MS, PhD, Texas A&M Univ, USA. **Associate Professor** (*Artificial Intelligence Applications to Power Systems; Parallel Processing Applications; Power System Operation & Control; Power System Restructuring*)

17.4 Grants and Sponsored Research Completed in 2007

Asian Regional Research Programme in Energy, Environment and Climate Phase III Coordination

Duration: 1-Jan-02-31-Mar-07
Project Investigator: Prof Sivanappan Kumar
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 18,236,972

Asian Regional Research Programme in Energy, Environment and Climate Phase III- Extension

Duration: 1-Jan-06-31-Oct-07
Project Investigator: Prof. Ram M. Shrestha, Prof Sivanappan Kumar, Prof C Visvanathan
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 6,038,761

Biomass Energy in Asia: Assessment and Strategy Formulation

Duration: 1-Jan-02-31-Mar-07

Project Investigator: Prof S Kumar
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 9,649,393

Energy Security and Energy Efficiency Theme

Duration: 1-Jul-07-31-Mar-07
Project Investigator: Prof. S. Kumar, Prof. Ram Shrestha
Sponsor: Global Network on Energy for Sustainable Development (GNESD)-UNEP RISO
Total Contracted Amount (Baht) 850,000

Integrated Assessment Model for Developing Countries and Analysis of Mitigation Options and Sustainable Development Opportunities

Duration: 1-Oct-03-30-Sep-07
Project Investigator: Prof Ram Shrestha
Sponsor: Asia Pacific Network for Global Change Research
Total Contracted Amount (Baht) 2,535,000

Promotion of Biofuels for Sustainable Development in South and Southeast Asia

Duration: 25-May-06 - 30-Jun-07
Project Investigator: Dr. Animesh Dutta, Prof. S. Kumar, Prof. Ram Shrestha
Sponsor: Winrock International India
Total Contracted Amount (Baht) 608,580 THB

Renewable Energy Policy and Biomass Energy E-Learning

Duration: 23-Mar-07-30-Nov-07
Project Investigator: Prof S. Kumar, Dr Animesh Dutta, Dr Tsuchimoto
Sponsor: UNESCO Jakarta Office
Total Contracted Amount (Baht) 347,900

Renewable Energy Technologies in Asia: Phase III Extension

Duration: 1-Sep-05-31-Oct-07
Project Investigator: Prof. Ram M. Shrestha, Prof Sivanappan Kumar, Prof C Visvanathan
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 7,976,756

Small and Medium Industries in Asia: Energy Environment and Climate Interrelationships

Duration: 1-Jan-02-31-Mar-07
Project Investigator: Prof S. Kumar, Prof C. Visvanathan
Sponsor: Swedish International Development Cooperation Agency, Sweden

Total Contracted Amount (Baht) 10,174,913

Strategies for Promotion of Energy Efficient and Cleaner

Technologies in the Power Sector

Duration: 1-Jan-02-31-Mar-07
Project Investigator: Prof. Ram Shrestha
Total Contracted Amount (Baht) 9,422,065

Strategies for Promotion of Energy Efficient and Cleaner

Technologies in the Urban

Transport Project

Duration: 1-Jan-02-31-Mar-07
Project Investigator: Prof. Ram Shrestha
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 11,531,541

Targeted Capacity Development on CDM (TCD - CDN) in Thailand

Duration: 15-Apr-06 - 30-Jan-07
Project Investigator: Prof. Ram M. Shrestha, Prof Sivanappan Kumar
Sponsor: UNEP Risoe Centre (URC)
Total Contracted Amount (Baht) 2,452,450

Technical Officer Training

Duration: 6-Nov-06 - 28-Feb-07
Project Investigator: Dr. N. Mithulanathan, Prof. Athapol Noomhorn
Sponsor: University of Moratuwa, Sri Lanka
Total Contracted Amount (Baht) 125,400

Training on and Transfer of Efficient EU Technology in the Sugar Sector in Thailand

Duration: 7-Jan-06 - 06-Apr-07
Project Investigator: Dr. N. Mithulanathan, Dr. Weerakon Ongsakul, Dr. Animesh Dutta, Dr. Surapong Chirarattananon, Dr. H.P.W. Jayasuriya
Sponsor: EU-Thailand Economic Cooperation (Small Projects Facility)
Total Contracted Amount (Baht) 9,500,000

Transfer of EU Knowledge and Technology for Development of Wind Energy Tech. in Thailand

Duration: 1-Jan-06 - 28-Feb-07
Project Investigator: Dr. Nadarajah Mithulanathan, Dr. Weerakon Ongsakul, Dr. Animesh Dutta
Sponsor: EU Thailand Economic Cooperation SPF
Total Contracted Amount (Baht) 6,575,000

Urban and Peri-Urban Energy Access Phase 1

Duration: 14-Sep-06-01-Apr-07
Project Investigator: Prof. S. Kumar, Prof. Ram Shrestha
Sponsor: Global Network on Energy for Sustainable Development (GNESD)-UNEP RISO
Total Contracted Amount (Baht) 281,250

Urban and Peri-Urban Energy Access Phase 1

Duration: 14-Sep-06-01-Apr-07
Project Investigator: Prof Ram M. Shrestha, Prof S. Kumar
Sponsor: Global Network on Energy for Sustainable Development (GNESD)-UNEP RISO
Total Contracted Amount (Baht) 281,250

17.5 On-going Grants and Sponsored Research

Analyses of Energy related Environment Emissions in ASEAN and South Asian Countries

Duration: 13-Nov-06-28-Feb-08
Project Investigator: Prof Ram Shrestha
Sponsor: Mizuho Information and Research Institution, Inc., Japan
Total Contracted Amount (Baht) 1,950,000

Coordination Energy Security and Energy Efficiency Theme

Duration: 1-Jan-07-01-Jan-08
Project Investigator: Prof Ram M. Shrestha, Prof S. Kumar
Sponsor: Global Network on Energy for Sustainable Development (GNESD)-UNEP RISO
Total Contracted Amount (Baht) 320,000

Database on Driving Forces of Global Warming

Duration: 1-Dec-07-31-Dec-08
Project Investigator: Prof Ram Shrestha
Sponsor: Mizuho Information and Research Institution, Inc., Japan
Total Contracted Amount (Baht) 1,200,000

Electricity and Cooling Load Estimate for Outreach Building

Duration: 7-Sep-07-1-Feb-08
Project Investigator: Prof S Kumar; Dr Animesh Dutta
Sponsor: UNEP RRC.AP
Total Contracted Amount (Baht) 66,800

Energy Consumption and Air Pollution

Duration: 1-Aug-07-30-Sep-08
Project Investigator: Prof Ram Shrestha
Sponsor: Nies, Japan
Total Contracted Amount (Baht) 705,000

Energy Field of Studies Publications

Duration: 1-Jan-04-31-Dec-08
Project Investigator: Dr. Nadarajah Mithulanathan
Sponsor: Membership fees, AIT
Total Contracted Amount (Baht) 1,521,149

Networking with Norwegian and Regional Institutions in Energy Issues (South-South-North Networking): 2006-2009

Duration: 1-Aug-06 - 31-Dec-09
Project Investigator: Dr. Mithulanathan N., Prof. Ram Shrestha, Dr. Animesh Dutta
Sponsor: Norwegian Ministry of Foreign Affairs
Total Contracted Amount (Baht) 4,140,000

Strategic Database of Energy and Air Pollution in ASEAN and South Asian Countries

Duration: 13-Nov-06 - 28-Feb-08
Project Investigator: Prof. Ram M. Shrestha
Sponsor: Mizuho Information and Research Institution, Inc., Japan
Total Contracted Amount (Baht) 1,950,000

The Potential for Transferring and Implementing Renewable Energy Technologies through the Clean Development Mechanism of the Kyoto Protocol

Duration: 1-Feb-06-31-Jan-08
Project Investigator: Dr. Mithulanathan N., Dr. Animesh Dutta
Sponsor: European Commission
Total Contracted Amount (Baht) 1,646,570

The Potential for Transferring and Implementing Sustainable Energy Technologies through the Clean Development Mechanism of the Kyoto Protocol

Duration: 1-Feb-06 - 31-Jan-08
Project Investigator: Dr. N. Mithulanathan
Co-Investigator: Dr. A. Dutta
Sponsor: Commission of the European Communities (CEC)
Total Contracted Amount (Baht) 2,237,200

Urban and Peri-Urban Energy Access Phase 2

Duration: 15-Aug-07-28-Feb-08
Project Investigator: Prof Ram M. Shrestha,

Prof S. Kumar
Sponsor: Global Network on Energy for Sustainable Development (GNESD)-UNEP RISO
Total Contracted Amount (Baht) 595,000

17.6 Publications

Refereed Journals

Augustus L. M. and S. Kumar,
"Design and performance evaluation of a solar-biomass rock bed storage drying system", *Drying Technology*, (accepted for publication), 2007.

Augustus L. M. and S. Kumar,
"Mathematical modeling and thermal performance analysis of unglazed transpired solar collectors", *Solar Energy*, 81(1): 62-75, 2007.

Cattareeya Adsoongnoen,
Weerakorn Ongsakul, C. Maurer, and H.-J. Haubrich, "A New Transmission Pricing Approach for the Electricity Cross-Border Trade in the ASEAN Power Grid", *European Transaction on Electrical Power*, Vol. 17, No. 2, pp. 135-149, 2007.

Chinsuwan, Anusorn and A. Dutta,
"An empirical model for predicting the cross sectional averaged suspension density in commercial circulating fluidized bed boilers", *Journal of Institute of Energy*, (accepted for publication), November 2007.

Cattareeya Adsoongnoen, Weerakorn Ongsakul, C. Maurer, and H.-J. Haubrich, "Transmission Pricing Using the Exact Power and Loss Allocation Method for Bilateral Contracts in a Deregulated Electricity Supply Industry", *European Transaction on Electrical Power*, Vol. 17, No. 3, pp. 240-254, 2007.

Durga Gautam and N. Mithulanathan, "Locating Distributed Generator in the LMP based Electricity Market for Social Welfare Maximization," *Electric Power Systems Research*, Taylor and Francis, Vol. 35, No.5, pp. 489 – 503, May, 2007.

Durga Gautam and N. Mithulanathan,
"Optimal Distributed Generator Placement in Deregulated Electricity

- Market," *Electric Power Systems Research*, EPSR, Elsevier, Vol. 77, Issue 12, pp. 1627-1636, October 2007.
- Govinda R. Timilsina and Ram M. Shrestha, "Alternative tax instruments for CO2 emission reduction and effects of revenue recycling schemes, *Energy Studies Review*, Vol. 15 (accepted for publication), 2007.
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- Kejun Jiang, Songli Zhu and Ram M. Shrestha, "Analysis of policy options for promotion of clean and energy efficient technologies in the transport sector in Beijing" *International Journal Environment and Pollution*, Vol.30, No. 1, pp. 59-74, 2007.
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Sompop Jarungthammachote, B. Acharya B., A. Dutta, "Parametric effect of Agricultural Residues and Woody Biomass on Hydrogen Production through Gasification Process", International Agricultural Engineering Conference (IAEC 2007), AIT, Thailand, December 3-6, 2007.

Sunil Malla, Ram M. Shrestha, S. Kumar and Migara H. Liyanage, "Energy system development and environmental implications under CO2 emission reduction targets in Thailand", Proceedings of the 27th USAEE Conference on Developing and Delivering Affordable Energy in the 21st Century, Houston, Texas, USA, September 16-19, 2007.

Vo Ngoc Dieu and Weerakorn Ongsakul, "Heuristic-Guided Lagrangian Relaxation and Hopfield Network for Unit Commitment", Proceedings of the PowerAfrica 2007 Conference and Exposition, University of the Witwatersrand, Johannesburg, South Africa, July 16-19, 2007.

Vo Ngoc Dieu and Weerakorn Ongsakul, "Improved Merit Order and Augmented Lagrange Hopfield Network for Ramp Rate and Transmission Constrained Unit Commitment", Proceedings of the 2007 PES General Meeting, Tampa, Florida, July 24-28, 2007.

Other Publications

A. Dutta, "Energy and Products from

17.7 Doctoral Students' Dissertation

A Study on Renewable Energy Based Hybrid System for Rural Electrification
By: Napaporn Phuangpornpitak
Supervisor: Prof. Sivanappan Kumar

Augmented Lagrangian Hopfield Network Based Methods for Optimal Generation Scheduling
By: Vo Ngoc Dieu
Supervisor: Dr. Weerakorn Ongsakul

Theoretical and Experimental Investigation of a Solar Biomass Hybrid Air Heating System for Drying Applications
By: Augustus Leon Mathias
Supervisor: Prof. Sivanappan Kumar

Transmission Pricing using the Exact Power and Loss Allocation and Sensitivity Analysis in a Deregulated Environment
By: Cattareeya Adsoongnoen
Supervisor: Dr. Weerakorn Ongsakul

Optimal Placement of Multi-type FACTS Devices by the Hybrid Tabu Search/Simulated Annealing Approach
By: Pornrapeepat Bhasaputra
Supervisor: Dr. Weerakorn Ongsakul

Daylighting Through Light Pipes for Deep Interior Illumination with Consideration of Heat Gain
By: Vu Duc Hien
Supervisor: Prof. Surapong Chirarattananon

A Study of Tropical Daylight and its Illuminance through Windows
By: Pipat Chaiwiwatworakul
Supervisors: Prof. Sivanappan Kumar / Prof. Surapong Chirarattananon

17.8 Masters Students' Theses and Research Studies

A Study of Torrifaction Process for Agriculture Residues
By: Anuphon Pimchuai
Supervisor: Dr. Animesh Dutta

Econometric Analysis of Electricity Demand

and Peak Load: The Case of Thailand

By: Badee Prachumchon

Supervisor: Prof. Ram M. Shrestha

Reliability Enhancement in an Electricity Distribution System: A Case Study of Samdrup Jongkhar Network

By: Vesraj Bhujel

Supervisor: Dr. Mithulananthan Nadarajah

Kamonpan Chumpolrat

A Study of Solar SI-PV-Thermal Hybrid

System in Thai Hospitals

Prof. Sivanappan Kumar

Nguyen The Cuong

Electromagnetic Transient Simulation: A Case of Quang Ninh - Thuong Tin 500 kV.

Dr. Weerakorn Ongsakul

Dinh Tien Dung

Improving Voltage Profile and Reducing Loss in Hanoi Power Distribution System

Considering Distributed Generations and Capacitor Banks

Dr. Mithulananthan Nadarajah

Tran Quoc Dung

Locating TCSC in Program System for

Improving Oscillation Damping

Dr. Mithulananthan Nadarajah

Debajit Dutta

A Study on Heat Transfer Across Double Skin Facade in Hot Climate

Prof. Sivanappan Kumar

Maria Kathrina B. Grauto

Production of Activated Carbon from Coconut Shell: Optimization Using Response Surface

Methodology (RSM)

Dr. Animesh Dutta

Kamal Bdr. Gurung

Distribution Expansion Planning: A Case of

Yangtse Distribution System in Bhutan

Dr. Weerakorn Ongsakul

Nguyen Tri Hieu

Feasibility of a Quang Ninh-Thuong Tin 500 KV Transmission Line in the Vietnam Power System

Dr. Mithulananthan Nadarajah

Natapong Kamnerdkiatissak

A Study of Processed Municipal Solid Waste and Agriculture Residue Combustion in

Fluidized Bed and Gasifier Stove

Dr. Animesh Dutta

Ambika Karkee

An Analysis of Energy Consumption and Implementation of Electricity Use Reduction

Practices at an Educational Institution

Prof. Sivanappan Kumar

Littee Kitpipit

Energy Use in the Tourism Industry of Thailand

Prof. Sivanappan Kumar

Surapong Kongros

A Study of Daylighting in an Atrium Building

Dr. Animesh Dutta

Jutamanee Martchamadol

Biofuels from Energy Crops Lignocellulosic Materials in Thailand: Technology and Potential

Dr. Animesh Dutta

Bui Van Minh

Study of Static Voltage Stability Close to the Point of Collapse: A Case Study of Vietnam Power System

Dr. Mithulananthan Nadarajah

Nguyen Duc Ninh

High Voltage AC-DC Hybrid Transmission System for Vietnam Power System

Dr. Mithulananthan Nadarajah

Panithan Pichairurke

Coordination of Protective Devices in a Distribution System with Distributed Generation

Dr. Mithulananthan Nadarajah

Jirawadee Polprasert

Augmented Lagrangian Hopfield Network for Economic Dispatch

Dr. Weerakorn Ongsakul

Nuttachai Puttanon

Optimal Power with FACTS by Particle Swarm Optimization

Dr. Weerakorn Ongsakul

Sujan Rai

Interconnection Expansion Studies in the Bhutan Power System

Dr. Mithulananthan Nadarajah

Shubha Laxmi Shrestha

Long-term Energy System Planning of Nepal: An Assessment of Linkage between Electrified Transport Sector and Hydropower Development

Prof. Ram M. Shrestha

Hennadige Ramesh Pandula Soysa

A Study of Air Distribution Systems in a Circulating Fluidized Bed

Dr. Animesh Dutta

Devbratta Thakur

Influence of Wind Turbine on Power System, Oscillatory Instability

Dr. Mithulananthan Nadarajah

Maitri Antone Thamavithya

A Study on Municipal Solid Waste Gasification in a Spout-Fluid Bed Reactor

Dr. Animesh Dutta

Le Van Thanh

Analysis of a Small Hydro Power Project for Implementation under Clean Development

Mechanism: A Case in Vietnam

Prof. Ram M. Shrestha

Mai Xuan Thao

Assessment of a Geothermal Power Project in Vietnam for Implementation under Clean

Development Mechanism

Prof. Ram M. Shrestha

Thapakorn Thasnas

The Role of Nuclear Power and Renewable Energy Technologies in the Long Term Energy System Development of Thailand

Prof. Ram M. Shrestha

Le Minh Tuan

Multiple Distributed Generation Placement in Electric Distribution System Using Improved Particles Swarm Optimization

Dr. Mithulananthan Nadarajah

Phan Quang Vinh

Analyses of Learning-by-Doing Effects of Emerging Energy Technologies and Energy-Economy Interactions: A Case Study of Vietnam

Prof. Ram M. Shrestha

Wisa Wattanakankit

Energy Service in Rural Areas of Cambodia

Prof. Sivanappan Kumar

Sarawut Wattanawongpitak

Particle Swarm Optimization-Based Lagrangian Relaxation for Unit Commitment

Dr. Weerakorn Ongsakul

Outhit Thipmany

A Study on Renewable Energy Promotion (Solar Home Systems) for Sustainable

Development in Lao PDR

Prof. Sivanappan Kumar



A Pedal Power Pack developed by Renewable Energy Technologies in Asia Project



Asian Regional Research Programme in Energy, Environment and Climate

Chapter 18: SERD – ENVIRONMENTAL ENGINEERING AND MANAGEMENT FIELD OF STUDY

18.1 Introduction

Environmental Engineering at AIT began in 1964 with the need for sanitary engineering to address the problems of providing adequate water supplies and sanitation facilities. This pioneering environmental engineering program has grown into a range of fields needed to tackle the environmental issues facing Asia today.

Environmental Engineering and Management Field of Study is part of the School of Environment, Resources and Development. The overall program looks for solutions to environmental problems, water supply and sanitation, wastewater treatment and disposal systems, air pollution, solid and hazardous wastes, waste minimization, and life cycle assessment, environmental impact assessment and management and environmental toxicology. The three major focal areas are Environmental Technology and Management, Environmental Toxicology, Technology and Management, and Water and Wastewater Engineering

18.2 Research Facilities and Laboratories

The Environmental Engineering (EE) Laboratory is housed with facilities to handle a wide range of knowledge and skills in problem solving for industrial needs and analytical works for physical, chemical, microbiological, and environmental parameters such as water and wastewater quality, air pollutants and noise level, and solid waste. For teaching, training and research

purposes, the EE laboratory is categorized into three sub-laboratories namely, research, ambient, and environmental research station. The research laboratory is equipped with many sophisticated instruments such as GC-IRD-MSD, HPLC, UV-Vis spectrophotometers, atomic absorption analyzer with flame, graphite and cold vapor operations, and gas and liquid chromatographs. For lab and pilot scale testing purposes, the ambient laboratory has furnished with facility to conduct experiments for treating sludge, sewage and industrial wastes. It is also housed with advanced water and wastewater treatment units such as different membrane bioreactors, and high rate anaerobic treatment processes with methane gas recovery. The Environmental Research Station consists of pilot scale aerobic and anaerobic biological wastewater treatment units, constructed wetlands, waste stabilization ponds, lysimeters for solid waste treatment, a hazardous wastewater treatment plant and ambient air monitoring station.

Among its major equipment include Gas Chromatograph; High Performance Liquid Chromatograph; Atomic Absorption Spectrometer; Total Organic Carbon Analyzer; Ion Chromatograph, Induced Couple Plasma, UV Spectrophotometer; Supercritical Fluid Extractor; Microwave Digestion System; Primus Thermal Cyclers; Universal Mutation Detection System; Microscope; Microbalance; Microcentrifuge.

18.3 Faculty and Research Staff

Full-time Faculty

AJIT P ANNACHHATRE

BTech, PhD, Indian Inst of Tech, Kanpur, India.

Professor (*Anaerobic Wastewater Treatment; Biofilm Processes; Environmental Biotechnology; Environmental Impact Assessment; Mathematical Modeling*)

CHONGRAK POLPRASERT

BEng, Chulalongkorn Univ, Thailand; MEng, AIT, Thailand; PhD, Univ of Washington, USA.

Professor (*Hazardous Waste Engineering; Resources Recovery; Sanitation*)

CHETTIYAPPAN VISVANATHAN

BTech, IIT, Madras, India; MEng, AIT, Thailand; PhD, Inst Natl Polytech, Toulouse, France. **Professor** (*Cleaner production; Industrial Environment Management; Membrane Technology for Water and Wastewater Treatment and, Solid Waste Management*)

NGUYEN THI KIM OANH

DipEng, Odessa Hydrometeorology Inst, Ukraine; MEng, DEng, AIT, Thailand. **Associate Professor** (*Air Pollution Engineering and Management, Transboundary pollution, Air Pollution and Climate Interaction, Environmental Monitoring and Modelling, Exposure Assessment, Integrated Industrial Environment Management*)

OLEG V SHIPIN

MSc, Univ of Saratov; PhD, Inst of Biochemistry and Physiology of Microorganisms, Moscow, Russia. **Associate Professor Anaerobic and Aerobic Wastewater Treatment; Environmental Impact Assessment** (*Biophysical Environment*); *Microbialbiotechnology (production of commercially important metabolites); Natural systems (ponds and wetlands) as Wastewater treatment systems; Microbial aspects of Environmental Engineering; Molecular Microbiology, Health Risk assessment and water -born pathogens)*

PREEDA PARKPIAN

BSc, Kasetsart Univ, Thailand; MSc, Mississippi State Univ; PhD, Texas A&M Univ, USA. **Associate Professor** (Ecotoxicology; Heavy Metals; Micronutrient Chemistry)

THAMMARAT KOOTATEP

BEng, Chiangmai Univ; MEng, DEng, AIT, Thailand. **Assistant Professor** (*Decentralized Waste and Wastewater Treatment Systems; Eco-engineering Technology for Waste and Wastewater Treatment and Management; Environmental Health and Sanitation*)

Visiting Faculty

NGUYEN CONG THANH

BSc, DSc, Laval Univ, Canada. **Visiting Professor** (*Environmental impact assessment; Industrial pollution control; Wastewater management; Water supply*)

SHINICHI OKAMOTO

BEng, MEng, DEng, Waseda Univ, Japan. **Visiting**

Professor (*Environmental Engineering*)

Research Staff

AUNG ZAW NAING LIN,

MSc **Research Associate** (*Actively involve in Asian Regional Research Programme on Environmental Technology Program (ARRPET) research activities*).

Chaiyaporn Imsapsangworn,

BSc **Laboratory Technician II** (*Manages chemical and lab preparation for laboratory courses; assist students in laboratory experimental work and experimental set-up; data collection and fieldwork assistance to students and research staff*)

DANUTAWAT TIPAYAROM,

MEng **Research Associate** (*manages researches on ambient air quality analysis especially agro-residue burning*)

EVELYN C. MARTEL

BSc. **Project Assistant** (*assisting in research and administrative work*)

HTIN AUNG KYAW

MCSE **Research Assistant** (*Project website and Computer trouble shooter.*)

JEANGER P. JUANGA

MEng. **Research Associate** (*Manages research projects, prepares technical reports and presentations*)

MAUNG TIN WIN

MEng Research. **Laboratory Supervisor** (*supervises instrumentation and data acquisition, calibration and maintenance of analytical instruments, assistant to senior laboratory supervisor for such as teaching, lab management, etc..*)

Narongkorn Waew-ngam

BTech (Mech) **Lab Technician I** (*assists students in laboratory experimental work and experimental set-up*)

ORATHAI KLUBBARAKOH

BSc **Laboratory Technician II** (*chemistry and environmental analysis for environmental samples*)

as

well as prepare for chemical and glassware for laboratory courses and research projects)

Panupong Boonyanun,

BSc **Laboratory Technician II** (*repair and maintenance of lab equipment and facilities; assists students i laboratory experimental work and experimental setup*)

PREM ANANTH ANIYARANGAN,

MEng **Research Associate** (*Manages research projects, prepares technical reports and presentations*)

RADHA ADHIKARI

MSc Research **Associate** (*Report writing and project management*)
SUKON HADSOL, MSc Research Associate (*Laboratory operating and sample analysis, report writing, project management and collaborating with research partners*)

RAQUEL P. PEDRAJAS

MEng Senior **Research Associate** (*Assists in project coordination, prepares project reports, prepares project budgets and manage project finances, assists in maintenance of project websites, organizes international workshops, a conference, training programs and seminars, prepares project brochures, posters, etc., assists formulation of research proposal, co-edits project newsletters, assists evaluation of reports from National Research Institutions involved in the project, performs other duties as assigned*)

SALAYA PHUNSIRI

MSc Senior **Laboratory Supervisor** (*administrative for Environmental Engineering Laboratory as well as supervise for experimental and research projects on water, wastewater, air pollution, and solid wastes analysis*)

SOMCHAI AREMSUM-ANG,

B. Sc. **Research Assistant** (*wastewater and soil analysis, field survey and data collection, testing and other laboratory sessions*)

SUPATTRA JIAWKOK,

MSc **Research associate** (*Manages research projects, prepares technical reports and presentations*)

SUSAN JACOB

BTech **Research Assistant**
(*Manage finance and assist the team in its regular activities*)

TENZIN NORBU

MSc Senior **Research Associate**
(*Project Coordination and Management, handling technical reports, networking with research partners*)

VO THI QUYNH TRUC

MSc **Research Associate** (*studying air pollution, effects of air pollution on human health, doing laboratory experiments, using models to analysing data*)

Walaiporn Siriratwatthana

B.S. **Research Assistant**
(*Laboratory operating and sample analysis, prepares technical reports and presentations, collaborating with research partners*)

WIJITTRA SANSUD

BSc **Laboratory Technician II**
(*manages laboratory chemical and equipment inventory; issue chemical and equipments for students; conduct water analysis; assist in organizing laboratory sessions*)

WORRARAT THIANSAHIT

MEng **Research Associate**
(*Manages researches on diesel particulate matter and other air pollutants analysis*)

18.4 Grants and Sponsored Research Completed in 2007

Aerosol Emission from Diesel-Powered Vehicles and Open Biomass Burning, and Effects on Air Quality and Climate

Duration: 1-Jul-6 - Jun-07

Project Investigator: Dr. Nguyen Thi Kim Oanh
Sponsor: University of Illinois at Urbana-Champaign

Total Contracted Amount (Baht) 245,560

AIT-UNU Workshop

Duration: 1-Mar-07-31-May-07

Project Investigator: Prof. Ajit P. Annachhatre
Sponsor: AIT Operation

Total Contracted Amount (Baht) 117,600

Annual Review Workshops under ARRPE II

Duration: 1-Jan-04 - 31-Dec-07

Project Investigator: Prof. Ajit P. Annachhatre
Sponsor: Sida

Total Contracted Amount (SEK) 1,765,445

Asian Institute of Technology - United Nations University (AIT-UNU) Brainstorming Workshop

Duration: Nov-06 - May -07

Project Investigator: Prof. Ajit P. Annachhatre
Sponsor: AIT

Total Contracted Amount (Baht) 117,600

Determination and Mitigation Measures of Pollution Controls in the Upper Gulf of Thailand (UPPER GOT)

