



The **Philippine**  
**Men & Women**  
of Science

A compilation of bio-bibliographical information on men and women in the field of science and technology.

Volume XXXI

# **Philippine Men and Women of Science**

**(Formerly Philippine Men of Science)**



**INFORMATION RESOURCES AND ANALYSIS DIVISION  
Science and Technology Information Institute  
Department of Science and Technology**

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## PREFACE

The Philippine Men and Women of Science (PMWS) is an online publication of the Science and Technology Information Institute (STII). The first volume was published in 1964 as the Philippine Men of Science (PMS) featuring one hundred and one Filipino scientists' contributions to the scientific community.

Obstacles and risks are opportunities for change. While problems always stand in the way of scientific breakthrough, how we respond to them will depend on the tools we use. This online bio-bibliographical publication is a tool for the general public - the national leaders, the researchers, the scholars, the workers, the students, and all. As a whole, researchers, institutions, and partners mentioned can be harnessed into a unified national or international research program towards solving existing or emerging problems. For Filipino citizens, this compilation may add a sense of nationalism and pride when it comes to their heritage. It also aids in aligning our nation's present reality when it comes to science, technology, and society with past accomplishments. Now is the time to show our people that they can dare to be that scientist, that researcher, whom they heard about. Now is the time to instill one vision and build the nation on the rock of scientific progress.

The *Philippine Men and Women of Science Volume 31* continues an invaluable tradition of honoring our own men and women of science. It builds on the existing treasury of researchers and researches made since the first volume was launched. Individual profiles chosen for this edition show research prowess whose works are relevant to Weather, Climate Change, and Disaster Risk Management. If a quick preview is desired, readers can use the authors and specialization indexes.

Climate change remains a major issue worldwide, the effects of which can be felt. A growing awareness on the subject has made the problem known around the world. Since the Philippines faces clear environmental issues like seasonal typhoons and other natural disaster hazards, it is but timely to encourage the uncharted territory of mappings, planned relocations, biochemical and environmental restorations, reengineering structures, nanotechnology, and social development as places for strengthened research.

Our team upholds a continuous, concerted effort that diligently coordinates records. To date, we have persevered in the timeless tradition of ongoing data mining, organization, and communication of facts on productive scientists and researchers in their fields.

We offer our deepest gratitude to our scientists, researchers, partners, and staff who contributed to the completion of this volume.

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**Organizational Affiliations**

Technical Consultant, Participatory GIS, Asian Development Bank, Mandaluyong City, Philippines

**Education**

Doctor of Philosophy in Remote Sensing, Satellite/Environmental Remote Sensing, Chiba University - Japan, Chiba Prefecture, Chiba, Japan 2004

Master of Science in Remote Sensing, Satellite/Environmental Remote Sensing, University of the Philippines, Diliman, Quezon City 1997

Bachelor of Science in Biology, University of the Philippines, College of Arts and Sciences, P. Faura, Ermita, Manila 1988

**Fields of Specialization**

Remote Sensing

Satellite/Environmental Remote Sensing

Biology

Global Environmental Change

Ecosystems Change Research

Watershed and Climate Change Impacts

GIS

Climatic Oscillations

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Technical Consultant, Participatory GIS, Asian Development Bank (ADB), April 2015-present

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Senior Lecturer, Environmental Studies and Geography Department Faculty Arts and Social Sciences, Universiti Brunei Darussalam, December 2010-June 2014

Project Manager/Coordinator, Communication and Information Systems for the Control of Avian Influenza (CISCAI Project), October 2008-December 2012

General Manager and Consultant, SpaceVision Mapping Services (SVMS), September 2006-March 2009

Senior Science Research Specialist, DOST-Philippine Council for Advanced Science and Technology Research and Development, August 1991-September 2009

Training Specialist, National Institute for Science & Mathematics Education & Development, University of the P, June 1989-February 1990

**Association Membership**

Member, Philippine Astronomical Society



Member, Halleywatch Committee of the Philippines  
Member, Philippine Astronomical Society  
Member, Solarwatch Committee of the Philippines, Manila-Based  
Member, Biology majors Association (BIOMAS)  
Member, Scientists, Technologists and Engineers for the People (STEP)  
Member, Philippine Association for the Advancement of Science (PHILAAS)  
Member, Earthsavers' Movement  
Member, Society for the Advancement of Technology Management in the Philippines (SATMP)  
Member, Biotechnology Association of the Philippines (BAPI)  
Associate Member, National Research Council of the Philippines  
President, Science and Technology Advisory Council - Japan Chapter (STAC-J)  
Former Editor-in-chief, APPULSE - the Official Newsletter of the Philippine Astronomical Society

#### **Honors / Awards**

Young Author's Award, ISPRS Commission VII WG6, International Workshop on Monitoring/Modeling Global Environmental Change, Kyoto, Japan 2003

#### **Trainings**

EC-ASEAN National Radar Training Course, European Space Agency  
Philippines NASA AirSAR Technical Workshop, NAMRIA, Makati City, Philippines  
NEDA-ITC Meeting on Geographic Information Technology for Local Government Units, Sulo Hotel, Quezon City, Philippines  
Japan International Cooperation Agency-sponsored Global Mapping Course, Geographical Survey Institute of Japan, Tsukuba, Japan  
[National Delegate] Space Generation Forum (SGF) - 3rd United Nations Conference on the Peaceful Uses of Outer Space (UNISPACE III) [Signatory to the Vienna Declaration of the SGF; & National Liaison Officer to the UNISPACE III], Vienna, Austria  
Seminar Workshop on the Inter-Agency Task Force on Geographic Information (IATFGI) Plenary Workshop on GIS Definition, Classification and Policies, NAMRIA  
Land Use Change and the Terrestrial Carbon Cycle in Asia, Kobe, Japan  
GOFRC Regional Fire Workshop: Southeast Asia Regional Needs and Capabilities for Satellite-based Fire Monitoring, Earth Observation Center NASDA, Tokyo, Japan  
CEReS International Symposium on Remote Sensing of the Atmosphere and Validation of Satellite Data, Chiba University, Chiba, Japan  
CEOS SAR Workshop 2001 - Working Group on Calibration and Validation, Earth Observation Center NASDA, Tokyo, Japan  
Earth Observation Conference, Canadian Embassy, Tokyo, Japan  
International Symposium on LUCC Contribution to Asian Environmental Problems,

Science Council of Japan, Tokyo, Japan

International Geoscience and Remote Sensing Symposium (IGARSS) 2002, Toronto, Canada

Symposium on Indonesian Environmental Monitoring 2003 (SIEM2003), Chiba University, Chiba, Japan

## Researches

### Completed

Compendium on the First National Congress on Space Technology Applications and Research (NC-STAR)

Technical Report I: Climate and Hydrological Analyses. Bago River Irrigation System Rehabilitation Project (BRISRIP)

Technical Report II: Satellite Image Processing. Bago River Irrigation System Rehabilitation Project (BRISRIP)

Pre-feasibility study on the Local Development of Small Satellites

## Papers Presented

- 2003 Aban, J.E.L., Tateishi, R., & Asanuma, I. (2003). Characterization of time series power spectra from multi-temporal NOAA-AVHRR data and its relationship with various external and internal forcings, ISPRS Commission VII WG6 - International Workshop on Monitoring/Modeling Global Environmental Change, Kyoto, Japan.
- 2002 Aban, J.E.L., Tsolmon R., & Tateishi R. (2002). Linear Mixing Model Based on Optimization Method for Land Cover Mapping Using LANDSAT ETM+ and SPOT-HRV Data, International Geoscience and Remote Sensing Symposium (IGARSS).
- 2002 Aban, J.E.L., Tateishi R., & Tsolmon R. (2002). The Polynomial Least Squares Operation (PoLeS): A Method for Reducing Noise in NDVI Time Series Data, 23rd Asian Conference on Remote Sensing (ACRS), Kathmandu, Nepal.
- 2002 Aban, J.E.L., & Tateishi R. (2002). The Two-Dimensional Polynomial Least Squares (PoLeS) Filter: A Method for Reducing High and Low Value Noise in Satellite Data, 23rd Asian Conference on Remote Sensing (ACRS), Kathmandu, Nepal.
- 1998 Aban, J.E.L. (1998). Assessment and Mapping of the DENR Cinchona Reforestation Project Using Spectroradiometric Analyses and Digital Image Processing Techniques, 1st International Conference on Tropical Forest and Climate Change, ACCEED Bldg., Makati City, Philippines, and signatory to the Manila Declaration on Climate Change.
- 1998 Aban, J.E.L. (1998). Construction of a Global Map Around Mindanao, Philippines, 19th Asian Conference on Remote Sensing, Traders Hotel, Manila, Philippines.
- 1995 Aban, J.E.L. (1995). Spectroradiometric Analyses of Seven Varieties of Cinchona Species in the DENR Cinchona Reforestation Project, Mt. Kaatoan, Lantapan Bukidnon, Philippines, 16th Asian Conference on Remote Sensing, Suranaree University of Technology, Nakhon Ratchasima, Thailand.
- 1993 Aban, J.E.L. (1993). Lithological Discrimination through Geobotanical and Lineament Enhancement Selection of Dry Season Images: Study for the Volcanic Terrain Subic-Castillejos, Zambales, Sixth Annual Convention of the Geological Society of the Philippines.

## Publications

- 2013 Villa Real, L., Aban, J.E.L., & Husain, S.A., A Novel Noise Removal Algorithm for Vertical Artifacts on Digital Elevation Models. 34th Asian Conference on Remote Sensing (ACRS), Bali, Indonesia, 2013.
- 2012 Aban, J.E.L., & Yong, W., Mangroves in the Inner Brunei Bay: Updating the Knowledge Base using QuickBird Satellite Imagery. 11th Brunei Research Council (BRC), 2012.  
Aban, J.E.L., Tsunami Hazard Simulation Mapping of Northeast Japan Using SRTM Data. 33rd Asian Conference on Remote Sensing (ACRS), Pattaya, Thailand, 2012.
- 2011 Aban, J.E.L., Duane, W., & Yong, G., The Potential Impact of Urbanisation on Climate Change Brunei Darussalam. 44th EAROPH & IFHP Regional Planning Conference 2011 "Managing Urban Growth: Challenges for Small Cities". Brunei Darussalam, 2011.
- 2004 Aban, J.E.L., Tateishi, R., & Asanuma, I., Characterization of NOAA-AVHRR NDVI Time Series Power Spectra and its Linked Relationship with the Pacific Decadal Oscillation (PDO). 1st International CLIVAR Science Conference, Baltimore, MD USA, 2004.
- 2003 Aban, J.E.L., Tateishi, R., & Asanuma, I., Characterization of time series power spectra from multi-temporal NOAA-AVHRR data and its relationship with various external and internal forcings. Proceedings of the ISPRS Commission VII WG6 - International Workshop on Monitoring/Modeling Global Environmental Change, Kyoto, Japan, 2003.
- 2002 Aban, J.E.L., Tzolmon, R., & Tateishi, R., Linear Mixing Model Based on Optimization Method for Land Cover Mapping Using LANDSAT ETM+ and SPOT-HRV Data. Proceedings of the 2002 IEEE International Geoscience and Remote Sensing Symposium, 2002.  
Aban, J.E.L., Tateishi, R., & Tzolmon, R., The Polynomial Least Squares Operation (PoLeS): A Method for Reducing Noise in NDVI Time Series Data. Proceedings of the 23rd Asian Conference on Remote Sensing, 2002.
- 1998 Aban, J.E.L., Technical Study: Construction of a Global Map. Geographical Survey Institute of Japan, Ministry of Construction, 1998.  
Aban, J.E.L., Construction of a Global Map Around Mindanao, Philippines. Proceedings of the 19th Asian Conference on Remote Sensing, Manila, Philippines, 1998.  
Aban, J.E.L., Assessment and Mapping of the DENR Cinchona Reforestation Project Using Spectoradiometric Analyses and Digital Image Processing Techniques. Proceedings of the Euro-Asian Space Week, Singapore, 1998.  
Aban, J.E.L., Assessment and Mapping of the DENR Cinchona Reforestation Project Using Spectoradiometric Analyses and Digital Image Processing Techniques. Proceedings of the 1st International Conference on Tropical Forests and Climate Change, Makati City, 1998.
- 1997 Aban, J.E.L., Spectoradiometric and Digital Data Analysis of Seven Cinchona Species in the DENR Cinchona Reforestation Project, Mt. Kaatoan, Lantapan Bukidnon, Philippines. The Philippine Remote Sensing Newsletter, NAMRIA, 1997, VII(1):8-9.
- 1995 Aban, J.E.L., Spectoradiometric Analyses of Seven Varieties of Cinchona Species in the DENR Cinchona Reforestation Project, Mt. Kaatoan, Lantapan Bukidnon, Philippines. Proceedings of the 16th Asian Conference on Remote Sensing, Nakhon Ratchasima, Thailand, 1995.
- 1993 Aban, J.E.L., & Flores, R.F., Lithological Discrimination through Geo-botanical and Lineament Enhancement Selection of Dry Season Images: Study for the Volcanic

Terrain Subic Castilejos, Zambales. Proceedings of the 6th Geological Society of the Philippines (GCP) Geological Convention, 1993.

1990

Aban, J.E.L., Methane, a Fuel from Decaying Matter. Inquiry. Science and Mathematics Education Journal for Teachers, 1990, 5(4).

Aban, J.E.L., Comet to grace night sky this month. Manila Chronicle, 1990, 32(260).

Aban, J.E.L., Lunar Eclipse to occur on Feb. 10. Philippine Daily Inquirer, 1990.

Aban, J.E.L., The Wonders of Holography. SciTech - a Magazine on Science and Technology, 1990, 4(7).

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Plant Taxonomy

**Publications**

2015

Ng, V.A.S., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Secondary Metabolites from *Cycas aenigma*. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 2015, 7(6):267-270.

Ng, V.A.S., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Chemical Constituents of *Cycas aenigma*. *Journal of Applied Pharmaceutical Science*, 2015, 5(9):32-36.

Ragasa, C.Y., Ng, V.A.S., Agoo, E.M.G., & Shen, C.C., Chemical Constituents of *Cycas edentata*. *International Journal of Pharmaceutical Sciences Review and Research*, 2015, 33(2):107-109.

Ng, V.A.S., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Secondary Metabolites from the Male Cone of *Cycas vespertilio*. *International Journal of Pharmacognosy and Phytochemical Research*, 2015, 7(4).

Ragasa, C.Y., Ng, V.A.S., Agoo, E.M.G., & Shen, C.C., A Neolignan from *Cycas sancti-lasallei*. *Der Pharma Chemica*, 2015, 7(7):373-376.

Ragasa, C.Y., Ng, V.A.S., Agoo, E.M.G., & Shen, C.C., Chemical constituents of *Cycas vespertilio*. *Revista Brasileira de Farmacognosia*, 2015.

Ng, V.A.S., Agoo, E.M.G., Shen, C.C., & Consolacion, R.Y., Chemical Constituents of *Cycas lacrimans*. *International Journal of Pharmacognosy and Phytochemical Research*, 2015, 7(3):616-620.

Ng, V.A.S., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Chemical Constituents of *Cycas sancti-lasallei*. *Journal of Applied Pharmaceutical Science*, 2015, 5(Suppl 1):012-017.

Ragasa, C.Y., Ng, V.A.S., Agoo, E.M., & Shen, C.C., Lignans and a Furanone from *Cycas sancti-lasallei*. *International Journal of Pharmacognosy and Phytochemical Research*, 2015, 7(5).

Matthews, P.J., Nguyen, V.D., Tandang, D., Agoo, E.M.G., & Madulid, D.A.,

- Taxonomy and ethnobotany of *Colocasia esculenta* and *C. formosana* (Araceae): implications for the evolution, natural range, and domestication of taro. *Aroideana International Aroid Society, Inc.*, 2015, 38E(1):153-176.
- Ng, V.A.S., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Secondary Metabolites from *Cycas edentata*. *Journal of Pharmaceutical Sciences and Research*, 2015, 7(9):643-646.
- Ng, V.A.S., Agoo, E.M., Shen, C.C., & Ragasa, C.Y., Chemical Constituents of *Cycas nitida*. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 2015, 6(6).
- 2014 Espineli, D.L., Agoo, E.M.G., Del Fierro, R.S., Shen, C.C., & Ragasa, C.Y., Cytotoxic and Antimicrobial Compounds from *Cinnamomum cebuense* Kosterm. (Lauraceae). *Pharmaceutical Chemistry Journal*, 2014, 48(9):600-604.
- Ragasa, C.Y., Espineli, D.L., Agoo, E.M.G., & Shen, C.C., Chemical Constituents of *Cinnamomum trichophyllum*. *Chemistry of Natural Compounds*, 2014, 50(2):389-390.
- 2013 Espineli, D.L., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Chemical Constituents of *Cinnamomum iners*. *Chemistry of Natural Compounds*, 2013, 49(5):932-933.
- Espineli, D.L., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Chemical Constituents of *Cinnamomum iners*. *Khimiya Prirodnikh Soedinenii*, 2013(5):798-799.
- Espineli, D.L., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Chemical Constituents of *Cinnamomum utile*. *Chemistry of Natural Compounds*, 2013, 49(4):769-770.
- Espineli, D.L., Agoo, E.M.G., Shen, C.C., & Ragasa, C.Y., Chemical Constituents of *Cinnamomum utile*. *Khimiya Prirodnikh Soedinenii*, 2013(4):658-659.
- Clores, M.A., & Agoo, E.M.G., Flowering Distribution and Fruiting Success of *Syngodium isoetifolium* (Cymodoceaceae) in Bogtong Bay, Lahuy Island, Caramoan, Philippines. *Academic Research International*, 2013, 4(4):14-29.
- Ragasa, C.Y., Espineli, D.L., Agoo, E.M.G., & Shen, C.C., Chemical Constituents of *Cinnamomum rupestre* and *Cinnamomum nanophyllum*. *Chemistry of Natural Compounds*, 2013, 49(4):757-758.
- Ragasa, C.Y., Espineli, D.L., Agoo, E.M.G., & Shen, C.C., Chemical Constituents of *Cinnamomum rupestre* and *Cinnamomum nanophyllum*. *Khimiya Prirodnikh Soedinenii*, 2013(4):647-648.
- Ragasa, C.Y., Espineli, D.L., Agoo, E.M.G., & Del Fierro, R.S., Chemical constituents of *Cinnamomum cebuense*. *Chinese Journal of Natural Medicines*, 2013.
- Ragasa, C.Y., Espineli, D.L., Agoo, E.M.G., & Shen, C.C., Chemical constituents of *Cinnamomum griffithii*. *Chemistry of Natural Compounds*, 2013, 49(1):127-128.
- Ragasa, C.Y., Espineli, D.L., Agoo, E.M.G., & Shen, C.C., Chemical constituents of *Cinnamomum griffithii*. *Khimiya Prirodnikh Soedinenii*, 2013(1):111.
- 2012 Agoo, E.M.G., & Madulid, D.A., *Cycas sancti-lasallei* (Cycadaceae), a new species from the Philippines. *Blumea Journal of Plant Taxonomy and Plant Geography*, 2012, 57(2):131-133.
- Madulid, D.A., Buot, I.E., Jr., & Agoo, E.M.G., The Philippine *Rafflesia panchoana* from Mt. Makiling, Luzon and *R. manilana* from Basey, Samar, compared (Rafflesiaceae). *Philippine Journal of Systematic Biology*, 2012, 6:43-45.
- 2009 Madulid, D.A., & Agoo, E.M.G., Taxonomy and conservation of Philippine Cycads. *Blumea Journal of Plant Taxonomy and Plant Geography*, 2009, 54(13):99-102.
- Obico, J.J.A., Bagay, C.K.C., Asencion, A.S., Agoo, E.M.G., & Medecillo, M.M., Comparative Study of the Leaf Morphology of *Epipremnum Schott* and *Rhaphidophora Hassk.* (Araceae) in the Philippines. *Philippine Journal of Systematic Biology*, 2009, 1(1):15-26.
- Agoo, E.M.G., Status of Orchid Taxonomy Research in the Philippines. *Philippine Journal of Systematic Biology*, 2009.

- 2008 Madulid, D.A., & Agoo, E.M.G., On the identity of *Rafflesia manillana* Teschem. (Rafflesiaceae). *The Philippine Scientist*, 2008, 44.  
Agoo, E.M.G., New taxa of Philippine *Trichoglottis* Blume (Orchidaceae). *The Philippine Scientist*, 2008, 43.
- 2007 Madulid, D.A., Buot, I.E., Jr., & Agoo, E.M.G., *Rafflesia panchoana* (Rafflesiaceae), a New Species from Luzon Island, Philippines. *Acta Manilana*, 2007, 55:43-47.  
Agoo, E.M.G., & Oyong, G., Assessment of Genetic Diversity in *Tectona philippinensis* Benth. & Hook.f. (Verbenaceae) Inferred from TRNL Intron Sequences. *The Philippine Scientist*, 2007, 45:80-98.
- 2005 Madulid, D.A., & Agoo, E.M.G., A New Species of *Cycas* (Cycadaceae) from the Philippines. *Blumea Journal of Plant Taxonomy and Plant Geography*, 2005, 50(3):519-522.

**Name** Kathleen Bernardo Aviso

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**Organizational Affiliations**

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Master of Science in Environmental Engineering and Management, De La Salle University, Taft Ave., Manila 2006

Bachelor of Science in Chemical Engineering, University of the Philippines, Diliman, Quezon City 2000

**Fields of Specialization**

Chemical Engineering

Pollution

Environmental Chemistry

Disaster Risk and Management

Optimization tools for environmental management

Applications of artificial intelligence in decision theory and analysis

Rough sets for decision support in life cycle analysis

Mathematical modeling for resource conservation in industrial systems

**Employment**

Research and Advanced Studies Director, Gokongwei College of Engineering, De La Salle University, 2014 May-present

Associate Professor, Chemical Engineering Department, De La Salle University, Manila, 2010 October-present

Graduate Fellow/Research Assistant, Center for Engineering and Sustainable Development Research, De La Salle University, Manila, 2007 September-present

Environmental Specialist, Conduct of the Third National Inventory for Dioxins and Furans, Innogy Solutions, 2012

Assistant Professorial Lecturer, Chemical Engineering Department, De La Salle University, Manila, 2007 May-2007 September

Lecturer, Chemical Engineering Department, De La Salle University, Manila, 2006 May-2007 April

Graduate Fellow/Research Assistant, Center for Engineering and Sustainable Development Research, De La Salle University, Manila, 2004 May-2006 April

Quality Assurance Analyst, Monde Nissin Corporation, Balibago Sta. Rosa, Philippines, 2001 April-2003 February



## **Association Membership**

Member, Philippine Institute of Chemical Engineers  
Member, Operations Research Society of the Philippines (ORSP)  
Member, Society of Risk Analysis  
Member, International Input - Output Association (IIOA)  
Member, Philippine American Academy of Science and Engineering (PAASE)

## **Honors / Awards**

Paterno and Natividad Bacani Professorial Chair in Engineering, Gokongwei College of Engineering, De La Salle University 2013  
Philippine National Academy of Science and Technology (NAST) Outstanding Young Scientist Award in the field of Industrial Engineering, National Academy of Science and Technology (DOST-NAST) 2013  
Talent Search for Young Scientist, National Academy of Science and Technology (DOST-NAST) 2010  
Ph.D. Graduate Fellowship (3 years), De La Salle University, Manila 2007-2010  
Outstanding Scientific Paper Award, National Academy of Science and Technology (DOST-NAST) 2008  
Outstanding Scientific Paper Award, National Academy of Science and Technology 2008  
Graduated with High Distinction, De La Salle University 2006  
M.S. Graduate Fellowship (2 years), De La Salle University, Manila 2004-2006  
Outstanding Master's Thesis Award, De La Salle University, Manila 2006  
M.S. Graduate Fellow / Cum Laude, De La Salle University 2000

## **Trainings**

Workshop on Material Flow Accounting, International Input-Output Association, Lisbon, Portugal 2014 July 14  
Life Cycle Initiative Training on Water Footprinting, Malaysiang Green Technology Corporation and UNEP, Putrajaya, Malaysia 2013 December 4  
International Summer Research Workshop on Global Value Chain Upgrading, Duke University's Center on Globalization, Governance and Competitiveness with Venice International University's Center for Studies on Technologies on Distributed Intelligence Systems, Venice, Italy 2010 July  
Training Program on Industry and Environmental Protection for ASEAN with Special Focus on Life Cycle Assessment, Association for Overseas Technical Scholarship, Bangkok, Thailand 2008 September  
Training on Environmental Management and Accounting for South East Asia, Internationale Weiterbildung und Entwicklung gGmbH (InWent), Manila, Philippines 2005 April

## **Researches**

Bi-level fuzzy optimization approach for water exchange in eco-industrial parks

Designing Eco-Industrial Water Exchange Networks Using Fuzzy Mathematical Programming

Fuzzy optimization of topologically constrained eco-industrial resource conservation networks with incomplete information

## Publications

2015

- Tan, R.R., & Aviso, K.B., An Extended P-Graph Approach to Process Network Synthesis for Multi-Period Operations. *Computers & Chemical Engineering*, 2015.
- Andiappan, V., Tan, R.R., Aviso, K.B., & Ng, D.K.S., Synthesis and optimisation of biomass-based tri-generation systems with reliability aspects. *Energy*, 2015.
- Andiappan, V., Tan, R.R., Aviso, K.B., & Ng, D.K.S., Synthesis of Biomass-based Trigeration Systems with Reliability Aspects. *Computer Aided Chemical Engineering*, 2015, 37:2243-2248.
- Wan, Y.K., Ng, R.T.L., Ng, D.K.S., Aviso, K.B., & Tan, R.R., Fuzzy multi-footprint optimisation (FMFO) for synthesis of a sustainable value chain: Malaysian sago industry. *Journal of Cleaner Production*, 2015.
- Leong, Y.T., Tan, R.R., Aviso, K.B., & Chew, I.M.L., Fuzzy analytic hierarchy process and targeting for inter-plant chilled and cooling water network synthesis. *Journal of Cleaner Production*, 2015.
- Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Solis, F.D.B., Yu, K.D.S., & Santos, J.R., A Shock Absorption Index For Inoperability Input-Output Models. *Economic Systems Research*, 2015, 27:1-17.
- Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Yu, K.D.S., & Santos, J.R., Development of a fuzzy linear programming model for allocaton of inoperability in economic sectors due to loss of natural resource inputs. *DLSU Business & Economics Review*, 2015, 24(2):1-12.
- Tan, R.R., Aviso, K.B., & Uy, O.M., Comprehensive sensitivity analysis in NLP models in PSE applications using space-filling DOE strategy. *Chemical Engineering Transactions*, 2015, 45:523-528.

2014

- Aviso, K.B., Cayamanda, C., Solis, F.D., Promentilla, M.A.B., Yu, K.D.S., Santos, J.R., & Tan, R.R., P-graph Approach to Optimal Allocation of Electricity to Economic Sectors in Crisis Conditions. *Energy Procedia*, 2014, 61:675-678.
- Tan, J., Sulaiman, N.M.N., Tan, R.R., Aviso, K.B., & Promentilla, M.A.B., A Hybrid Life Cycle Optimization Model for Different Microalgae Cultivation Systems. *Energy Procedia*, 2014, 61:299-302.
- Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Yu, K.D.S., & Santos, J.R., Fuzzy Inoperability Input-output Analysis of Mandatory Biodiesel Blending Programs: The Philippine Case. *Energy Procedia*, 2014, 61:45-48.
- Promentilla, M.A.B., Aviso, K.B., & Tan, R.R., A Group Fuzzy Analytic Network Process to Prioritize Low Carbon Energy Systems in the Philippines. *Energy Procedia*, 2014, 61:808-811.
- Aviso, K.B., Cayamanda, C.D., Solis, F.D.B., Danga, A.M.R., Promentilla, M.A.B., Yu, K.D.S., Santos, J.R., & Tan, R.R., P-graph approach for GDP-optimal allocation of resources, commodities and capital in economic systems under climate change-induced crisis conditions. *Journal of Cleaner Production*, 2014, 92:308-317.
- Ubando, A.T., Culaba, A.B., Aviso, K.B., Ng, D.K.S., & Tan, R.R., Fuzzy mixed-integer linear programming model for optimizing a multi-functional bioenergy system with biochar production for negative carbon emissions. *Clean Technologies and Environmental Policy*, 2014, 16(8):1537-1549.
- Tan, R.R., Cayamanda, C.D., & Aviso, K.B., P-graph approach to optimal operational adjustment in polygeneration plants under conditions of process inoperability. *Applied Energy*, 2014, 135:402-406.