Duration: 1-Mar-06 - 31-Jul-07

Project Investigator: Dr. Thammarat Koottatep
Sponsor: Pollution Control Department, Ministry of Natural Resources and Environment, Thailand

Total Contracted Amount (Baht) 1,664,064

Development of an International Long Distance Internet Based Masters Course on Environmental Technology and Management

Duration: Apr-03 - 31-May-07

Project Investigator: Prof. C. Visvanathan
Sponsor: Asia-Link; European Commission

Total Contracted Amount (Baht) 2,621,843

Enhancement of Natural Attenuation of Soil and Groundwater Polluted by Trichoroethylene(TCE)

Duration: 1-Sep-04-31-Dec-07

Project Investigator: Dr Preeda Parkpian
Sponsor: RTG Joint Research Project FY 2004

Total Contracted Amount (Baht) 1,000,000

Environmental Sanitation and Urban Agriculture

Duration: 25-Sep-02-31-Dec-07

Project Investigator: Dr. Thammarat Koottatep
Sponsor: Department of Water and Environmental Sanitation in Developing Countries (SANDEC), Switzerland

Total Contracted Amount (Baht) 9,892,240

Evaluation of Dispersion Coefficients of Sugar in a River Stream

Duration: 28-Jun-07-30-Oct-07

Project Investigator: Dr. Thammarat Koottatep
Sponsor: Pollution Control Department,

Ministry of Natural Resources and Environment, Thailand

Total Contracted Amount (Baht) 399,378

Health Effects of Traffic Air Pollution in Hanoi

Duration: 1-Apr-06 - 31-Oct-07

Project Investigator: Dr. Nguyen Thi Kim Oanh
Sponsor: CIDA (through the SEA-UEMA Project)

Total Contracted Amount (Baht) 345,150

Integrated Study on Treatment of Shrimp Aquaculture Wastewater Based on Membrane Bioreactor and Development of a Membrane Technology Curriculum

Duration: 1-Nov-05 to 31-Mar-07

Project Investigator: Prof. C. Visvanathan
Sponsor: Royal Thai Government

Total Contracted Amount (Baht) 1,000,000

MIRI-AIT Inventory Profiling

Duration: 1-Mar-07-31-Dec-07

Project Investigator: Prof C Visvanathan
Sponsor: Mitsubishi Research Institute

Total Contracted Amount (Baht) 888,600

Persistent Organic Pollutants (POPs) Workshop

Duration: 1-Jan-07-31-Dec-07

Project Investigator: Prof. Ajit P. Annachhatre
Sponsor: Sida

Total Contracted Amount (Baht) 2,655,934

Quality Assurance for the Curriculum and Course Materials for the Major Courses of Undergraduate Environmental Science (RUPP)

Duration: 1-Apr-03 - 31-Mar-07

Project Investigator: Dr. Thammarat Koottatep
Sponsor: Royal Danish Embassy

Total Contracted Amount (Baht) 2,297,400

Sai Noi Dumpsite Rehabilitation and Its Potential for Refuse Derived Fuel Recovery

Duration: 1-Jan-06 - 31-Aug-07

Project Investigator: Prof. C. Visvanathan
Sponsor: SEA-UEMA / CIDA Project

Total Contracted Amount (Baht) 395,650

SWOP Analysis of Eco-Industrial Clusters in Thailand, India and Vietnam

Duration: 1-Apr-06 - 30-Jun-07

Project Investigator: Prof. C. Visvanathan

Sponsor: Institute for Global Environmental Strategies, Japan
Total Contracted Amount (Baht) 918,197

Technical Training-Cum-Study Visits on Sustainable Sanitation Systems and Constructed Wetlands (UNICEF Training)

Duration: 15-May-06 - 30-Apr-07
Project Investigator: Dr. Thammarat Koottatep
Sponsor: UNICEF, Sri Lanka
Total Contracted Amount (Baht) 1,440,791.50

The Fourth International Symposium on Southeast Asian Water Environment

Duration: 16-May-06 - 31-Mar-07
Project Investigator: Prof. C. Visvanathan
Sponsor: The University of Tokyo, Japan
Total Contracted Amount (Baht) 311,875

WHO Collaborating Centre for Water Supply and Waste Disposal: International Symposium on Water Treatment, Research Projects and Training Programs in Health-related Environmental Engineering

Duration: 1-Jan-05 - 1-Dec-07
Project Investigator: Dr. Oleg Shipin
Sponsor: WHO Geneva
Total Contracted Amount (Baht) 1,236,609

Workshop on Asian Regional Programme on Persistent Organic Pollutants (ARRPOPs)

Duration: Aug-05 - Apr-07
Project Investigator: Prof. Ajit P. Annachatre
Sponsor: Sida
Total Contracted Amount (SEK) 530,000

18.5 On-going Grants and Sponsored Research

3R Knowledge Hub

Duration: 10-Oct-06 - 09-Oct-08
Project Investigator: Prof. C. Visvanathan
Sponsor: Asian Development Bank
Total Contracted Amount (Baht) 4,500,000

Annual Review Workshops under ARRPE II

Project Investigator: Prof Ajit P Annachatre
Total Contracted Amount (SEK) 1,765,445

Application of Constructed Wetlands for Wastewater

Treatment of Chulachomkiao Royal Military Academy

Duration: 1-May-07-30-Apr-08
Project Investigator: Prof Chongrak Polprasert; DrThammarat Koottatep
Sponsor: RTG Visiting Scholar
Total Contracted Amount (Baht) 1,000,000

Application of Electrochemical Process for Color Removal in Wastewater from Textile Industries in Thailand

Duration: 1-May-07-30-Apr-08
Project Investigator: DrThammarat Koottatep
Sponsor: RTG Visiting Scholar
Total Contracted Amount (Baht) 800,000

Application of Filtration Technologies for Piggery and Industrial Wastewater Treatment/Reuse and Resource Recovery under Tropical Conditions

Duration: 1-Nov-03 – 16-Apr-08
Project Investigator: Dr. Oleg Shipin
Sponsor: Kumoh National Institute of Technology, Korea, and Environmental Management Corporation, Incheon
Total Contracted Amount (Baht) 1,827,081

Asian Regional Research Programme on Environmental Technology Phase II (ARRPET Phase II)

Duration: 1-Jan-04 - 31-Dec-07
Project Investigator: Prof. Ajit Annachatre
Sponsor: Sida

ARRPET Coordination under ARRPE II

Coordinator: Prof Ajit P Annachatre
Total Contracted Amount (SEK) 1,799,947

Biowaste Reuse in Southeast Asian Cities

Duration: 30-Nov-06 - 31-Dec-08
Project Investigator: Dr. Thammarat Koottatep
Sponsor: European Commission (Asia Pro Eco Program)
Total Contracted Amount (Baht) 915,123.10

Capacity Strengthening on Hazardous Chemicals Management

Duration: 1-Jan-07-31-Dec-09
Project Investigator: Dr. Nguyen Thi Kim Oanh, Prof. Chongrak Polprasert
Sponsor: The Norwegian Ministry of Foreign

Affairs
Total Contracted Amount (Baht) 23,732,687

Development of Nanoparticle-based technologies for environmental purposes

Duration: 15-Jun-07-14-May-08
Project Investigator: Dr Oleg Shipin
Sponsor: Center of Excellence in Nanotechnology, NSTDA
Total Contracted Amount (Baht) 500,000

Eco-Industrial Clusters in Rural Urban Fringe Areas of China, Indonesia and Sri Lanka

Duration: 1-Dec-07-31-Jul-08
Project Investigator: Prof C Visvanathan
Sponsor: Institute for Global Environmental Strategies, Japan
Total Contracted Amount (Baht) 753,000

Effective Sanitation Systems through stakeholder involvement: A case study of fecal sludge management in Thailand

Duration: 1-Jul-07-30-Sep-08
Project Investigator: DrThammarat Koottatep
Sponsor: National Center for Competence in Research (NCCR), Switzerland
Total Contracted Amount (Baht) 1,350,000

Enhanced Urban Water Pollution Abatement Function of Bang Pu Nature Reserve through multiple approach

Duration: 1-Jul-07-30-Jun-08
Project Investigator: Dr Oleg Shipin
Sponsor: SEA-UEMA / CIDA Project
Total Contracted Amount (Baht) 636,400

Industrial and Hazardous Waste Treatment and Management Project

Duration: 1-Jan-04 to 30-Jun-08
Project Investigator: Prof. Ajit P. Annachatre
Collaborating Institutes: Agharkar Research Institute, India; Center for Pulp and Paper, Indonesia Universiti Kebangsaan Malaysia, Malaysia; De la Salle University, Manila, Philippines; University of Moratuwa, Sri Lanka
Sponsor: Sida

Inter Laboratory Comparison for Implementing Phase III of the Male Declaration

Duration: 1-Jun-07-30-Jun-08
Project Investigator: Dr Nguyen Thi Kim Oanh
Sponsor: UNEP RRC.AP

Total Contracted Amount (Baht) 516,000

Improving Air Quality in Asian Developing Countries project

Project Investigators: Dr Nguyen Thi Kim Oanh, Prof Chongrak Polprasert
Collaborating Institutes: Research Centre for Eco-Environmental Sciences, Chinese Academy of Sciences, University of Science and Technology of China, Beijing, China
Indian Institute of Technology, Madras, India
Institute of Technology of Bandung, Indonesia
Manila Observatory, Philippines
Hanoi University of Sciences, Vietnam
Total Contracted Amount (SEK) 7,589,944

Industrial and Hazardous Waste Treatment and Management project

Project Investigator: Prof Ajit P Annachhatre
Collaborating Institutes: Agharkar Research Institute, Indi
Center for Pulp and Paper, Indonesia
Universiti Kebangsaan Malaysia, Malaysia
De la Salle University, Manila, Philippines
University of Moratuwa, Sri Lanka
Total Contracted Amount (SEK) 7,764,006

Industrial Environmental Management at Thai

Duration: 1-Jul-07-31-Jul-08
Project Investigator: Prof C Visvanathan
Sponsor: Thai Ambrica Chemicals Co. Ltd
Total Contracted Amount (Baht) 575,000

Industrial Wastewater Reuse and Reclamation

Duration: 15-Jun-07-14-Jun-08
Project Investigator: Dr Oleg Shipin
Sponsor: Kumoh National Institute of Technology (KIT), Korea
Total Contracted Amount (Baht) 87,375

Investigation on the Impacts of Urban-Rural Air Pollution on Air Quality and Climate in Southeast Asia

Duration: 1-Dec-06-30-Dec-08
Project Investigator: Dr Nguyen Thi Kim Oanh
Sponsor: Asia Pacific Network (APN) for Global Change Research
Total Contracted Amount (Baht) 2,134,800

Low-Cost Treatment of Septage by Constructed Wetlands and Pond Systems in Tropical Regions

Duration: 1-Aug-96-31-Dec-08
Project Investigator: Dr Thammarat Koottatep
Sponsor: Swiss Federal Institute for Environmental Science and Technology

(SANDEC)
Total Contracted Amount (Baht) 6,993,981

National Center of Competence in Research North-South: WP3: Health and Environmental Sanitation

Duration: Sept-02 - Dec-09
Project Investigator: Dr. Thammarat Koottatep
Sponsor: EAWAG, Switzerland
Total Contracted Amount (Baht) 14,668,452.64

Phyto-Bioremediation for VOCs at Contaminated Site

Duration: 1-Nov-07-30-Apr-10
Project Investigator: Prof Chongrak Polprasert; Dr Preeda Parkpian
Sponsor: NEDO/ Shimizu Corporation Japan
Total Contracted Amount (Baht) 1,080,000

Sustainable Solid Waste Landfill Management in Asia project

Project Investigator: Prof C Visvanathan
Collaborating Institutes: Hanna University, Chennai, India
Kasetsart University, Thailand
University of Peradeniya, Sri Lanka
Tongji University, China
Total Contracted Amount (SEK) 5,751,479

Swedish Resource Persons under ARRPETII

Duration: 1-Jan-04 to 30-Jun-08
Project Investigator: Prof. Ajit P. Annachhatre
Sponsor: Sida
Total Contracted Amount (SEK) 681,000

Wastewater Reuse and Recycling for Industrial, Domestic and Agricultural sectors in Thailand

Duration: 25-Jun-07-01-Sep-08
Project Investigator: Dr Thammarat Koottatep
Sponsor: Pollution Control Department, Ministry of Natural Resources and Environment, Thailand
Total Contracted Amount (Baht) 3,799,763

Water Supply and Waste Disposal project of the WHO Collaborating Centre at AIT

Duration: 6-Jan-05-06-Oct-08
Project Investigator: Dr Oleg V Shipin, Preeda and Dr Parpikian (Co-PI)
Sponsor: World Health Organization(WHO)
Total Contracted Amount (Baht) 1,160,061

Wastewater Treatment and Management project

Investigator: Prof Ajit P Annachhatre
Collaborating Institutes: Indian Institute of Technology, Kanpur, India
Indian Institute of Technology, Bombay, India
Center for Environmental Technology and Management, Vanlang University, Vietnam
King Mongkut University of Technology Thonburi, Bangkok, Thailand
Total Contracted Amount (SEK) 6,648,179

18.6 Publications

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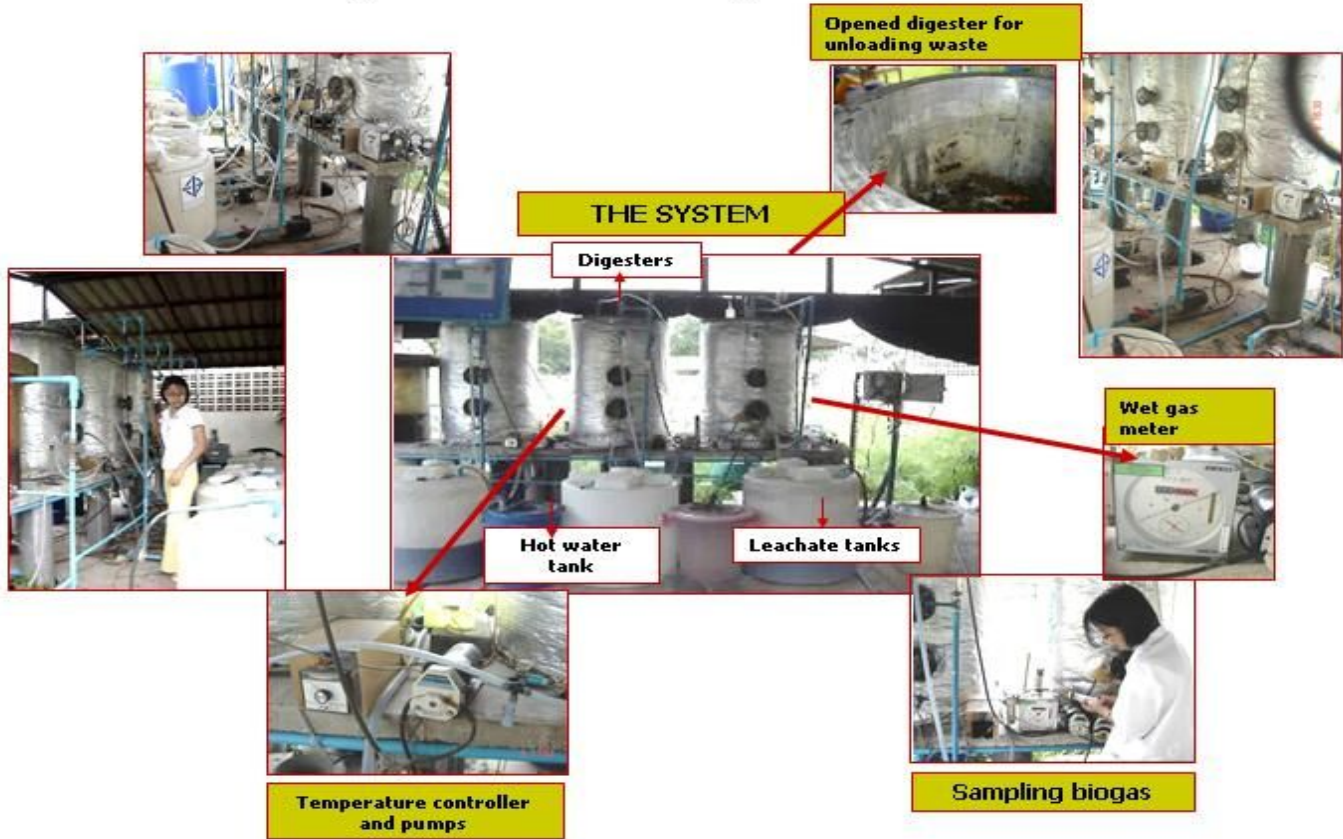
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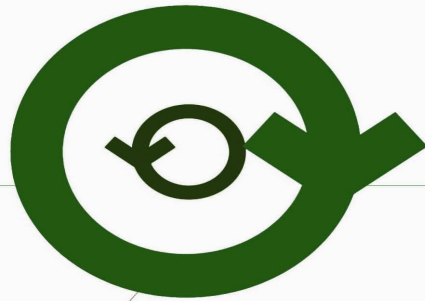
Anaerobic Dry Fermentation Experimental set up at AIT



Research carried out by AIT as part of *Sustainable Solid Waste Landfill Management* project under ARRPET



Phyto-Bioremediation for VOCs at Contaminated Site Project



3R in Asia

a gap analysis in selected
asian countries

3RKH
Reduce, Reuse, Recycle

Reduce Reuse Recycle



3R Knowledge Hub



AIT
ASIAN INSTITUTE OF TECHNOLOGY

supported by: in collaboration with:



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U., Martens, J., Sharif, L.A., Visvanathan, C. and W. Stepniewski, "Safe and Sustainable Management of Municipal Solid Waste in Khulna City of Bangladesh", Eleventh

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Khan, S.J., Visvanathan, C.,

Jegatheesan, V. and R. Ben Aim, "Influence of Mechanical Mixing Rates on Sludge Characteristics and Membrane Fouling in MBRs", *IWA International Conference on Particle Separation*, Toulouse, France, July 9-11, 2007.

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- Pentamwa, P. and N.T. Kim Oanh, "Levels of Persistent Organic Pollutants (POPs) in Homes in Bangkok Metropolitan Region, Thailand", Presented at the 12th International Conference of the Pacific Basin Consortium "Environment & Health In The 21st Century: Challenges & Solutions", Beijing, China, October 26-29, 2007.
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- Prem Ananth, A., Nishimiya, Hiroshi and C. Visvanathan, "3Rs of Waste Management: Reduce, Reuse, Recycle", International Conference on Waste to Wealth, Kuala Lumpur, Malaysia, November 26-28, 2007.
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Other Publications

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Visvanathan, C. and B.F.A. Basnayake, "Landfill Pretreatment for Tropical Asia", a joint report by University of Peradeniya and Asian Institute of Technology under Asian Regional Research Programme on Environmental Technology (phase II), Sustainable Landfill Management

in Asia,

Visvanathan, C., Joseph, K., Chiemchaisri, C., Basnayake, B.F.A. and Z. Gongming, "Asian Urban Waste Management Approaches What Where How.....", a report under Asian Regional Research Programme on Environmental Technology (phase II), Sustainable Landfill Management in Asia.

18.7 Doctoral Students' Dissertation

Membrane Fouling Studies in Suspended and Attached Growth Membrane Bioreactor Systems

By: Kwannate Sombatsompop
Supervisor: Prof. Chettiyappan Visvanathan

Anaerobic Co-Digestion of Sewage and Brewery Sludge

By: Athapol Pecharaply
Supervisor: Dr. Preeda Parkpian

Assessment of Metal Contents in a Water Reservoir of Northern Thailand

By: Vichayut Tupwongse
Supervisor: Dr. Jutamaad Satayavivad/Dr. Preeda Parkpian

Optimization of the Operating Parameters for Continuous Partial Nitrification Process

By: Banashri Sinha
Supervisor: Prof. Ajit Annachhatre

The Effects of Arsenic on Oxidative Stress Responses in Xanthomonas Campestris pv. Phaseoli

By: Karnjana Hrimpeng
Supervisor: Prof. Skorn Mongkolsuk/Dr. Preeda Parkpian

Zinc Removal from Industrial Discharge Using Thermophilic Biological Sulfate Reduction with Molasses as Electron Donor

By: Warounsak Liamleam
Supervisor: Prof. Ajit Annachhatre

18.8 Masters Students' Theses and Research Studies

Air Pollution Emission from Waste Co-Fueling Cement Kiln and Associated Effects on Ambient Air Quality

By: Nguyen Tri Quang Hung
Supervisor: Dr. Nguyen Thi Kim Oanh

Assessment of Dredging Influenced Sediment Toxicity of Endosulfan and Lindane using Black Tiger Shrimp (Penaeus monodon

- Fabricius) as an Animal Model in Chantaburi Estuary*
By: Jayakody Arachchige Sumith
Supervisor: Dr. Preeda Parkpian
- Comparison of Farming and Soil Quality Indicators for Prediction of Environmental Impact*
By: Chan Let Mon
Supervisor: Dr. Preeda Parkpian
- Comparative Valuation of Wetlands in Laos*
By: Nilinda Sourinphoumy
Supervisor: Dr. Oleg Shipin
- Enhancing Municipal Solid Wastes Management Systems with 3R Options in Thimphu, Bhutan*
By: Yeshey Penjor
Supervisor:
Prof. Chettiyappan Visvanathan
- Indoor Air Pollution in Vientiane City, Lao PDR in Relation to Fuel Used and Kitchen Design*
By: Bounyaseng Sengkhammy
Supervisor: Dr. Nguyen Thi Kim Oanh
- Potential of Refuse Derived Fuel Production from Bangkok Municipal Solid Waste*
By: Jidapa Nithikul
Supervisor: Prof. Chettiyappan Visvanathan
- Harshani Ayoma Basnayaka
Chromium Removal from Wastewater using Vertical Flow Constructed Wetlands with Low-Cost Bed Media
Dr. Thammarat Koottatep
- Panee Boonsiri
Wastewater Reduction in the Pharmaceutical Industry: The Effect of Temperature on Magnesium Hydroxide Paste Process
Dr. Thammarat Koottatep
- Phrompol Chantrasakdakul
Pilot Scale Investigations on Treatment of Wastewater from Surimi Processing Using Anammox Gas-Lift Reactor
Prof. Ajit Annachhatre
- Shamit Bringi Dev
Application of 3R Principles in Solid Waste Management in the Asian Institute of Technology (AIT) Campus
Prof. Chettiyappan Visvanathan
- Cao Dung Hai
Particulate Matter Air Pollution in Hanoi with a Focus on Source Apportionment Study by Receptor Modeling
Dr. Nguyen Thi Kim Oanh
- Nguyen Thai Hoa
Effects of Different Bed Media on Nitrogen Removal in Constructed Wetlands Treating Faecal Sludge
- Dr. Thammarat Koottatep
- Bal K.C.
An Integrated Model for Organic and Nutrient Removal by Duckweeds-Based Wastewater Treatment System (DUBWAT)
Prof. Chongrak Polprasert
- Manoj Pandharinath Kendre
Assessment of the Water Quality Management in Udon Thani City
Dr. Oleg Shipin
- Nguyen Ba Loc
Characterization and Management of Drilling Wastes from Oil and Gas Field: A Case Study of Tien Hai Field, Vietnam
Prof. Chongrak Polprasert
- Navaneethan Navaratnam
Anaerobic Digestion of Waste Activated Sludge with Ultrasonic Pretreatment
Prof. Chettiyappan Visvanathan
- Khim Nora
Assessment of Aeration and Leachate Recirculation in Open Cell Landfill Operation with Leachate Management Strategies
Prof. Chettiyappan Visvanathan
- Didin Agustian Permadi
Surface Ozone Air Quality in Jakarta: Current Status, Precursor Emission Inventory and Modeling Efforts
Dr. Nguyen Thi Kim Oanh
- Songkeart Phattarapattamawong
Wastewater Reuse and Recycle in an Acrylic Fiber Industry using Bioreactor Process
Prof. Ajit Annachhatre
- Nguyen Thu Phuong
Industrial Environment Management through Eco-industrial Network Formation: Case Study in Fisheries Industry in An Giang Province, Vietnam
Prof. Chettiyappan Visvanathan
- Shovana Pradhan
Nitrogen Removal Options and Underlying Processes in Piggery Wastewater Treatment
Dr. Oleg Shipin
- Pavinee Prasertchai
Application of Chlorella sp. and Chitosan for Au Recovery from Mine Tailing Wastewater
Prof. Chongrak Polprasert
- Dipok Chandra Sarker
Cumulative Effects Assessment in the Chao Phraya Estuarine Ecosystems
Dr. Oleg Shipin
- S.T.M.L.D. Senevirathna
- Co-Composting of Sludges from Septic Tanks and Kitchen Wastes by Vermi-Composting Process*
Dr. Thammarat Koottatep
- Nuttapol Tanadchangsang
Modeling of ANAMMOX Process under Nitrite Inhibitory Conditions
Prof. Ajit Annachhatre
- Phan Thai
Biological Sulfate Reduction in a Pilot Scale UASB Reactor under Thermophilic Condition
Prof. Ajit Annachhatre
- Nguyen Phuc Thanh
Assessment of Effect of Aniline on the Biological Nitrification Process using Fish Technique
Prof. Ajit Annachhatre
- Tran Minh Thao
Study of Bacterial Communities Underlying Treatment of High-Strength Organic Wastewater at Thermo- and Mesophilic Conditions
Dr. Oleg Shipin
- Zin Hnin Ei Tun
Fate of Cadmium and Zinc from Seawater Sediment and its Potential Risk
Dr. Preeda Parkpian
- Sawitree Vicheanpong
Bioaccumulation of Cadmium in Selected Aquatic Animals as an Indicator of Cadmium Pollution in the Inner Gulf of Thailand
Dr. Preeda Parkpian
- Chira Wongburana
Hydraulic Characteristics of a Full Scale Constructed Wetland System for Wastewater Treatment
Dr. Thammarat Koottatep
- Niranchana Authayanraksa
Opportunities and Barriers to an Agro Eco-Industrial Network in Chachoengsao Province
Prof. Chettiyappan Visvanathan
- Do Thi Thanh Canh
Diurnal Variation of Particulate Matter and their Contributory Sources in the Bangkok Metropolitan Region during the Dry Season
Dr. Nguyen Thi Kim Oanh
- Kunnika Changwichan
Removal of Fate of Bisphenol A in Constructed Wetland Systems
Prof. Chongrak Polprasert
- Chanokkamon Cheawtada
Enhanced Degradation of PCB by using Ozone and TiO₂
Prof. Chongrak Polprasert

Robert Dongol
Application of Molecular Technnique (FISH) to Detect the Occurrence of Pathogenic Indicator in Wastewater Treatment Systems
Prof. Chongrak Polprasert

Chea Eliyan
Anaerobic Digestion of Municipal Solid Waste in Thermophilic Continuous Operation
Prof. Chettiyappan Visvanathan

Indra Gurung
Application of Clean Development Mechanism (CDM) for Solid Waste Management in Developing Countries: A Case Study for Bangkok, Thailand
Prof. Chongrak Polprasert

Phyu Phyu Htwe
Optimization of Biological Sulfide Oxidation to Sulfur in Airlift Reactor
Prof. Ajit Annachatre

Bonduush Ichinkhorloo
Nanoparticle-Based Improvement of the FISH and Light Microscopy Techniques for Contrast Enhancement in Environmental Microbiology
Dr. Oleg Shipin

Angkhana Intharasawat
Assessment of Nitrogen in Sediments of Selected Agricultural Landuse
Dr. Thammarat Koottatep

Luna Keshari Kansakar
Roles of Bed Media in Arsenic Removal from the Sub-surface Flow Constructed Wetlands
Dr. Thammarat Koottatep

Sawanya Laohaprapanon
Development and Operation of Activated Sludge with Partial Nitrification Process Treating a Seafood Processing Wastewater
Prof. Ajit Annachatre

Hoang Anh Le
Integrated Monitoring - Modeling Tool to Develop Air Quality Management Strategies for A Brick Kiln Manufacturing Community in Vietnam
Dr. Nguyen Thi Kim Oanh

Monruedee Moonkhum
Aerobic Digestibility of Ultrasonic Pretreated Waste Activated Sludge
Prof. Chettiyappan Visvanathan

Sirikan Nawapan

Functional and Expression Analyses of Cop Operon Required for Copper Resistance in Agrobacterium Tumefaciens
Dr. Preeda Parkpian

Ilkhom A. Nazarov
Water Harvesting and its Potential in Central Asia: Conceptual Approach
Dr. Oleg Shipin

Zaw Ko Oo
Removal and Management of Zinc Containing Wastewater from Rayon Industry
Prof. Ajit Annachatre

Vanhxay Phiomanyvone
Persistent Organic Pesticides Contamination in Agricultural Soil and Remediation Potential Composting Technology in Vientiane, Lao P.D.R.
Dr. Preeda Parkpian

Diep Dinh Phong
Hydrogenotrophic Denitrification of Saline Aquaculture Wastewater using Hollow Fiber Membrane Bioreactor
Prof. Chettiyappan Visvanathan

Mahzabeen Rahman
Performance Evaluation of Pond Sand Filters in Rural Bangladesh
Dr. Oleg Shipin

Pasavi Ratchapongsirikul
Assessment of Occupational Exposure to Polycyclic Aromatic Hydrocarbons in Bangkok Airport Worker
Dr. Preeda Parkpian

Sawitree Sasirat
Potential Plant Species as Fluoride Hyperaccumulators
Dr. Preeda Parkpian

Kanokwan Saswattecha
Exhaust Control Devices for Diesel Vehicle Emission Reduction and Associated Effects on Air Quality and Climate: A Case Study for Bangkok
Dr. Nguyen Thi Kim Oanh

Kok Sothea
Emission Inventory and Modeling for Air Quality Management in Phnom Penh City, Cambodia
Dr. Nguyen Thi Kim Oanh

Benjawan Tawatsupa
Occurrence of Microbial Pathogens in Raw and Oxidation Pond-treated Wastewater
Dr. Oleg Shipin

Monta Thammasatta
Characterization of czcA, a Gene Involved in Heavy Metal Resistance in Acinetobacter sp. ADP1
Dr. Preeda Parkpian

Do Hoang Thao
Assessment of Microbiological Effectiveness and Cost of Treating Water in the Home by Boiling in a Rural Community in Bac Kan, Vietnam
Dr. Oleg Shipin

Vanhsumay Thongkhammeng
Evaluation of Water Pollution and Its Mitigation by Natural Wastewater Treatment Linked to Agriculture/Aquaculture and Conservation of Biodiversity in the That Luang Marshland (Laos)
Dr. Oleg Shipin

Nguyen Thi Minh Thu
Sustainable Solid Waste Management Practices: A Comparative Study of Bangkok City and Ho Chi Minh City
Prof. Chongrak Polprasert

Thai Phuong Vu
Penetration of Outdoor Air Pollutants into Indoor Environment in Vicinity of Main Road in Seoul, Korea
Dr. Nguyen Thi Kim Oanh

Chapter 19: SERD – FOOD ENGINEERING AND BIOPROCESS TECHNOLOGY FIELD OF STUDY

19.1 Introduction

This field of study is focused on the application of bioconversion in various sectors of industry and agriculture. These include food processing, aquaculture, environmental engineering, paper and textile manufacturing, cosmetics and health care. BPT focuses on the application of microorganism and enzymes to meet the demands of the developing countries of the region. FE focuses on the systems for handling, processing and storage of both durable and perishable food products in developing aof small-scale food processing technologies. Emphasis is also placed on the determination of material properties; design and development of new processes and related equipment; and computer modeling and simulation of postharvest and food processing operations.