- Diamante, J.A.R., Tan, R.R., Foo, D.C.Y., Ng, D.K.S., Aviso, K.B., & Bandyopadhyay, S., Unified pinch approach for targeting of carbon capture and storage (CCS) systems with multiple time periods and regions. *Journal of Cleaner Production*, 2014, 71:67-74.
- Ramadhan, N.J., Wan, Y.K., Ng, R.T.L., Ng, D.K.S., Hassim, M.H., Aviso, K.B., & Tan, R.R., Life cycle optimisation (LCO) of product systems with consideration of occupational fatalities. *Process Safety and Environmental Protection*, 2014, 92(5).
- Aviso, K.B., Design of robust water exchange networks for eco-industrial symbiosis. *Process Safety and Environmental Protection*, 2014, 92(2):160-170.
- Yu, K.D.S., Tan, R.R., Aviso, K.B., Promentilla, M.A.B., & Santos, J.R., A Vulnerability Index for Post-Disaster Key Sector Prioritization. *Economic Systems Research*, 2014, 26:86-97.
- Ramadhan, N.J., Wan, Y.K., Ng, R.T.L., Ng, D.K.S., Hassim, M.H., Aviso, K.B., & Tan, R.R., Life cycle optimization (LCO) of product systems with consideration of occupational fatalities. *Process Safety and Environmental Protection*, 2014, 92:390-405.
- 2013 Tan, R.R., Aviso, K. B., Bandyopadhyay, S., & Ng, D.K.S., Optimal source sink matching in carbon capture and storage systems with time, injection rate, and capacity constraints. *Environmental Progress and Sustainable Energy*, 2013, 32:411-416.
- Ubando, A.T., Aviso, K.B., Culaba, A.B., Ng, D.K.S., & Tan, R.R., Fuzzy Multi-Objective Approach for Designing of Biomass Supply Chain for Polygeneration With Triple Footprint Constraints. ASME 2013 International Mechanical Engineering Congress and Exposition, American Society of Mechanical Engineers, 2013:V012T13A045-V012T13A045.
- Tan, R.R., Aviso, K.B., Huelgas, A.P., & Promentilla, M.A.B., Fuzzy AHP approach to selection problems in process engineering involving quantitative and qualitative aspects. *Process Safety and Environmental Protection*, 2013, 92(5):467-475.
- Ubando, A.T., Culaba, A.B., Aviso, K.B., & Tan, R.R., Simultaneous carbon footprint allocation and design of trigeneration plants using fuzzy fractional programming. *Clean Technologies and Environmental Policy*, 2013, 15(5):823-832.
- Tan, R.R., Aviso, K.B., Bandyopadhyay, S., & Ng, D.K.S., Optimal source–sink matching in carbon capture and storage systems with time, injection rate, and capacity constraints. *Environmental Progress & Sustainable Energy*, 2013, 32(2).
- 2012 Diamante, J.A.R., Tan, R.R., Foo, D.C.Y., Ng, D., Aviso, K.B., & Bandyopadhyay, S., A Graphical Approach for Pinch-Based Source–Sink Matching and Sensitivity Analysis in Carbon Capture and Storage Systems. *Industrial & Engineering Chemistry Research*, 2012, 52(22):7211-7222.
- Tan, R.R., Aviso, K.B., Bandyopadhyay, S., & Ng, D.K.S., Continuous-Time Optimization Model for Source–Sink Matching in Carbon Capture and Storage Systems. *Industrial & Engineering Chemistry Research*, 2012, 51(30):10015-10020.
- Tan, R.R., Aviso, K.B., Barilea, I.U., Culaba, A.B., & Cruz, J.B., A fuzzy multi-regional input–output optimization model for biomass production and trade under resource and footprint constraints. *Applied Energy*, 2012, 90(1-90):154-160.
- Diamante, J.R., Tan, R.R., Foo, D.C.Y., Ng, D.K.S., Aviso, K.B., & Bandyopadhyay, S., A graphical approach for pinch-based source-sink matching and sensitivity analysis in carbon capture and storage systems. *Industrial and Engineering Chemistry Research*, 2012, 52(2):7211-7222.
- Tan, R.R., Ooi, R., Foo, D.C.Y., Ng, D.K.S., Aviso, K.B., & Bandyopadhyay, S., A Graphical Approach to Optimal Source-Sink Matching in Carbon Capture and Storage Systems with Reservoir Capacity and Injection Rate Constraints. *Computer Aided Chemical Engineering*, 2012, 31:480-484.
- Tan, R.R., Aviso, K.B., Bandyopadhyay, S., & Ng, D.K.S., Continuous-time

- optimization model for source-sink matching in carbon capture and storage systems. *Industrial and Engineering Chemistry Research*, 2012, 51(30):10015-10020.
- Tan, R.R., & Aviso, K.B., An Inverse Optimization Approach to Inducing Resource Conservation in Eco-Industrial Parks. *Computer Aided Chemical Engineering*, 2012, 31:775-779.
- 2011 Aviso, K.B., Tan, R.R., Culaba, A.B., Foo, D.C.Y., & Hallale, N., Fuzzy optimization of topologically constrained eco-industrial resource conservation networks with incomplete information. *Engineering Optimization*, 2011, 43(3):257-279.
- Tan, R.R., Aviso, K.B., Cruz, J.B., & Culaba, A.B., A note on an extended fuzzy bi-level optimization approach for water exchange in eco-industrial parks with hub topology. *Process Safety and Environmental Protection*, 2011, 89(2):106-111.
- Aviso, K.B., Tan, R.R., Culaba, A.B., & Cruz, J.B., Fuzzy input-output model for optimizing eco-industrial supply chains under water footprint constraints. *Journal of Cleaner Production*, 2011, 19(2-3-19):187-196.
- 2010 Tan, R.R., Ng, D.K.S., Foo, D.C.Y., & Aviso, K.B., Crisp and fuzzy integer programming models for optimal carbon sequestration retrofit in the power sector. *Chemical Engineering Research and Design*, 2010, 88(12):1580-1588.
- Aviso, K.B., Tan, R.R., & Culaba, A.B., Designing eco-industrial water exchange networks using fuzzy mathematical programming. *Clean Technologies and Environmental Policy*, 2010, 12(4):353-363.
- Aviso, K.B., Tan, R.R., Culaba, A.B., & Cruz, J.B., Jr., Bi-level fuzzy optimization approach for water exchange in eco-industrial parks. *Process Safety and Environmental Protection*, 2010, 88(1):31-40.
- 2009 Tan, R.R., Foo, D.C.Y., Aviso, K.B., & Ng, D.K.S., The use of graphical pinch analysis for visualizing water footprint constraints in biofuel production. *Applied Energy*, 2009, 86:605-609.
- Tan, R.R., Ng, D.K.S., Foo, D.C.Y., & Aviso, K.B., A superstructure model for the synthesis of single-contaminant water networks with partitioning regenerators. *Process Safety and Environmental Protection*, 2009, 87:197 - 205.
- Tan, R.R., Ballacillo, J.B., Aviso, K.B., & Culaba, A.B., A Fuzzy Multiple Objective Approach To The Optimization Of Bioenergy System Footprints. *Chemical Engineering Research and Design*, 2009, 87:1162 - 1170.
- 2008 Tan, R.R., Culaba, A.B., & Aviso, K.B., A Fuzzy Linear Programming Extension Of The General Matrix-Based Life Cycle Model. *Journal of Cleaner Production*, 2008, 16:1358-1367.
- Aviso, K.B., Tan, R.R., & Culaba, A.B., Application of rough sets for environmental decision support in industry. *Clean Technologies and Environmental Policy*, 2008, 10:53-66.
- Tan, R.R., Culaba, A.B., & Aviso, K.B., A fuzzy linear programming extension of the general matrix-based life cycle mode. *Journal of Cleaner Production*, 2008, 16(13-16):1358-1367.
- 2006 Tan, R.R., Culaba, A.B., & Aviso, K.B., A multi criteria rough set based methodology for life cycle impact assessment. *Philippine Institute of Industrial Engineers Journal*, 2006, 3:1-12.
- 2005 Aviso, K., Tan, R.R., & Culaba, A.B., A multicriteria rough set based decision support system for life cycle impact assessment. *Proceedings of the 6th Asia Pacific Industrial Engineering and Management Systems Conference*, 2005.
- Pascual-Aquino, L., Tan, R.R., Mutoe, J.E., Aviso, K., & Culaba, A.B., A system dynamics approach on the life cycle analysis of coal-fired power generator. *Proceedings of the 6th Asia Pacific Industrial Engineering and Management Systems Conference*, 2005.
- Pasual-Aquino, L., Aviso, K., Tan, R.R., & Culaba, A.B., A comparative analysis of

six life cycle impact assessment methodologies. Proceedings of the 25th Annual PAASE Scientific Meeting and Symposium, 2005.

2015

Tan, R.R., & Aviso, K.B., An Extended P-Graph Approach to Process Network Synthesis for Multi-Period Operations. Computers & Chemical Engineering, 2015.

Andiappan, V., Tan, R.R., Aviso, K.B., & Ng, D.K.S., Synthesis and optimisation of biomass-based tri-generation systems with reliability aspects. Energy, 2015.

Andiappan, V., Tan, R.R., Aviso, K.B., & Ng, D.K.S., Synthesis of Biomass-based Trigeration Systems with Reliability Aspects. Computer Aided Chemical Engineering, 2015, 37:2243-2248.

Wan, Y.K., Ng, R.T.L., Ng, D.K.S., Aviso, K.B., & Tan, R.R., Fuzzy multi-footprint optimisation (FMFO) for synthesis of a sustainable value chain: Malaysian sago industry. Journal of Cleaner Production, 2015.

Leong, Y.T., Tan, R.R., Aviso, K.B., & Chew, I.M.L., Fuzzy analytic hierarchy process and targeting for inter-plant chilled and cooling water network synthesis. Journal of Cleaner Production, 2015.

Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Solis, F.D.B., Yu, K.D.S., & Santos, J.R., A Shock Absorption Index For Inoperability Input-Output Models. Economic Systems Research, 2015, 27:1-17.

Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Yu, K.D.S., & Santos, J.R., Development of a fuzzy linear programming model for allocation of inoperability in economic sectors due to loss of natural resource inputs. DLSU Business & Economics Review, 2015, 24(2):1-12.

Tan, R.R., Aviso, K.B., & Uy, O.M., Comprehensive sensitivity analysis in NLP models in PSE applications using space-filling DOE strategy. Chemical Engineering Transactions, 2015, 45:523-528.

**Name** Rene Juna R. Claveria

**Gender** Male

**Organizational Affiliations**

Assistant Professor, Department of Environmental Science, Ateneo de Manila University

**Education**

Doctor of Philosophy in Geology, University of the Philippines, Diliman, Quezon City

**Fields of Specialization**

Geology

Mining and Metallurgy

Soil Science

Environmental Geology

**Publications**

- 2014 Gotera, K.C., Doronila, A.I., Claveria, R.J.R., Perez, T.R., Unson, J.R.S., Peñaranda, M.C.R., Sebastian, M.B., & Medina, J.C.S., *Breynia cernua* (Poir.) Müll. Arg. (Phyllanthaceae) is a hyperaccumulator of nickel. *The Asian International Journal of Life Sciences*, 2014, 23(1):231-241.
- 2012 Gotera, K.M.C., & Claveria, R.J.R., An assessment of the compartmentalization and localization of nickel in *Breynia Cernua*, a potential hyperaccumulator in nickeliferous laterite in Zambales. Abstracts to Poster presentation, NSWES 2012, 2012.
- 2011 Claveria, R.J.R., de Leon, E.G.E., & Teodoro, K.B., The identification of fern species as metallophytes and their implications to mine rehabilitation. Abstracts of Papers, 33rd NAST Annual Scientific Meeting, Transactions of the National Academy of Science and Technology, 2011, 33(1).
- 2010 Patdu, M.K., Lorenzo, T.M.E., Unson, J.R.S., & Claveria, R.J.R., Nickel uptake and soil microbial activity of *Brassica Juncea* (indian mustard) and *Zea Mays* (corn) grown in nickeliferous laterites from Palawan, Philippines. First National Conference on Bioremediation, 2010.
- Doronila, A.I., Unson, J.R.S., Penaranda, M.C.R., Gotera, K.M.S., & Claveria, R.J.R., The discovery of a nickel hyperaccumulator plant, *Breynia Cernua*, in the ultramafic terrains of Zambales, Philippines. First National Conference on Bioremediation, 2010.
- Claveria, R.J.R., Medina, J.C.S., Sebastian, M.B., Joven, P.M.T., & delos Santos, C., Geobotanical survey in nickeliferous laterite terrains: Implications to mine rehabilitation. *Proceedings GEOCON 2010* (Geological Society of the Philippines), 2010.
- 2009 Claveria, R.J.R., del los Santos, C., & Teodoro, K., The Identification of Metallophytes in Ni-Fe and Cu-As Enriched Soils: Implications to Phytomining. *Proceedings of the 2009 Earth Science International Conference*, 2009.
- Claveria, R.J.R., Microscopic Analysis of Gold Occurrences in a High Sulfidation Epithermal System. *The Proceedings of the 2009 MICOSPHIL Annual Scientific Conference*, 2009.
- Claveria, R.J.R., Review: The Formation of magnesite Deposits in Ultramafic

Terrains. The Ateneo de Manila University, 2009:143-150.

Claveria, R.J.R., Del los Santos, C., Teodoro, K., Rellosa, M.A., & Valera, N.S., The Identification of Metallophytes in the Fe and Cu Enriched Environments of Brooke's Point, Palawan and Mankayan, Benguet and their Implications to Phytoremediation. Science Diliman, 2009, 21:1-12.

Patdu, M.K., Unson, J.R.S., & Claveria, R.J.R., Phytoextraction of nickel by *Brassica juncea* (Indian mustard) and *Zea mays* (corn) cultivated in nickeliferous laterite from Brooke's Point, Palawan, Philippines. Proceedings in 29th Annual paase Meeting and Symposium, Ateneo de Manila University, Quezon City, 2009.

2008

Claveria, R.J.R., Severino, G.A.J., & Perez, T.R., Bathymetry and Sedimentation in Palacpaquen Lake, San Pablo City, Laguna, Philippines. The Loyola Schools Review (School of Science and Engineering), 2008:73-85.

Claveria, R.J.R., & Adriano, R., The Geology of the Nickeliferous Laterite Deposit at Brooke's Point, Southern Palawan. The Loyola Schools Review (School of Science and Engineering), 2008:115-130.

**Name** Emilyn Q. Espiritu

**Gender** Female

**Organizational Affiliations**

Associate Professor, Department of Environmental Science, Ateneo de Manila University  
Loyola Heights, Quezon City

**Education**

Doctor in Philosophy in Applied Biological Science major in Environmental Technology,  
Ecotoxicology, Biomonitoring, Environmental Management, University of Gent, Belgium

**Fields of Specialization**

Applied Biological Science

Environmental Technology

Ecotoxicology

Biomonitoring

Environmental Management

**Publications**

- 2011 Espiritu, E.Q., Teran, A.B., & Antonio, R.L., Development of an Enzymatic Toxicity Test with Selected Phyllopod Species. University of San Carlos Press, 2011:17-34.  
Espiritu, E.Q., SOS: Earth in Trouble!. Ateneo de Manila University Press, 2011:149-172.  
Espiritu, E.Q., Pimentel, S.S., Marquez, N.D.E., Roxas, C.M.R., & Domingo, F.A.T., Toxicological and Histopathological Evaluations of the Effects of Synthetic Hormones-Ethinylestradiol and Levonorgestrel on Tilapia (*Oreochromis niloticus* L.). The National Academy of Science and Technology Philippines, 2011, 227:1.  
Espiritu, E.Q., Development of standard toxicity tests for tropical aquatic environments: 1. the use of tilapia, *oreochromis niloticus* (L.), as toxicity test organism for freshwater habitats. Philippine Scientist, 2011, 48:17-34.
- 2009 Espiritu, E.Q., Water Resources and Water Quality: Challenges to Philippine Sustainable Development Initiatives. Ateneo de Manila University Loyola Schools, 2009:184.
- 2008 Espiritu, E.Q., De Guzman, K.L., & Quevedo, C.C., Use of Black Tiger Prawn, *Penaeus monodon*, as Test Organism for Toxicity Testing in Tropical Marine Environments. The Loyola Schools Review, Office of Research and Publication, Ateneo de Manila University, 2008:55-71.
- 2007 Espiritu, E.Q., Region 3: National Water Quality Status Report 2001-2005. DENR-EMB, 2007:45.  
Espiritu, E.Q., Region National Water Quality Status Report 2001 - 2005. DENR-EMB, 2007:54.
- 2006 Espiritu, E.Q., De Guzman, K.L., & Quevedo, C.C., Development of a Standard Protocol for the Marine Environment using the Black Tiger Shrimp, *Penaeus monodon*. Transactions of the National Academy of Science and Technology Philippines, 2006.  
Espiritu, E.Q., Hufemia, A.M., & Lubo, P., Preliminary Study on the Polishing Efficiency of Clinoptilolite in the Tertiary Treatment of Hog Farm Effluents. Office of Research & Publication, Ateneo de Manila University, 2006.



- 2005 Espiritu, E.Q., Chapter 2: The Way the Natural World Works. Office of Research and Publication, Ateneo de Manila University, 2005:266.  
Espiritu, Emilyn Q. (Ed.), Introduction to Environmental Science: Managing Resources for Sustainable Development (trial edition). Office of Research and Publication, Ateneo de Manila University, 2005:266p.
- 2003 Espiritu, E.Q., Troubled Earth. Office of Research and Publication, Office of Research & Publication, Ateneo de Manila University, 2003:337.
- 2001 Espiritu, E.Q., Dancel, C., Cruz, E., Dayrit, F.M., Teran, A.B., & Gonzales, B.M.V., A Comparative Study of the Toxicity of Three Commercially Available Detergents on Tilapia (*Oreochromis niloticus*). Transactions of the National Academy of Science and Technology Philippines, 2001, 23:317-318.  
Espiritu, E.Q., & Teran, A.B., A Comparative Study on the Toxicity of Three Commercial Detergents on *Oreochromis niloticus*. Office of Research and Publication, Ateneo de Manila University, 2001:15-29.  
Espiritu, E.Q., Module 3: Environmental Issues - Troubled Earth. Office of Research and Publication, Ateneo de Manila University, 2001:295.
- 2000 Espiritu, E.Q., Module 13: Environmental Procurement Coursebook. International Trade Centre UNCTAD/WTO, 2000:110.  
Espiritu, E.Q., Cruz, E., Dancel, C., & Dayrit, F.M., Assessment of the Acute Toxicity of Surfactants (LAS and CFAS) Using Selected Species of Fish. Transactions of the National Academy of Science and Technology Philippines, 2000, 22.  
Espiritu, E.Q., Cheng Chua, K., & Torres, A., An Investigation on the Potential of Highly Absorbent Material Obtained from Surplus Diapers and Sanitary Napkins as Lahar Conditioner. Transactions of the National Academy of Science and Technology Philippines, 2000.
- 1999 Dayrit, F.M., Tangtatco, M., Wong, R., Espiritu, E.Q., & Segarra, P., Metals and Total Organic Levels in the San Mateo Landfill Leachate. Transactions of the National Academy of Science and Technology Philippines, 1999.  
Dayrit, F.M., Espiritu, E.Q., Gonzales, N., Rojas, N., Aguilan, J.T., Basilio, A.M., Chainani, E.T., Cruz, E., & Matanguihan, B., Development of <sup>31</sup>P Nuclear Magnetic Resonance Methods for the Study of Phosphate Metabolisms in *E. coli* and *B. subtilis*. *Kimika*, 1999, 128(15):1.  
Espiritu, E.Q., Module 3: Environmental Issues - Troubled Earth. Office of Research and Publication, Office of Research and Publication, Ateneo de Manila University, 1999, 187.
- 1997 Espiritu, E.Q., Ecotoxicological Assessment of Selected Sites in the Manila Bay Area. Transactions of the National Academy of Science and Technology Philippines, 1997:101-102.
- 1996 Espiritu, E.Q., Janssen, C.R., & Persoone, G., Development of an Enzymatic Toxicity Test with Selected Phyllopod Species. Transactions of the National Academy of Science and Technology Philippines, 1996, 94.
- 1995 Espiritu, E.Q., Janssen, C.R., & Persoone, G., Cyst-based Toxicity Test VII: Evaluation of the 1-hour Enzymatic Inhibition Test (Fluotox) with *Artemia* Naupli. John Wiley & Sons, Inc., 1995, 1:25-34.
- 1993 Espiritu, E.Q., Janssen, C.R., & Persoone, G., Evaluation of the New "Enzymatic Inhibition" Criterion for Rapid Toxicity Testing with *Daphnia magna*. Lewis Publishers, London, 1993, 208.  
Espiritu, E.Q., Janssen, C.R., & Persoone, G., Validation of the 1-hour Fluotox (Visual) Test Results with *Daphnia magna* Using an Automated Fluorescence Scanning System. SETAC, 1993:282-283.
- 1992 Espiritu, E.Q., Janssen, C.R., & Persoone, G., Application of the 1-h Enzymatic Inhibition Criterion (Fluotox Test) to Toxicity Screening with the Brine Shrimp *Artemia*. SETAC-

Europe, 1992.

1991 Espiritu, E.Q., Janssen, C.R., & Persoone, G., Evaluation of the New "Enzymatic Inhibition" Criterion for Rapid Toxicity Testing with Invertebrate. SETAC-Europe, 1991.

**Name** Decibel Villarisco Faustino-Eslava

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**Organizational Affiliations**

Dean, School of Environmental Science and Management (SESAM), University of the Philippines Los Baños College, Laguna, 4031

**Education**

Doctor of Philosophy in Geology, The University of Hong Kong, Department of Earth Sciences, James Lee Building, Pokfulam Road, Hong Kong, People's Republic of China 2009

Master of Science in Earth Systems, Kumamoto University, Department of Systems in Natural Environment, Graduate School of Science and Technology, 2-39-1 Kurokami, Kumamoto 860-8555, Japan 2003

Master of Science in Geology, University of the Philippines, National Institute of Geological Sciences, Diliman, Quezon City 2000

Bachelor of Science in Geology, University of the Philippines, National Institute of Geological Sciences Diliman, Quezon City 1997

**Fields of Specialization**

Natural Resources

Environment

Education

DDR

Weather-induced disasters

Geochemistry

Tectonics

**Employment**

Dean, School of Environmental Science and Management (SESAM), University of the Philippines Los Baños, 2015-present

Associate Professor 6, School of Environmental Science and Management (SESAM), University of the Philippines Los Baños, 2011 September-present

Project Leader/Researcher, Rushurgent Working Group, National Institute of Geological Sciences, University of the Philippines, 2010-present

Project Researcher, National Institute of Geological Sciences, University of the Philippines, 2008 September-2009 December

Research Associate, Department of Earth Sciences, The University of Hong Kong, Hong Kong, P.R.O.C., 2008 March-2008 May

Senior Lecturer, Department of Physical Sciences and Mathematics, College of Arts and Sciences, U.P. Manila, 2003 October-2004 January

Senior Lecturer, Department of Physical Sciences and Mathematics, College of Arts

and Sciences, U.P. Manila, 2009 June Instructor 3, Department of Physical Sciences and Mathematics, College of Arts and Sciences, U.P. Manila, 2000 June-2001 September

University Research Associate, National Institute of Geological Sciences, University of the Philippines, 1997 June-2000 May

Student Assistant, National Institute of Geological Sciences, University of the Philippines, 1994 November-1997 May

### **Association Membership**

Member, Global Young Academy (GYA)

Member, The World Academy of Sciences (TWAS)

Member, Asia Oceania Geosciences Society (AOGS)

Member, Geological Society of the Philippines (GSP)

Regular Member, National Research Council of the Philippines (NRCP)

Member, Philippine Association of Japanese Ministry of Education Scholars (Philajames)

Member, Philippine Consortium on Environmental Sciences (PCES)

Member, U.P. Geology Alumni Association (UPGAA)

Member, U.P. Cwm Zena'na Alumnae Council (UPCZAC)

Member, The University of Hong Kong Alumni Association (HKUAA)

Member, Organizing Committee, 5th Asia-Africa Minerals Conference, Quezon City, Philippines

Chairperson, Division on Earth and Space Sciences, National Research Council of the Philippines (NRCP)

Co-Chair, Crust-Mantle Evolution in Active Arcs, Sequoia Hotel, Quezon City

Organizing committee member, 3rd National Conference and Workshop on Environmental Science, Ateneo de Manila University

Facilitator, Cluster on Atmospheric and Environmental Change: Future Earth Program Workshop, Scientific Conference and 81st National Research Council of the Philippines General Membership Assembly, "Future Earth, Future Philippines", Manila Hotel, Philippines

Coordinator for Research, Development and Extension Committee, School of Environmental Science and Management, UP Los Baños

Chair, Scientific Committee, 2nd National Conference and Workshop on Environmental Science, UP Los Baños

Member, Organizing Committee, National Symposium on Building Blocks for Climate Resilience of Local Communities in the Philippines

Co-Chair, Organizing Committee, 2nd International Symposium and Fieldwork of the International Geoscience Programme 589

Treasurer, Geological Society of the Philippines

Member, Organizing Committee, 5th AUN/SEED-Net Regional Conference on Geo-

disasters in the ASEAN

Member, Organizing Committee, 1st National Symposium and Workshop on Environmental Science

Member, Editorial Board, Journal of the Geological Society of the Philippines

Chair, Committee on Extension Services, Division on Earth and Space Sciences, National Research Council of the Philippines (NRCP)

Member, Organizing Committee, Annual Geological Convention of the Geological Society of the Philippines

Member, Organizing Committee, Geohazards Forum of the Geological Society of the Philippines

Member, Organizing Committee, Mining and Minerals Forum of the Geological Society of the Philippines

Member, National Institute of Geological Sciences (NIGS) Tectonics and Geodynamics Research Group

Chair, Committee on Research, Division on Earth and Space Sciences, National Research Council of the Philippines (NRCP)

Member, Technical Working Group on the formulation of the Philippine Strategy on Climate Change Adaptation

Director, UP Geology Alumni Association

Member, Philippine Contingent, Philippines-Taiwan Collaboration on Geosciences

Member, Organizing Committee, Earth Sciences International Conference

Member, Organizing Committee, Rediscovering the Philippine Setting: Meteorology, Mineralization and Tectonics Symposium

### **Honors / Awards**

Young Affiliate Fellow (4 years), The World Academy of Sciences 2013 to 2017

U.P. President's International Publication Awards, University of the Philippines 2000, 2001, 2012, 2013

Studentship Award (5 years), The University of Hong Kong 2004 to 2009

Monbukagakusho Scholarship (2 years), Japanese Government (Monbu-kagaku-shÅ ) 2001 to 2003

Fifth Placer, 1997 National (Philippine) Geology Licensure Examination, Professional Regulation Commission 1997

College Scholar Awardee, University of the Philippines 1994

U.P. President's International Publication Awards, University of the Philippines

U.P. President's International Publication Awards, University of the Philippines

U.P. President's International Publication Awards, University of the Philippines

### **Researches**

Geochemical characterization of volcanic rocks along the Bangong-Nujiang Suture Zone

## **Completed**

Across arc variation in the Pinatubo - Arayat transect: Degree of partial melting, mantle source region or tectonic control signature?

Establishing the history of the Philippine island arc system: Clues from the rocks of the Zambales-Pangasinan region

Phase II of the RP-Taiwan collaboration on Geosciences: Overriding the Plate Dynamics: Towards an Integrated Understanding of the Central Philippine Tectonics and its Implications for Mineralization, Current Environmental Conditions and Geophysical Hazard

Philippines-Taiwan integrated predictive studies of geometeorological hazards

Predictive forensics for averting possible disasters: A FORIN template for tackling issues related to the Valley Fault System and the Angat Dam in Luzon, Philippines

Formulation of the Basic Early Warning/Evacuation protocol for the production sites of the Energy Development Corporation (EDC)

Influence of agro-industrialization on the land use of the landscape of Mt. Makiling in San Juan river watershed in Calamba city and Sto. Tomas, Batangas

Influence of land uses on water quality and fish assemblage of the different tributaries of Mt. Makiling watershed in Los Baños and Bay, Laguna

Preparation of Environmental Code of Laguna (Writer for articles on 1) Minerals and 2) Climate Change and Disaster Risk Reduction (Province of Laguna)

Survival and growth of broadcasted *Gliricidia sepium* seeds in a grassland in Carranglan, Nueva Ecija and Mt. Makiling

Formulation of Guidelines for Integration of Climate Change Assessment and Disaster Risk Response in Local Development Planning and Mainstreaming Climate Change Research in Policy Formulation in Selected LGUs

Climate change influences on watershed landscape patterns and water quality

Paleomagnetism of the Amnay Ophiolite: Constraining the translation history of a South China Sea oceanic fragment

Eco-profiling of Batangas City: Geohazards and Hydrogeological assessment of the Kalumpang River

Enhancing Communities' Capacity to Confront Extreme Geo-Meteorological Events at the Core of Climate Change

Quick-response team: Investigation of the effects of the typhoons Ondoy and Pepeng in Luzon, Philippines

Geochemical and geophysical characterization of the Subic Bay Fault Zone: Towards an understanding of its tectonic setting

Publication of the ASEAN Journal of Science and Technology for Development: A Regional Technical Journal

Characterization of the flooding problem in Metro Manila

A study of the Bohol crust - mantle suites emplaced in contrasting tectonic environments

Geology and geochemistry of Philippine ophiolite and ophiolitic complexes

Zamboanga Peninsula: Geological characterization of a new mining district  
 Geomorphological and geological profiling of Mati, Davao Oriental  
 Geological baselining of hill-based subdivisions in Antipolo and Montalban areas  
 Paleomagnetic investigation of central and southern Luzon  
 Geophysical studies in Kyushu, Japan: \* Seismic surveys and gravity core sampling of Beppu Bay, Oita, Japan \* Seismic surveys and gravity core sampling of the Ariake Sea, Amakusa, Japan \* Seismic surveys, gravity core and grab sampling in the North Pacific  
 Paleomagnetic investigation of the Bangong-Nujing Suture Zone  
 Arc-continent collision in West Central Philippines: Implications on Resource Potential and Natural Hazards  
 Quick-response team: Investigation of the January 2009 flooding of Mindanao consequent to the tail end of the cold front

### **Ongoing**

Mainstreaming Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI)  
 Preparation of Environmental Code of Tanuan City, Batangas

### **Publications**

- 2015 Salapare, R.C., Dimalanta, C.B., Ramos, N.T., Manalo, P.C., Faustino-Eslava, D.V., Queaño, K.L., & Yumul, G.P., Jr., Upper crustal structure beneath the Zambales Ophiolite Complex, Luzon, Philippines inferred from integrated gravity, magnetic and geological data. *Geophysical Journal International*, 2015, 201(3):1522-1533.  
 Manalo, P.C., Dimalanta, C.B., Faustino-Eslava, D.V., Ramos, N.T., Queaño, K.L., & Yumul, G.P., Jr., Crustal thickness variation from a continental to an island arc terrane: Clues from the gravity signatures of the Central Philippines. *Journal of Asian Earth Sciences*, 2015, 104:205-214.  
 Dimalanta, C.B., Salapare, R.C., Faustino-Eslava, D.V., Ramos, N.T., Queaño, K.L., Yumul, G.P., Jr., & Yang, T.F., Post-emplacement history of the Zambales Ophiolite Complex: Insights from petrography, geochronology and geochemistry of Neogene clastic rocks. *Journal of Asian Earth Sciences*, 2015, 104:215-227.
- 2014 Tangunan, D., Peleo-Alampay, A.M., Abuda, J.B., Mambuay, L.A.T., Ramos, C.R.A., Fernando, A.G.S., Dimalanta, C.B., Faustino-Eslava, D.V., Pascua, C.S., & Vargas, E.P., Post-Collision Deposition of Balanga Formation in northwest Mindoro, Philippines: Calcareous Nannofossil Evidence. *Stratigraphy*, 2014, 11(3-4):235-243.
- 2013 Yumul, G.B., Jr., Dimalanta, C.B., Tamayo, R.A., Jr., & Faustino-Eslava, D.V., Geological features of a collision zone marker: The Antique Ophiolite Complex (Western Panay, Philippines). *Journal of Asian Earth Sciences*, 2013, 65:53-63.  
 Perez, A.D.C., Faustino-Eslava, D.V., Yumul, G.P., Jr., Dimalanta, C.B., Tamayo, R.A., Jr., Yang, T.F., & Zhou, M.F., Enriched and depleted characters of the Amnay Ophiolite upper crustal section and the regionally heterogeneous nature of the South China Sea mantle. *Journal of Asian Earth Sciences*, 2013, 65:107-117.
- 2012 Canto, A.P.B., Padrones, J.T., Concepcion, R.A.B., Perez, A.D.C., Tamayo, A.D.C., Jr., Dimalanta, C.B., Faustino-Eslava, D.V., Queaño, K.L., & Yumul, G.P., Jr., Geology of northwestern Mindoro and its offshore islands: Implications for terrane accretion in west Central Philippines. *Journal of Asian Earth Sciences*, 2012, 61:78-87.