19.2 Faculty and Research Staff

Full-time Faculty

ATHAPOL NOOMHORN

BSc, Kasetsart Univ, Thailand; MEng, Lamar Univ, Texas; PhD, Louisiana State Univ, USA. **Professor (Agro-Industrial Development Food Process Technology Post Harvest Technology)**

SUDIP KUMAR RAKSHIT

BSc, Loyola College; BTech, Jaavpur Univ, India; MTech, PhD, Indian Inst of Tech, India **Professor**

(Biochemical Engineering and Biotechnology; Biopolymers and Lipid Biotechnology; Fermentation and Enzyme Technology; Food Biotechnology; Functional Foods)

19.3 Grants and Sponsored Research Completed in 2007

Development of Rapid Methods for the Detection of Pathogens in Aquatic Food

Duration: 1-Feb-06 - 31-Dec-07
Project Investigator: Prof. Sudip K. Rakshit
Sponsor: Royal Thai Government (RTG)
Total Contracted Amount (Baht) 830,000

Estimation of Milling Yields for Paddy with High Moisture Content and High Filth Contamination

Duration: 1-Jan-07-31-Aug-07
Project Investigator: Prof Athapol Noomhorn
Sponsor: Department of Internal Trade, Ministry of Commerce, Royal Thai Government
Total Contracted Amount (Baht) : 650,000

Evaluation of milling yield of Thai rice in 2007

Duration: 1-Feb-07-30-Sep-07
Project Investigator: Prof Athapol Noomhorn
Sponsor: Department of Internal Trade, Ministry of Commerce, Royal Thai Government
Total Contracted Amount (Baht) 600,000

Regional Workshop on “Integrated Policies for Bio-Innovations in Agriculture and Health in Asia”

Duration: 1-Oct-06 - 01-Oct-07
Project Investigator: Prof. Sudip K. Rakshit
Sponsor: International Development Research Centre (IDRC) and the Rockefeller Foundation
Total Contracted Amount (Baht) 1,555,937

The Compilation of Technical and Business Information for GABA

rice, chitin/chitosan, bioplastic and organic agriculture

Duration: 1-May-07-30-Nov-07
Project Investigator: Prof Athapol Noomhorn
Sponsor: National Innovation Agency, Ministry of Science and Technology, Royal Thai Government
Total Contracted Amount (Baht) 200,000

Training Workshop on Food Safety Assessment of Agriculture-Related GMOs

Duration: 1-Sep-06 - 31-May-07
Project Investigator: Prof. Sudip K. Rakshit
Sponsor: AGRICO Co. Ltd/ Asian Development Bank Technical Assistance
Total Contracted Amount (Baht) 940,236

19.4 On-going Grants and Sponsored Research

AIT Support to National University (2007-2010)-Research

Duration: 1-Jun-07-31-Dec-10
Project Investigator: Prof Sudip Kumar Rakshit
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 3,252,400

Post harvest training course

Duration: 7-Dec-07-31-Dec-08
Project Investigator: Prof Athapol Noomhorn
Sponsor: The State Polytechnic of Jember, Indonesia
Total Contracted Amount (Baht) 168,000

19.5 Publications

Refereed Journals

Chutintrasri B and Noomhorm, A., “Color degradation kinetics of pineapple puree during thermal processing”, LWT-Food science and Technology, Volume 40, Issue 2, March 2007, Pages 300-306, 2007.

Homdok, R and Noomhorm, A., “Hydrothermal treatments of rice starch for improvements of rice noodle quality”, LWT-Food science and Technology, Volume 40, Issue 10, December 2007, Pages 1723-1731, 2007.

- Noomhorm, A., "Overview of dehydration method on quality of fruit and vegetable Srinakarinviroj University, Thailand" Science Journal. Vol. 23 No.1; Pg 9-22, 2007.
- Sirisontaralak P and Noomhorm, A., "Changes in physicochemical and sensory-properties of irradiated rice during storage", Journal of Stored Products Research 43 (2007) 282-289, 2007.
- Shimelis, A.E., and Rakshit, S. K. (2005). "Effect of processing on antinutrients and in vitro protein digestibility of kidney bean (*Phaseolus vulgaris* L.) varieties grown in East Africa". Food Chemistry, Elsevier Publisher. Volume 103, Issue 1, 2007, Pages 161-172.
- Suthasinee Nilsang, Kuty Selva Nanda Kumar, Igor Yu. Glaev, Sudip Kumar Rakshit, Rikard Holmdaht, Bo Mattiasson and Ashok Kumar. "Monoclonal Antibody Production Using a New Supermacroporous Cryogel Bioreactor", Biotechnology Progress, 23 (4), 932 -939, 2007
- Khantisophon Nittaya, Montet Didier, Loiseau Gérard, Rakshit Sudip, Stevens Willem, Ramesh Chandra Ray. "Formulation of nutritional cassava (*Manihot esculenta*/ Crantz) starch-based beverage. Acta Alimentaria, 36, (3) 355-364 (2007).
- Mahesha L. Nadugala, Rakshit, S.K. "The effect of DNaseI enzyme on food pathogens subjected to different food processing treatments. Journal of the National Science Foundation of S.Lanka, Vol.35 (3), 2007, Pages 67-173
- DNase treated DNA multiplex polymerase chain reaction assay for rapid detection of viable food borne pathogens L. Mahesha N. Sigera Nadugala and Sudip K. Rakshit, Journal of the National Science Foundation of S.Lanka, Vol.35 (4), 2007, Pages 225- 233
- F. Sharmin, S.K. Rakshit, and H.P.W. Jayasuriya. Enzyme Immobilization on Glass Surface for the Development of Phosphate Detection Biosensors. Manuscript FP 06 019. Vol. IX. April, 2007.
- Shimelis, A.E., and Rakshit, S. K. (2005). Effect of processing on antinutrients and in vitro protein digestibility of kidney bean (*Phaseolus vulgaris* L.) varieties grown in East Africa. Food Chemistry, Elsevier Publisher. Volume 103, Issue 1, 2007, Pages 161-172.
- "Monoclonal Antibody Production Using a New Supermacroporous Cryogel Bioreactor" Suthasinee Nilsang, Kuty Selva Nanda Kumar, Igor Yu. Glaev, Sudip Kumar Rakshit, Rikard Holmdaht, Bo Mattiasson and Ashok Kumar, Biotechnology Progress, 23 (4), 932 -939, 2007
- Production, purification and characterization of *Bacillus* sp. GRE7 xylanase and its application in eucalyptus Kraft pulp biobleaching". K. Jeyagowri, Alfredo J. Anceno and S.K.Rakshit accepted for publication in World Journal of Microbiology and Biotechnology, July 25th, 2007.
- Ultrasound Pretreatment of Cassava Chip Slurry to Enhance Sugar Release for Subsequent Ethanol Production. Saoharit Nitayavardhana, Sudip Kumar Rakshit, David Grewell, Anthony L. Pometto III, J. (Hans) van Leeuwen, and Samir K. Khanal, 2007
- Conference Proceedings**
- Noomhorm, A. and Soni, P., "What sustainability means for food export and agricultural value addition? Pathways to our common future", Proceedings of the Alliance for Global Sustainability, Annual meeting, Barcelona, Spain, March 18-21, 2007.
- Assawarachan, R. and Noomhorm, A., "Design and development laboratory scale microwave vacuum evaporator of juice concentrate", Paper presented at international workshop on Food Safety and processing technology, Non Lam University; Faculty of Food science and technology, Ho Chi Minh City, Vietnam, November 29-30, 2007,.
- Sripinyowanich, J. and Noomhorm, A., "Study on quality of Thai aromatic rice", Paper presented at international workshop on Food Safety and processing technology, Non Lam University; Faculty of Food science and technology, Ho Chi Minh City, Vietnam, November 29-30, 2007.
- 3rd International Forum of TIC21 (Internet and new technologies for the 21st Century) on Sustainable development and information technology held in Valenciennes, France from October 30 to 31st, 2007, Invited keynote lecture. Rakshit, S.K.
- Workshop on "Biosafety education in Asia", organized by the University of Tsukuba, Tsukuba, Japan from the October 31st to November 2nd, 2007. "Asian Biosafety Education Network" (ABEN), University of Tsukuba, Japan Rakshit, S.K.
- Other Publications**
- Noomhorm, A., Sirisontaralak, P., Inprasit, C. and Chuapan, K., "Evaluation of Thai rice milling yield for 2007", Research project report, submitted to Internal Trade Department, Ministry of Commerce, Thailand, (in Thai), September 2007.
- Noomhorm, A., Sirisontaralak, P., Inprasit, C. and Chuapan, K., "Evaluation of rice filth on Thai rice", Research project report, submitted to Internal Trade Department, Ministry of Commerce, Thailand, (in Thai), September 2007.
- Noomhorm, A, and Siripinyowanich, J., "Overview and setting up the website on different type of product for business information on chitin/chitosan, GABA rice, organic agriculture and biodegradable", Research report, submitted to National Innovation Agency (NIA), Bangkok, November 2007.
- Enzyme Immobilization on Glass Surface for the Development of Phosphate Detection Biosensors. F. Sharmin, S.K. Rakshit, and H.P.W. Jayasuriya. CGIAR e-journal Manuscript FP 06 019. Vol. IX. April, 2007.
- S.K.Rakshit, A bio-driven future, Opinion/Feature, The Nation, Sunday, July 15, 2007.
- S.K.Rakshit, Developing countries should set research goals, The Learning Post, Bangkok Post, August 29th, 2007
- 19.6 Doctoral Students' Dissertation**
- Controlled Processes of Drying, Storage and Hydrothermal Treatments for Improvement of Rice Starch Quality*
By: Rungarun Horndok
Supervisor: Prof. Athapol Noomhorm
- Development of a New Animal Cell Bioreactor for Monoclonal Antibody Production*
By: Suthasinee Nilsang
Supervisor: Prof. Sudip K. Rakshit
- Modeling Quality Changes during Roasting of Cashew Kernels*
By: Apinun Wanlapa
Supervisor: Prof. Athapol Noomhorm / Prof. Vinod K. Jindal
- 19.7 Masters Students' Theses and Research Studies**
- Natthaporn Jirakitkul
Microwave Vacuum Drying of Mulberry Leaves
Prof. Sudip K. Rakshit
- Chau Duy Khang
Studying Post-Harvest Technology in the Mekong Delta and Assessing Quality of Vietnamese Rice
Prof. Athapol Noomhorm
- Tunyanuch Uakaronchaikul
Effects of Drying Method on the Quality and Quercetin Content in Red Onions
Prof. Sudip K Rakshit
- Ladarat Baka
Effect of High Pressure Processing on the Quality of Rice Products

Prof. Athapol Noomhorm

Khishigjargal Batjantsan
The Effect of Probiotics on Food Pathogen E. coli O157:H7 during Fermentation and Storage of Home-made Yogurt
Prof. Sudip K. Rakshit

Saowalak Choodang
Growth Characterization and Control of Histamine-Forming Bacteria in Dried Anchovies of Southern Thailand
Prof. Sudip K. Rakshit

Arparat Huttasan
Electronic Nose for Discrimination of Thai Rice Wine
Prof. Athapol Noomhorm

Thippavong Khambang
Optimization of Formulation and Fermentation of Laotian Fermented Pork Sausage (Som Moo) using Different Starter Cultures
Prof. Sudip K. Rakshit

Saw Marlar
Bioconjugation of Monoclonal Antibodies to Chitosan Coated ZnS Quantum Dots for Detection of Listeria & Vibrio Species
Prof. Sudip K. Rakshit

Nantaprapa Nantiyakul
Biodiesel Production from Rice Bran Oil using Immobilized Lipase Biocatalyst
Prof. Athapol Noomhorm

Saoharit Nitayavardhana
Ultrasound Pretreatment of Cassava Chip Slurry to Enhance Sugar Release for Subsequent Ethanol Production
Prof. Sudip K. Rakshit

Prueksa Sawardsuk
Effect of Extrusion Condition on the Physicochemical Properties of Brown Rice and Soybean Snacks
Prof. Sudip K. Rakshit

Piyatida Tiangtham
Microwave-Assisted Extraction of Total Polyphenols from Mulberry Leaves
Prof. Athapol Noomhorm

Boualy Vongvisith
Bio-Ethanol Production by Simultaneous Cassava Starch Hydrolysis and Fermentation using Screened Microorganisms
Prof. Athapol Noomhorm

Onuma Wongsangam
Effect of Corn Germ and Rice Bran for Substitute Skim Milk Powder in Functional Ice Cream
Prof. Athapol Noomhorm

Chapter 20: SERD – GENDER AND DEVELOPMENT STUDIES

FIELD OF STUDY

20.1 Introduction

A small project, Women in Development was initiated in the Human Settlements Development Division at AIT in the late 1980s. This grew into the Gender and Development Studies unit in 1991, with financial support from CIDA, NORAD, the Dutch Development Cooperation and the Japanese Government.

Gender and Development Studies (GDS) is a center for graduate studies, research and outreach in the School of Environment, Resources and Development. Within the overall gender specific framework, GDS highlights both the need for specialized academic degree awarding studies in gender and development, and the integration of gender analysis and a gender relations perspectives in AIT's other fields of study.

20.2 Faculty and Research Staff

Full-time Faculty

BARBARA EARTH

BA, MS, University of Cincinnati; MA, PhD, Ohio University, USA. **Assistant Professor** (*Environmental/occupational health; Gender and health social science; Gender and human rights; Gender and Water; HIV/AIDS; Qualitative research; Social aspects of technology change.*)

BERNADETTE RESURRECCION,
BSc, Assumption College, Philippines; MA, PhD, Inst of Social Studies, the Hague, the Netherlands. **Assistant Professor** (*Gender, environment and natural resource management; Discourses and practices of gender mainstreaming; Participation and governance in natural resource management; Gender and migration in Asia; Policy processes in environment and development*)

KYOKO KUSAKABE

BA, Sophia University, Tokyo, Japan; MSc, PhD, AIT, Thailand. **Associate Professor** (*Women's employment under macroeconomic changes; Gender issues in trade and migration; Women and micro-vendors/ informal sector; Borderland studies, Gender issues in organizations, Gender and development policy and planning; Gender issues in fisheries/aquaculture.*)

PHILIPPE DONEYS

B.A., University of Toronto, Canada; MA, University of London, UK; PhD, Institut d'Etudes Politiques de Paris, France. **Assistant Professor** (*Gender, HIV/AIDS in Southeast Asia, Migration, Globalization, Gender, Politics and Civil Society*)

Visiting Faculty

MARI OSAWA

BA, MA, PhD, University of Tokyo, JAPAN **Professor**, Institute of Social Science, University of Tokyo, Japan and **co-editor** of the international refereed journal Gender, Technology and Development. (*Economic development, social policies and gender relations*)

YAYOI SUGIHASHI

BA, MA, Hosie University Graduate School, PhD University of Manchester, UK **Lecturer**, Ochanomizu University, Japan (*Gender and economic development; Gender statistics; and Gender issues in employment*)

Research Staff

JULAIKHA BENTE HOSSAIN

MSc in University of Dhaka, Bangladesh; MSc. in Asian Institute of Technology, Thailand; PhD Candidate, Asian Institute of Technology, Thailand. **Project Researcher**, Gender and Development Studies, AIT, Thailand (*Gender issues in Employment; organizational management; Migration; Gender, Development and Public Policy; Gender mainstreaming*)

KITTIMA LEERURUTTANAWISUT,

MS in Urban and Regional Planning, Chulalongkorn University, Thailand **Research Associate**, Gender and Development Studies, AIT, Thailand (*Research on Policy processes in Biotechnology and Bio safety measures in Shrimp Farming in Thailand under IDRC on Knowledge System*)

NAW EH MWEE

MSc. in Asian Institute of Technology, Thailand **Project Researcher**, Gender and Development Studies, AIT, Thailand (*Gender, Crossborder Migrant Workers and Citizenship: A case study of the Burmese-Thai border*)

SAN SITHILERTPRASIT

MSc. in Center of Development Studies, University of Wales, Swansea, UK. **Project Researcher**, Gender and Development Studies, AIT, Thailand (*Gender, Crossborder Migrant Workers and Citizenship: A case study of the Burmese-Thai border*)

20.3 Grants and Sponsored Research Completed in 2007

IDRC Publication on Gender and Natural Resource Management in Asia

Duration: 1-Feb-05-28-Feb-07
Project Investigator: Dr. Bernadette Resurreccion
Sponsor: IDRC
Total Contracted Amount (Baht) 372,520

Strengthening Gender Mainstreaming Capabilities in IFAD Projects in Lao, PDR

Duration: 26-May-04-31-Dec-07
Project Investigator: Kyoko Kusakabe
Sponsor: International Fund for Agricultural Development (IFAD), Asia Division
Total Contracted Amount (Baht) 3,780,000

The Impact of State Power in Ethnic Conflict Areas

Duration: 1-May-05-31-Jan-07
Project Investigator: Dr. Kyoko Kusakabe
Sponsor: OSI Development
Total Contracted Amount (Baht) 1,038,301

Training Workshop for the Students from Ochanomizu University, Japan

Duration: 2007
Project Investigator: Dr. Kyoko Kusakabe
Sponsor: Japanese Government
Total Contracted Amount (Baht) 1,050,000

Understanding Policy Processes in Biotechnology and Bio-safety Measures in Thailand & China

Duration: 1-Jul-05-31-Jul-07
Project Investigator: Dr. Bernadette Resurreccion; Dr Edsel Sajor
Sponsors: Research on Knowledge Systems, International Development Research Center; Rockefeller Foundation
Total Contracted Amount (Baht) 5,007,383

20.4 On-going Grants and Sponsored Research

Capacity Building for Gender, Poverty and Mobility Analysis of Road Transportation Development in the GMS Region

Duration: 1-Jan-08-01-Jul-10
Sponsor: ASEAN Foundation
Total Contracted Amount (Baht) 10,889,238

Gender, Cross Border Migrant Workers and Citizenship- A Case Study of the Burmese-Thai Border

Duration: 1-Nov-06-31-Oct-09
Project Investigator: Dr Kyoko Kusakabe
Sponsor: IDRC
Total Contracted Amount (Baht) 10,559,630

Gender and Sustainable Development: Natural Resource Management, Migration and Multi-local Livelihoods

Duration: 1-Dec-07-01-Aug-10
Project Investigator: Dr Bernadette Resurreccion
Sponsor: European Commission
Total Contracted Amount (Baht) 3,098,103

M-Power Research Fund

Duration: 1-Jan-07-31-Dec-09
Project Investigator: Dr Bernadette Resurreccion
Sponsor: Mekong Program on Water, Environment and Resilience (M-Power)
Total Contracted Amount (Baht) 732,600

Micro-vendors' Association Leadership in the Development of a solid waste management system in Daem Kor Market Phnom Penh: A process of documentation

Duration: 1-Aug-07-31-Jul-08
Project Investigator: Dr. Kyoko Kusakabe
Sponsor: SEA-UEMA / CIDA Project
Total Contracted Amount (Baht) 32,400

NORAD-Gender and Development

Studies 2006-2009

Duration: 1-Jan-06 - 31-Dec-09
Project Investigator: Dr. Bernadette Resurreccion
Sponsor: NORAD
Total Contracted Amount (Baht) 20,781,377

Post-Graduate Education: Gender and Social Analysis in Environment & Development

Duration: 1-Apr-05-31-Jul-08
Project Investigator: Dr. Bernadette Resurreccion
Sponsor: IDRC
Total Contracted Amount (Baht) 8,406,177

Research on Local Governance in Cambodia and India

Duration: 1-Dec-06-31-Jan-08
Project Investigator: Dr Kyoko Kusakabe
Sponsor: Ryukoku University
Total Contracted Amount (Baht) 311,725

Student Exchange Program from University of Dhaka, Bangladesh

Duration: 1-Mar-07-31-Dec-09
Project Investigator: Dr. Bernadette Resurreccion
Sponsor: University of Dhaka, Bangladesh
Total Contracted Amount (Baht) 173,150

20.5 Publications

Refereed Journals

Kusakabe, Kyoko, and Zin Mar Oo, "Relational places of Burman women migrants in the borderland town of Tachilek, Myanmar", *Singapore Journal of Tropical Geography*, Vol. 28, pp. 300-313, 2007.

Resurreccion, Bernadette, "Reproducing Gender. Female Rural-Urban Migration in the Red River Delta", *Population. Space and Place*, Vol. 13 No. 3, 2007.

Refereed Books/Chapters

Kusakabe, Kyoko, "Women agency workers after the economic crisis in Thailand: Social exclusion and erosion of workers' rights", *Globalization and Asian Women*, Ed. Chang Jiyeun, Korea Labour Institute, pp. 217-254 (in Korea), 2007.

Kusakabe, Kyoko, Md. Mozammel

Haque, and Rajani Rajbandari, "Gender situation in urban environment management in Southeast Asia", (Eds.), Urban Environmental management Application Project, AIT, Thailand, 2007.

Resurreccion, Bernadette, and Manorom, Kanokwan, "Democratizing Water Governance in the Mekong Region, Thailand", Gender, Eds. L. Lebel, J. Dore, Y.S. Koma, Silkworm Books, 2007.

Resurreccion, Bernadette and Sajor, Edsel 'Not a Real Worker': (Re)productions of Gender, Identity and Place in Technology-intensive Shrimp Farming, Thailand,' International Workshop on Female Labour Migration in Globalizing Asia, organized by the Asian Research Institute, National University of Singapore, Singapore, 13-14 September 2007.

Panel Convenor, 'Gender, Migration and Multi-local Livelihoods,' Gender, Human Security, Migration and Multi-local Livelihoods, organized by the Institute of Social Studies, the Hague, 29-30 August 2007.

Conference Proceedings

Kyoko Kusakabe, and Ruth Pearson, "Policy contradictions and women migrant workers: A case study of Burmese women workers in Thailand's border factories", Presented at the Workshop on Female labor Migration in Globalizing Asia: Translocal/Transnational identities and Agencies, National University of Singapore, Singapore, September 13-14, 2007.

Kyoko Kusakabe, and Ruth Pearson, "Globalization, gender and labor mobility: A case study of Burmese women workers in Thailand's border factories", Presented at IAFFE Annual Conference, Bangkok, Thailand, June 29 – July 1, 2007.

Kyoko Kusakabe, "Joint Degree Program for GMS Development Planning and Management", Presented at the Workshop on Formation of Research and Education Projects in the Greater Mekong Sub region, AIT, May 8,

2007.

Kyoko Kusakabe, and Ruth Pearson, "Building and International Collaboration on Research on Asian Women Workers", Presented at the LSSI Research Methods Seminars, International Research Approaches, University of Leeds, UK, April 19, 2007.

Nurunnaher and Kyoko Kusakabe, "Aquaculture extension approaches and women's improvement in decision making: Case study of Greater Noakhali Aquaculture Project", Presented at the Second Global Symposium on Gender and Fisheries, "8th Asian Fisheries Forum", Kochi, India, November 21-23, 2007.

Resurreccion, Bernadette and Sajor, Edsel, "Not a Real Worker": (Re) productions of Gender Identity and Place in Technology-intensive Shrimp Farming, Thailand," International Workshop on Female Labour Migration in Globalizing Asia, National University of Singapore, Singapore, September 13-14, 2007.

"Gender monitoring and evaluation." (Kyoko Kusakabe). Date: 28 February 2007/ Khampong Cham, Cambodia. Sponsored by: Ministry of Women's Affairs/ JICA.

"Migrant workers' workshop on locating ourselves in the economy and society." (Kyoko Kusakabe with University of Leeds) Date: 8 July 2007/ Mae Sot. Sponsored by: IDRC

Regional training of trainers on "Gender analysis in UEM in South east Asia." (Kyoko Kusakabe) Date: 13-15 November 2007/ Amari Don Muang Airport Hotel, Bangkok. Sponsored by: SEA-UEMA

Regional workshop on "Gender analysis toolkit for UEM in Southeast Asia." (Kyoko Kusakabe). Date: 29-30 January 2007/ Luang Prabang, Lao PDR. Sponsored by: SEA-UEMA

Second follow up workshop on "Formation of research and education projects in The Greater Mekong Sub region." (Kyoko Kusakabe, Dr. Weerakorn, Dr. Paul Janasek, Prof. Vilas).

Date: 10 August 2007/ Khon Kaen University, Thailand. Sponsored by: GMSARN/RTG

Third follow up workshop on "Formation of research and education projects in The Greater Mekong Sub region." (Kyoko Kusakabe, Dr. Weerakorn, Dr. Paul Janasek, Prof. Vilas). Date: October 18-19, 2007/ AIT. Sponsored by: GMSARN/RTG

"Workshop on analyzing linkages between migrant workers, commodity chains and regional development in Mae Sot." (Kyoko Kusakabe with University of Leeds) Date: 7 July 2007/ Mae Sot. Sponsored by: IDRC

Other Publications

Resurreccion, Bernadette, "Report on Impact pathways for Monitoring and Evaluation: Arguing for Social Embeddedness", Cali: Center for International Tropical Agricultural Research (CIAT), 2007.

Resurreccion, Bernadette, Hoe Sophea, and Phan Sothea, "Terminal Evaluation of the Cambodia Project on Expanding Employment Opportunities for (Rural) Women (EEOW)", ILO., Bangkok, 2007.