- Concepcion, R.A.B., Dimalanta, C.B., Yumul, G.P., Jr., Faustino-Eslava, D.V., Queaño, K.L., Tamayo, R.A., Jr., & Imai, A., Petrography, geochemistry, and tectonics of a rifted fragment of Mainland Asia: Evidence from the Lasala Formation, Mindoro Island, Philippines. *International Journal of Earth Sciences*, 2012, 101(1):273-290.
- 2011 Faustino-Eslava, D.V., Yumul, G.P., Jr., Servando, N.T., & Dimalanta, C.B., The January 2009 anomalous precipitation associated with the "Tail-end of the Cold Front" weather system in Northern and Eastern Mindanao (Philippines): Natural hazards, impacts and risk reductions. *Global and Planetary Change*, 2011, 76(1-2):85-94.
- 2009 Faustino-Eslava, D.V., Aitchison, J.C., Tamayo, R.A., Jr., Yumul, G.P., Jr., & Dimalanta, C.B., Late Mesozoic crustal extension along the southern Eurasian margin: evidence from volcanic rocks of the Bangong-Nujiang Suture zone, Tibet. 5th International Symposium of IGCP-516 Geological Anatomy of East and South Asia: Paleogeography and Paleoenvironment in Eastern Tethys, 2009.  
Faustino, D.V., Late mesozoic magmatism along the Bangong-Nujiang suture zone, Tibet. The University of Hong Kong (Pokfulam, Hong Kong), 2009.
- 2008 Yumul, G.P., Jr., Dimalanta, C.B., Bellon, H., Faustino, D.V., De Jesus, J.V., Tamayo, R.A., Jr., & Jumawan, F.T., Adakitic lavas in the Central Luzon back-arc region, Philippines: Lower Crust partial melting products? *Island Arc*, 2008, 9(4):499-512.
- 2006 Faustino, D.V., Yumul, G.P., Jr., Dimalanta, C.B., De Jesus, J.V., Zhou, M.F., Aitchison, J.C., & Tamayo, R.A., Jr., Volcanic-hypabyssal rock geochemistry of a subduction-related marginal basin ophiolite: Southeast Bohol Ophiolite-Cansiwang Mélange Complex, Central Philippines. *Geosciences Journal*, 2006, 10(3):291-303.
- 2005 Aitchison, J.C., Ali, J.R., Badengzhu, Davis, A.M., Faustino, D.V., Hui, L., Safaya, S., Ross, I., & Zeng, Q.G., The Bangong-Nujiang suture between Gertse and Dong Tso (84° - 85°E), central Tibet. 20th Himalaya-Karakoram-Tibet Workshop HKT 20, 2005.
- 2004 Faustino, D.V., Ali, J.R., & Aitchison, J.C., Paleomagnetic investigations along the Bangong-Nujiang suture zone, central Tibet. The 4th International Symposium on the Tibetan Plateau, 2004.
- 2003 Faustino, D.V., Yumul, G.P., Jr., De Jesus, J.V., Dimalanta, C.B., Aitchison, J.C., Zhou, M.F., Tamayo, R.A., Jr., & De Leon, M.M., Geology of Southeast Bohol, Central Philippines: Accretion and sedimentation in a marginal basin. *Australian Journal of Earth Sciences*, 2003, 50(4):571-583.
- 2002 Yumul, G.P., Jr., Dimalanta, C.B., Baretto, J.A., Faustino, D.V., & De Jesus, J.V., Mineralization potential of the Southeast Bohol Ophiolite Complex, Central Philippines. *Journal of Geological Society Philippines*, 2002, 57:19-28.
- 2001 Yumul, G.P., Jr., Zhou, M.F., Tamayo, R.A., Maury, R.C., Faustino, D.V., Olaguera, F.O., & Cotten, J., Onramping of Cold Oceanic Lithosphere in a Forearc Setting: The Southeast Bohol Ophiolite Complex, Central Philippines. *International Geology Review*, 2001, 43(9):850-866.
- 2000 De Jesus, J.V., Yumul, G.P., Jr., & Faustino, D.V., The Cansiwang Melange of Southeast Bohol (Central Philippines): Origin and tectonic implications. *Island Arc*, 2000, 9(4):565-574.
- 1998 Yumul, G.P., Jr., Dimalanta, C.B., Faustino, D.V., & De Jesus, J.V., Upper mantle-lower crust dikes of the Zambales Ophiolite Complex (Philippines): Distinct short-lived, subduction-related magmatism. *Journal of Volcanology and Geothermal Research*, 1998, 84(3):287-309.



**Name** Charlotte Kendra de Zuñiga Gotangco-Castillo

**Gender** Female

**Organizational Affiliations**

Assistant Professor, Department of Environmental Science, 3rd floor, Manila Observatory building Ateneo de Manila University Loyola Heights, Quezon City 1108

**Education**

Doctor of Philosophy in Earth and Atmospheric Science, Purdue University

Masters in Environmental Management, Ateneo de Manila University - University of San Francisco

Bachelor of Science in Physics, minor in Philosophy, Ateneo de Manila University

**Fields of Specialization**

Earth and Atmospheric Science

Physics

Environmental Management

Human-environment dynamics and the systems approach

Climate change and disaster risk management research and policy

Science-Policy nexus

Integrative science education

**Association Membership**

Junior Associate, Abdus Salam International Centre for Theoretical Physics

Secretary, Board of Directors (BoD), Philippine Fulbright Scholars Association (PFSA)

Member, Working Group on Regional Climate (WGRC), World Climate Research Programme (WCRP)

Member, Asia-Oceania Geosciences Society (AOGS)

Member, American Geophysical Union

Member, Golden Key Honours Society

Co-coordinator, Earth & Atmospheric Sciences, Women in Science Program

Member, American Geophysical Union

**Honors / Awards**

Second Place, NAST Talent Search for Young Scientists, National Academy of Science and Technology - DOST 2015

Fulbright Fellow, Philippine-American Educational Foundation 2007 to 2011

Ross Fellow, Purdue Climate Change Research Center 2007

International Peace Scholar, PEO International 2007 to 2008

## Publications

- 2013 Ponce de Leon, I., & Gotangco, C.K., Reconciling Post-Positivist and Post-Modern Worldviews in Climate Research and Services. *WMO Bulletin*, 2013, 62:45-48.  
Gotangco, C.K., Josol, J., Padilla, M., Dalupang, J.P., See, J., & Elumba, R., Harmonizing FORIN for Climate Change Adaptation and Disaster Risk Management to Develop Multi-sectoral Narratives for Metro Manila. Volume 1: CCA-DRM Addendum to the FORIN Project Document, Technical Report, Manila Observatory and the International START Secretariat, 2013.  
Gotangco-Castillo, C.K., A Sensitivity Analysis of Surface Biophysical, Carbon, and Climate Impacts of Tropical Deforestation Rates in CCSM4-CNDV. *Journal of Climate*, 2013, 26:805-821.
- 2012 Gotangco-Castillo, C.K., Raymond, L., & Gurney, K.R., REDD+ and Climate: Thinking Beyond Carbon. *Carbon Management*, 2012, 3:457-466.  
Gotangco-Castillo, C.K., Levis, S., & Thornton, P., Evaluation of the new CNDV option of the Community Land Model: Effects of dynamic vegetation and interactive nitrogen on CLM4 means and variability. *Journal of Climate*, 2012, 25:3702-3714.  
Gurney, K.R., Castillo, C.K.G., Li, B., & Zhang, X., A positive carbon feedback to ENSO and volcanic aerosols in the tropical terrestrial biosphere. *Global Biogeochemical Cycles*, 2012, 26.  
Gotangco-Castillo, C.K., & Gurney, K.R., Exploring Surface Biophysical-Climate Sensitivity to Tropical Deforestation Rates using a GCM: A Feasibility Study. *Earth Interactions*, 2012, 16:1-23.
- 2010 Huizenga, C., Castillo, C.K.G., Ajero, M., & Sanqui, D.C., The Co-Benefits Approach: An Integrated Policy Response to Climate Change and Development in Asia. *Climate Change Negotiations: Can Asia Change the Game?* 2010:59-73.
- 2006 Castillo, C.K.G., Consequentialism and Climate Change Policy: An Exploratory Paper. *Eubios Journal of Asian and International Bioethics*, 2006, 16:182-192.

**Name** Rotacio S. Gravoso

**Gender** Male

**Organizational Affiliations**

Professor (Full), Visayas State University, Baybay City, Leyte

**Fields of Specialization**

Development studies

Development communication

Policy

Social Science

Communication and media

**Publications**

- 2014 Gravoso, R.S., Patindol, R.A., & Predo, C.D., Behavioral Responses to Climate Information: A Case of Small Scale Rice Farmers in Vulnerable Communities in Leyte, Philippines. *Annals of Tropical Research*, 2014, 36(2):45-62.  
Cortes, J.A., & Gravoso, R., Effects of activating metacognition on high school students' skills in retrieving information from the Internet. *Proceedings of the PACE National Conference 2014*, Benguet State University, 2014.
- 2011 Gravoso, R.S., Gregorio, N.O., Gerona, M.A.D., Serifio, M.N.V., Harrison, S.R., Pajaron, H.V., & Godoy, J.V., Development and Implementation of a Forest Nursery Accreditation Policy at a Local Level in Leyte, Philippines. *Small-scale Forestry*, 2011, 10(4).
- 2010 Gravoso, R., Gregorio, N., Gerona, A., & Godoy, J., Design and implementation of a communication campaign on best management practice for forest nurseries. *Annals of Tropical Research*, 2010, 32(2):89-99.
- 2009 Gravoso, R., Mangaoang, E., Gerona, M.A., Pasa, A., & Harrison, S., Users' Reactions to the Primer on Tree Registration Policies: Lessons for Designing Extension Materials and Improving Information Flow. *Small-scale Forestry*, 2009, 8(3):275-287.
- 2008 Godoy, J.V., & Gravoso, R.S., Design and Implementation of an Instructional Innovation for At-Risk Learners: A Classroom Study. *The Asia-Pacific Education Researcher*, 2008, 17(2).  
Gravoso, R.S., Pasa, A.E., Labra, J.B., & Mori, T., Design and Use of Instructional materials for Student-Centered Learning: A Case in Learning Ecological Concepts. *The Asia-Pacific Education Researcher*, 2008, 17(1):109-120.
- 2007 Velarde, G.L.M., Gravoso, R.S., Cagasan, E.G., & Gabrillo, C.A., Most significant changes experienced by farmers from adopting rainforestation farming. *Annals of Tropical Research*, 2007, 29(3):109-122.  
Gordon, M., Gravoso, R., Mangaoang, E., & Balbarino, E., Development of an extension 'primer' on tree registration policy in Leyte: An example of a collaborative material design. *Annals of Tropical Research*, 2007, 29(3):25-37.

**Name** Richard Rudolf Hartmann

**Gender** Male

**Organizational Affiliations**

Associate Professor, Physics Division, De La Salle University Taft Ave., Manila

**Education**

Doctor of Philosophy in Physics (Theoretical), The University of Exeter, Exeter, Devon EX4, United Kingdom 2010

Physics 4 year integrated masters (MPhys), The University of Exeter, Exeter, Devon EX4, United Kingdom 2007

A-levels: Mathematics (A), Physics (A), Biology (A); As-levels: Pure Further Mathematics (A), Chemistry (B), Totton College, Calmore Road, Totton SO40 3ZX, United Kingdom 2003

As-levels: Geography (A); GCSE's: 11 passes including English Language and Maths, Hardley School, Southampton Long Lane, Hampshire, SO45 2PA, UK 2001

**Fields of Specialization**

Terahertz applications

Theoretical Physics

Nanotechnology

Carbon nanotubes

**Employment**

Associate Professor, De La Salle University Manila, 2012-present

Host of Baler, (Popular Media) Living Asia Channel, 2015

Host of China Chimelong and China Guangxi, (Popular Media) Living Asia Channel, 2015

Host of Special Origins, Apayao, (Popular Media) Living Asia Channel, 2015

Sultan Kudarat, Writer, (Popular Media) Living Asia Channel, 2015

Host of Special Origins, Atimonan, (Popular Media) Living Asia Channel, 2014

Host of Special Origins, Kalinga, (Popular Media) Living Asia Channel, 2014

Host of Lago De Oro 10th Perpetual Cup, (Popular Media) Living Asia Channel, 2014

Host of Kota Kinabalu, Malaysia, (Popular Media) Living Asia Channel, 2014

Host of Greenhill's shopping center features, (Popular Media) Living Asia Channel, 2014

Bolinao Puerto del Sol, Writer, (Popular Media) Living Asia Channel, 2014

BDO Print ad, (Popular Media) Bangko de Oro, 2013

(Popular Media) Cherry Mobile television commercial, 2013

Host of Special Origins, Negros Oriental, (Popular Media) Living Asia Channel, 2013

(Popular media) Hennessy commercial, 2012  
Article on self-defence, (Popular Media) Total fitness magazine, 2012  
BDO television commercial, (Popular Media) Bangko de Oro, 2012  
Host of Special Origins, Negros Occidental, (Popular Media) Living Asia Channel, 2012  
Host of Special Origins, Baybay, Leyte, (Popular Media) Living Asia Channel, 2012  
(Popular media) Great taste coffee commercial, 2011  
IB Faculty, Mahatma Gandhi International School (MGIS), 2011-2012  
SGEN Director of Academics and Special events / IB Faculty, Southville International School and Colleges (SISC), 2010-2011