Kusakabe, Kyoko, and So Rothavy, "Guidelines on gender mainstreaming in LASED Project", Land Allocation for Social and Economic Development (LASED) Project in Cambodia, World Bank, June 2007.

Kusakabe, Kyoko, "Training Manual for Gender Mainstreaming Framework for LASED", Land Allocation for Social and Economic Development (LASED) Project in Cambodia, World Bank, June 2007.

20.6 Doctoral Student's Dissertation

Women Engineers in the Construction Industry: A Comparative Study in Bangladesh and Thailand

By: Julaikha Bente Hossain
Supervisor: Dr. Kyoko Kusakabe

*The Stereotypical Representative of
Femininity in Thai Newspapers*

By: Rattima Mukda-anan
Supervisor: Dr. Kyoko Kusakabe

*Social Relations and Female Farmers'
Participation in the Learning Activities of Two
Farmer Field Schools in Cambodia*

By: Yoshiko Ogawa
Supervisor: Dr. Kyoko Kusakabe

20.7 Masters Students' Theses and Research Studies

*Brick Child Labour at Imadole Suburb in
Kathmandu: A Gender Perspective*

By: Meena Baidya Panday
Supervisor: Dr. Bernadette P. Resurreccion

*Monitoring Gender Mainstreaming Process in
a Government Rural Development Project:
Case*

*Study of Rural Poverty Reduction Project in
Cambodia*

By: Sao Chenda
Supervisor: Dr. Kyoko Kusakabe

*Power and Vulnerability: Masculinity and HIV
in Phnom Penh*

By: Anders Julin
Supervisor: Dr. Philippe Doney

*Women's Career Development in the Judicial
Institutions of Mongolia*

By: Ariunaa Jamsran
Supervisor: Dr. Kyoko Kusakabe

*Women's Land Rights and Effects on their
Social Status in Nagaland, India*

By: Chozhule Kikhi
Supervisor: Dr. Bernadette P. Resurreccion

*Gender and Land Use Planning in
Agroforestry Farm Households: A Case Study
in Bogra District, Bangladesh*

Dr. Bernadette P. Resurreccion

Nisbat Ahsan

*Women Garment Workers in Dhaka: Life after
Losing the Job*

Dr. Barbara Earth

Nguyen Thi Ngoc Anh

*Examining Popular Notions on Women's
Participation in Political Life in Vietnam*

Dr. Bernadette P. Resurreccion

Masooma Butt

*Resistance to the Construction of Kalabagh
Dam on Pakistan's Indus River: A Gender
Perspective*

Dr. Bernadette P. Resurreccion

Sun Dajiang

*Upland Women's Land Rights and
Livelihoods: A Case Study of Yunnan Province
in China*

Dr. Bernadette P. Resurreccion

Manju Giri

*Assessment of Women's Empowerment
through Participation in Environmental
Conservation and Micro Finance: A Case
Study of Phobjikha Conservation Area, Bhutan*

Dr. Bernadette P. Resurreccion

Nguyen Thi Thanh Ha

*The Implications of Vietnam's Joint-Land Title
Policy on Women and their Empowerment*

Dr. Bernadette P. Resurreccion

Murshida Khanam

*Gendered Challenges of Women Street
Vendors in Dhaka City*

Dr. Kyoko Kusakabe

Deborah Ling

*Burmese Migrant Workers' Access to Health
Care Services in Thailand*

Dr. Kyoko Kusakabe

Alyaphone Manivanh

*Gender - Specific Changes in Shifting
Cultivation on Upland Livelihood: Case Study
in Houaymor Village, VangVieng District,
Vientiane*

Dr. Barbara Earth

Nisha Onta

*Reproduction of Newar Identity in the Lives of
Young Newar Women, Kathmandu Nepal*

Dr. Bernadette P. Resurreccion

Rinzi Pem

*Women's Leadership at Gewog Level in
Bhutan: A Case Study in Shengana Gewog,
Punakha District*

Dr. Kyoko Kusakabe

Wanwichanee Sritha

*Gender and Farm Management, Technology-
Intensive Shrimp Farming in Surattani
Province, Thailand*

Dr. Bernadette P. Resurreccion

Sophorn Tous

*How are Remittances Used?: Families of
Migrant Women Garment Workers in
Kompong Speu Province, Cambodia*

Dr. Kyoko Kusakabe

Var Vannaksereyaksmeay

*Gender Differentiated Issues in Balancing
Work and Education for Working Children in
the Context of the Tourism Boom: A Case
Study of the Angkor Park in Siem Reap,
Cambodia*

Dr. Kyoko Kusakabe

Kang Virya

*Women Small Scale Entrepreneurs in Phnom
Penh, Cambodia*

Dr. Kyoko Kusakabe

Manithong Vonglokhom

*Gender and Health Behaviour in Malaria
Prevention and Treatment: Rural
Savannakhet, Lao PDR*

Dr. Barbara Earth

Punam Kumari Yadav

*Gender Dimension of Conflict-Induced Internal
Displacement in Nepal*

Dr. Kyoko Kusakabe

Tashi Yangzom

*Gender Perspective in Community-based
Natural Resource Management in Punakha
District, Bhutan*

Dr. Kyoko Kusakabe

Chapter 21: SERD – NATURAL RESOURCES MANAGEMENT

FIELD OF STUDY

21.1 Introduction

This field of study emphasizes natural resources, including land, forest and wild animal, and environmental conservation concerns. It addresses the problems of deforestation, land and coastal ecosystem degradation, biodiversity depletion, diminishing water supply, and other environmental pressures and threats on local, national, regional and global ecosystems.

21.2 Faculty and Research Staff

Full-time Faculty

DIETRICH SCHMIDT-VOGT
BSc, Freiburg University, Germany; MSc, University of Saskatoon, Canada; PhD, Heidelberg University, Germany. **Associate Professor** (*Landscape Ecology; Integrated Land Use Systems; Sustainable Forest Management; and Human Impact on Vegetation*)

EDWARD L WEBB, BA, Occidental College, Los Angeles; PhD, Univ of Miami, USA.
Associate Professor (*Tropical Forest Ecology; Community-based natural resources management, and Forestry*)

GANESH P SHIVAKOTI, BS, MS, Udaipur Univ, India; PhD, Michigan State Univ, USA.
Associate Professor (*Natural Resources Economics; Common Property Resources; NRM*)

Policy Analysis; and Watershed Management)

RAJENDRA P SHRESTHA, BSc, Haryana Agri. Univ, India; MSc, DTechSc, AIT, Thailand. **Assistant Professor** (*Sustainable Land Management; Natural Resources Degradation and Environmental indicators; GIS/ RS applications and Geoinformation for Decision making*)

Visiting Faculty

AMBIKA PRASAD GAUTAM, MSc, PhD, AIT, Thailand. **Visiting Lecturer** (*Integrated Use of Biological; RS/GIS Technologies; Social Research Methods*)

21.3 Grants and Sponsored Research Completed in 2007

AIT Support to National University, Laos

Duration: 1-Sep-06 - 30-Jun-07
Project Investigator: Dr. Dietrich Schmidt-Vogt
Sponsor: SIDA-Swedish Research Council
Total Contracted Amount (Baht) 2,012,000

Development, Land Use and Forest Conservation in Thua Thien Hue Province, Vietnam

Duration: 1-Apr-03-31-Dec-07
Project Investigator: Dr Edward L. Webb
Sponsor: MacArthur Foundation, USA
Total Contracted Amount (Baht) 9,358,900

International Forestry Resources and Institutions Training

Duration: 1-May-07-31-Dec-07
Project Investigator: Prof Ganesh Shivakoti; Dr Edward Webb
Sponsor: Michigan State University, USA and Indiana University

Total Contracted Amount (Baht) 199,500

Regional workshop on sustainable land management

Duration: 1-Oct-06 - 30-Apr-07
Project Investigator: Dr. Rajendra P. Shrestha
Sponsor: United Nations Office for Project Services
Total Contracted Amount (Baht) 1,228,910

21.4 On-going Grants and Sponsored Research

AIT Support to National University (2007-2010)-Curriculum Development

Duration: 1-May-07-31-Dec-10
Project Investigator: Dr Dietrich Schmidt-Vogt and Dr N. Mithulanathan
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 3,285,600

AIT Support to National University (2007-2010)-Financial Management

Duration: 1-Jun-07-31-Dec-10
Project Investigator: Dr Dietrich Schmidt-Vogt
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 998,000

Applying Traditional Knowledge on Forest Management in Tropical Forest Restoration

Duration: 25-Apr-07-24-Apr-08
Project Investigator: Dr Dietrich Schmidt-Vogt
Sponsor: RTG Visiting Scholar
Total Contracted Amount (Baht) 900,000

Collaboration in Integrated Natural Resources Management in Indonesia "Decentralization, Local People, Gender and Resources"

Duration: 1-Aug-05-31-Dec-09
Project Investigator: Prof Ganesh Shivakoti
Sponsor: The Ford Foundation
Total Contracted Amount (Baht) 984,000

Creation of a Dedicated Website at AIT for SLM Support for GSU Portfolio project Implementation

Duration: 23-Jul-07-30-Jun-08
Project Investigator: Dr Rajendra Shrestha
Sponsor: UNDP-GEF
Total Contracted Amount (Baht) 200,880

Development, Land Use and Forest Conservation in Thua Thien Hue Province, Vietnam

Duration: 1-Apr-03-31-Dec-09
Project Investigator: Dr Edward L. Webb
Sponsor: MacArthur Foundation, USA
Total Contracted Amount (Baht) 9,358,900

Land Degradation in Afghanistan

Duration: 1-Jun-07-31-Mar-08
Project Investigator: Dr Rajendra Shrestha
Sponsor: UNEP ROAP
Total Contracted Amount (Baht) 68,760

MSU-Study Abroad VI

Duration: 1-Jan-07-5-Apr-08
Project Investigator: Prof Ganesh P. Shivakoti
Sponsor: Michigan State University, USA
Total Contracted Amount (Baht) 946,359

21.5 Publications

Refereed Journals

Gnanavelrajah, N., Shrestha, R., Schmidt-Vogt, D., Samarakoon, L., "Carbon stock assessment and soil carbon management in agricultural land uses in Thailand", *Land Degradation and Development*, 18, pp. 1-15, 2007.

Heinimann, A., Messerli, P., Schmidt Vogt, D., Wiesmann, U., "The dynamics of secondary forest landscapes in the Lower Mekong Basin: a regional scale analysis", *Mountain Research and Development*, 27 (3), pp. 232-241, 2007.

Jiang, Y., M. Kang, D. Schmidt-Vogt and R.P. Shrestha, "Identification of Agricultural Factors for Improving Sustainable Land Resource Management in Northern Thailand: A Casestudy in Chiangmai Province", *Sustainable Development and World Ecology*, 14, 382-290, 2007.

Lasut, Markus, K. R. Jensen and Ganesh Shivakoti, "Analysis of constraints and potentials for wastewater management in the coastal city of Manado, North Sulawesi, Indonesia", *Environmental*

Management, (in press), 2007.

Perret, S. & Geysler, M., "The full financial costs of irrigation services: a discussion on existing guidelines and implications for smallholder irrigation in South Africa", *Water SA*, 33(1): 67-78, 2007.

Rohlini, H., R.S. Clemente, J.K. Routray, and R.P. Shrestha, "Integration of Biophysical and Socioeconomic factors to Assess Soil Erosion Hazard in the Upper Kaligarang Watershed, Indonesia", *Land Degradation and Development*, 18, 453-469, 2007

Saengsupavanich, Cherdvong, U. Seenprachawong, W.G. Gallardo and G. Shivakoti, "Port-induced erosion prediction and valuation of a local recreational beach", *Ecological Economics*, (in press), 2007.

Thiha, Webb, E.L. and Honda, K., "Biophysical and policy drivers of landscape change in a central Vietnamese district", *Environmental Conservation*, 34(2): 164-172, 2007.

Tipraqsa, P., Craswell, E.T., Noble, A.D., Schmidt-Vogt, D., "Resource integration for multiple benefits: multifunctionality of integrated farming systems in Northeast Thailand", *Agricultural Systems*, 94, pp. 694-703, 2007.

Viswanathan, P.K. and Ganesh P. Shivakoti, "Conceptualising Sustainable Farm-livelihood Systems in the Era of Globalisation: A study of Rubber Integrated Farm Livelihood Systems in North East India", *Social Change and Development*, 5:111-142, 2007.

Wannasai, N. and Shrestha, R.P., "Determinants of rural land use change in Prasae watershed, Thailand", *Asia-Pacific Journal of Rural Development*, 17(2)30-39, 2007.

Wong, T., Delang, C.,O., Schmidt Vogt, D., "What is a forest? Competing meanings and the politics of forest classification in Thung Yai Naresuan Wildlife Sanctuary, Thailand", *Geoforum*, 38, pp. 643-654, 2007.

Yonariza and Webb, E.L.,

"Rural household participation in illegal timber felling in a protected area of West Sumatra, Indonesia", *Environmental Conservation*, 34(1): 73-82,2007.

Refereed Books/Chapters

Schmidt-Vogt, D., "Relict emergents in swidden fallows of the Lawa in North Thailand", *Voices from the forest: integrating indigenous knowledge into sustainable farming*, Ed. Cairns, M., Washington, RFF Press, pp. 38-54, 2007.

Schmidt-Vogt, D., "Matthias Schmidt: Boden- und Wasserrecht in Shigar, Baltistan: autochthone Institutionen der Ressourcennutzung im Zentralen Karakorum. *Bonner Geographische Abhandlungen* 112. Sankt Augustin 2004", *Internationales Asienforum (International Quarterly for Asian Studies)*, 38 (3-4), pp. 418-419, 2007.

Schmidt-Vogt, D., "Reiner Buergin: Umweltverhaeltnisse jenseits von Tradition und Moderne. Die Karen im Thung Yai Naresuan Weltnaturerbe im Spannungsfeld nationaler Modernisierung und globaler Umweltdiskurse, *Stuttgart 2004*", *Erdkunde*, 61 (2), 2007.

Shivakoti, Ganesh P., "Coping with Policy, Institutions, and Governance Challenges of Water Resources Issues with Special Reference to Irrigation in Nepal", *Natural Resources Security in South Asia: Nepal's Water*, Eds. Rotberg, F. and Ashok Swain, Stockholm-Naka: Institute for Security and Development Policy, pp. 111-139, 2007.

Webb, E.L., and Shivakoti, G.P., "Decentralization, forests and rural communities: policy outcomes in South and Southeast Asia", (Eds.), Sage Press, India, 2007.

Conference Proceedings

Gnanavelrajah, N. and R.P. Shrestha, "Assessing Plant Diversity in Cultivated Landscape: A case of Khlong Yai Sub-watershed, Thailand", 2nd GMSARN

International Conference, Pattaya, Thailand, December 12-14, 2007.

- Pensuk, A. and R.P. Shrestha,
"Effect of land use change on rural livelihoods: A case study of Phattalung watershed, Thailand", 2nd GMSARN International Conference, Pattaya, Thailand, December 12-14, 2007.
- Shrestha, R.P., Gnanavelrajah, N. and L. Samarakoon, "A watershed-scale assessment of present and future Carbon stock: GIS application in Khlong Yai watershed of Thailand", 28th Asian Conference on Remote Sensing, Kuala Lumpur, Malaysia, November 12-16, 2007.

Other Publications

- Crawford, B., R.P. Shrestha, T. Tingsanchali, V. Nitivattananon and D. Bengen, "An assessment of capacity for effective coastal management: Indonesia country assessment", Research report, submitted to IUCN, Thailand, September 2007.
- Shrestha, R.P., "Land degradation in Afghanistan", A chapter, prepared for the State of the Environment of Afghanistan, June 2007.
- Perret, S., "Agriculture et développement durable: approches historiques", Module introductif 'Institutions, acteurs, sociétés et territoires', Ensemble numérique en Sciences de l'Environnement et du Développement Durable de l'Université Virtuelle Environnement et Développement Durable (UVED). <http://www.uved.fr/index.php?id=299>, 2007.
- Perret, S., Kotze, DI, Lorentz, S., Ridell, E. & Ellery, W., "Investigating an assessment of capacity for effective coastal management: Indonesia country assessment", Research report, submitted to IUCN, Thailand, September 2007.
- Pollard, S., Perret, S., Kotze, D., Lorentz, S., Ridell, E. & Ellery, W., "Investigating interactions between biophysical functioning, usage patterns, and livelihoods in a wetland agro-ecosystem of the Sand River Catchment through dynamic modeling", Final research report, submitted to Challenge

Programme Water & Food, Wetland project, Award and Iwmi publ., Pretoria, South Africa, 52p, 2007

21.6 Doctoral Students' Dissertation

- Biodiversity Conservation in Nepal: An Appraisal of National Policies and Local Practices under Community Forestry*
By: Sarba Raj Khadka
Supervisor: Dr. Dietrich Schmidt-Vogt
- Protected Area and Local Livelihood: A Study of People-Forest Interaction in Barisan I Nature Reserve West Sumatra - Indonesia*
By: Yonariza
Supervisor: Prof. Ganesh Shivakoti
- Biology and Management of Homegardens in Southwestern Bangladesh*
By: Md. Enamul Kabir
Supervisor: Dr. Edward L. Webb
- Sustainable Land-use Options for Enhancing Carbon Sequestration, Plant Diversity and Productivity: A Case of Khlong Yai Subwatershed, Thailand*
By: Nalina Gnanavelrajah
Supervisor: Dr. Rajendra Shrestha

What Drives Land Use/Cover Change? Some Evidence from a Remote Central Vietnamese District
By: Thiha
Supervisor: Dr. Edward L. Webb

21.7 Masters Students' Theses and Research Studies

- Tanzeem Ali
Users' Perceptions of a Privatized Water Supply System: A Comparative Case Study in Dhaka, Bangladesh
Prof. Ganesh P. Shivakoti
- Pongsai Chansri
Fish Production and Management Performance of Trap Ponds in the Tung Kula Ronghai Area, Surin Province, Thailand
Dr. Dietrich Schmidt-Vogt
- Dao Thi Chau Ha
Natural Regeneration and Tree Species Composition of a Selected Forest Association in Cuc Phuong National Park, Vietnam
Dr. Dietrich Schmidt-Vogt

Bounmai Kounvesai

Biodiversity Inventory Rice-Fields: Case Study in BoungVha Village, Kaisonm Phomviha District, Savannakhet Province, Lao PDR
Dr. Dietrich Schmidt-Vogt

Phurba Lhendup
Black-necked Cranes in Bhutan: Migration Routes, Threats and Conservation Prospects
Dr. Edward L. Webb

Bae Pheaxay
Existing Utilization and Income Contribution from Ratan, Cardamom and Aromatic spices of Local Villagers in Feuang District, Vientiane Province, Lao PDR
Prof. Ganesh P. Shivakoti

Long Qingsong
Assessment of "Grain for Green" Program in Ethnic Poor Areas in China
Prof. Ganesh P. Shivakoti

Hoang Thi Hong Que
*Conservation of *Baccaurea sylvensis* and *Scaphium lychnophorum* Tree Species: Monitoring and Propagation in Nam Dong District, Thua Thien Hue Province, Vietnam*
Dr. Edward L. Webb

Rujee Rodcha
Land Evaluation in an Agricultural Land Reform Area using Geographical Information System : A Case Study in Pluak Daeng District, Rayong Province, Thailand
Dr. Rajendra Prasad Shrestha

Rutchakon Sedthachatanan
Marine and Coastal Resource Management Related Tourism, and Perception on Marine and Coastal Resource Conservation at Koh Tao, Suratthani Province, Thailand
Prof. Ganesh P. Shivakoti

Ubonwan Sintopan
Public Participation GIS for Community Forest Management in Li Watershed, Lamphun Province, Northern Thailand
Dr. Rajendra Prasad Shrestha

Salai Cung Lian Thawng
Forest Condition Change and Local Livelihoods in Post Armed Conflict Area: A Case Study of Manwin Village in Kachin State, Northern Myanmar
Dr. Dietrich Schmidt-Vogt

Ha Van Tiep
Prospects for Cultivation of Two Key Non-Timber Forest Product Species in Nam Dong District, Vietnam
Dr. Edward L. Webb

Luo Zhitie
A Traditional Integrated Land Use System of Yi In The Cool, Mountainous and High Altitude

*Areas: A Case Study in Liangshan Yi
Prefecture, Ichuan Province, PR China*
Dr. Dietrich Schmidt-Vogt

*Environmental Conservation Policy in Bhutan:
Impacts and Implication on Rural Livelihood &
Natural Resources*
By: Thinley Gyamtsho
Supervisor: Prof. Ganesh P. Shivakoti

*Management of Non-timber Forest Products
(NTEPs) for Rural Livelihood: A Case Study in
Phonxay District, LuangPrabang Province,
Lao PDR*
By: Dalivanh Samontry
Supervisor: Dr. Dietrich Schmidt-Vogt

*The Contribution of Wild Aquatic Resources
for Community Livelihood in Kandieng District,
Pursat Province, Cambodia*
By: Say Tom
Supervisor: Prof. Ganesh P. Shivakoti

*"Tragedy in Common" or "Mutual Success":
Assessment of Community-Based Forest
Management in Western Thailand*
By: Galli Demis
Supervisor: Dr. Edward L. Webb

Chapter 22: SERD – PULP AND PAPER TECHNOLOGY

FIELD OF STUDY

22.1 Introduction

This field of study strives for finding basic solutions for the immediate technical problems facing the local pulp and paper industry. Research activities in PPT are focused on optimising pulping, bleaching and papermaking processes with emphasis on the reduction of their negative impact on environment. The quality of the product is also emphasized to maintain competitive edge of local pulp and paper industry in the global market. Modification of existing processes to suit local raw material is another challenging area of research.

22.2 Research Facilities and Laboratories

The Pulp and Paper Laboratory was established to provide the need for research and high level education for this specific field. The laboratory is equipped with all basic facilities for teaching and research purposes in the field of pulp and paper technology. Several sophisticated equipment have been constantly furnished to extend the services for advance research and special studies likewise. The facilities are provided for activities in pulping paper testing, printing and coating, as well as for wood component analysis. The equipment is standardized according to ISO, TAPPI, and Scandinavian Standards. The programmable six-vessel autoclave digester makes cooking study in research level possible in the most convenient setting. Other major equipment in Pulp and Paper Laboratory include the single batch

digester, bleaching reactor, sheet formers, fiber length analyzer, formation tester, deinking flotation cell, and spectrophotometer with ERIC option. In addition to provide assistance and research facilities needs for students, faculty, the laboratory also provides professional services for pulp and paper industry internationally. Among its major equipment include a 6-bomb autoclaved digester, CRS Engineering; Bleaching reactor; PFI mill; Fiber length analyzer FS-200, Kajaani; Spectrophotometer with ERIC option, Technidyne; and a Beta formation tester, Ambetec.

22.3 Faculty and Research Staff

Full-time Faculty

HEIKKI E K KOLEHMAINEN
MSc, Helsinki Univ of Tech,
Finland.

Instructor

MOUSA M NAZHAD
BSc, Univ of Tehran, Iran;
MSc, Univ of Concordia,
Montreal; PhD, Univ of
British Columbia, Vancouver,
Canada. **Associate
Professor** (*Fiber structure;
Stock preparation;
Papermaking; Pulp
processing; Recycling*)
*[Formation or fines
influence on paper
properties; Upgrading of
secondary fibers; Refining
compared with surface
treatment of fibers;*

*Papermaking quality of
frayed fibers)*

RAIMO O MALINEN
, MSc, LicTech, DTech,
Helsinki Univ. of Tech.,
Finland. **Associate
Professor** (*Wood and Fibre
Chemistry in general;
Pulping Technology; Fibre
Technology; the use of
different fibre raw materials
in pulping papermaking;
Environmental Technology;
Project Management, Basic
Engineering and Feasibility
Studies*)

Visiting Faculty

AKI VILPPONEN
Visiting Lecture

ESA KALEVI LEHTINEN
MSc, Lic Sc, Helsinki Univ of
Technology, Finland **Visiting
Lecturer**

22.4 Grants and Sponsored Research Completed in 2007

Hercules US Study

Duration: 15-Jul-06 - 14-Jul-07
Project Investigator: Dr. Raimo Malinen
Sponsor: Hercules Incorporated, USA
Total Contracted Amount (Baht) 1,140,000

22.5 Publications

Refereed Journals

Erik Rusdi Sutjipto, Kecheng Li,
Saisanee Pongpattanasuegsa and
Mousa M. Nazhad, "Effect of
recycling on paper properties",
Tappsa Journal, Page no. , Vol.
No. , month, 2007.

Navae-Ardeh, S. and Mousa M. Nazhad, "A new model for maximizing the bending stiffness of a symmetric three-ply paper or board", *Tappi journal*, Page no. , Vol. No. , month, 2007.

Navae-Ardeh S., and Nazhad, M. M., "Optimization of symmetric three-ply paper or board properties", *Canadian chemical engineering journal (CCEJ)*, Page no. , Vol. No. , month, 2007.

Sridach, W., Hodgson, K., and Nazhad, M. M., "Biodegradation and recycling potential of barrier coated boards", *e-journal of Bioresources*, Page no. , Vol. No. , month, 2007.

Tao Lin, Xuefeng Yin, Elias Retulainen and Mousa M. Nazhad, "Effect of Chemical Pulp Fines on Filler Retention and Paper Properties", *Appita journal*, Page no. , Vol. No. , month, 2007.

Wibowo, A. and Nazhad, M. M., "Printability of Acacia pulp compared to Birch or eucalyptus", *Appita journal*, Page no. , Vol. No. , month, 2007.

Conference Proceedings

Erik, K., Li, K. and Nazhad, M.M., "Effect of recycling on surface properties of fiber", *Tappsa conference, ISWFPC & APPW, Durban, South Africa, June Date, 2007.*

Girindra K. Mishra, Hodgson, K., Retulainen, E. and Mousa M. Nazhad, "The influence of network structure on compression strength of linerboard", *Tappsa conference, ISWFPC & APPW, Durban, South Africa, June Date, 2007.*

Hoang, N.M, Navae-Ardeh, S. and Mousa M. Nazhad, "The importance of pulping condition in neutral deinking", *Paptac Conference, Montreal, Canada, February Date, 2007.*

Inthang and Nazhad, M. M., "Effect of modified tapioca starch on properties of base paper and coating color", *Tappsa conference, ISWFPC & APPW, Durban, South Africa, June Date, 2007.*

Le Tien Dung and Mousa M. Nazhad, "Influence of water hardness and sodium silicate on deinking and their

sacling potential", *Paptac Conference, Montreal, Canada, February Date, 2007.*

Lin Tao, Yin, X., Hodgson, K. and Mousa M. Nazhad, "Comparison of fines from reed pulp with fines from eucalyptus or pine", *61st Appita Annual Conference and Exhibition, Gold Coast, Australia, May 6-9, 2007.*

Nitorisoravut, N., Malinen, R., "Fiber morphology and papermaking properties of selected Thai bamboos", *61st Appita Annual Conference and Exhibition, Gold Coast, Australia, p. 83-89, May 6-9, 2007.*

22.6 Doctoral Students' Dissertation

Improving Filler Share of Fine Paper through Fines

By: Lin Tao
Supervisor: Dr. Mousa M. Nazhad

22.7 Masters Students' Theses and Research Studies

Nguyen Van Duy
Effect of Temperature on ECF-Bleaching of Eucalyptus camaldulensis Kraft Pulp
Dr. Raimo O. Malinen

Li Huajie
Optimization of Conditions for a Kraft Pulp Bleach Plant
Dr. Raimo O. Malinen

Cheng Jiahua
Effects of Latexes on Surface Properties of Coated Paper
Dr. Esa Lehtinen

Ocky Kristanto
Effect of Pigment Particle Size and Shape on Binder Demand of the Coating Layer
Dr. Esa Lehtinen

Wang Kun
Effect of Coating Polymers on Print Quality of GCC and PCC Coated Ink Jet Paper
Dr. Esa Lehtinen

Wang Mei
Effects of Particle Size and Particle Shape of CaCO₃ on the Properties of Coating Color and Coating Layer
Dr. Esa Lehtinen

Ika Munika
Effect of Starch Grades on Coating Color and Coated Paper Properties
Dr. Esa Lehtinen

Lili Suryani
Effect of Woodfree Recycled Fiber on the Properties of Woodfree Coated Paper: A Case Study
Dr. Esa Lehtinen

Zhang Wenliang
Improving Strength and Drainage Properties of OCC
Dr. Esa Lehtinen
Xiao Na
Starch, Soy Protein, CMC, and PVOH as OBA Carriers, and their Effect on Final Coated Paper Properties
Dr. Esa Lehtinen

Liu Xin
Comparison of ECF and TCF Bleaching of Eucalyptus camaldulensis Kraft Pulp
Dr. Raimo O. Malinen

Xuelian Yang
Characteristics of Frayed Fiber and its Role as a Reinforcement Pulp
Dr. Esa Lehtinen

Sugiyanto
Kraft Pulping of Cocos Nucifera Coir and Trunk
Dr. Raimo O. Malinen

Farzana Afrose
Effect of the Molecular Weight of Carboxy Methyl Cellulose (CMC) on Rheological Properties of Coating Colour and Coated Paper
Dr. Esa Lehtinen

Md. Zaved Hossain Khan
Pulp and Paper Making of Banana Pseudo-Stem
Dr. Raimo O. Malinen

Devendra Kumar
Effect of the Hexenuronic Acid Group on Paper Making Properties of Bleached Eucalyptus Camaldulensis Pulp
Dr. Raimo O. Malinen

Bui Thu Trang
The Effect of Anthraquinone on Kraft Pulp Bleachability and Pollution Abatement
Dr. Raimo O. Malinen

Nguyen Tien Vinh
The Effect of Woodfree Base Paper Properties and Preclendring on Coated Woodfree Paper Properties
Dr. Esa Lehtinen

Chapter 23: SERD – REGIONAL AND RURAL DEVELOPMENT PLANNING FIELD OF STUDY

23.1 Introduction

This field of study focuses on rural poverty, improvement of the quality of life, and social and economic development of rural areas. Practice oriented rural regional planning is carried out regularly at district and subdistrict levels following a participatory and integrated approach, and attention is paid to management of development Institutions, infrastructure and physical resources. Sectoral and spatial planning is equally emphasized along with the management of rural development programs and local development projects to strengthen rural communities for sustainable development.

23.2 Faculty and Research Staff

Full-time Faculty

GOPAL B THAPA

BSc, Tribhuvan Univ, Nepal; MSc, DTechSc, AIT, Thailand. **Professor**(Natural Resources Management; Sustainable Agricultural Development and Planning; Watershed Management)

JAYANT K ROUSTRAY

BSc(Hons), MSc, PhD, Utkal Univ; MRP, Indian Inst of Tech, India. **Professor** (*Community Forestry; Distric Planning Methods and Techniques; Geographic Information Systems; Rural Transport Development; Rural- Regional Development; Social Impact*

Assessment)

MOKBUL MORSHED AHMAD

BSc, MSc, Dhaka Univ, Bangladesh; MSc, AIT, Thailand; PhD, Univ of Durham, UK. **Assistant Professor** (*Economic geography; regional and rural development planning; community development; Non-Governmental Organizations (NGOs); civil society; globalization etc*)

SOPARTH PONGQUAN,

BSc, Chiang Mai Univ; MSc, AIT, Thailand; DSc, Univ of Wageningen, The Netherlands. **Associate Professor** (*Capacity Building; Community Development and Monitoring and Evaluation of Development Projects; Decentralized Local Government; People's and Community Participation; Rural Development*)

VITON NIL-UBOL

MSc, AIT, Thailand **Field Lab Supervisor**, Regional and Rural Development Planning

23.3 Grants and Sponsored Research Completed in 2007

Learning Program on Effective Rural Leadership

Duration: 1-Nov-05-30-Apr-07
Project Investigator: Dr Soparth Pongquan
Sponsor: Asian Development Bank (ADB)
Total Contracted Amount (Baht) 2,080,000

Participation of Urban Poor in Municipal Government for Delegates from Bangladesh

Duration: 1-Oct-06-30-Apr-07
Project Investigator: Dr Soparth Pongquan
Sponsor: Asian Development Bank (ADB)
Total Contracted Amount (Baht) 334,663

Strengthening Institutional Capability for Urban Environmental Management

Duration: 1-Jan-04-31-Dec-07
Project Investigator: Prof Gopal B. Thapa
Sponsor: United Nations University and AIT
Total Contracted Amount (Baht) 2,423,000

Training Programme on Environmental Management Tools for SAARC Countries

Duration: 1-Jan-06 - 31-Dec-07
Project Investigator: Prof Jayant Roustray
Sponsor: UNEP ROAP
Total Contracted Amount (Baht) 1,920,000
Total Contracted Amount (CAD\$) 156,970

23.4 On-going Grants and Sponsored Research

Learning Program on Effective Rural Leadership

Duration: 1-Nov-05-30-Apr-07
Project Investigator: Dr Soparth Pongquan
Sponsor: Asian Development Bank (ADB)
Total Contracted Amount (Baht) 2,080,000

Strengthening Institutional Capability for Urban Environmental Management

Duration: 1-Jan-04-31-Dec-07
Project Investigator: Prof Gopal B. Thapa
Sponsor: United Nations University and AIT
Total Contracted Amount (Baht) 2,423,000

Training Programme on Environmental Management Tools for SAARC Countries

Duration: 1-Jan-06 - 31-Dec-07
Project Investigator: Prof Jayant Roustray
Sponsor: UNEP ROAP
Total Contracted Amount (Baht) 1,920,000
Total Contracted Amount (CAD\$) 156,970

23.5 Publications

Refereed Journals

Ahmad, M.M., "The Careers of NGO Field-Workers in Bangladesh". Non-profit Management and Leadership, Vol. 17. No. 3. pp. 349-365, 2007.

Ahmad, M. M., "Interactions between Field Workers and their Clients and Superiors in the NGOs (Non-Governmental Organisations) in Bangladesh" Rural Development, Vol. 26 No. 2, pp. 227-252, 2007.

A. K. M. Ahsan Ullah and Jayant K. Routray, "Rural poverty alleviation through NGO interventions in Bangladesh: how far is the achievement?" Social Economics, Vol. 34, No.4 (237-248), 2007

Jayant K. Routray, "One Village One Product: Strategy for sustainable rural development in Thailand" CAB Calling (Journal of the College of Agricultural Banking, Reserve Bank of India, Pune), Vol. 31, No. 1 (30-34), 2007.

Kannapa Pongponrat, Soparth Pongquan, "Community Participation in a Local Tourism Planning Process: A Case Study of Nathon Community on Samui Island, Thailand", Asia and Pacific Journal of Rural Development, Vol. XVII, No. 1, 1 July 2007.

Niroula, G.S. and Thapa, G.B., "Impact of land use on input use, crop yield and production efficiency in the mountains of Nepal", Land Degradation and Development, Vol. 18, pp. 237-248, 2007.

Pokhre, D.M., and Thapa, G.B., "Are marketing intermediaries exploiting mountain farmers in Nepal? A study based on market price, marketing margin and income distribution analyses", Agricultural Systems, Vol. 94, pp. 151-164, 2007.

Rohlini Halim, Roberto S. Clemente, Jayant K. Routray and Rajendra P. Shrestha, "Integration of biophysical and socioeconomic factors to assess soil erosion hazard in the upper Kaligarang watershed, Indonesia" Land Degradation and

Development, Vol. 18 (453-469), 2007.

Rasul, G. and Thapa, G.B., "The Role of policy and institutional environment in promoting sustainable agricultural land use systems: the case of the Chittagong Hill Tracts, Bangladesh", Environmental Management, Vol. 40, pp.1237-283, 2007.

Refereed Books/Chapters

Ahmad Morshed Mokbul, and Kumar, Arvind, "Hope not complacency disaster management in India and Sri Lanka", AIT, Thailand, 2007.

Ahmad Morshed Mokbul, and Kumar, Arvind, "More Sweat Less Blood A Disaster Preparedness Manual", AIT, Thailand, 2007.

Jayant K. Routray and Anurupa Mohanty Environmental Management Tools: A Training Manual, (Eds.), School of Environment, Resources and Development, Asian Institute of Technology, Bangkok, Thailand, 2006.

Conference Proceedings

Long, C.T.M. and Thapa, G.B. "Sustainability of coffee mono-cropping and integrated farmin in Daklak Province, Vietnam", Proceedings of the Regional Conference on Environmental Planning and Management Issues in Southeast Asian Countries, Hanoi, Agriculture Publishing House, pp. 195-213,

23.6 Doctoral Students' Dissertation

Community Participation in Local Tourism Development Planning in Thailand: A Case Study of Koh Samui, Surat Thani Province
By: Kannapa Pongponrat
Supervisor: Dr. Soparth Pongquan

23.7 Masters Students' Theses and Research Studies

Assessing Food Self-Sufficiency of Communities in the Remote Rural Region of Northern Chin

State, Myanmar
By: Thang Za Lian
Supervisor: Prof. Jayant Kumar Routray

Participatory Pasture Management in Alxa Area of the Northwestern China
By: Saren
Supervisor: Prof. Gopal Bahadur Thapa

Performance of a Farmer Managed Small Scale Irrigation System in Kompong Thom Province, Cambodia
By: Chhay Toeu
Supervisor: Prof. Gopal Bahadur Thapa

Research Study: Agro-Ecosystems Zoning as a Tool for District Level Development Planning in Lao PDR: The Case Study of Phonxay and Namong District
By: Bounchanh Lattanavongkot
Supervisor: Dr. Mokbul Morshed Ahmad

Socio-economic Impacts of the Natural Forest Protection Program on Rural Livelihoods in Gansu, China
By: Huimin Zhang
Supervisor: Dr. Mokbul Morshed Ahmad

Nguyen Ngoc Anh
Social Services for the Out of School Children with Disabilities in Hanoi
Dr. Mokbul Morshed Ahmad

Pich Charya
Research Study: Rural Road Infrastructure Development through the Commune Council in Cambodia: Analysis of Planning, Implementation and Maintenance Process
Dr. Mokbul Morshed Ahmad

Laksiri Chomchuen
Effectiveness of the Community-based Rice Exporting Group in the Northeast of Thailand: A Case Study of Yasothon Province
Dr. Soparth Pongquan

Maniseng Douangnoulack
Research Study: Management Performance of a Village Water Supply: A Case Study in Vientiane Province, Lao PDR
Dr. Soparth Pongquan

Augusta Na Fa
Assessing the Financial Management Practices of the Myanmar Baptist Convention
Dr. Mokbul Morshed Ahmad

Nguyen Thi Ngoc Hanh
Research Study: Health and Financial Status of the Old People in Rural Vietnam
Dr. Mokbul Morshed Ahmad

Ngo Thanh Huy

Effect of Income Generating Activities on the Poverty Reduction Program of a Local NGO in Vietnam

Prof. Jayant Kumar Routray

Sabrina Islam

Public and Private University Education in Bangladesh: A Comparative Analysis for Policy Implications

Dr. Mokbul Morshed Ahmad

Arvind Kumar

NGO Managed Information System for Disaster Preparedness: A Comparative Study of Two Villages, Nagapattinam, India

Dr. Mokbul Morshed Ahmad

Liang Li

Impact of Land Reforms on Rural Communities in China

Prof. Jayant Kumar Routray

Nguyen Thi Quy Linh

Farmers' Participation in an Aquaculture Development Project: A Case Study in Quynh Loc Commune, Quynh Luu District, Nghe An Province, Vietnam

Dr. Soparth Pongquan

Chau Thi Minh Long

The Relative Sustainability of Coffee and Mixed Farming Systems in Daklak Province, Vietnam

Prof. Gopal Bahadur Thapa

Thuy Moly

Microfinance for the Rural Poor in Cambodia

Prof. Jayant Kumar Routray

Oul Nak

Research Study: Benefits of The Rural Water Supply to Rural Household in Cambodia: A

Case Study in Steung Sen district, Kampong Thom Province

Dr. Soparth Pongquan

Ranjita Nepal

The Contribution of Urban Centers to Agricultural Commercialization in Nepal: A Case Study of the Hinterland of Biratnagar Sub-Metropolitan City

Prof. Gopal Bahadur Thapa

Sampao Ngamchoie

Rural Poverty Alleviation through Community Forestry: A Case Study of Burirum Province in Thailand

Dr. Mokbul Morshed Ahmad

Hoang Trong Nghia

Research Study: Evaluation of a Resettlement Project in Kontum Province, Vietnam

Dr. Mokbul Morshed Ahmad

Jongkol Para

Assessing the Benefits of Village Development Fund Project on the Rural Area of Thailand: Comparison between Poor and Non-poor Household

Prof. Jayant Kumar Routray

Lada Phadungkiati

Comparison of the Effects of Community-based Rural Enterprises on Rural People in the Central Plain of Thailand: A Case Study of ChaiNat Province

Dr. Soparth Pongquan

Choulaphone Sayasene

Research Study: Assessing Credit Needs of the Rural Poor in Lao PDR: A Case Study of Two Villages in Thakhek District

Prof. Jayant Kumar Routray

Sok Serey

Compulsory Education for the Rural Children in Samraong District, Takeo Province, Cambodia

Dr. Soparth Pongquan

Chin Sosamphors

Research Study: Commune Development Planning Process for Decentralized Rural Development in Cambodia: A Case Study in Srayov Commune

Dr. Soparth Pongquan

Udyog Subedi

Performance of Farmers' Association in Bumthang District of Bhutan

Prof. Gopal Bahadur Thapa

Boontawee Teamvan

Assessment of Health Services under the Universal Coverage Scheme for Rural People in Thailand

Dr. Soparth Pongquan

Pham Trung Tuan

Research Study: Agricultural Cooperatives in Vietnam and their Contributions to Benefit the Rural Poor: A Case Study in An Giang Province, Vietnam

Dr. Mokbul Morshed Ahmad

Su Su Wai

Socio-Economic Conditions of Garment Workers in Cambodia

Prof. Jayant Kumar Routray

Seng Youraden

Sustainability of Commercial Microfinance Institutions in Kampong Thom Province, Cambodia

Prof. Gopal Bahadur Thapa

Chapter 24: SERD – URBAN ENVIRONMENTAL MANAGEMENT FIELD OF STUDY

24.1 Introduction

Management (UEM) is an area of academic discourse and professional practice in which urban planning and urban management issues are studied and practiced from an environmental management perspective.

As an academic field, UEM provides opportunities of graduate level education and research at master (MSc) and doctoral (PhD) level. It draws on and integrates theories and perspectives in established disciplines of urban planning urban and regional development and urban policy and management studies into a distinctive framework of problems, issues and questions concerning the urban environment. It enables students to identify problems; apply appropriate analytic methodologies; design, plan and implement programs and projects; and monitor impacts and challenges within the context of sustainable development in developing societies.

The Field of Study prepares students for professional careers in the public and private sector as well as international development agencies and civil society organizations engaged in urban and environmental management.

24.2 Research Facilities and Laboratories

The FoS has a workshop room which can accommodate about 24 students in four clusters at a time. Each cluster is equipped with a desk top computer with internet facilities. The

workshop room also has audio-visual facilities for presentations.

24.3 Faculty and Research Staff

Full-time Faculty

A T M NURUL AMIN,
BA (Hons), MA, Univ of Dhaka, Bangladesh; MA, PhD, Univ of Manitoba, Canada. **Professor**

EDSEL SAJOR
BSc, Univ of the Philippines; MA, PhD, ISS, The Hague, The Netherlands. **Assistant Professor**

NOWARAT COOWANITWONG
BS, Mahidol Univ; MS, Long Island Univ; MS, PhD, Univ of Florida, USA. **Assistant Professor**

RANJITH PERERA,
BSc, MSc, Univ of Moratuwa, Sri Lanka; MSc, PhD, AIT, Thailand. **Assistant Professor**

VILAS NITIVATTANANON,
BEng, Chulalongkorn Univ; MA, Thammasat Univ; MEng, AIT, Thailand; PhD, Univ of Pittsburgh, USA. **Assistant Professor**

Administrative Staff

BIMALENDU MOHANTY
FARHAT JAHAN CHOWDHUR
LEKHA RATNAYAKE PRAJAPATI
SHAPKOTA
MARITESS I CABRERA,

Network Coordinator Project Associates

PANUWAT BOONYANAN,
Project Technician

PRITAM KRISHNA SHRESTHA,

Project Manager

RAJANI A RAJBHANDARI

RUTMANEE ONGSAKUL

VANTANA PATTANAKUL

**Administrative Secretary
Project Staff** (*South-East Asia Urban Environmental Management Applications Project*)

24.4 Grants and Sponsored Research Completed in 2007

Toyo-AIT Joint Workshop and Research Symposium Series

Duration: 1-Jan-07 31-Dec-07
Project Investigator: Dr L.A.S. Ranjith Perera
Sponsor: Toyo University, Japan
Total Contracted Amount (Baht) 359,600

UEM - GENDEV Collaboration

Duration: 25-Sep-00-31-Dec-07
Project Investigator: Dr. Ranjith Perera, Dr Barbara Earth
Sponsor: United Nations Human Settlements Programme (UN HABITAT)
Total Contracted Amount (Baht) 9,374,10

UMP (Urban Management Programme)-AIT Partnership

Duration: 15-Sep-02-31-Dec-07
Project Investigator: Dr L.A.S.Ranjith Perera, Dr Barbara Earth
Sponsor: United Nations Human Settlements Programme (UN HABITAT)
Total Contracted Amount (Baht) 10,911,198

Understanding Policy Processes in Biotechnology and Bio-safety Measures in Thailand & China

Duration: 1-Jul-05-31-Jul-07
Project Investigator: Dr. Bernadette Resurreccion; Dr Edsel Sajor
Sponsors: Research on Knowledge Systems, International Development Research Center; Rockefeller Foundation
Total Contracted Amount 5,007,383

24.5 On-going Grants and Sponsored Research

Construction Waste Characterization and Management Options with a Focus on Concrete Utilization in Bangkok Metropolitan Region

Duration: 29-May-07-28-Oct-08
Investigators: Dr. Vilas Nitivattananon
Sponsor: Royal Thai Government (RTG)
Total Contracted Amount (Baht) 1,200,000

Research Cooperation between Sida and AIT on Support Planning Urban Research during 2007-2009

Duration: 15-May-07-31-Dec-08
Project Investigators: Dr. Edsel Sajor
Sponsor: SIDA-Swedish Research Council
Total Contracted Amount (Baht) 7,800,000

SEA-UEMA Community and stakeholder participation in water quality improvement and pollution abatement in Bang Pa canal in a peri-urban area in Ratchaburi Province, Thailand

Duration: 1-Dec-07-31-Dec-08
Project Investigators: Dr Edsel Sajor, Dr Nowarat Coowanitwong
Sponsor: SEA-UEMA / CIDA Project
Total Contracted Amount (Baht) 839,610

SEA-UEMA Project (Southeast Asia Urban Environmental Management Applications)

Duration: Nov-03 - Nov-08
Project Investigators: Dr. Edsel Sajor, Prof. A.T.M. Nurul Amin, Dr. Nowarat Coowanitwong, Dr. Kyoko Kusakabe, Dr. Vilas Nitivattananon, Dr Ranjith Perera
Sponsor: Canadian International Development Agency (CIDA)
Total Contracted Amount (CAD\$) 9,479,839

Wastewater Management (WWM) in Bangkok Metropolitan Region (BMR): A Search for Public Policy

and Action Programs to Improve the Local Environment

Duration: 26-Nov-07-31-Aug-08
Project Investigators: Prof. A.T.M. Nurul Amin
Sponsor: SEA-UEMA / CIDA Project
Total Contracted Amount (Baht) 312,015

24.6 Publications

Refereed Journals

Chan, N.W. and Nitivattananon, V., "The Role of Gender in Domestic Water Conservation in Malaysia", Malaysian Journal of Environmental Management, Page, Vol. No. month, 2007.

Coowanitwong N., Wu C.Y., Cai M., and Watano S., "Removal of Nitrogen Oxides using Nanosized Catalysts Prepared by Dry Mechanical Coating Technique", Environmental Engineering Science, 24(1), pp. 138-148, 2007.

Indarto A., Coowanitwong N., Choi J.W., Lee H., and Song H.K., "Kinetic Modeling of Plasma Conversion in a Dielectric Barrier Discharge", Fuel Processing Technology, Article in Press, 2007.

Perera, L.A.S.R. and Chowdhury, F.J., "Alumni of an educational institute as change agents for community-based environmental management initiatives: experience from a solid waste management demonstration project in Hanoi, Vietnam", Environmental Technology and Management, 7(3/4): 392-406, 2007.

Sajor, E. and Ongsakul, R., "Mixed Land Use and Equity in Water Governance in Peri-Urban Bangkok", Urban and Regional Research, Vol. 31. No 4, pp.782-801, 2007.

Sujaritpong, S and Nitivattananon, V., "Factors Influencing Wastewater Management Performance: Case of Housing Estates in Suburban Bangkok, Thailand", Environmental Management, (in press), 2007.

Refereed Books/Chapters

Coowanitwong N. and

Thammanosoth S., Proceedings of Policy Dialog (Eds.), Sustainable Solid Waste Management in Vientiane City, Lao PDR, pp. 1-52, ISBN 978-974-8257-39-6, 2007.

Coowanitwong N., Shapkota P., Pradhan P., and Gallardo L., Abstracts of the Papers (Eds.), International Conference on Air Quality Management in Southeast Asia, pp.1-50, ISBN 978-974-8257-45-7, 2007.

Gallardo L., Coowanitwong N., Sajor E., and Nietes-Satapornvanit A., Monograph (Eds.) Exploring Community and Informal Sector Partnership in Solid Waste Management in Kelurahan Rawajati, Jakarta, Indonesia, pp. 1-20, ISBN 978-974-8257-40-2, 2007.

Nitivattananon, V. and Hanaoka S., "Regional Study on Sustainable Infrastructure Development in Asia", Sustainable Infrastructure in Asia, ESCAP, United Nations Publication, ISBN: 978-92-1-120507-7, pp. 1-84, 2007.

Conference Proceedings

Amin, A.T.M.N., "The Informal Sector and Urban Environmental Management Legacies in Planning Education: A Personal Perspective", Paper presented to the First Non Resident Bangladeshi Conference, Dhaka, December 27-29, 2007.

Amin, A.T.M.N., "Towards a Lasting Approach to Urban Air Quality Improvement", Keynote address to the International Conference on Air Quality Management in Southeast Asia, Ho Chi Minh City, Vietnam, 23p, November 21-23, 2007.

Amin, A.T.M.N., "Legacies in Planning Education: Economic Aspects of Informal Sector & Urban Environmental Management", Professorial Lecture, delivered at Asian Institute of Technology, Bangkok, Thailand, 62p, October 24, 2007.

Andong R.F., and Coowanitwong N.,

"Contribution of Road Transport Sector to CO2 Emissions in Metro Manila, Philippines", Abstracts of the International Conference on Air Quality Management in Southeast Asia, Ho Chi Minh City, Vietnam,

p.37, November 21-23, 2007.

August 20-29, 2007.

Vietnam", Case Study Series 1/2007, CIDA-AIT Partnership Project, Bangkok: Asian Institute of Technology, 2007.

Dharsharna K.G.T. and Coowanitwong N., "Guidelines for Minimizing Respiratory Illness associated with PM10 in Colombo, Sri Lanka", Abstracts of the International Conference on Air Quality Management in Southeast Asia, Ho Chi Minh City, Vietnam, p.34, November 21-23, 2007.

Wirutskulshai U. and Coowanitwong N., "Sustainability Applications and Climate Change Policy in Thailand", Abstracts of the International Conference on Management in Southeast Asia, Ho Chi Minh City, Vietnam, p.21, November 21-23, 2007.

Perera, R., Permana, A.S. and Charoentrakulpeeti, W., "Promoting Reduction in Travel Demand in Transport Sector of Asian Cities: Case of Bangkok, Thailand", Air Pollution Control in the Transport Sector, Ed. Morishima, A., Third Phase Research Report of the Urban Environmental Management Project, Hayama, Institute of Global Environmental Strategies, pp.83-135, 2007.

Luong N.D. and Coowanitwong N., "Sustainable Transport-Related Air Quality Policies through Strategic Integrated Assessment", Abstracts of the International Conference on Air Quality Management in Southeast Asia, Ho Chi Minh City, Vietnam, p.35, November 21-23, 2007.

Other Publications

Amin, A.T.M.N., "Inspirational Public Policy and Action Programmes in Asia for Promoting Environmentally Sustainable Transport", Research report, prepared for the United Nations Centre for Regional Development (Nagaya: UNCRD), 14p., the Second EST (Environmentally Sustainable Transport) Forum, Yogyakarta, Indonesia, 11-12 December 2006.

Shrestha, R.P., Proceedings of "Asia workshop on Sustainable Land Management and National Capacity Self-Assessment", 20-23 November 2006, Asian Institute of Technology, Bangkok [CD version publication], sponsored by UNDP, 2007.

Nitivattananon, V., and Borongan. G.H., "Construction and Demolition Waste Management: Current Practices in Asia", International Conference on Sustainable Solid Waste Management, Chennai, India, September 5-7, 2007.

Amin, A.T.M.N., Sungoonshorn, S., Thepkunhanimita, P., Muenthaisong, P., "Solid Waste Management in Bangkok: A 3R-Perspective for Promotion of Circular Economy", Research report, prepared for the Institute for Global Environmental Strategies (IGES), 46p, 2007.

24.7 Masters Students' Theses and Research Studies

Mixed Land Use Planning for Sustainable Urban Development: A Case Study of Ahmedabad City, India
By: Patel Prashant Kiritkumar
Supervisor: Dr. L. A. S. Ranjith Perera

Nitivattananon, V., Velez, G. and Wijaya, C., "Improving City Environment through Urban Environmental Network in Southeast Asia", International Conference on City Foresight, Chiang Mai, Thailand, September 5-7, 2007.

Babette Resurreccion and Sajor, E., "Two-Case Study of Biotechnology Development and Policy Agenda Setting in the Food Sector: Shrimp Farming in Thailand and Rice Research in China", Scientific Report, submitted to IDRC, Ottawa, Canada in fulfillment of the Research Grant on Research on Knowledge Systems, 2004 Global Competition.

Un Chakrey
City Planning and Urban Wetlands: Case Study of an Urban Wetland in Phnom Penh City, Cambodia
Dr. Edsel E. Sajor

Phonvisai P. and Coowanitwong N., "Urbanization Assessment and Environmental Management of Air Pollution in Vientiane, Lao PDR", Abstracts of the International Conference on Air Quality Management in Southeast Asia, Ho Chi Minh City, Vietnam, p.43.e on Air Quality, November 21-23, 2007.

Thatsakone Chounlamounry
Promoting Public Participation for Water Quality Management in Hongseng Canal, Vientiane Capital City, Lao PDR
Dr. L. A. S. Ranjith Perera

Suthibak, S. and Nitivattananon V., "Assessment of Waste Recycling Performance: A Study of School Garbage Banks in Thailand", GMSARN International Conference 2007, Pattaya, Thailand, November 12-14, 2007.

Permana, A.S. and Perera, R., "Land use and transport as determinants of air quality: A study in Bandung, Indonesia", Monograph UEM 1/2007, CIDA-AIT Partnership Project, Bangkok: Asian Institute of Technology, 2007.

K.G. Thishan Dharshana
Ambient Particulate Matter and Respiratory Illnesses in Colombo City, Sri Lanka
Dr. Nowarat Coowanitwong

Velez, G. and Nitivattananon, V., "Partnership with Jeepney Associations in Managing Vehicle Emissions: Case Study of Davao City, Philippines", Asian Planning Schools Association Conference (APSA) 2007, Colombo, Sri Lanka,

Perera, Ranjith, "A Niche for the Informal Sector in the City of Bangkok", Space, 2007/11:101-103, 2007.