### **Association Membership**

Member, National Research Council of the Philippines

### **Trainings**

2015 Progress in Applied Mathematics in Science and Engineering (PIAMSE), Bali, Indonesia 2015  
Materials Science Unit MICROSPHIL Conference 2013, Manila, Philippines 2013  
IOP International Conference on Applied Physics and Materials Science, Davao, Philippines 2013  
30th SPP Physics Congress, La Salle Dasmarias, Philippines 2012  
International School on Spin-Optronics, Les Houches, France 2010  
Luttinger Liquids and Bosonization Techniques, Brasilia, Brazil 2009  
International School of Nanophotonics and Photovoltaics, Maratea (PZ), Italy 2009  
Colloquium at the "International Center for Condensed Matter Physics", Brasilia, Brazil 2009  
Graphene Week Conference, Miramare-Trieste, Italy 2008

### **Researches**

#### **Completed**

Excitons in Carbon-based Nanostructures  
Terahertz Absorption and Emission in Quasi-Metallic Carbon Nanotubes

#### **Ongoing**

Collective Excitations in Advanced Nanostructures (CoExAN)  
Researcher Links Travel Grant

### **Publications**

2015 Hartmann, R.R., & Portnoi, M.E., Exciton States in Narrow-Gap Carbon Nanotubes. Proceedings of the 2015 Progress in Applied Mathematics in Science and Engineering (PIAMSE), Bali, Indonesia, 2015.  
Portnoi, M.E., Saroka, V.A., Hartmann, R.R., & Kibis, O.V., Terahertz Applications of Carbon Nanotubes and Graphene Nanoribbons. Proceedings of the IEEE computer

- society annual symposium on VLSI, Montpellier, France, 2015:456-459.
- Hartmann, R.R., & Portnoi, M.E., Terahertz transitions in quasi-metallic carbon Nanotubes. IOP Conference Series: Materials Science and Engineering, International Conference on Applied Physics and Materials Science (ICAMS2013), Davao, 2015, 79(1):120140.
- 2014 Hartmann, R.R., Kono, J., & Portnoi, M.E., Terahertz Science and Technology of Carbon Nanomaterials. *Nanotechnology*, 2014, 25(32).  
Hartmann, R.R., Bound states in a hyperbolic asymmetric double-well. *Journal of Mathematical Physics*, 2014, 55(1).  
Hartmann, R.R., & Portnoi, M.E., Quasi-exact solution to the Dirac equation for the hyperbolic-secant potential. *Physical Review A*, 2014, 89(1).
- 2013 Portnoi, M.E., Downing, C.A., Hartmann, R.R., & Shelykh, I.A., Excitons and interband terahertz transitions in narrow-gap carbon nanotubes. *Proceedings of the 2013 International Conference on Electromagnetics in Advanced Applications (ICEAA)*, Torino, 2013:231-234.
- 2012 Hartmann, R.R., & Portnoi, M.E., Momentum alignment of photoexcited carriers in graphene. 30th SPP Physics Congress, La Salle Dasmarinas, Philippines Handbook, 2012:8.  
Portnoi, M.E., & Hartmann, R.R., Momentum alignment of photoexcited carriers in graphene. VI International Conference on the Fundamental Science of Graphene and Applications of Graphene-Based Devices (Graphene Week 2012), Delft, Netherlands, Book of Abstracts, 2012:96.  
Portnoi, M., Hartmann, R., Kibis, O., & Rosenau da Costa, M., Carbon nanotubes and graphene as terahertz emitters and detectors. *International Conference on Fundamental and Applied NanoElectroMagnetics*, Minsk, Belarus, Conference Proceedings, 2012:7.
- 2011 Hartmann, R.R., Shelykh, I.A., & Portnoi, M.E., Excitons in narrow-gap carbon nanotubes. *Physical Review B*, 2011, 84(3).  
Hartmann, R.R., & Portnoi, M.E., Optoelectronic Properties of Carbon-based Nanostructures: Steering electrons in graphene by electromagnetic fields. LAP LAMBERT Academic Publishing, Saarbrücken, 2011.  
Portnoi, M.E., & Hartmann, R.R., Momentum alignment of photoexcited carriers in graphene. *IOP Topical Research Meetings in Physics: Graphene and Related Two-Dimensional Materials*, London, Abstract Book, 2011:28-29.  
Hartmann, R.R., Robinson, N.J., Downing, C.A., Stone, D.A., & Portnoi, M.E., Fully confined states in graphene waveguides, quantum dots and rings. *IOP Topical Research Meetings in Physics: Graphene and Related Two-Dimensional Materials*, London, Abstract Book, 2011:18-19.  
Hartmann, R.R., & Portnoi, M.E., Momentum alignment of photoexcited carriers in graphene: The route to optovalleytronics. 11th International Conference on Physics of Light-Matter Coupling in Nanostructures (PLMCN-11), Berlin, Germany, Program and Abstracts, 2011:51.
- 2010 Hartmann, R.R., Robinson, N.J., & Portnoi, M.E., Smooth electron waveguides in graphene. *Physical Review B*, 2010, 81(24).  
Portnoi, M.E., & Hartmann, R.R., Momentum alignment of photoexcited carriers in graphene. *Graphene Brazil 2010 Conference*, Belo Horizonte, Brazil, Scientific Program, 2010:89.  
Portnoi, M.E., Hartmann, R.R., Robinson, N.J., & Downing, C.A., Fully confined states in smooth graphene waveguides and quantum dots. *Graphene Brazil 2010 Conference*, Belo Horizonte, Brazil, 2010:32.
- 2008 Hartmann, R.R., & Portnoi, M.E., Momentum alignment of photoexcited carriers and THz detection in graphene. *ICTP-UNESCO Conference 'Electronic Properties of*

Graphene-Based Nanostructures', Graphene Week 2008, Trieste, Italy, Abstract of Poster Sessions, 2008:22.

Portnoi, M.E., Hartmann, R.R., Kibis, O.V., & Rosenau da Costa, M., Carbon-based nanostructures as terahertz emitters and detectors. THz Radiation: Basic Research and Applications, International Workshop, Alushta, 2008.

Portnoi, M.E., Hartmann, R.R., Rosenau da Costa, M., & Kibis, O.V., Carbon-based nanostructures as terahertz emitters and detectors. 29th International Conference on the Physics of Semiconductors (ICPS-29), Rio de Janeiro, Brazil, Abstracts, 2008:555-556.

**Name** Ian A. Navarrete

**Gender** Male

**Organizational Affiliations**

Assistant Professor, Department of Environmental Science, Ateneo de Manila University  
Loyola Heights, Quezon City

**Education**

Post-doctorate in Soil Science, Soil Science of Tropical & Subtropical  
Ecosystems, Georg-August University of Goettingen, Germany

Doctor of Philosophy in Science of Bioproduction (Soil Science), United Graduate School  
of Agricultural Sciences, Iwate University, Japan

**Fields of Specialization**

Environmental Soil Science

Soil Carbon sequestration

Mechanisms of soil carbon stabilization

Soil pollution and remediation

Soil degradation

Marginal uplands

Greenhouse gas fluxes

Soil genesis and classification

Geochemistry

Land-use change

**Publications**

- 2015 Navarrete, I.A., & Tsutsuki, K., Chemical and Spectroscopic Properties of Soil Hydrophilic Fulvic Acid Purified by Tangential Flow Ultrafiltration. *Clean Soil Air Water*, 2015, 43(7):1044-1051.
- 2014 Navarrete, I.A., & Asio, V.B., Research productivity in soil science in the Philippines. *Scientometrics*, 2014, 100:261-272.
- 2013 Navarrete, I.A., Tsutsuki, K., & Asio, V.B., Characteristics and fertility constraints of some degraded soils in Leyte, Philippines. *Archives of Agronomy & Soil Science*, 2013, 59:625-639.
- Navarrete, I., Lina, S., Corre, M., Veldkamp, E., & Asio, V., Soil organic matter dynamics and mechanisms of carbon stabilization in soils with conversion from secondary forest to grassland in central Philippines. *Geophysical Research Abstracts*, 2013, 15.
- 2011 Navarrete, I.A., Tsutsuki, K., Asio, V.B., Masayuki, T., & Sueta, J., Chemical, mineralogical and morphological characteristics of a late Quaternary sedimentary-rock derived soils in Leyte, Philippines. *Soil Science*, 2011, 176:699-708.
- Navarrete, I.A., & Asio, V.B., Heavy metals content of two red soils in Samar. *Annals of Tropical Research*, 2011, 33:162-174.



- 2010 Navarrete, I.A., Tsutsuki, K., & Navarrete, R., Humus composition and the structural characteristics of humic substances in soils under different land uses in Leyte, Philippines. *Soil Science & Plant Nutrition*, 2010, 56(2-2):289-296.
- 2009 Susaya, J.P., Kim, K.H., Asio, V.B., Chen, Z.S., & Navarrete, I.A., Quantifying nickel in soils and plants in an ultramafic area in the Philippines. *Environmental Monitoring Assessment*, 2009, 167(1-4):505-514.
- Asio, V.B., Jahn, R., Perez, F.O., Navarrete, I.A., & Abit, S.M., Jr., A review of soil degradation in the Philippines. *Annals of Tropical Research*, 2009, 31:69-94.
- Navarrete, I.A., Macalde, S.O., & Asio, V.B., Nutrient characteristics of aggregates and rhizosphere of a degraded upland: implication for soil fertility evaluation. *Annals of Tropical Research*, 2009, 31:90-102.
- Navarrete, I.A., Tsutsuki, K., Asio, V.B., & Kondo, R., Characteristics and formation of rain forest soils derived from late Quaternary basaltic rocks in Leyte, Philippines. *Environmental Geology*, 2009, 58:1257-1268.
- 2008 Sakamoto, N., Tani, M., Navarrete, I.A., Koike, M., & Umetsu, K., Covering dairy slurry stores with hydrophobic fertilisers reduces greenhouse gases and other polluting gas emissions. *Australian Journal of Experimental Agriculture*, 2008, 48(2):202-207.
- Navarrete, I.A., Tsutsuki, K., Kondo, R., & Asio, V.B., Genesis of soils across a late Quaternary volcanic landscape in the humid tropical island of Leyte, Philippines. *Journal of Soil Research*, 2008, 46:403-414.
- Navarrete, I.A., & Tsutsuki, K., Land-use impact on soil carbon, nitrogen, neutral sugar composition and related chemical properties in a degraded Ultisol Derived From Volcanic Materials in Leyte, Philippines. *Soil Science & Plant Nutrition*, 2008, 54(3):321-331.
- 2007 Navarrete, I.A., Asio, V.B., Jahn, R., & Tsutsuki, K., Characteristics and genesis of two highly weathered soils in Samar, Philippines. *Australian Journal of Soil Research*, 2007, 45:153-163.
- 2000 Navarrete, I.A., Asio, V.B., Balbarino, E., & Tulin, A., The physico-chemical properties of rhizosphere soil grown to vetiver in a degraded upland. *Grassland Society of the Philippines Journal*, 2000, 4:29-34.

**Name** Michael Angelo B. Promentilla

**Gender** Male

**Organizational Affiliations**

Professor (Full), Chemical Engineering Department, Gokongwei College of Engineering, De La Salle University 2401 Taft Avenue, Manila

**Education**

Doctor of Engineering in Socio-Environmental Engineering, Hokkaido University, Kita 8, Nishi 5, Kita-ku, Sapporo, Hokkaido 060-0808, Japan 2006

Master of Science in Chemical Engineering, specialization in Environmental Engineering, University of the Philippines, Diliman, Quezon City 2001

Bachelor of Science in Chemical Engineering, cum laude, University of the Philippines Los Baños, College, Laguna, 4031 Philippines 1996

**Fields of Specialization**

Chemical Engineering

Environmental Engineering

Socio-Environmental Engineering

**Employment**

University Postdoctoral Fellow, Laboratory of Environmental Material Engineering, Graduate School of Engineering, Hokkaido University, April 2007-March 2010

University Researcher, Laboratory of Sound Material-Cycle Systems Planning, Graduate School of Engineering, Hokkaido University, October 2006-March 2007

University Assistant Professor, University of the Philippines Los Baños, October 2001-September 2003

University Instructor, University of the Philippines Los Baños, November 1996-September 2001

University Research Assistant, National Institute of Molecular Biology and Biotechnology (BIOTECH-UPLB), July 1996-October 1996

On-the-job Trainee, Fuels and Energy Division, Industrial Technology and Development Institute (ITDI), Department of Science and Technology (DOS), April 1995-May 1995

**Association Membership**

Member, Philippine Institute of Chemical Engineers (PIChE)

Member, Japan Society of Civil Engineers (JSCE)

Member, Japan Concrete Institute (JCI)

Vice President, Philippine Society of Material Science and Nanotechnology, Inc.