Tran Thi Hong Hanh
Integrated Environment, Health and Safety Management System for Government Entities: Case of Solid Waste Treatment Zone in Ho Chi Minh City, Vietnam
Dr. Vilas Nitivattananon

Perera, Ranjith et al., "Improved Sanitation and Alternative Energy in A Cattle Rearing Community in the Suburbs of Ho Chi Minh City,

Kannika Janchidfa

Sectoral and Procedural Equity in Water Allocation: The Case of the Eastern Seaboard Development Programme in Thailand
Dr. Edsel E. Sajor

Chitlatda Keomuongchanh
Water Supply Accessibility and its Impact on Quality of Life: A Case Study of Xaythany District, Vientiane Capital City, Lao PDR
Dr. Nowarat Coowanitwong

Kong Kosal
Improvement of Infrastructure and Basic Services and Poverty Reduction in Urban Poor Community in Phnom Penh, Cambodia
Dr. Edsel E. Sajor

Le Thuy Linh
Performance Assessment of a Decentralized Wastewater Management System Using Sustainability Indicators
Dr. Vilas Nitivattananon

Nguyen Duc Luong
Transport-Related Air Quality Policy Improvement using Strategic Environmental Assessment: A Case Study of Hanoi City, Vietnam
Dr. Nowarat Coowanitwong

Nalongxay Myvpadith
Rental Land and Housing for Low-Income People in Vientiane Capital City, Lao PDR
Dr. L. A. S. Ranjith Perera

Dwi Rinnarsuri Noraduola
Water Infrastructure Development for Indigenous People: A Case Study of Aquatic Based Culture of the Bajo Community on Peripheral Urban Kendari City, Indonesia
Dr. Edsel E. Sajor

Chhan Paul
Strategic Interventions to Control Effluents from Scattered Industries in Phnom Penh, Cambodia
Dr. L. A. S. Ranjith Perera

Sonethavy Phimmasane
Urban Water Sanitation Management: A Case Study of Sisattanak District, Vientiane Capital City, Lao P.D.R..
Dr. Nowarat Coowanitwong

Ply Pirom
Spatial Characteristics and Environmental Issues Associated with Sectoral Transformations: A Micro Level Study of Selected Strategic Areas in Bangkok
Dr. L. A. S. Ranjith Perera

Md. Anisur Rahman
Environmental Effects of Housing Estate Development in Dhaka City, Bangladesh
Dr. L. A. S. Ranjith Perera

Md. Matiar Rahman
Environmental Management Systems for Strategic Decision Making Practices: A Case Study of Khulna City Corporation, Bangladesh
Dr. Nowarat Coowanitwong

Meinardo Teves
Understanding the Contextual Factors in the Adoption of Cleaner-Air Technology: The Case of Autogas in Cebu City, Philippines
Dr. Edsel E. Sajor

Giovanni Velez
Partnership with Local Organizations in Managing Vehicle Emissions: Case Study of Jeepney Associations in Davao City, Philippines
Dr. Vilas Nitivattananon
Lonechanh Yangchouboulom
Water Conservation Measures for Expanding Water Supply System and Reducing Wastewater in Keo-oudom Town, Lao PDR
Dr. Vilas Nitivattananon

B. Zurkurniyanti
Social Capital and Participation in Urban Sanitation Project: A Case Study of Riverside-Kampung Community in Yogyakarta Municipality
Dr. Edsel E. Sajor

SEA-UEMA Project

Enhancing collaboration among communities, local governments and other organizations in adopting gender-responsive urban environmental practices in the region and working towards strengthening institutions and networks in Southeast Asia in advocating gender-responsive UEM policies and effective practices.



Core Areas

Graduate Education

Integrating lessons learned from the field into courses taught in the classroom, offering targeted scholarships, certificate programs and short-term training courses



Flagship Projects

supporting highly successful initiatives that are being expanded and up-scaled to benefit a larger community, municipality or city

Policy Advocacy

collaborating with institutions in Southeast Asia to campaign for urban environmental policy issues in their respective areas



Learning Networks and Training

strengthening and enhancing the capabilities of a network of urban environmental management stakeholders and professionals in Southeast Asia

Gender as a Cross-Cutting Theme

increasing understanding and application of gender equality integration in urban environmental management



Canada  **AIT**
Asian Institute of Technology

**CIDA-AIT Partnership
SEA-UEMA Project**

Urban Environmental Management FoS
School of Environment, Resources and Development
Asian Institute of Technology
www.sea-uema.ait.ac.th

Chapter 25: SCHOOL OF MANAGEMENT



25.1 Introduction

The School of Management (SOM) is Asia's pioneer business school for graduate studies offering Ph.D., MBA and diploma programs.

The School provides exceptional individuals with a supportive environment in which they can develop their skills and aptitudes, helping them to reach their professional goals and to serve the interests of countries in the Asia-Pacific region.

The School of Management was also one of the pioneer schools in discussion at the Workshop for Development and Collaboration of Asia-Pacific Business Schools in May 2001 in Seoul, Korea where a Declaration of Cooperation in "Strengthening Asia-Pacific Business Education" was signed by a Forum of Asian business schools leading to the Association of Asia-Pacific Business Schools (AAPBS).

SOM was established in October 1987 to meet the growing need for managerial expertise in the Asia-Pacific region. The School strongly believes in the intensive development of corporate leaders for the present and future.

As the world undergoes revolutionary changes on the social, economic,

political and technological fronts, various programs of the School offer unique competitive advantage to managers and enterprises by sharing expertise in international business and management of technology.

Perhaps the most important feature of the School of Management is that it offers an amazing cross-cultural experience with:

An international student body.

Students from 30 countries participate in our various programs. They work and live together in a 160-hectare campus north of Bangkok.

A multinational faculty.

A highly qualified and experienced faculty from 15 countries facilitates the participant learning and provides a real multi-cultural touch to management education.

An international approach to management education.

Courses are designed to prepare program participants to become effective international managers in an increasingly global business environment. The participants are encouraged to take part in international exchange programs with US, European and Asian universities.

25.2 Mission

Mission

"to develop socially responsible global leaders who will enhance organizational performance for the growth and sustainable development of economies and societies in Asia in particular and the world in general"

Vision

"to become the leading creator and disseminator of Asian management knowledge, practices and values"

Positioning

"A global management school which offers knowledge that promotes deep understanding of Asian management practices"

25.3 School Governance

Dean of School

INDRA M PANDEY, MComm, PhD,
Univ of Delhi, India. **Professor**

25.4 Center and Research

The School of Management is involved in training and extension activities through the Management Development Programs

Corporate Relations and Executive Development Services (CREDS)

function is established as an integral part of the School of Management (SOM). It is the research, consultancy, and executive development arm of the School. SOM's non-degree academic activities and programs are organized in project format under CREDS, which complement SOM's degree programs and other related activities of SOM. It facilitates the linkage between SOM, AIT and the business community and public sector in Asia.

The objectives of CREDS:

To establish closer links between the business community/public sector and SOM through executive education programs and consulting in the areas of Management of Technology, International Business, Service Marketing and Technology, and International Public Management.

To facilitate the development of research projects which are both of high practical value to the business community/public sector and academically rigorous.

CREDS activities include:

- Corporate relationship management
- Executive development programs
- Organizing executive forums, workshops, seminars, and conferences

- Other activities contributing to CREDS and SOM's objectives

25.5 Research Facilities and Laboratories

The School of Management has its own computer laboratory to support management education. For instructional purposes, there is a network of over 60 computers for student's use.

Laboratory consultants are available during office hours to assist with computer related problems that may arise in the lab. The consultants will provide help by answering general questions relating to the lab e.g., how to obtain a computer account, questions related to the PC Proficiency (i.e., class and test schedules and administering tests by appointment) questions about software applications, email, printing etc.

The School of Management has 5 state-of-the-art multimedia classrooms including a large amphitheater for academic use. Each classroom is equipped with a multimedia podium that consists of LCD projectors, audio cassette recorder, VHS player/ recorder, slide projectors or visualizer, built-in desktop PC, laptop and wireless internet connection.

The staff can assist the students in setting up the computer projection, orient them on how to use the multimedia equipment and will help in any problems with any equipment in the classroom.

25.6 Faculty and Research Staff

Full-time Faculty

BARBARA IGEL

BA, MA, Technical Univ, Berlin; PhD, Freie Univ, Berlin, Germany. **Associate Professor** (*High-tech Entrepreneurship; Industrial Economics; Knowledge Management; Management of Innovation*)

DO BA KHANG

MSc, Eotvos Lorand Univ, Hungary; MSc, DTechSc, AIT, Thailand. **Associate Professor** (*Management Science; Operations Management; Project Management; Service Management; Small and medium enterprises (SME) support and management*)

DONYAPRUETH KRAIRIT,

BS, Thammasat Univ, Thailand; MS, Univ of Colorado at Boulder; PhD, Massachusetts Inst of Tech, Cambridge, USA. **Assistant Professor** (*Technology, Policy and Management*)

FREDRIC W SWIERCZEK

BA, Temple Univ, USA; MA, PhD, Univ of Pittsburgh, Pennsylvania, USA. **Associate Professor** (*Behavioral Science; Organizational Development*)

HIMANGSHU PAUL

BE, Univ of Gauhati, India; MEng, PhD, AIT, Thailand. **Professor** (*Manufacturing Supply & Logistics; Manufacturing Strategy; Manufacturing Technology Management; Operations Management;*

TQM)

INDRA M PANDEY

MComm, PhD, Univ of Delhi, India. **Professor** (*Corporate Finance, Emerging Capital Markets*)

JOHN C S TANG

BS, MS, PhD, Univ of Florida, USA. **Professor** (*Engineering Economy; International Economics; International Operating Environment of Business; Managerial Economics*)

LALIT M JOHRI,

BSc(Hons), MSc, MBA, PhD, Univ of Delhi, India. **Professor** (*International Business; International Joint Ventures; Marketing; Negotiations; Strategic Management*)

NAZRUL ISLAM

BScEng, BUET, Bangladesh; MEng, DEng, AIT, Thailand. **Professor** (*Management of Technology; Technology and Development; Technology Policy; Technology Transfer*)

NICHOLAS J DIMMITT

BA, MA, San Francisco State Univ; PhD, Univ of Southern California, USA. **Assistant Professor** (*Business Communication, Business Ethics, Research Methods*)

RIAN BEISE-ZEE

Dipl. Ing. (Industrial Engineering), Technical University of Berlin, Dr.oec (Economics & Business), Germany **Assistant Professor** (*International*

Marketing, Innovation Marketing, Service Marketing)

ROY KOUWENBERG

MSc, PhD, Erasmus Univ of Rotterdam, The Netherlands.

Assistant Professor

(*Finance; Portfolio Management*)

SUNUNTA SIENGTHAI

BA, Chulalongkorn Univ, Thailand; MA, PhD, Univ of Illinois, USA.

Associate Professor (*Labor & Industrial Relations, HRM, Wages & Production*)

TRUONG QUANG

BSc, MSc, Natl Inst of Administration, Vietnam; MPA, Inst of Social Studies, The Hague; PhD, Free Univ, The Netherlands. **Associate Professor** (*Brand Management; Human Resources Management; International Business; Organizational Behavior; Public Policy*)

Visiting Faculty

ILKKA KAURANEN

MS Engg, Lic Tech, DTech, Helsinki University of Technology, Finland. **Visiting Professor** (*Development and Management in Industry*)

ROLAND AMOUSSOU-GUENOU

LLB, National Univ of Benin, South Africa; LLM, Univ of Toulouse, France; PhD, Univ of Paris II, France. **Visiting Lecturer** (*Legal Expert on Legal Corporation, French*

Ministry of Foreign Affairs, International Business Law, International Contracts & Dispute Resolution, International Private Law)

SUNDAR VENKATESH

BSc, BL, Univ of Calcutta; PhD, Indian Inst of Management, India. **Visiting Associate Professor** (*Finance; Financial Accounting*)

TAE-HONG JIE

BS, Korean Naval Academy; MA, Seoul Natl Univ, Korea; MS, US Naval PG School, USA; PhD, Brunel Univ, UK. **Visiting Professor** (*Management of Technology*)

WILLI ZIMMERMANN

PhD, Munich Univ, Germany. **Adjunct Faculty** (*Public Sector Management, Urban Governance, Environment Management*)

25.7 Grants and Sponsored Research Completed in 2007

AIT-SOM GTZ e-Learning

Duration: 01-Oct-05 – 31-Aug-07
Project Investigator: Dr. Sundar Venkatesh
Sponsor: GTZ
Total Contracted Amount (Euro) 150,000

Ansell Leadership Development Program 2006-07

Duration: 1-Oct-06-30-Sep-07
Project Investigator: Dr Sundar Venkatesh
Sponsor: Ansell Limited, Australia
Total Contracted Amount (Baht) 3,948,000

International Executive MBA (IEMBA) Program Vietnam

Duration: 1-Jan-04 - 30-Jun-07
Project Investigator: Dr Fredric W. Swierczek
Sponsor: Multi-donors
Total Contracted Amount (Baht) 36,000,000

MTEC Management Development Program

Duration: 1-Dec-06-31-Aug-07
Project Investigator: Singha Chiamsiri
Sponsor: National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency (NSTDA)
Total Contracted Amount (Baht) 2,000,000

SME Alumni Workshop

Duration: 15-Feb-07-31-May-07
Project Investigator: Dr Ilkka Kauranen
Sponsor: Swedish International Development Cooperation Agency, Sweden
Total Contracted Amount (Baht) 75,788

Technolopreneur Development Program 2006

Duration: 11-Mar-06-30-Jun-07
Project Investigator: Dr Barbara Igel
Sponsor: NECTEC, Thailand
Total Contracted Amount (Baht) 1,050,000

The 6th Global Conference on Flexible Systems Management 2006

Duration: 1-Dec-06-31-Mar-07
Project Investigator: Prof Himangshu Paul
Sponsor: Participants
Total Contracted Amount (Baht) 231,515

25.8 On-going Grants and Sponsored Research

2nd Swiss EMBA Programme Study Trip

Duration: 5-Dec-06-31-Mar-08
Project Investigator: Prof John C Tang
Sponsor: University of Applied Sciences (HTW, Churs) Switzerland
Total Contracted Amount (Baht) 864,000

Ansell Leadership Development Program 2007-08

Duration: 1-Oct-07-30-Sep-08
Project Investigator: Dr. Sundar Venkatesh
Sponsor: Ansell Limited, Australia
Total Contracted Amount (Baht) 3,740,000

DBA Program in Bangkok 2006

Duration: 31-Oct-06-31-Dec-09
Project Investigator: Prof Indra Pandey, Dr Nicholas Dimmit, Dr Fredric W. Swierczek, Dr Rian Beise-zee, Prof Nazrul Islam, Dr Do Ba Khang, Dr Sundar Venkatesh, Dr Sununta Siengthai, Prof Lalit Johri

Sponsor: Multi-donors
Total Contracted Amount (Baht) 15,552,000

DBA Program in Bangkok 2007

Duration: 1-Feb-07-31-Jan-10
Project Investigator: Prof Indra Pandey, Dr Nicholas Dimmit, Dr Fredric W. Swierczek, Dr Rian Beise-zee, Prof Nazrul Islam, Dr Do Ba Khang, Dr Sundar Venkatesh, Dr Sununta Siengthai, Prof Lalit Johri
Sponsor: Multi-donors
Total Contracted Amount (Baht) 19,440,000

DBA Program in Sri Lanka 2006

Duration: 31-Oct-06-31-Dec-09
Project Investigator: Prof Indra Pandey, Dr Nicholas Dimmit, Dr Fredric W. Swierczek, Dr Rian Beise-zee, Prof Nazrul Islam, Dr Do Ba Khang, Dr Sundar Venkatesh, Dr Sununta Siengthai, Prof Lalit Johri
Sponsor: Multi-donors
Total Contracted Amount (Baht) 11,988,000

DBA Program in Ho Chi Minh City, Vietnam (HCMC) 2007

Duration: 1-Feb-07 31-Jan-10
Project Investigator: Prof Indra Pandey, Dr Nicholas Dimmit, Dr Fredric W. Swierczek, Dr Rian Beise-zee, Prof Nazrul Islam, Dr Do Ba Khang, Dr Sundar Venkatesh, Dr Sununta Siengthai, Prof Lalit Johri, Prof Ilkka Kauranen
Sponsor: Multi-donors
Total Contracted Amount (Baht) 14,000,000

DBA Program in Hanoi Vietnam (HN) 2007

Duration: 1-Jul-07-30-Jun-10
Project Investigator: Prof Indra Pandey, Dr Nicholas Dimmit, Dr Fredric W. Swierczek, Prof Nazrul Islam, Dr Do Ba Khang, Dr Sundar Venkatesh, Dr Sununta Siengthai, Prof Ilkka Kauranen
Sponsor: Multi-donors
Total Contracted Amount (Baht) 12,250,000

DBA Program in Taiwan 2007

Duration: 1-Nov-07-31-Dec-10
Project Investigator: Prof Indra Pandey, Dr Nicholas Dimmit, Dr Fredric W. Swierczek, Prof Nazrul Islam, Dr Do Ba Khang, Dr Sundar Venkatesh, Dr Sununta Siengthai, Prof Ilkka Kauranen
Sponsor: Multi-donors
Total Contracted Amount (Baht) 14,025,000

Executive MBA Program in Human Resources Management

Duration: 1-Jan-04-31-Dec-08
Project Investigator: Dr Truong Quang
Sponsor: Swedish International Development

Cooperation Agency, Sweden
Total Contracted Amount (Baht) 45,658,200

The Asia Pacific Management Conference

Duration: 1-Oct-06-31-Dec-08
Project Investigator: Prof Nazrul Islam
Sponsor: Participants
Total Contracted Amount (Baht) 693,750

25.9 Publications

Refereed Journals

Hla Theingi and Tang, J.C.S., Firm's specific characteristics and entry mode on firm's performance: Electrical and electronic industry in Thailand. *Asia Pacific Journal of Economics and Business*. Accepted, February 2007.

Igel, B. and P. Kanjanasanpetch, (2007), "A knowledge based view of implementing Enterprise Resource Planning", *Intl J. of Business and Systems Research*, *INDERSCIENCE*, (under review)
Chairakul, Tanyamai and B. Igel (2007): Integration of interaction channels to achieve widespread Internet banking acceptance in Asian cultures: The case of Thailand, *Intl. J. of Financial Services Management*, *INDERSCIENCE*, (under review)

Kimpakorn, N. and Dimmitt, N. (In press), Employer Branding: The perspective of hotel management in the Thai Luxury Hotel Industry. *Australasian Marketing Journal*.

Kraitir, D. (2007) Commentaries: Thailand's e-Government for Helping the Poor. *Regional Development Dialogue*, UN Centre for Regional Development, Vol. 27 No. 2, Autumn 2006.

Khang, D.B., Managing international development projects, Vikalpa, *Journal for Decision Makers*, Vol. 32, No.3, 2007, pp.94-97.

M. Bachalas, M. K. Tiwari, and Ravi Shankar (2007), Sequencing of parts on single stage multifunctional machine system using chaos-embedded simulated annealing algorithm, Accepted for publication in *International Journal of Production Research*.

- N. Khilwani, Ravi Shankar, and M. K. Tiwari (2007) Facility Location Problem: An approach based on Group Decision Making System and Psycho-clonal Algorithm, Accepted for publication in International Journal of Production Research.
- Neal, M. and Finlay, J. L. 2007. American Hegemony and Business Education in the Arab World. Journal of Management Education. Published on September 19, 2007, doi:10.1177/1052562906297075
- P. Charan, Ravi Shankar, R. K. Baisya (2007), Analysis of interactions among the variables of supply chain performance measurement system implementation, Accepted in: Business Process Management Journal
- Ravi Shankar, S. Acharia, A. Baveja (2007), Soft system knowledge management framework for new product development, Accepted in: Journal of Knowledge Management.
- Ravi V., Ravi Shankar, M. K. Tiwari (2007) Selection of a reverse logistics project for end-of-life computers: ANP and goal programming approach, Accepted for publication in International Journal of Production Research
- Romel M. Carlos and Do Ba Khang, Characterization of biomass energy projects in Southeast Asia, Accepted for Journal of Biomass Energy, March 2007.
- S. Gandhi, D. K. Banwet, and Ravi Shankar (2007), Analysis of Interactions among core, transaction and relationship specific investments: the core off-shoring, Accepted for publication in: Journal of Operations Management (Sciencedirect)
- Seppo Hänninen and Ilkka Kauranen. Product innovation as a micro strategy. International Journal on Innovation and Learning, volume 4, number 4, 2007, pages 425 - 443.
- Seppo Hänninen; Ilkka Kauranen; Ari Serkkola and Jaakko Ikävalko. Barriers to commercialisation from the "four knowledge bases" perspective: A study of innovation in the software development sector. International Journal on Management Practice, 2007, volume 2, number 3, pages 197 - 213.
- Shrestha R.M., Islam N., Oanh N .T. K., Adhikari S., Yedla S., Jiang, K., Siagian U., Tuan N. D., Abrenica J. (2007); Strategies for the promotion of cleaner and energy efficient technologies in the urban transport system in selected Asian cities; International Journal of Environment and Pollution, vol. 30, no.1, pp. 45-58
- Sundar Venkatesh and Ayurzana Puntsagdavaa, "Siam Makro Plc", Asian Case Research Journal (forthcoming in 2007).
- Tilak Raj, Ravi Shankar, Mahd. Suhaib, An ISM Approach for Modeling the Enablers of Flexible Manufacturing System, Accepted for publication in International Journal of Production Research.
- Tilak Raj, Ravi Shankar, Mahd.Suhaib (2007), An ISM Approach to Analyze Interaction between Barriers of Transition to Flexible Manufacturing System, Accepted in International Journal of Manufacturing Technology and Management.
- Treeranon, C., Haddawy, P., & Krairit, D. (2007) Integrating Visualization and multi-attribute utility theory for online product selection. International Journal of information Technology and Decision Making, Vol. 6 issue 3, September 2007.
- Vanichchinda, A. and B. Igel (2007): A Critical Comparison between Total Quality Management and Supply Chain Management, Intl. J. of Management History, (under review)
- Wongsurawat, W. (2007), Determinants of public reactions to concorde test flights at the John F. Kennedy International Airport. Journal of Air Transport Management, 13 (6), 371-375.
- the Pacific, Korea Labour Institute, Korea.
- David Simchi-Levi, Philip Kaminsky, Edith Simchi-Levi, and Ravi Shankar, Designing and Managing The Supply Chain: Concepts, Strategies, and Case Studies (Third Edition as Special Indian Edition), Tata McGraw-Hill Publishing Company Ltd, New Delhi (2007)
- Siengthai, Sununta; Uthai Tanlamai; and Chris Rowley (2007) The Changing Face of Human Resource Management in Thailand. In Chris Rowley and Saaidah Abdul-Rahman (eds.) The Changing Face of South East Asian Human Resource Management (pp.155-184). Routledge, U.K.
- Sundar Venkatesh and Winston Kwok Chee Chiu, National University of Singapore, Financial Reporting and Analysis: An Asian Case Book, Pearson/Pretice Hall, 2007.

Conference Proceedings

- Chia-Hsing Huang and Shu-Shian Lin, 2007, The Impact of WTO on International Interdependence Degree among United States, Korea and China, Universite de Cergy, Tunisia, French, 2007 AFFI Conference.
- Do Ba Khang and Tun Lin Moe, Success Criteria and Factors for International Development Projects: A life Cycle-based Framework, Proceedings of the Joint Conference of the International Society of Marketing and Development and the Macromarketing Society, Washington D.C. 2-5 June 2007.
- Neal, M. and Jones, C. J. (Eds.) 2007. Official Proceedings of the International Colloquium on Tourism and Leisure (7-10 May 2007, Chiang Mai, Thailand), ICTL Publications, Delaware, U.S. ISBN: 978-1-4243-4100-9.

Refereed Books/Chapters

- Siengthai, Sununta (2007) Globalization and Changes in Employment Conditions in Thailand. In J. Hur and S. Lee (eds.) Globalization and changes in employment conditions in Asia and
- Sundar Venkatesh and Ranchana Rajathevin, "Current Practice of Corporate Finance in Thailand", 20th Australasia Banking and Finance Conference, Sydney, Australia, December 2007.

Suppyueng V., Islam, N. and Kulkarni, U.; Knowledge Management Practices in Thai SMEs: Influence of SME Characteristics on Knowledge Management Processes; Americas' Conference on Information Systems (AMCIS); Keystone Colorado, USA, August 9-12, 2007

Tilak Raj, Ravi Shankar, M. Suhaib, and R.A. Khan, HFMS: A new concept in the context of Flexible Manufacturing Systems, Presented in International Conference of GLOGIFT, Noida, (India) November 15-17, 2007; also published in the Proceedings of GLOGIFT 2007, pp. 321-327

Tilak Raj, Ravi Shankar, M. Suhaib, and R.A. Khan, Some dimensions of flexibility in FMS, Presented in International Conference of GLOGIFT, Noida, (India) November 15-17, 2007; also published in the Proceedings of GLOGIFT 2007, pp. 328-334

Other Publications

Huang, C-H (2007), Real Estate Investment, 3rd ed., Shinlou, Taiwan.

Raimo Kainulainen and Ilkka Kauranen. Teaching case on producing the financial part of a business plan in a start-up company. Bangkok, Thailand. Asian Institute of technology, School of Management. 2007. 16 pages.

Shi-Ming Yang and Chia-Hsing Huang, et al., 2007, Taiwan Real Estate Market Annual Report, Shin-Yi Real Estate.