**Honors / Awards**

Outstanding Young Scientist, National Academy of Science and Technology (NAST) 2013

Collaborative Research Project Grant, Japan International Cooperation Agency (JICA) through Asian University Network - Science and Engineering Education Development Network (AUN-SEED NET). Main proponent. Development of novel functional material from red mud, rice hull ash and diatomaceous 2012

Best Paper Award for "A decision modeling approach to prioritize remediation options for contaminated sites", Science and Technology Congress 2011. De La Salle University, Manila 2011

Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship Award for Foreign Researchers for "Application of synchrotron-based microtomography for microstructure characterization of cement-based materials" (2 years), Japan Society for the Promotion of Science (JSPS) 2008-2010

Center of Excellence (COE) Postdoctoral Fellowship, Graduate School of Engineering, Hokkaido University for "Pore structure characterization of cement-based materials using X-ray microtomography" (1 year), Hokkaido University 2007-2008

Best Paper Presentation Award for "Three dimensional characterization of air void system in cement-based materials", The 3rd Asian Concrete Federation (ACF) International Conference, Ho Chi Minh, Vietnam 2008

Highly Commendable Paper Award for "Evaluation of tortuosity of cement-based materials with X-ray synchrotron radiation microtomography", The First International Conference on Recent Advances in Concrete Technology. Washington DC, USA 2007

BASF Award for an Outstanding and Original Paper for "Studies on 3D micro-geometry and diffusion tortuosity of cement-based materials using X-ray microtomography", The 32nd Conference on Our World in Concrete and Structures, Singapore 2007

Japanese Government MEXT (Monbukagakusho) Scholarship (3 years), Japanese Government under the English Graduate Program of Socio-Environmental Engineering (EGPSEE) of Hokkaido University October 2003 - September 2006

University Local Fellowship (2 years), University of the Philippines Los Baños November 1998 - October 2000

5th place (PRC Rating: 85.5%), National Chemical Engineering Licensure Exam, Professional Regulatory Commission (PRC) May 1997

Outstanding Student Award, College of Engineering and Agro-industrial Technology (CEAT), University of the Philippines Los Baños, Philippines 1996

Scholarship under the Junior Level Assistance Program (5 years), Department of Science and Technology (DOST) June 1991 – March 1996

Award for Academic Excellence in Science, DOST-Science Education Institute (DOST-SEI) 1996

Mercury Drug Corporation Award for Academic Excellence in Science, High School, Maryhill Academy, Lucena City, Quezon, Mercury Drug Corporation 1991

Mercury Drug Corporation Award for Academic Excellence in Mathematics, High School, Maryhill Academy, Lucena City, Quezon, Mercury Drug Corporation 1991

## Researches

### Completed

A Study of the Environmental Performance on Hazardous Waste Management of the Semiconductor and Electronics Industries in Selected Industrial Estates in Luzon, Philippines

Determinants of Environmental Performance of Industrial Estates and Locators with Centralized Wastewater Treatment

Prospects of Carbon Capture and Storage in South East Asia

Computational investigation of microstructure-transport property of porous and cementitious materials

Synthesis of functionalized metal phthalocyanine -TiO<sub>2</sub> Nanoparticles as Photocatalytic Paint Additive for Degradation of Organic Air Pollutants

Carbon dioxide absorption using aqueous ammonia and chemical looping combustion of Philippine coal using Iron Oxide

National Capacities Assessment and Priority Setting for Management of New Persistent Organic Pollutants (POPS)

Development of a Calibrated Multiple-Objective Linear Programming Inoperability Input-Output Model (MOLP-IIM) for Disaster Risk Management in the Philippines

Research Program Workshop (RPW) on Developing Sustainable Solutions to Environmental Problems Associated with Coal-fired Power Plant in ASEAN region

### Papers Presented

- 2013 November 12-13 Promentilla, M.A.B. (2013 November 12-13). Producing geopolymer-based materials from a ternary blend of red mud, rice husk ash and diatomaceous earth, 20th Regional Symposium in Chemical Engineering (RSCE 2013), Bohol, Philippines.
- 2012 November 9-10 Promentilla, M.A.B. (2012 November 9-10). Application of image analysis to study civil engineering materials for engineering education and research, 1st International Conference on Civil Engineering Education (ICCEE 2012), DLSU-Manila, Philippines.
- 2012 November 7-8 Promentilla, M.A.B. (2012 November 7-8). A decision modeling approach to evaluate the climate change mitigation options in the Philippines, 9th Regional Symposium in Chemical Engineering (RSCE 2012). Bali, Indonesia.
- 2012 March 19-21 Promentilla, M.A.B. (2012 March 19-21). Computing Climate Change Vulnerability Index with AHP, 8th CBMS Philippines National Conference. SMX Convention Center MOA Complex, Pasay City, Philippines.
- 2012 February 21-24 Promentilla, M.A.B. (2012 February 21-24). Characterizing the Pore Structure-Transport Property of Porous Materials with X-ray Microtomography, 14th Asia-Pacific Confederation of Chemical Engineering Congress (APCCHE 2012), Suntec city, Singapore.
- 2012 February 21-24 Promentilla, M.A.B. (2012 February 21-24). A Methodology for Augmenting Sparse Pairwise Comparisons in the Analytic Hierarchy Process Using Partial Ranking of Alternatives, 14th Asia-Pacific Confederation of Chemical Engineering Congress (APCCHE 2012), Suntec city, Singapore.
- 2012 February 16-17 Promentilla, M.A.B. (2012 February 16-17). Three dimensional characterization of microstructure in cementbased materials, 73rd Philippine Institute of Chemical Engineers National Convention at Hotel Tavern (PICHE 2012), Surigao city.

- 2012 January 18-19 Promentilla, M.A.B. (2012 January 18-19). Application of ANP to complex environmental and energy related decision problems, 4th Regional Conference on Global Environment (RCGE 2012), Emerald Hotel, Bangkok, Thailand.
- 2012 January 16 Promentilla, M.A.B. (2012 January 16). Training workshop on Computing Climate Change Vulnerability Index with AHP, Community-Based Monitoring System Network Technical Workshop. Angelo King International Center, Manila, Philippines, De La Salle University.
- 2011 November 21-22 Promentilla, M.A.B. (2011 November 21-22). Application of X-ray microtomography to study microstructure of cement-based materials, SDCC/AIT-France Network Workshop. De La Salle University, Manila, Philippines.
- 2011 November 14-15 Promentilla, M.A.B. (2011 November 14-15). Analytic Hierarchy Process, Community-based Monitoring System Technical Workshop. Angelo King International Center, Manila, Philippines.
- 2011 September 7 Promentilla, M.A.B. (2011 September 7). 3D Image Analysis of Cracks in Cement-based Materials, PIChE-MMAC Research Forum 2011. Mapua-Makati, Philippines.
- 2011 July 22 Promentilla, M.A.B. (2011 July 22). Decision modeling with Analytic Hierarchy and Network Process (AHP/ANP) for multi-criteria analysis of environmental and energy-related issues, Lecture-Discussion Session for the Research Program Workshop (RPW) on "Developing Strategies to Manage Risks Resulting from Climate Change" De La Salle University, Manila, Philippines.
- 2011 June 15-18 Promentilla, M.A.B. (2011 June 15-18). 3D Crack Characterization from Microtomographic Images of Cement-based Materials, 31st Annual Meeting and Symposium of the Philippine- American Academy of Science and Engineering (PAASE), National Institute of Physics, UPD, Philippines.
- 2011 April 28 Promentilla, M.A.B. (2011 April 28). Microstructure Investigation of Cement-based Materials using X-ray Microtomography, Annual Conference and General Assembly of Microscopy Society of the Philippines, Inc. De La Salle University, Manila, Philippines.
- 2011 February 24 Promentilla, M.A.B. (2011 February 24). A decision modeling approach to prioritize remediation options for contaminated sites, DLSU Science and Technology Congress 2011. De La Salle University, Manila, Philippines.
- 2011 February 16-18 Promentilla, M.A.B. (2011 February 16-18). A consensus-seeking decision model for evaluation of remediation alternatives of contaminated sites, 72nd Philippine Institute of Chemical Engineers (PIChE) National Convention. L' Fisher Hotel, Bacolod City, Negros Occidental, Philippines.
- 2011 January 20-21 Promentilla, M.A.B. (2011 January 20-21). Microstructure characterization of Cement-based Materials using X-ray Microtomography, 3rd Regional Conference on Chemical Engineering. Edsa Shangri-la Hotel, Mandaluyong City, Metro Manila, Philippines.
- 2010 November 24 Promentilla, M.A.B. (2010 November 24). Microstructure investigation of cement-based materials using X-ray computed microtomography, 1st Philippine Material Science and Nanotechnology Conference. Yuchengco Seminar Room, De La Salle University, Manila.
- 2010 November 11-12 Promentilla, M.A.B. (2010 November 11-12). Three-dimensional Analysis of Cracks in Cement-based Materials Using X-ray Microtomography, 3rd ASEAN Civil and Environmental Engineering Conference. Edsa Shangri-la Hotel, Mandaluyong City, Metro Manila, Philippines.

- 2010 September 10 Promentilla, M.A.B. (2010 September 10). X-ray Microtomography as a Tool for Microstructure Investigation of Cementitious Materials, 5th Philippine Engineering Research and Development for Technology (ERDT) Conference. Sofitel Philippine Plaza Manila, Philippines.
- 2010 March 1-3 Promentilla, M.A.B. (2010 March 1-3). Application of Microfocus X-ray CT to Investigate the Frost-induced Damage Process in Cement-based Materials, GeoX2010: Advances in Computer Tomography for Geomaterials. New Orleans, LA, USA.
- 2009 November 29 - December 3 Promentilla, M.A.B. (2009 November 29 - December 3). Computation of Crack Tortuosity from Microtomographic Images of Cement-based Materials, The Twelfth International Conference on the Enhancement and Promotion of Computational Methods in Engineering and Science (EPMESC XII), Hong Kong and Macau.
- 2008 November 11-13 Promentilla, M.A.B. (2008 November 11-13). Three dimensional characterization of air void system in cement-based materials, The 3rd Asian Concrete Federation (ACF) International Conference, Ho Chi Minh, Vietnam.
- 2008 October 15 Promentilla, M.A.B. (2008 October 15). Application of synchrotron microtomography at SPring-8 for microstructure investigations of cementitious materials, Proceedings of Workshop for 50-year anniversary of Prof. Sun Wei in Teaching and Research. Nanjing, China.
- 2008 October 13-15 Promentilla, M.A.B. (2008 October 13-15). Three-dimensional imaging of cement-based materials with X-ray tomographic microscopy: visualization and quantification, The International Conference on Microstructure-related Durability of Cementitious Concrete, Nanjing, China.
- 2009 September 7-9 Promentilla, M.A.B. (2009 September 7-9). Pore space analysis and estimation of transport properties of deteriorated cementitious material using synchrotron microtomography, 2nd International RILEM workshop on Concrete Durability and Service Life Planning (ConcreteLife 2009). Haifa, Israel.
- 2008 June 16-18 Promentilla, M.A.B. (2008 June 16-18). Microstructure investigation of cement-based materials using X-ray computed microtomography, 18th ACBM/NIST Computer Modeling Workshop, NIST, Gaithersburg, MD, USA.
- 2007 December 20 Promentilla, M.A.B. (2007 December 20). Studies on pore structure characterization in hydrated cement system based on 3D micro-geometry technique, Proceedings of the JCI symposium on Durability Mechanics, Tokyo, Japan.
- 2007 September 19-21 Promentilla, M.A.B. (2007 September 19-21). Evaluation of tortuosity of cement-based materials with X-ray synchrotron radiation microtomography, The First International Conference on Recent Advances in Concrete Technology (RACT 2007). Washington DC, USA.
- 2007 August 27-29 Promentilla, M.A.B. (2007 August 27-29). Studies on 3D micro-geometry and diffusion tortuosity of cement-based materials using X-ray microtomography, The 32nd Conference on Our World in Concrete and Structures (OWICS, 2007), Singapore.
- 2006 March 9-10 Promentilla, M.A.B. (2006 March 9-10). Evaluation of Remedial Alternatives using a Prioritization Method based on a Hierarchical Network Model, Proceedings of 2nd International Engineering Research Conference, University of San Carlos, Cebu City, Philippines.
- 2005 October 3-7 Promentilla, M.A.B. (2005 October 3-7). A multi-criteria decision analytic process for evaluation of remedial countermeasures of contaminated site: a case study of uncontrolled landfill, The Tenth International Waste Management and Landfill

- Symposium (Sardinia 2005), Sardinia, Italy.
- 2005 April 3-6 Promentilla, M.A.B. (2005 April 3-6). An ANP-based decision analytic model for evaluation of remedial countermeasure strategies of contaminated sites, The 20th International Conference on Solid Waste Technology and Management, Philadelphia, PA, USA.
- 2005 March 20 Promentilla, M.A.B. (2005 March 20). A Multicriteria Evaluation Method for Contaminated Site Remedial Countermeasures, 4th Hokkaido Indonesian Student association Scientific Meeting, Sapporo, Japan.
- 2003 July 9-10 Promentilla, M.A.B. (2003 July 9-10). Removal of Basic Rhodamine B From Aqueous Solution Using Rice Straw as Adsorbent, Poster Paper (included in the Abstract of Papers) Presented in the 25th National Academy of Science and Technology (NAST) Annual Scientific Meeting, Manila Hotel, Philippines.
- 2003 July 9-10 Promentilla, M.A.B. (2003 July 9-10). Parametric Study on the Adsorption of Basic Rhodamine B on Sodium Hydroxide-Pretreated Corn Pith, Poster Paper (included in the Abstract of Papers) Presented in the 25th National Academy of Science and Technology (NAST) Annual Scientific Meeting, Manila Hotel, Philippines.
- 2002 July 10-11 Promentilla, M.A.B. (2002 July 10-11). Parametric and Kinetic Analysis of the Acid Hydrolysis of Copra Meal, Poster Paper Presented in the 24th NAST Annual Scientific Meeting, Manila Hotel, Philippines.
- 2001 December 5-7 Promentilla, M.A.B. (2001 December 5-7). An Evaluation of Landfill Disposal of Asbestos-containing Waste and Geothermal Residues within a Risk-Assessment Framework, Proceedings of the 10th Pacific Basin Conference on Hazardous Waste. Okayama, Japan.
- 2001 October 23-24 Promentilla, M.A.B. (2001 October 23-24). A Three-Tier Risk Assessment Study on Landfill Disposal of Geothermal Residues, 30th Annual Convention of Chemical Society of the Philippines-Southern Tagalog Chapter. SEARCA, UP Los Banos, College, Laguna, Philippines.
- 2001 July 11-12 Promentilla, M.A.B. (2001 July 11-12). Production of Activated Carbon from Pili (Canarium Ovatum Engl.) Nut Shell by Ammonium Chloride Activation, Poster Paper Presented in the 25th Anniversary of the National Academy of Science and Technology, Manila Hotel, Philippines.

## Publications

- 2016 Nguyen, T.H., Le, Q.D., Promentilla, M.A.B., Yu, K.D.S., & Aviso, K.B., A model for multi-criterion disaster vulnerability assessment of economic systems: implications for Vietnam's bioethanol policy. *Clean Technologies and Environmental Policy*, 2016:1-13.
- Bacudio, L.R., Benjamin, M.F.D., Eusebio, R.C.P., Holaysan, S.A.K., Promentilla, M.A.B., Yu, K.D.S., & Aviso, K.B., Analyzing barriers for implementing industrial symbiotic networks using DEMATEL. *Sustainable Production and Consumption*, 2016, 7:57-65.
- Yu, K.D.S., Aviso, K.B., Promentilla, M.A.B., Santos, J.R., & Tan, R.R., A weighted fuzzy linear programming model in economic input-output analysis: an application to risk management of energy system disruptions. *Environment Systems & Decisions*, 2016, 36(2):183-195.
- 2015 Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Solis, F.D.B., Yu, K.D.S., Santos, J.R., A Shock Absorption Index for Inoperability Input-Output Models. *Economic Systems Research*, 2015, 27(1).