25.10 Doctoral Students' Dissertation

International Business

Value Based Localization Strategies in the Automobile Industry: Case Studies of International Companies in Thailand
By: Ms. Phallapa Petison
Supervisor: Prof. Lalit M. Johri

Performance Measurement Through Efficiency

Analysis: Applications of DEA
By: Ms. Sangchanh Kantabutra
Supervisor: Prof. John C.S. Tang

Critical Success Factors in Project Management: An Analysis of Infrastructure Projects in Vietnam
By: Mr. Cao Hao Thi
Supervisor: Dr. Fredric W. Swierczek

Corporate Governance in East Asian Financial Corporations
By: Wiparat Chuanrommanee
Supervisor: Dr. Fredric W. Swierczek

Determinants of Bank Loan Financing by Private SMEs in Vietnam
By: Le Thi Bich Ngoc
Supervisor: Dr. Sundar Venkatesh

Firm's Specific Advantages, Diversification Strategy, Entry Mode and Firm's Performance: Electrical and Electronic Industry in Thailand
By: Hla Theingi
Supervisor: Prof. John C. S. Tang

Integration of Interaction Channels in Banking Services to Enhance Corporate Customer Satisfaction: A Study of Thai Commercial Banks
By: Tanyamai Chiarakul
Supervisor: Dr. Barbara Igel

Materialism and Consumer Perception of Status Products
By: Thirarut Sangkhawasi
Supervisor: Prof. Lalit M. Johri

Service Brand Equity: The Linkage between Internal and External Branding
By: Narumon Kimpakorn
Supervisor: Dr. Nicholas Dimmitt

Management of Technology

A Performance Measurement Method for Supply Chains: An Integrated Multiple Criteria Decision Analysis Approach
By: Adisak Theeranuphattana
Supervisor: Prof. John C S Tang

The Impact of Functional and Business Strategies on Organizational Performance of Automobile Manufacturers in Thailand
By: Vichak Phongpetra
Supervisor: Prof. Lalit M. Johri

25.11 Masters Students' Theses, Research Studies and Projects

International Business

May 2007

Research Study: A Business Plan for an Animation Company in Jaipur, India
By: Mr. Vaibhav Agrawal
Supervisor: Dr. Barbara Igel

Research Study: Customer to Customer online Shopping Preferences in China's E-commerce
By: Ms. Liu Jieting
Supervisor: Dr. Fredric W. Swierczek

Research Study: Performance Management for Competency Improvement: A Case Study of a Hospital in Myanmar
By: Ms. Pale Sandar
Supervisor: Dr. Fredric W. Swierczek

Research Study: The Economic Development of China: Opportunities and Risks for French Companies
By: Mr. Blaise Massu
Supervisor: Dr. Fredric W. Swierczek

Research Study: The Future Outlook of Pulp and Paper Industry in Thailand- A Case Study of Phoenix Pulp and Paper Public Company Limited
By: Mr. Shashank Handa
Supervisor: Dr. Fredric W. Swierczek

Research Study: Corporate Social Responsibility in the Tata Group
By: Mr. Abhijit Mohanty
Supervisor: Dr. Fredric W. Swierczek

Research Study: Tourism Industry in Bagan, Myanmar
By: Ms. Win Ni Myint
Supervisor: Dr. Fredric W. Swierczek

Research Study: The Power Generation Industry in Bangladesh: Potential Alternatives
By: Mr. Md. Abdur Razzak Rana
Supervisor: Dr. Fredric W. Swierczek

Research Study: Mobile Marketing: IT's in the Pocket!
By: Mr. Mathieu Castel
Supervisor: Dr. Fredric W. Swierczek

Research Study: Marketing Communication for Brand Image Renewable: A Case Study of Thailand Securities Depository Co., Ltd.
By: Ms. Narisara Intarakomheang
Supervisor: Dr. Nicholas J. Dimmitt

Research Study: Mobile Television and Content Providers: The Convergence of Media, Internet and Telecoms
By: Mr. Pierre La Carbona
Supervisor: Dr. Nicholas J. Dimmitt

Research Study: Advertising and the Process of Adaptation to a Local Context: The Case of Morocco
By: Ms. Aida Bakkali Hassani
Supervisor: Dr. Nicholas J. Dimmitt

Research Study: Drug Lag and Demand Lag: An Investigation on Pharmaceuticals in Thailand
By: Mr. Sakhawat Sobhan
Supervisor: Dr. Rian Beise-Zee

Research Study: Communication Strategies of FMCG Companies in Rural Areas of Developing Countries: A Case Study on India
By: Ms. Pallavir Dhir
Supervisor: Dr. Rian Beise-Zee

Research Study: The Effect of Marketing Communication on Trust of Users in Internet Banking Services in Thailand
By: Ms. Varinya Suntayodom
Supervisor: Dr. Rian Beise-Zee

Research Study: Critical Purchase Decision Factors for Customers in B2B Industry: An Exploratory Survey in India
By: Mr. Sanju Thoppil Thomas
Supervisor: Dr. Rian Beise-Zee

Research Study: Comparison of Methods for Coping with Social Desirability Bias in Marketing Research
By: Ms. Ratula Bhaumick
Supervisor: Dr. Rian Beise-Zee

Research Study: Emergence of Online Travel Agents and their Impact on Traditional Businesses: A Case Study on India
By: Ms. Ritishka Vij
Supervisor: Dr. Rian Beise-Zee

Research Study: The Dynamics of the Country-of-Origin Effect in the Consumer Sector in Asia: An Empirical Study for the Cosmetic Sector in Thailand
By: Ms. Tatsanaporn Todhanakasem
Supervisor: Dr. Rian Beise-Zee

Research Study: The Choice of Optimal Channels in Retail-Internet vs. Store Outlets: A Case Study of Jewelry Industry in Thailand
By: Mr. Ashish Bahadur Shrestha
Supervisor: Dr. Rian Beise-Zee

Research Study: Processes of Product Adaptation for Meeting Local Market Needs
By: Ms. Sneha Hebli
Supervisor: Dr. Rian Beise-Zee

Research Study: Success Factors for Customer Loyalty of Internet Book Retailer
By: Ms. Ruethairat Sureephong
Supervisor: Dr. Rian Beise-Zee

Research Study: The ROI of Chinese Companies and In-depth Study of Some Market Leaders
By: Ms. Hu Zhifang
Supervisor: Dr. Sundar Venkatesh

Research Study: A Study of Returns on Dual Listed Stocks on Hong Kong and Mainland Stock Exchanges
By: Ms. Mei Yiu-Lo
Supervisor: Dr. Sundar Venkatesh

Research Study: The Relationship between Financial Ratios and Beta: A Study of Stocks on the Stock Exchange of Thailand
By: Ms. Nirutchara Watthanawaniwut
Supervisor: Dr. Sundar Venkatesh

Research Study: Stock Trading Behavior of Bangkok Residents
By: Ms. Alisa Sony

Supervisor: Dr. Sundar Venkatesh

Research Study: Knowledge Management-Stage of the Art: Progress and Problem in Thailand Business Sector
By: Mr. Prakarn Korkiatcharoon
Supervisor: Dr. Sununta Siengthai

Research Study: Feasibility Study of Human Resource Management Outsourcing in the Chinese State-owned Enterprises
By: Ms. Sun Rui
Supervisor: Dr. Sununta Siengthai

Research Study: Recruitment and Selection Practices in the Myanmar Hotel Industry: A Case Study of Selected Hotels
By: Ms. Hnin Zarchi Aung
Supervisor: Dr. Sununta Siengthai

Research Study: Management and Employee Perceptions of Firm's Human Resource Management: A Case Study of PTT Exploration and Production Public Co., Ltd. (PTTEP)
By: Ms. May Myat Thwin
Supervisor: Dr. Sununta Siengthai

Research Study: China Luxury Market Characteristics and Implication for Multinational Luxury Brands
By: Mr. Shi Pu
Supervisor: Dr. Sununta Siengthai

Research Study: An Analysis of Recruitment and Selection Practices in Chinese Enterprises: A Case Study of Sichuan SNECMA AERO-Engine Maintenance Co., Ltd.
By: Mr. Huang Junhua
Supervisor: Dr. Sununta Siengthai

Research Study: Service Quality and Customer Satisfaction in the Myanmar Private Healthcare Industry: A Case Study of Asia Royal Cardiac and Medical Care Center
By: Ms. Hnin Wah Wah Sann
Supervisor: Dr. Willi Zimmermann

Research Study: Investment Climate and Energy Strategies: A Study of the Emerging Indian Real Estate Market
By: Mr. Ashish Chopra
Supervisor: Prof. H. Paul

Research Study: Corporate Governance & Firm Performance: A Study on Thailand
By: Mr. Jyotirmoy Podder
Supervisor: Prof. I.M. Pandey

Research Study: Top Down Approach to Investment: A Case Study of Indian Telecom Infrastructure Sector
By: Ms. Tanya Vij
Supervisor: Prof. I.M. Pandey

Research Study: Innovation Management Model for the Agriculture Seeds Industry: Case Study of a Vegetable Seed Company
By: Mr. Somnath Ray
Supervisor: Prof. Ilkka Kauranen

Research Study: Business Development Strategy: A Case Study of SICEDECO Company, Ho Chi Minh City

By: Mr. Nguyen The Phuong
Supervisor: Prof. John C.S. Tang

Research Study: A Study of Risks and Prospect of Real Estate Industry in China
By: Mr. Ding Guoyu
Supervisor: Prof. John C.S. Tang

Research Study: Economic Cooperation between Korea and Association of Southeast Asian Nations (ASEAN) - In terms of Korea-ASEAN FTA Negotiations
By: Mr. Jaeho Jung
Supervisor: Prof. John C.S. Tang

Research Study: The Tourism Industry in Yunnan Province, China
By: Ms. Ye Jing
Supervisor: Prof. John C.S. Tang

Research Study: Foreign Direct Investment in Bhutan: A Qualitative Assessment of Key Prospects and Challenges
By: Mr. Gyeltshen
Supervisor: Prof. John C.S. Tang

Research Study: A Comparative Study on the Financial Performance of Joint Venture and Domestic Private Commercial Banks in Nepal
By: Mr. Deep Chandra Regmi
Supervisor: Prof. John C.S. Tang

Research Study: Feasibility of Brand Concept Mapping: A Case Study of Shopping Malls in Hanoi, Vietnam
By: Ms. Nguyen Thi Ninh Ket
Supervisor: Prof. John C.S. Tang

Research Study: Globalization versus Localization of brands: A Case study of Procter & Gamble in Thailand
By: Ms. Priyanka Barua
Supervisor: Prof. John C.S. Tang

Research Study: Chinese Management Consulting Services: Current Competitive Settings and Strategies
By: Ms. Ye Rui
Supervisor: Prof. John C.S. Tang

Research Study: Analysis of Wenzhou Model in Private Sector Development in the People's Republic of China
By: Ms. Xia Min
Supervisor: Prof. John C.S. Tang

Research Study: Prospects and Challenges of Suvarnabhumi Airport as an Aviation Hub
By: Ms. Sumolrat Kosoldilokkul
Supervisor: Prof. John C.S. Tang

Research Study: Microfinance in Cambodia: Prospects and Challenges
By: Ms. Sao Pisey
Supervisor: Prof. John C.S. Tang

Research Study: Designing Optimal Supply Chain for Sportswear: A Case Study of Adidas, Thailand
By: Mr. Somchoke Visuthiratsopon
Supervisor: Prof. Lalit M. Johri

Research Study: International Acquisition in Telecommunication Industry: A Case Study of Shin Corporation (Thailand) and Temasek

Holdings (Singapore)
By: Mr. Noppon Issarapinyo
Supervisor: Prof. Lalit M. Johri

Research Study: Impact of Information and Communication Technologies and E-business on the European Tourism Industry
By: Mr. Camille Bomal
Supervisor: Prof. Nazrul Islam

Project: The Impact of Nanotechnology on Pharmaceutical Industry
By: Mr. Prasert Sirichotvithyakorn
Supervisor: Prof. John C.S. Tang

Project: Communicating the Brands: The Case Study of Quiksilver Europe
By: Ms. Vanessa Gaud
Supervisor: Dr. Nicholas J. Dimmitt

Project: Emotional Branding: The Case of Big Brother in France
By: Mr. Mehdi Berrada
Supervisor: Dr. Donyapreuth Krairit

Project: Corporate Social Responsibility in Thailand and France
By: Ms. Sophie Mahe
Supervisor: Dr. Willi Zimmermann

Project: Social Responbility and Tobacco Companies
By: Ms. Himmi Ihsane
Supervisor: Dr. Nicholas J. Dimmitt
August 2007

Research Study: A Study of the Implementation of Oracle Siebel Program in AIS
By: Ms. Kolluri Venkata Sri Sudha
Supervisor: Prof. Nazrul Islam

Research Study: Credit Risk Management Practices of Thai Commercial Banks Pre-and Post -The Asian Crisis
By: Mr. Wang Xiaohui
Supervisor: Prof. John C.S. Tang

Research Study: Equity Research in Emerging Markets: The Case Study of Singapore Company
By: Mr. Egamberdiev Nodir
Supervisor: Prof. I.M. Pandey

Research Study: Knowledge Creation in an Organization: A Case Study of the Stock Exchange of Thailand
By: Ms. Kamolchanok Kanwanich
Supervisor: Dr. Sununta Siengthai

Research Study: The Impact of Firms' Capital Expenditure on Working Capital Management: An Empirical Study Across Industries in Thailand
By: Mr. B.A. Ranjith Appuhami
Supervisor: Dr. Sundar Venkatesh

Research Study: Biodiesel Feasibility Study in Surat Thani Province
By: Ms. Laongtip Wanasuwannakul
Supervisor: Prof. John C.S. Tang

Research Study: An Analysis of the Competitive Environment of Thai and Malaysian Automobile Industry
By: Ms. Tiamkare Thitithamtada

Supervisor: Prof. Lalit M. Johri

Research Study: State of Project Management Practices in the Software Industry of Pakitan
By: Mr. Kazim Sarfraz Khan Sumbal
Supervisor: Prof. Lalit M. Johri

Research Study: Application of Management Control on Human Resource Practices: A Case Study of Societe Generale Group, France
By: Mr. Zou Yi
Supervisor: Dr. Sununta Siengthai

Research Study: Assessment of the Adoption of Strategic Management Accounting Practices in Thailand
By: Ms. Marianne Guerry
Supervisor: Dr. Sundar Venkatesh

Research Study: An Analysis of Exchange-traded Funds Development in the United States
By: Mr. Benjamin Philippaerts
Supervisor: Prof. John C.S. Tang

Research Study: Forex Market, Theory and Practices
By: Mr. Raphael Perez
Supervisor: Prof. John C.S. Tang

Project: A Study on Chitosan Manufacturing Plants: Case Studies in Thailand and Ecuador
By: Mr. Lallement Arthur
Supervisor: Dr. Donyaprueth Krairit

December 2007

Research Study: The Incompatibilities in E-commerce Adoption in SMEs in Provincial Regions of Developing Countries: The Case of Hoi An Province-Vietnam
By: Ms. Le Kiem Ai
Supervisor: Dr. Rian Beise-Zee

Research Study: The Effects of Foreign Ownership on Firm Performance: Evidence from Thailand
By: Mr. Sutthiroj Sitwatananon
Supervisor: Dr. Sundar Venkatesh

Research Study: A Case Study of the Nepali Tea Industry: Opportunities, Risks and Challenges
By: Ms. Sweta Pokharel
Supervisor: Prof. John C.S. Tang

Research Study: Consumers' Attitudes towards Private Label and National Brands: An Empirical Study for Toilet-Tissue Product in Thailand
By: Ms. Krisupang Anantavanich
Supervisor: Dr. Rian Beise-Zee

Research Study: Hydropower Development in Nepal: A Study on Private Sector Participation
By: Mr. Siddharth Mani Rajbhandari
Supervisor: Prof. John C.S. Tang

Research Study: IPO Process and the Level of Underpricing in Vietnam
By: Ms. Nguyen Van Anh

Supervisor: Dr. Sundar Venkatesh

Research Study: The Analysis of Marketing Strategy for Pet Bottled Water in Laos: A Case Study of Viva vs Tigerhead
By: Ms. Douangdao Inthavongxay
Supervisor: Prof. John C.S. Tang

Project Title: Market and Competition Analysis for "BlueID": A Strategic Insight for GIDTEC mbH
By: Mr. Gaurav Rishi
Supervisor: Dr. Rian Beise-Zee

Project Title: Market Attractiveness for Non-woven Textiles in Thailand
By: Mr. Shravan Bakshi
Supervisor: Dr. Sununta Siengthai

International Public Management

May 2007

Research Study: Success Factors of Projects Implemented by International Non-government Organizations in Laos
By: Mr. Vilay Duangthongla
Supervisor: Dr. Do Ba Khang

Research Study: Life Cycle based Critical Success Factors in International Development Projecs of the Poverty Reduction Fund (PRF) in Lao, PDR
By: Mr. Chevala Vongthongchit
Supervisor: Dr. Do Ba Khang

Research Study: Politically Connected Firms and the Allocation of Government Expenditure: An Empirical Study
By: Mr. Nguyen The Hoang
Supervisor: Dr. Donyapreuth Krairit

Research Study: Management and Application of Telecommunication Broadband Technology for Universal Service Obligation Provision: Case Study: Implementation of Universal Service Obligation in Vietnam Post and Telecommunication Group (VNPT)
By: Ms. Nguyen Thi Thanh Hoa
Supervisor: Dr. Donyapreuth Krairit

Research Study: Evaluation of HRD-STOFA's Training Programs for Ministry of Fisheries
By: Ms. Pham Tuyet Hanh
Supervisor: Dr. Sununta Siengthai
Research Study: ISO 9000 Implementation in Public Services: A Comparative Study of Two Public Organizations in Hochiminhcity, Vietnam
By: Ms. Nguyen Diep Bich Hanh
Supervisor: Dr. Willi Zimmermann

Research Study: Analysis of the Survey and of the Attitudes on Staff, Organisation and Procedures: The Case of Local Political Leaders in Ho Chi Minh City
By: Ms. Nguyen Thi My Dai
Supervisor: Dr. Willi Zimmermann

Research Study: Decentralization in Bhutan: Key challenges in development planning
By: Mr. Melam Zangpo
Supervisor: Dr. Willi Zimmermann

Research Study: Microfinance in Poverty

Reduction: The Case of Vietnam
By: Ms. Le Thi Thu Thuy
Supervisor: Dr. Willi Zimmermann

Research Study: Comparative Study on Information and Communication Technology (ICT) in Public Schools: Case Study of Wat Weruwan School (Chaing Mai) and Prathomsuksa Thammasat School (Pathumthani), Thailand
By: Ms. Kotchakan Rungkaew
Supervisor: Dr. Willi Zimmermann

Research Study: Attitudes and Behavior of Major Stakeholders: The Case of Ta Prohm Temple, Angkor Region, Cambodia
By: Ms. Sok Lang
Supervisor: Dr. Willi Zimmermann
December 2007

Research Study: Practices of Labor Export in Vietnam
By: Ms. Nguyen Thi Minh Phuong
Supervisor: Dr. Do Ba Khang

Research Study: Non-Legal Factors in the Enactment Procedure of Legal Documents by Local Governments at Ho Chi Minh City, Vietnam
By: Mrs. Dinh Thi Hien Ly
Supervisor: Dr. Do Ba Khang

Management of Technology

May 2007

Research Study: Tourism Industry in Myanmar - An Analysis of Barriers and Development Options
By: Ms. Hsu Htet Hlaing
Supervisor: Dr. Barbara Igel

Research Study: Business Incubation in Nepal-A Survey on Supply and Demand of Incubation Services
By: Mr. Rahul Shah
Supervisor: Dr. Barbara Igel

Research Study: Business Plan for Implementing a 5 MW Small Hydro Power

Project in Nepal
By: Mr. Nishesh Shakya
Supervisor: Dr. Barbara Igel

Research Study: The Impact of Internet Search Engines on Information Searching: The Case of Google
By: Mr. Chun Chieh Chen
Supervisor: Dr. Donyapreuth Krairit

Research Study: The Prospects of E-commerce for Bhutanese Handicrafts
By: Mr. Tshering Norbu
Supervisor: Dr. Donyapreuth Krairit

Research Study: The Semantic Technologies: A guide to the billion dollar market
By: Mr. Maxime Boulin
Supervisor: Dr. Donyapreuth Krairit

Research Study: Technology Development and the Significance of Human Capital in Least Developed Countries: the Case of Nepali Expatriates
By: Mr. Binit Pradhanang
Supervisor: Dr. Willi Zimmermann

Research Study: Formulating Competitive Strategies: A Case Study of a Service Company in Cambodia
By: Mr. Hong Leang Y
Supervisor: Prof. Ilkka Kauranen

Research Study: Development of a Venture Capital Industry in the Philippines
By: Mr. Eliseo C. Bacolod
Supervisor: Prof. Ilkka Kauranen

Research Study: Analysis of Trends in Development of China's PC Industry
By: Mr. Thosaporn Khetkaewsomboon
Supervisor: Prof. John C.S. Tang

Research Study: Export of Marine Products from Myanmar Problems and challenges
By: Ms. Zin Mar Win
Supervisor: Prof. John C.S. Tang

Research Study: Hospital Services to Foreign Patients in Thai Hospitals: A Case of Myanmar

Patients in a Private Hospital
By: Mr. Aung Naing Oo
Supervisor: Prof. Nazrul Islam

Project: How IT can Help a Nonprofit Organization More Effectively Respond to Various Needs of Stakeholders: A Case Study of Population Service International, Thailand
By: Ms. Laksana Siriwat
Supervisor: Dr. Nicholas J. Dimmitt

Project: Framework to Analyze Core and Non-core Business: A Case Study of Bharat Heavy Electricals Limited (BHEL), India
By: Mr. Suman Kumar Reddy Purumandla
Supervisor: Prof. Ilkka Kauranen

December 2007

Research Study: Consumers' Attitudes towards Online Food Ordering: An Empirical Study for Restaurant Chain in Thailand
By: Ms. Nattima Kitvaroros
Supervisor: Dr. Donyapreuth Krairit

Research Study: Software Export from Bangladesh: Problems and Remedies
By: Mr. S.M. Arifuzzaman
Supervisor: Prof. Nazrul Islam

Research Study: Trends of Human Resources Management in Thailand: The Case of E-HRMs versus HR-Outsourcing
By: Ms. Vanar Chandhasin
Supervisor: Dr. Sununta Siengthai

Research Study: The Sufficiency Economy Philosophy - The Theory and Application to Thai Enterprises
By: Ms. Wimolmas Wongmakornpan
Supervisor: Dr. Barbara Igel

Thesis Title Technology Transfer from Parent Company to Oversea Subsidiary: The Case of Engineering, Procurement and Construction (EPC) Company
By: Mr. Po-Yao Wang
Supervisor: Prof. Nazrul Islam

Chapter 26: AIT EXTENSION

26.1 Introduction

AIT Extension contributes to the development of the region through continuing professional education, short-course training and consultancy services. We do this by working to develop highly qualified and committed professionals who play a leading role in the sustainable development of the region and its integration into the global economy.

AIT Extension's operating programs:

- Agriculture, Resources and Development (ARD)
- Development Management (DM)
- Education and Information Technology (EIT)

26.2 Mission

AIT Extension identifies and responds to regional opportunities for continuing education, training and consultancy, and thus helps realize AIT's mission to develop highly qualified and committed professionals who will play a leading role in the sustainable development of the region and its integration into the global economy. AIT Extension is an innovative and responsive provider of a broad array of capacity building programs and service

26.3 Unit Governance

Dr. Jonathan Shaw
Director

26.4 Learning Approach

AIT Extension's learning systems utilize interactive, task-based, web-

based, distance mentoring and self-access learning experiences.

Teaching-learning methods used in AIT Extension training course include lectures, workshops, group discussions, case analyses group work, individual exercises, reflective thinking, role plays, project work and study visits. We believe strongly in the value of peer learning, problem-based learning, participatory learning and learner-centeredness and aim to maximize learning in all training by using these approaches appropriately. Participants benefit from close personal attention from accomplished professionals. A typical training course provides five to six hours of workshop sessions every weekday.

In all courses, participants learn relevant applications of computer and information technology. The internet is used as a support tool for sourcing information and to facilitate distance learning and mentoring activities. In most courses desktop computer is provided for exclusive use of each participant for the duration of their training. Dedicated computer and other laboratory facilities are accessible 24 hours/day, including weekends.

All training courses take advantage of our stimulating academic and social environment, which is a multicultural English speaking academic community.

26.5 Training Resources

AIT Extension has a wide pool of academic and professional Resource

Persons drawn from AIT's schools, and from leading international and local organization in the region.

Its professional staff are specialists in human resources development, curriculum planning, instructional system design, information technology application development and other specific technological areas.

AIT has incorporated state-of-the- art educational and information technologies into all training facilities on campus.

Extension's training facilities including computing and networking hardware and software are used for various training programs. The training facilities are accessible 24 hours daily. At least one computing station is dedicated for exclusive use of each participant throughout the duration of the program. All training program participants have unlimited use of e-mail and access to the Internet.

26.6 Grant and Sponsored Trainings Initiated in 2007

2007 Leadership Program on Business Strategies For Sustainable Development
Duration: 22-Jul-07-27-Nov-07
Project Investigator: Niramol Ponvilai
Sponsor: CSR Asia
Total Contracted Amount (Baht) 465,134.00

7th Fredskorpset Preparatory Course in Asia
Duration: 27-Apr-07-16-May-07
Project Investigator: Reynaldo A. Calabdan, Kanlaya Muangsan
Sponsor: Fredskorpset, Norway

Total Contracted Amount (Baht) 2,865,033.00	420,897.00	Duration: 19-Mar-07-1-Jun-07 Project Investigator: Pradeep Dash, Purvi Chudasama
Capacity Building for Organization and Personnel Department, Ministry of Agriculture Vietnam Duration: 24-Jun-07-30-Oct-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: VOCTECH, Vietnam Total Contracted Amount (Baht) 278,141.00	Effective Leadership and Execution Duration: 6-Aug-07-08-Nov-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Nepal Telecom Total Contracted Amount (Baht) 364,608.00	Sponsor: Nepal Rastra Bank Total Contracted Amount (Baht) 448,005.00
Contract Administration for International Construction Projects Duration: 26-Feb-07-1-May-07 Project Investigator: Fazole Karim and Ma. Socorro Fontanilla Sponsor: Japan Bank for International Cooperation Total Contracted Amount (Baht) 842,621.00	Effective Management Skills Development using IT Applications Duration: 24-Jun-07-30-Nov-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: BPATC/ Government of Bangladesh Total Contracted Amount (Baht) 1,361,584.00	General Banking in Central Bank Duration: 23-Apr-07-30-Sep-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Nepal Rastra Bank Total Contracted Amount (Baht) 469,478.00
Convention on Bio Diversity Workshop (year 2006) Duration: 9-Oct-06-30-Apr-07 Project Investigator: Voravate Chonlasin Sponsor: UNEP Total Contracted Amount (Baht) 1,401,853.-	Effective Monitoring and Evaluation for Agricultural Development Projects Duration: 6-Aug-07-6-Oct-07 Project Investigator: Wichit Silpamaneephan Sponsor: IFAD and Sri Lankan Government Total Contracted Amount (Baht) 567,512.00	Implementation of ERP Duration: 3-Sep-07-31-Dec-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: Swedish International Development Agency/SAREC Total Contracted Amount (Baht) 262,570.00
Design and Development of Instructional Materials Using Desktop, Web and Multimedia Tools Duration: 28-May-07-13-Sep-07 Project Investigator: Fazole Karim and Ma. Socorro Fontanilla Sponsor: NCED of Nepal Ministry of Education and Sports Total Contracted Amount (Baht) 319,913.00	Effective Training Implementation and Management (year 2006) Duration: 20-Nov-06-08-Mar-07 Project Investigator: Reynaldo A. Calabdan, Kanlaya Muangsan Sponsor: Multi-Sponsors Total Contracted Amount (Baht) 1,737,285.00	Improving Administrative Data Sources for Monitoring of MDG Indicators Duration: 9-Jul-07-10-Nov-07 Project Investigator: Niramol Ponvilai Sponsor: Asian Development Bank Total Contracted Amount (Baht) 357,837.00
Eco House Construction And Energy Conservation Duration: 14-May-07-23-Aug-07 Project Investigator: Sirinthip Pongsuvina Sponsor: SQCA-Bhutan Total Contracted Amount (Baht) 349,864.00	Environmental Risk Assessment (Postponed) Duration: 9-Jul-07-20-Oct-07 Project Investigator: Sahdev Singh Sponsor: Multi-donors Total Contracted Amount (Baht) 511,428.00	INAFI Microfinance Conference 2007 Duration: 12-Mar-07-12-Jun-07 Project Investigator: Niramol Ponvilai Sponsor: INAFI, India Total Contracted Amount (Baht) 635,072.00
Education Policy Formulation & Education Quality Assurance (year 2006) Duration: 13-Nov-06-30-Mar-07 Project Investigator: Mr. Reynaldo A. Calabdan, Ms. Kanlaya Muangsan Sponsor: Multi-Sponsors Total Contracted Amount (Baht)	Exploratory Visit to Thailand by Education Officials of NFEC Nepal Duration: 10-Sep-07-15-Dec-07 Project Investigator: Kanlaya Muangsan, Warindhorn Wachirasiri Sponsor: ESAT/DANIDA Total Contracted Amount (Baht) 170,032.00	Inspection, Monitoring and Evaluation of Education Duration: 12-Mar-07-8-Jun-07 Project Investigator: Kanlaya Muangsan Sponsor: Second Education Development Project, Mongolia Total Contracted Amount (Baht) 620,730.00
	Financial Management and Accounting	International Business Development and Management Duration: 30-Jul-07-08-Nov-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Sudan Glad Company for Development Total Contracted Amount (Baht) 491,715.00

International Exposure Program on Agribusiness and Agro Processing in Thailand and Malaysia Duration: 21-Jan-07-5-Apr-07 Project Investigator: Wichit Silpamaneephan Sponsor: Reserve Bank of India Total Contracted Amount (Baht) 1,375,622.00	323,910.00	Office Management Skills Duration: 14-May-07-23-Aug-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Multi-donors Total Contracted Amount (Baht) 453,791.00
IT Applications in Management (year 2006) Duration: 6-Nov-06-28-Feb-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: World Bank/IDA/GoB Total Contracted Amount (Baht) 381,791.00	Library and Office Management Duration: 19-Mar-07-5-Jun-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: NCED of Nepal Ministry of Education and Sports Total Contracted Amount (Baht) 722,446.00	Participatory Curriculum Development and Student-Centered Teaching and Learning Duration: 26-Feb-07-7-Jun-07 Project Investigator: Kanlaya Muangsan Sponsor: IRQUE, Sri Lank Total Contracted Amount (Baht) 402,258.00
IT Applications in Management Duration: 4-Jun-07-31-Aug-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: Multi-donors Total Contracted Amount (Baht) 556,627.00	Management and Implementation of Development Project (year 2006) Duration: 23-Oct-06-10-Feb-07 Project Investigator: Anil Rajbhandari Sponsor Multi-donors Total Contracted Amount (Baht) 1,280,620.00	Planning and Administration of Good Governance Duration: 26-Feb-07-7-Jun-07 Project Investigator: Kanlaya Muangsan Sponsor: NCED of Nepal Ministry of Education and Sports Total Contracted Amount (Baht) 575,531.00
IT Applications in Project Management Duration: 8-Oct-07-31-Jan-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: Swedish International Development Agency/SAREC Total Contracted Amount (Baht) 262,570.00	Management of Organizational Change (year 2006) Duration: 7-Nov-06-28-Feb-07 Project Investigator: Wichit Silpamaneephan, Khin Ma Ma Gyi Sponsor: BEPZA Bangladesh Total Contracted Amount (Baht) 1,092,864.00	Planning and Design of Pumping Works Duration: 20-Aug-07-30-Nov-07 Project Investigator: Worawan Sumroentrum Sponsor: Overseas Technical Scholarship (AOTS) and EBARA Hatekeyama Memorial Fund, Tokyo Japan Total Contracted Amount (Baht) 244,552.00
Knowledge Management and Organizational Learning (year 2006) Duration: 3-Jul-06-28-Feb-07 Project Investigator: Pradeep Kumar Dash Sponsor: Multi-donors Total Contracted Amount (Baht) 828,524.00	Modern Public Sector Management Duration: 4-Mar-07-17-Jun-07 Project Investigator: Worawan Sumroentrum Sponsor: SLIDA, Sri Lanka Total Contracted Amount (Baht) 1,165,365.00	Power System Protection for Airport Facilities Duration: 18-Feb-07-2-May-07 Project Investigator: Sirinthip Pongsuvinai Sponsor: Maldives Airport Company Limited Total Contracted Amount (Baht) 713,800.00
Leadership in Rural Development Duration: 16-Jul-07-20-Oct-07 Project Investigator: Parichad Nuntavong Sponsor: Multi-donors Total Contracted Amount (Baht) 572,990.00	Modern Public Sector Management (year 2006) Duration: 20-Nov-06-05-Feb-07 Project Investigator: Sorat Phutthaphithak, Anil Gopal Rajbhandari, Thaniya Jirasathitpornpong Sponsor: Sri Lanka Institute of Development Administration Total Contracted Amount (Baht) 987,477.00	Professional Development Course on Management of Training Centers Duration: 21-May-07-06-Sep-07 Project Investigator: Reynaldo A. Calabdan, Kanlaya Muangsan Sponsor: Bina Nusantara Univ, Muhammadiyah Univ, Gov't of India Total Contracted Amount (Baht) 469,795.00
Leading Change and Organizational Renewal (year 2006) Duration: 6-Nov-06-31-Jan-07 Project Investigator: Khin Ma Ma Gyi Sponsor: Ministry of Health, Maldives Total Contracted Amount (Baht)	Office Management Duration: 21-May-07-23-Aug-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Nepal Rastra Bank Total Contracted Amount (Baht) 445,406.00	Project Management Duration: 23-Apr-07-6-Aug-07

Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: International Total Contracted Amount (Baht) 1,660,777.-	Sponsor: Rural Development Administration (RDA) Korea Total Contracted Amount (Baht) 477,140.00	Chudasama Sponsor: Multi-donors Total Contracted Amount (Baht) 392,040.00
Project Management (Repeated) Duration: 23-Apr-07-30-Sep-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Multi-donors Total Contracted Amount (Baht) 2,072,070.00	Solid Waste Management Duration: 15-Jan-07-25-Jan-07 Project Investigator: Sirinthip Pongsuvina Sponsor: UNDP-Maldives Total Contracted Amount (Baht) 881,533.00	Training Program on "Human Resource Management" Duration: 22-Jan-07-09-Apr-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Nepal Rastra Bank Total Contracted Amount (Baht) 462,724.00
Public Administration Capacity Building (Batch I-V) Duration: 25-Mar-07-30-Sep-07 Project Investigator: Thaniya Jirasathitpornpong Sponsor: BPATC/ Government of Bangladesh Total Contracted Amount (Baht) 5,242,598.00	Strategic Result Based Management for Poverty Reduction Strategy Duration: 16-Jul-07-20-Oct-07 Project Investigator: Sorat Phutthaphithak, Voravate Chonlasin Sponsor: Asian Development Bank Total Contracted Amount (Baht) 725,230.00	Training Program on "Human Resource Management" (year 2006) Duration: 6-Nov-06-17-Jan-07 Project Investigator: Dr. Pradeep K. Dash Sponsor: World Bank/IDA/GoB Total Contracted Amount (Baht) 885,708.00
Quality Assurance for Education Training and Institutions Duration: 26-Mar-07-2-Jul-07 Project Investigator: Reynaldo A. Calabdan, Kanlaya Muangsan Sponsor: Islamic University Indonesia and NECD MOES, Nepal Total Contracted Amount (Baht) 771,300.00	Strategies and Implementation of E-commerce and E-services Duration: 25-Jun-07-11-Oct-07 Project Investigator: Fazole Karim and Ma. Socorro Fontanilla Sponsor: Multi-donors Total Contracted Amount (Baht) 499,603.00	Training Program on Mega Cities: Good Governance in Urban Environment Management Duration: 27-Aug-07-30-Nov-07 Project Investigator: Brahmage Upul Kaluhetti Sponsor: LEAD, Pakistan, China and India Total Contracted Amount (Baht) 756,840.00
Regulatory and Supervisory Framework Duration: 5-Mar-07-7-Jun-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Nepal Rastra Bank Total Contracted Amount (Baht) 453,798.00	Supervisory Skills Development Training for WFP Staff (Batch Two) (year 2006) Duration: 15-May-06-28-Mar-07 Project Investigator: Anil Rajbhandari Sponsor: World Food Program Total Contracted Amount (Baht) 1,000,268.00	Training Program on Organizational Financial Planning and Cost Control Duration: 30-Apr-07-09-Aug-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Multi-donors Total Contracted Amount (Baht) 595,200.00
Remote Sensing and GIS Application in Natural Resources Management Duration: 25-Jun-07-11-Oct-07 Project Investigator: Fazole Karim and Ma. Socorro Fontanilla Sponsor: GRAS, Denmark Total Contracted Amount (Baht) 586,680.00	Support Service Management Duration: 18-Jun-07-20-Sep-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: Nepal Rastra Bank Total Contracted Amount (Baht) 444,722.00	Training Program on Project Management PKSF Duration: 21-May-07-30-Aug-07 Project Investigator: Pradeep Dash, Purvi Chudasama Sponsor: PKSF, Bangladesh Total Contracted Amount (Baht) 660,672.00
Soil and Water Monitoring for Environmental Friendly Agriculture Duration: 18-May-07-29-May-07 Project Investigator: Wichit Silpamaneephan	Training on Integrated Ecosystem Management Duration: 20-Aug-07-30-Nov-07 Project Investigator: Sorat Phutthaphithak Sponsor: Multi-donors Total Contracted Amount (Baht) 868,530.00	Urban Poverty Alleviation (year 2006) Duration: 23-Oct-06-31-Mar-07 Project Investigator: Worawan Sumroentrum Sponsor: GTZ- Nepal Total Contracted Amount (Baht) 777,771.00

<p>Web-based Database Applications Development Using MySQL and PHP Duration: 26-Mar-07-12-Jul-07 Project Investigator: Fazle Karim and Ma. Socorro Fontanilla Sponsor: World Bank Total Contracted Amount (Baht) 312,379.00</p>	<p>Duration: 1 Oct 07- 9 Jan 08 Project Investigator: Dr. Pradeep Kumar Dash and Ms Purvi Chudasama Sponsor: Multi-donor Total Contracted Amount (Baht) 421,748.00</p>	<p>Local Government, Community Participation, Rural Infrastructure and IT Application for Sustainable Duration: 19 Nov 07 – 31 Jan 08 Project Investigator: Ms. Thaniya Jirasastipornpong Sponsor: LEAD/Bangladesh Total Contracted Amount (Baht) 541,920.00</p>
<p>Workshop and Study Visit Program on Good Governance in Universities Duration: 21-May-07-30-May-07 Project Investigator: Reynaldo A. Calabdan, Kanlaya Muangsan Sponsor: Pakistan's Higher Education Commission (HEC) Total Contracted Amount (Baht) 728,534.00</p>	<p>IT Application in Project Management, Lao PDR, Duration: 7 Oct 07 – 31 Jan 08 Project Investigator: Ms. Thaniya Jirasastipornpong Sponsor: LEAD/Bangladesh Total Contracted Amount (Baht) 262,571.00</p>	<p>Information and Community Technologies Duration: 29 Oct 07 -10 Jan 08 Project Investigator: Ms. Warinhorn Watchirasiri Sponsor: IRQUE, Ari Lanka Total Contracted Amount (Baht) 421,248.00</p>
<p>Local Governance and Moderization Project Duration: 26 Mar 07 – 25 Jul 07 Project Investigator: Mr. Reynaldo Calabdan, and Ms. Kanlaya Muangsan Sponsor: SEMP, Sri Lanka Total Contracted Amount (Baht) 780,680.00</p>	<p>Leadership in Public Services Duration: 8 Oct 07- 17 Jan 08 Project Investigator: Dr. Pradeep Kumar Dash Ms Purvi Chudasama Sponsor: Government of Inida Total Contracted Amount (Baht) 405,894.00</p>	<p>Water Utilities Leadership Center Asia Duration: 1 Jul 07 – 31 Mar 08 Project Investigator: Mr. Jeffrey B. Major Sponsor: USAID/Eco-Asia Total Contracted Amount (Baht) 365,400.00</p>
<p>AIT-NCED Linkage for Capacity Building Activity Duration: 1 Jul 07 – 31 Dec 08 Project Investigator: Voravate, Reynaldo Sponsor: NCED Nepal Total Contracted Amount (Baht) 1,954,548.00</p>	<p>Management of Organization Change Duration: 8 Oct 07 - 17 Jan 08 Project Investigator: Dr. Pradeep Kumar Dash Ms Purvi Chudasama Sponsor: Government of India Total Contracted Amount (Baht) 395,986.00</p>	<p>Information Technology and Management Duration: 5 Nov 07 – 31 Jan 08 Project Investigator: Ms. Thaniya Jirasathipornpong Sponsor: Multi-donors Total Contracted Amount (Baht) 404,696.00</p>
<p>Coastal Community Empowerment Duration: 18 Aug 07- 30 Nov 08 Project Investigator: Dr. Sahdev, Ms. Parichad Sponsor: Ministry of Marine Affairs and Fisheries Total contracted Amount (Baht) 268,320.00</p>	<p>Education Research Methodology Duration: 15 Oct 07- 24 Jan 08 Project Investigator: Mr. Reynaldo, Ms. Kanlaya Muangsan Sponsor: Ministry of Education and Sport) MoES), Nepal Total Contracted Amount (Baht) 615,809.00</p>	<p>Strategic HR: Making Human Resources a Strategic Function Duration: 5 Nov 07- 14 Feb 08 Project Investigator: Dr. Pradeep Kumar Dash Sponsor: Multi-donors Total Contracted Amount (Baht) 737,150.00</p>
<p>Office Management (Bhutan) Duration: 17 Sep 08- 20 Nov 07 Project Investigator: Dr. Pradeep Kumar Dash Sponsor: Ministry of Home and Cultural Affairs Total Contracted Amount (Baht) 357,945.00</p>	<p>Conflict Mediation and Dialogue Duration: 1 Oct 07- 3 Jan 08 Project Investigator: Ms. Purvi Chudasama Sponsor: Government of Inspectorate of Vietnam Total Contracted Amount (Baht) 866,345.00</p>	<p>Delivering Quality Extension Services Duration: 12 Nov 07 – 28 Jan 08 Project Investigator: Mr. Wichit Silpmaneephan Sponsor: SCJAR Total Contracted Amount (Baht) 498,401.00</p>
<p>Effective Management Skill and Techniques</p>	<p>Participatory Curriculum Development Duration: 29 Oct 07 – 7 Feb 08 Project Investigator: Ms. Kanlaya Muangsan Sponsor: IRQUE, Sri Lanka Total Contracted Amount (Baht) 1,053,481.00</p>	<p>Rural Agribusiness Development and Management Duration: 12 Nov 07 – 18 Jan 08 Project Investigator: Mr. Wichit Silpmaneephan</p>

Sponsor: SCIAR and ADRA Mongolia
Total Contracted Amount (Baht)
773,171.00

(Baht)1,069,882.00

Improving Administration Data Source for
Monitoring of MDG Indicators.
Duration: 26 Nov 07- 26 Feb 08
Project Investigator: Ms. Niramol
Ponvilai
Sponsor: ADB
Total Contracted Amount (Baht)
288,182.00

Small Scale Water Resources
Development
Duration: 3 Dec 07 -25 Feb 08
Project Investigator: Mr. Wichit
Silpmaneephan
Sponsor: SCIAR and ADRA Mongolia
Total Contracted Amount (Baht)
975,679.00

Selected Tools for Oracle 10g Database
Development and Administration
Duration: 12 Nov 07 – 31 Jan 08
Project Investigator: Ms. Thaniya
Jirasathipornpong
Sponsor: Bank of Mongolia
Total Contracted Amount (Baht)
1,940,429.00

Biotechnology Management; Assessment
of Biosafety and Analysis of Policy Issues

Duration 17 Dec 07 -21 Mar 08
Project Investigator: Ms. Sirinthip
Pongsuvinai
Sponsor: ACIAR
Total Contracted Amount (Baht)
358,971.00

E-Governance for Decision Makers
Duration 19 Nov 07 – 28 Feb 08
Project Investigator: Dr. Pradeep Kumar
Dash
Sponsor: Government of India
Total Contracted Amount (Baht)
377,048.00

Right-Based Approach to Development
Duration: 3 Dec 07 – 1 Mar 08
Project Investigator: Ms. Worawan
Sumroetrum
Sponsor: Multi-donor
Total Contracted Amount (Baht)
336,200.00

Public-Private Partnership in Urban
Environment Management
Duration: 2 Dec – 28 Feb 08
Project Investigator: Dr. Sahdeve Sing
and Mr. Bahul Raj Shrestha
Sponsor: UNDP – Nepal
Total Contracted Amount (Baht)
210,886.00

University Management and
Administration
Duration; 13 Dec 06 – 21 Mar 08
Project Investigator: Ms. Kanlaya
Muangsan
Sponsor: IRQUE, Sri Lanka
Total Contracted Amount

Chapter 27: INTERNET EDUCATION AND RESEARCH LABORATORY (IntERLab)

27.1 Introduction

Continual expansion of the Internet is creating greater demand for well-trained human resources to support the infrastructures and applications of the Internet. New computer science and engineering solutions are needed to simply handle the exponential growth in the traffic and bandwidth usage which is putting severe strain on the Internet today. There is urgent need for a new breed of engineers and technologists to respond to the growing demand from this rapid expansion with endless range of new applications.

As the Internet continues to penetrate every corner of society and of the economy, there are other non-technical issues to be addressed along with the advancement of technological progress. There is a definite need for better understanding of the Internet's social, business, economic as well as legal implications in order to promote the standards of behaviour and practices for the community that are appropriate to continued growth and beneficial use of the Internet.

Since December 2003, AIT has set up the Internet Education and Research Laboratory (intERLab), as a multidisciplinary unit, to focus on training people for designing, building and maintaining, and operating Internet and on-line educational services, or for simply using the Internet as a major tool in their everyday life and work. To keep up with the rapid development in the field, intERLab will be organized as a laboratory concentrating on research

in three main directions: technical/engineering, e-learning and social/policy/business/legal aspects.

The concept of establishing a fixed location for the internet human resources development has been discussed and endorsed by leading Asia-Pacific Internet organizations at their AP* Retreat meeting at AIT in year 2000. Several leading research institutions in Asia-Pacific, Europe and the US have indicated their interests in forming up a network of support for intERLab research, training and education.

The core component of the laboratory will be on research activities. This will be achieved by maintaining excellent research facilities and staff, hosting visiting researchers and taking advantage of linkages with research laboratories worldwide. The lab was built upon pre-existing Internetworking Research Laboratory of the School of Advanced Technologies and the Distributed Education Center.

27.2 Mission

To be a center for human resources development for top Internet specialists for the region.

27.3 Unit Governance

Prof. Kanchana Kanchanasut
InterlabLab Director

27.4 Resources

- VClass royal free elearning platform

- Custom courseware development; E-learning consultancy; instructional design consultancy; Custom course design
- VClass Trainings for AIT Faculty and Staff
- VClass Hosting Service and Technical Services
- Trainings for Network Infrastructure Engineers (7~8 courses per year)
- Video Conferencing services
- Secretariats for AP* Retreat and APNG organizations

27.5 Research Staff

Mr. Andrey Kuprianov
Research Associate SIP and VoIP; Synchronous elearning; Web Programming Master of Science in Computer Science, Asian Institute of Technology, Thailand Bachelor of Science in Computer Science, Assumption University, Thailand Voice-over-IP (VoIP) Technologies; 3GPP IMS; Synchronous and Mobile elearning and Multimedia Applications

Dr. Apinun Tunpan
Researcher Information Retrieval; Multimedia Database; Computer Networking Ph.D. (Computer Science), University of Maryland College Park, USA; MS (Computer Science), University of

Maryland College Park, USA; B.Eng. (Computer Engineering), Chulalongkorn University, Thailand. Mobile Ad Hoc Network and Multimedia Applications Mr. Mohammad Abdul Awal Research Associate Network Performance Measurement and Analysis; Streaming Media; Emergency Networks Masters of Science in Computer Science, Asian Institute of Technology, Thailand Bachelor of Science in Computer Science, American International University, Bangladesh Mobile and Wireless Mesh Networks; VoIP and SIP; Peer-to-Peer Networks and Digital Divides Elimination

Mr. Dwijendra Kumar Das Research Associate Wireless Networks; Graphics and animation programming and Image Processing M.E - Comp Sc. and Engg, Asian Institute of Technology, Thailand B.E in Computer Science and Engineering, Dibrugarh University, Assam, India Wireless Networks; Mobile Ad-hoc Networks and Feature extraction and recognition

Prof. Kanchana Kanchanasut Professor of Computer Science, School of Engineering and Technology Director of intERLab Internetworking; distributed computing and Internet for education. M.Sc and Ph. D. Computer Science, University of Melbourne, Australia. Graduate Diploma, Computer Science, University of Queensland, Australia. B. Sc.

Mathematics, University of Queensland, Australia. Heterogeneous Networks; Emergency Networks; Mobile Ad Hoc Networks; Streaming Media and Distributed Computing

Visiting Faculty

Prof. Noel Crespi GET/INT, France Visiting Professor SIP; 3G Services; IP Multimedia Subsystem And Context Awareness Ing. Dipl (ENST), MSc, PhD. B3G Core network and Service Architectures

Dr. Panita Pongpaiboon Researcher National Electronics and Computer Technology Center (NECTEC) Next Generation Internet; IPv6; Traffic classification and Intelligent transport systems Ph.D. in Electrical and Computer Engineering, Carnegie Mellon University Master of Science in Electrical Engineering, Stanford University Bachelor of Science (with University Distinction) in Electrical Engineering, Stanford University Optical network management; IP-overoptical networking; Survivable and fault-tolerant networks; Network measurement; Traffic classification; IPv6; Mobile IP and Intelligent transport system

Dr. Surat Lertlum Research Scientist Chulachomklao Royal Military Academy Doctor of Technical Science in Computer Science, Asian Institute of Technology (AIT),

Thailand, Master of Science in Computer Science, The George Washington University, Washington D.C., U.S.A., Bachelor of Science in Computer Science Engineering, Norwich University, Northfield, Vermont, U.S.A., Low-resolution (NOAA AVHRR) forest classification includes thermal band; Highresolution (Landsat TM) forest classification includes thermal band; Multiresolution forest classification includes thermal band; Object-Oriented data model for multi-resolution / multitemporal remote sensing and GIS data sets

Dr. Yasuo Tsuchimoto Keio University, Japan Visiting Assistant Professor Computer Networks and Internet Education PhD in Media and Governance, Keio University, Japan Master of Media and Governance, Keio University, Japan Bachelor of Arts in Environmental Information from Keio University, Japan Computer Networks; Internet Education; Multimedia communication and Overlay network Adjunct Researchers

Affiliates

Dr. Poompat Saengudomlert Assistant Professor School of Engineering and Technology Ph.D. in Electrical Engineering and Computer Science, MIT, USA M.S. in Electrical Engineering and Computer Science, MIT, USA B.S.E. in Electrical Engineering, Princeton University, USA Areas of

Communication Theory;
Optical networks; Resource
Allocation Problems and
Array Processing

Dr. Teerapat Sanguankotchakorn
Associate Professor School
of Engineering and
Technology D.Eng in
Information Processing,
Tokyo Institute of
Technology, Japan. M.Eng in
Information Processing,
Tokyo Institute of
Technology, Japan.
Certificate in Japanese
Language, Osaka University
of Foreign Study, Japan.
B.Eng. in Electrical
Engineering, Chulalongkorn
University, Thailand. Digital
Signal Processing; Routing
Algorithm in the network
such as IP and MPLS
network; High Speed network
and IP-based multimedia
applications

27.6 Research Projects Initiated in 2007

APNG Secretariat

Duration: 1-Dec-06-30-Nov-07
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Asia Pacific Networking Group
Total Contracted Amount (Baht) 600,000

APNIC-INTERLAB Collaboration on Training Events Administration

Duration: 1-Nov-05-31-Mar-07
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Asia Pacific Network Information
Centre, Australia
Total Contracted Amount (Baht) 785,970

ASEAN Virtual University of Science and Technology

Duration: 1-Oct-05-30-Nov-07
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Science and Technology
Professionals from SEA Region
Total Contracted Amount (Baht) 1,000,000

Asia Pacific Networking Group

APNG Secretariat

Duration: 1-Nov-07-31-Oct-08
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Asia Pacific Networking Group
Total Contracted Amount (Baht) 400,000

Asian Internet Engineering Conference (AINTEC) 2006

Duration: 1-Sep-06-31-May-07
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Multi-donors
Total Contracted Amount (Baht) 800,000

Asian Internet Engineering Conference (AINTEC) 2007

Duration: 30-Jun-07-31-May-08
Project Investigator: Prof. Kanchana
Kanchanasut, Ms. Wit Hmone Tin Latt, D.
Kumardas, M. Awal
Sponsor: NECTEC and Participants
Total Contracted Amount (Baht) 900,000

Basic and Advanced DNS Workshops

Duration: 1-May-07-30-Apr-08
Project Investigator: Prof. Kanchana
Kanchanasut, Ms. Wit Hmone Tin Latt
Sponsor: Multi-donors
Total Contracted Amount (Baht) 500,000

Basic and Advanced Routing Workshops

Duration: 1-Jul-07-31-Dec-07
Project Investigator: Prof. Kanchana
Kanchanasut, Ms. Wit Hmone Tin Latt
Sponsor: Multi-donors
Total Contracted Amount (Baht) 400,000

CanalAVIST (Initial Phase)

Duration: 1-Dec-07-31-May-09
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: DANTE
Total Contracted Amount (Baht) 200,000

DSSEC Workshop

Duration: 6-Oct-06-1-Mar-07
Project Investigator: Prof. Kanchana
Kanchanasut, Ms. Wit Hmone Tin Latt
Sponsor: Participants
Total Contracted Amount (Baht) 350,000

ICT Policy for National University of Laos

Duration: 30-Jun-07-31-Dec-09
Project Investigator: Prof. Kanchana

Kanchanasut, Ms. Wit Hmone Tin Latt
Sponsor: Swedish International Development
Agency
Total Contracted Amount (Baht) 2,201,308

Internet Crime: Prevention, Detection and Investigation

Duration: 1-Oct-07-31-Mar-08
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Participants
Total Contracted Amount (Baht) 450,000

IT Training for National University of Laos (NUOL)

Duration: 1-Jun-07-31-Dec-10
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Swedish International Development
Agency
Total Contracted Amount (Baht) 3,063,745

Multicast Workshop

Duration: 1-Nov-07-31-Mar-08
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Participants
Total Contracted Amount (Baht) 350,000

Multimedia Architecture and Application Based on SIP

Duration: 1-Mar-06-3-Jun-08
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Science and Technologies of
Information and Communication in Asia -
Institute National de Technologie
Total Contracted Amount (Baht) 460,000

New Generation Internet for Medical Science Remote Classroom

Duration: 1-Jan-06-31-Dec-07
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: Science and Technologies of
Information and Communication in Asia -
l'universite Pierre et Marie Curie
Total Contracted Amount (Baht) 506,000

New Generation Internet for Medical Science Remote Classroom-07

Duration: 1-Jul-07-30-Jun-08
Project Investigator: Prof Kanchana
Kanchanasut
Sponsor: French Ministry of Foreign Affairs
ICT-Asia Program
Total Contracted Amount (Baht) 754,068

Optimization Tool with Graphical User Interface for topology Design of the Thai Government Backbone Network

Duration: 1-Feb-07-30-Nov-07
Project Investigator: Dr Poompat
Sponsor: NECTEC
Total Contracted Amount (Baht) 662,000

Renewable Energy Policy and Biomass Energy-E-Learning

Duration: 23-Mar-07-29-Feb-08
Project Investigator: Prof Kanchana Kanchanasut
Sponsor: UNESCO Jakarta
Total Contracted Amount (Baht) 139,160

Technical Support for National

University of Laos

Duration: 1-Jun-07-31-Dec-08
Project Investigator: Prof Kanchana Kanchanasut
Sponsor: Swedish International Development Agency
Total Contracted Amount (Baht) 1,507,358

TEIN2 Workshops in 2006 for HRD

Duration: 1-Apr-06-30-Apr-07
Project Investigator: Prof Kanchana Kanchanasut
Sponsor: DANTE
Total Contracted Amount (Baht) 2,055,000

TEIN2 Workshops in 2007 for HRD

Duration: 1-Jan-07-31-Dec-07
Project Investigator: Prof. Kanchana Kanchanasut, Ms. Wit Hmone Tin Latt

Sponsor: DANTE
Total Contracted Amount (Baht) 1,437,500

Vclass SIP-based Mobile Classroom

Duration: 1-Feb-06-31-Jan-08
Project Investigator: Prof Kanchana Kanchanasut
Sponsor: Asian Media Information and Communication Centre (AMIC), Singapore
Total Contracted Amount (Baht) 1,200,000

VoIP & SIP Workshop

Duration: 1-Apr-07-31-Jul-07
Project Investigator: Prof. Kanchana Kanchanasut, Ms. Wit Hmone Tin Latt
Sponsor: Multi-donors
Total Contracted Amount (Baht) 300,000

Chapter 28: INSTITUTE-WIDE SPONSORED AND CONTRACTED PROJECTS

GMSARN Case Study Research and Training

Duration: 01 September 2004 to 31 December 2008

Project Investigator: Prof Vilas Wuwongse

Sponsor: Swedish International Development Cooperation Agency, Sweden

Total Contracted Amount (Baht) 1,022,500

GMSARN Case Research Training Workshop

Duration: 01 September 2004 to 31 December 2008

Project Investigator: Prof Vilas Wuwongse

Sponsor: Swedish International Development Cooperation Agency, Sweden

Total Contracted Amount (Baht) 592,000

ADB-AIT Networking

Duration: 01 January 2002 to 31 March 2007

Project Investigator: Prof Vilas Wuwongse

Sponsor: Asian Development Bank

Total Contracted Amount (Baht) 6,300,000

Wetlands Alliance Program

Duration: 01 January 2006 to 01 December 2008

Project Investigator: Nicholas Innes-Taylor

Sponsor: Swedish International Development Cooperation Agency, Sweden

Total Contracted Amount (Baht) 27,852,904

Feasibility Study for the Conservation of Biodiversity and Development of Sustainable Tourism Laos

Duration: 01 May 2007 to 31 December 2007

Project Investigator: Jean-Philippe Thouard

Sponsor: French Embassy in Bangkok

Total Contracted Amount (Baht) 1,587,000



Wetlands Alliance Program

Chapter 29: OVERVIEW OF RESEARCH ACTIVITIES FOR 2007

Overview of Research Activities in AY 2007								
School	Sponsored and Contracted Projects		Total	Publications				Total
	Completed	On-going		Refereed Journals	Conference Proceedings	Refereed Books/Chapters	Other Publications	
SET	53	82	135	82	104	26	20	232
CS	2	7	9	20	25	3	0	48
CEIM	3	3	6	5	0	1	0	6
DM and IM	4	9	13	9	0	10	1	20
GTE	3	8	11	12	19	1	8	40
ME and MI	4	13	17	10	17	3	0	30
RS and GIS	13	12	25	4	2	5	0	11
STE	6	11	17	2	0	0	1	3
TC	2	2	4	4	16	2	1	23
TRE	3	5	8	7	15	1	3	26
WEM	13	12	25	9	10	0	6	25
SERD	73	88	161	152	101	27	47	327
ASE	7	8	15	25	12	4	12	53
AARM	5	12	17	11	5	0	1	17
Energy	17	11	28	31	11	0	1	43
EEM	20	29	49	36	32	6	9	83
FEFT	6	2	8	14	5	0	6	25
GDS	5	9	14	2	13	5	4	24
NRM	4	8	12	13	3	5	5	26
PPT	1	0	1	6	7	0	0	13
RRDP	4	4	8	9	1	3	0	13
UEM	4	5	9	5	12	4	9	30
SOM	7	10	17	22	8	3	3	36
intERLab	11	13	24					0
AIT Ext	64	24	88					0
AIT-Wide	2	3	5					
Total	210	220	430	256	213	56	70	595