- Tan, R.R., Aviso, K.B., Cayamanda, C.D., Chiu, A.S.F., Promentilla, M.A.B., Ubando, A.T., & Yu, K.D.S., A fuzzy linear programming enterprise input-output model for optimal crisis operations in industrial complexes. *International Journal of Production Economics*, 2015.
- Aviso, K.B., Chiu, A.S.F., Yu, K.D.S., Promentilla, M.A.B., Razon, L.F., Ubando, A.T., Sy, C.L., & Tan, R.R., P-graph for Optimising Industrial Symbiotic Networks. *Chemical Engineering Transactions*, 2015, 45:1345-1350.
- Tan, R.R., Aviso, K.B., Yu, K.D.S., Promentilla, M.A.B., & Santos, J.R., P-Graph Approach to Allocation of Inoperability in Urban Infrastructure Systems. *Chemical Engineering Transactions*, 2015, 45:1339-1344.
- Promentilla, M.A.B., Aviso, K.B., & Tan, R.R., A Fuzzy Analytic Hierarchy Process (FAHP) Approach for Optimal Selection of Low-carbon Energy Technologies. *Chemical Engineering Transactions*, 2015, 45:829-834.
- Aviso, K.B., Amalin, D., Promentilla, M.A.B., Santos, J.R., Yu, K.D.S., & Tan, R.R., Risk assessment of the economic impacts of climate change on the implementation of mandatory biodiesel blending programs: A fuzzy inoperability input-output modeling (IIM) approach. *Biomass and Bioenergy*, 2015, 83:436-447.
- 2014 Ubando, A.T., Cuello, J.L., Culaba, A.B., Promentilla, M.A.B., & Tan, R.R., Multi-criterion Evaluation of Cultivation Systems for Sustainable Algal Biofuel Production Using Analytic Hierarchy Process and Monte Carlo Simulation. *Energy Procedia*, 2014, 61:389-392.
- Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Yu, K.D.S., & Santos, J.R., Fuzzy Inoperability Input-output Analysis of Mandatory Biodiesel Blending Programs: The Philippine Case. *Energy Procedia*, 2014, 61:45-48.
- Tan, J., Nik Sulaiman, N.M., Tan, R.R., Aviso, K.B., & Promentilla, M.A.B., A Hybrid Life Cycle Optimization Model for Different Microalgae Cultivation Systems. *Energy Procedia*, 2014, 61:299-302.
- Aviso, K.B., Cayamanda, C., Solis, F.D., Promentilla, M.A.B., Yu, K.D.S., Santos, J.R., & Tan, R.R., P-graph Approach to Optimal Allocation of Electricity to Economic Sectors in Crisis Conditions. *Energy Procedia*, 2014, 61:675-678.
- Promentilla, M.A.B., Aviso, K.B., & Tan, R.R., A Group Fuzzy Analytic Network Process to Prioritize Low Carbon Energy Systems in the Philippines. *Energy Procedia*, 2014, 61:808-811.
- Aviso, K.B., Cayamanda, C.D., Solis, F.D.B., Danga, A.M.R., Promentilla, M.A.B., Yu, K.D.S., Santos, J.R., & Tan, R.R., P-graph approach for GDP-optimal allocation of resources, commodities and capital in economic systems under climate change-induced crisis conditions. *Journal of Cleaner Production*, 2014, 92.
- Yu, K.D.S., Tan, R.R., Aviso, K.B., Promentilla, M.A.B., & Santos, J.R., A Vulnerability Index for Post-Disaster Key Sector Prioritization. *Economic Systems Research*, 2014, 26(1).
- 2013 Promentilla, M.A.B., Tapia, J.F.D., Arcilla, C.A., Dugos, N.P., Gaspillo, P.D., Roces, S.A., & Tan, R.R., Short communication: Interdependent ranking of sources and sinks in CCS systems using the analytic network process. *Environmental Modelling and Software*, 2013, 50:21-24.
- Tan, R.R., Aviso, K.B., Huelgas, A.P., & Promentilla, M.A.B., Fuzzy AHP approach to selection problems in process engineering involving quantitative and qualitative aspects. *Process Safety and Environmental Protection*, 2013, 92(5).
- Darma, I.S., Sugiyama, T., & Promentilla, M.A.B., Application of X-Ray CT to Study Diffusivity in Cracked Concrete Through the Observation of Tracer Transport. *Journal of Advanced Concrete Technology*, 2013, 11(10):266-281.
- 2012 Tan, R.R., & Promentilla, M.A.B., A methodology for augmenting sparse pairwise comparison matrices in AHP: applications to energy systems. *Clean Technologies and Environmental Policy*, 2012, 15(4).



- Tan, R.R., & Promentilla, M.A.B., Conference Paper: A Methodology for Augmenting Sparse Pairwise Comparisons in the Analytic Hierarchy Process using Partial Ranking of Alternatives. 14th Asia Pacific Confederation of Chemical Engineering Congress, 2012.
- Promentilla, M.A.B., Conference Paper: Characterizing the Pore Structure-transport Property of Porous Materials with X-ray Microtomography. 14th Asia Pacific Confederation of Chemical Engineering Congress, 2012.
- 2010 Sugiyama, T., Promentilla, M.A.B., Hitomi, T., & Takeda, N., Application of synchrotron microtomography for pore structure characterization of deteriorated cementitious materials due to leaching. *Cement and Concrete Research*, 2010, 40(8):1265-1270.
- Promentilla, M.A.B., & Sugiyama, T., X-Ray Microtomography of Mortars Exposed to Freezing-Thawing Action. *Journal of Advanced Concrete Technology*, 2010, 8(2):97-111.
- Promentilla, M.A.B., & Sugiyama, T., Computation of Crack Tortuosity from Microtomographic Images of Cement-based Materials. *Proceedings of The 2nd International Symposium on Computational Mechanics and the 12th International Conference on the Enhancement and Promotion of Computational Methods in Engineering and Science. AIP Conference Proceedings*, 2010, 1233:1378-1383.
- 2009 Promentilla, M.A.B., Sugiyama, T., Hitomi, T., & Takeda, N., Quantification of tortuosity in hardened cement pastes using synchrotron-based X-ray computed microtomography. *Cement and Concrete Research*, 2009, 39(6).
- 2008 Promentilla, M.A.B., Furuichi, T., Ishii, K., & Tanikawa, N., A fuzzy analytic network process for multi-criteria evaluation of contaminated site remedial countermeasures. *Journal of Environmental Management*, 2008, 88(3):479-95.
- Promentilla, M.A.B., Sugiyama, T., Hitomi, T., & Takeda, N., Characterizing the 3D Pore Structure of Hardened Cement Paste with Synchrotron Microtomography. *Journal of Advanced Concrete Technology*, 2008, 6(2):273-286.
- 2006 Promentilla, M.A.B., Furuichi, T., Ishii, K., & Tanikawa, N., Evaluation of remedial countermeasures using the Analytic Network Process. *Waste Management*, 2006, 26(12):1410-21.
- Promentilla, M.A.B., Furuichi, T., Ishii, K., & Tanikawa, N., A Prioritization Method Using Hierarchical Network Model for Multi-Criteria Evaluation of Remedial Countermeasures. *Doboku Gakkai Ronbunshuu G*, 2006, 62(3):308-324.
- 2003 Promentilla, M.A.B., & Peralta, G.L., An evaluation of landfill disposal of asbestos-containing waste and geothermal residues within a risk-assessment framework. *Journal of Material Cycles and Waste Management*, 2003, 5(1):0013-0021.

**Name** Juan M. Pulhin

**Gender** Male

**Organizational Affiliations**

Professor and Dean, Department of Social Forestry and Forest Governance, University of the Philippines Los Baños College, Los Baños, Laguna

**Fields of Specialization**

Geographical Sciences

Community forestry

Forest management

Environment

Agroforestry

Forest policy

Forest conservation

Natural resource management

REDD+

**Papers Presented**

- 2012 Prabhakar, S., Pereira, J.J., Nambi, A.A., Tan, T.C., Trong, T.D., & Pulhin, J. (2012). Strengthening Capacity for Policy Research on Mainstreaming climate change adaptation, Networking Beyond Rio+20: Climate Adaptation Partnerships for Sustainable Development, Adaptation Futures: 2012 Int. Conf. on Climate Adaptation.
- 2008 Pulhin, J.M., Dizon, J.T., & Cruz, R.V.O. (2008). Tenure Reform and Its Impacts in the Philippine Forest Lands, 12th Biennial Conference of the International Association for the Study of Commons (IASC), University of Gloucestershire, Cheltenham, England, United Kingdom.

**Publications**

- 2015 Pulhin, J.M., & Tapia, M.A., Chapter: Vulnerability and Sustainable Development: Issues and Challenges from the Philippines' Agricultural and Water Sectors. Sustainable Development and Disaster Risk Reduction, Edited by Juha I. Uitto and Rajib Shaw, 2015:189-206.
- Larson, A.M., Cronkleton, P.J., & Pulhin, J.M., Formalizing Indigenous Commons: The Role of 'Authority' in the Formation of Territories in Nicaragua, Bolivia, and the Philippines. World Development, 2015:70.
- 2014 Prabhakar, S.V.R.K., Pereira, J., Pulhin, J., Srinivasa Rao, G., Scheyvens, H., & Cummins, J., Effectiveness of Insurance for Disaster Risk Reduction and Climate Change Adaptation: Challenges and Opportunities. Report number: IGES Research Report 2014-04, Institute for Global Environmental Strategies, Hayama, Japan, 2014.
- Prabhakar, S., Srinivasa Rao, G., Cummins, J., Pereira, J.J., & Pulhin, J.M., Scaling Up Risk Insurance In The Asia-Pacific Region: Issues And Way Forward. APN Science Bulletin, 2014(4):103-105.

- 2013 Hlaing, E.E.S, Inoue, M., & Pulhin, J.M., A Property-Rights Approach to Understanding Regulations and Practices in Community-Based Forest Management: Comparison of Three Systems in the Philippines. *Small-scale Forestry*, 2013, 12(4).  
 Sikor, T., Gritten, D., Atkinson, J., Huy, B., Dahal, G.R., Duangsathaporn, K., Hurahura, F., Phanvilay, K., Maryudi, A., Pulhin, J., Ramirez, M.A., Win, S., Toh, S., Vaz, J., Sokchea, T. Marona, S., & Yaqiao, Z., Community forestry in Asia and the Pacific: Pathway to inclusive development. RECOFTC - The Center for People and Forests, 2013.  
 Sugimoto, A., Pulhin, J.M., & Inoue, M., Is Recentralization Really Dominant? The Role of Frontline Foresters for Institutional Arrangement in the Philippines. *Small-scale Forestry*, 2013, 13(2):183-200.  
 Hasegawa, M., Pulhin, J.M., & Inoue, M., Facing the Challenge of Social Forestry in Japan: The Case of Reviving Harmonious Coexistence Between Forest and People in Okayama Prefecture. *Small-scale Forestry*, 2013, 12(2).
- 2012 Dressler, W., McDermott, M., Smith, W., & Pulhin, J., REDD Policy Impacts on Indigenous Property Rights Regimes on Palawan Island, the Philippines. *Human Ecology*, 2012, 40(5).  
 Neyra-Cabatac, N.M., Pulhin, J.M., & Cabanilla, D.B., Indigenous agroforestry in a changing context: The case of the Erumanen ne Menuvu in Southern Philippines. *Forest Policy Econ. Forest Policy and Economics*, 2012, 22:18-27.  
 Peñalba, L.M., Elazegui, D.D., Pulhin, J.M., & Cruz, R.V.O., Social and institutional dimensions of climate change adaptation. *International Journal of Climate Change Strategies and Management*, 2012, 4(3):308-322.  
 Larson, A.M., & Pulhin, J.M., Enhancing Forest Tenure Reforms Through More Responsive Regulations. *Conservation and Society*, 2012, 10(2):103-113.  
 Prabhakar, S., Pereira, J.J., Nambi, A.A., Tan, T.C., Trong, T.D., & Pulhin, J., Strengthening Capacity for Policy Research on Mainstreaming climate change adaptation. *Proceedings of Adaptation Futures: 2012 International Conference on Climate Adaptation*, Arizona, USA, 2012.  
 Cronkleton, P., Pulhin, J.M., & Saigal, S., Co-management in Community Forestry: How the Partial Devolution of Management Rights Creates Challenges for Forest Communities. *Conservation and Society*, 2012, 10(2):91-102.
- 2011 Palao, L.K.M., Dressler, W.H., Cruz, R.V.O., Pulhin, J.M., Bantayan, N.C., & Florece, L.M., Land Cover Change in Cabayugan, Puerto Princesa Subterranean River National Park, Palawan, Philippines. *Journal of Environmental Science and Management*, 2011, 13(2):1-13.  
 Palao, L.K.M., Dressler, W.H., Cruz, R.V.O., & Pulhin, J.M., Changes in indigenous land use system: From swidden to sedentary agriculture. *The Asian International Journal of Life Sciences*, 2011, 20(2):395-416.
- 2010 Shaw, R., Pulhin, J.M., & Pereira, J.J., Climate Change Adaptation and Disaster Risk Reduction: An Asian Perspective. *Community*, 2010, 5:1-18.  
 Shaw, R., Pulhin, J.M., & Pereira, J.J., Climate Change Adaptation and Disaster Risk Reduction: Issues and Challenges. *Community*, 2010, 4:1-19.  
 Pulhin, J.M., Shaw, R., & Pereira, J.J., Chapter 21: Climate change adaptation and disaster risk reduction: Key challenges and ways forward. *Community*, 2010, 5:451-476.  
 Pulhin, J.M., Lasco, R.D., Pulhin, F.B., Ramos, L., & Peras, R.J.J., Chapter 11: Climate change adaptation and community forest management. *Community*, 2010, 4:243-263.  
 Pulhin, J.M., Peras, R.J.J., & Tapia, M.A., Climate Change Adaptation in Water and Agricultural Sectors in the Philippines: Some Issues and Challenges. *Asian Journal of Environment and Disaster Management (AJEDM)*, 2010, 2(4):471.

- 2009 Dressler, W., & Pulhin, J., The Shifting Ground of Swidden Agriculture on Palawan Island, the Philippines. *Agriculture and Human Values*, 2009, 27(4):445-459.  
Pulhin, J.M., & Dressler, W.H., People, Power and Timber: The Politics of Community-Based Forest Management. *Journal of Environmental Management*, 2009, 91(1-91):206-214.
- 2008 Balooni, K., Pulhin, J.M., & Inoue, M., The effectiveness of decentralisation reforms in the Philippines forestry sector. *Geoforum*, 2008, 39(6-39):2122-2131.
- 2007 Pulhin, J.M., Inoue, M., & Enters, T., Three Decades of Community-Based Forest Management in the Philippines: Emerging Lessons for Sustainable and Equitable Forest Management. *International Forestry Review*, 2007, 9(4):865-883.  
Adger, W.N., Agrawala, S., Mirza, M.M.Q., Conde, C., O'Brien, K., Pulhin, J., Pulwarty, R., Smit, B., & Takahashi, K., Assessment of Adaptation Practices, Options, Constraints and Capacity. *Climate Change 2007: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanso, 2007.
- 2006 Pulhin, J.M., Peras, R.J.J., Cruz, R.V.O., Lasco, R.D., Pulhin, F.B., & Tapia, M.A., Vulnerability of communities to climate variability and extremes: the Pantabangan-Carranglan watershed in the Philippines. *AIACC Working Papers, Assessment of Impacts and Adaptations to Climate Change*, 2006, 44.  
Lasco, R.D., Cruz, R.V.O., Pulhin, J.M., & Pulhin, F.B., Tradeoff analysis of adaptation strategies for natural resources, water resources, and local institutions in the Philippines. *AIACC Working Papers, Assessment of Impacts and Adaptations to Climate Change*, 2006, 32.  
Chokkalingam, U., Carandang, A.P., Pulhin, J.M., Lasco, R.D., Peras, R.J.J., & Toma, T., One century of forest rehabilitation in the Philippines: Approaches, outcomes and lessons. *Review of Forest Rehabilitation Initiatives: Lessons from the Past*. Center for International Forestry Research (CIFOR), Bogor, Indonesia, 2006.  
Lasco, R.D., & Pulhin, J.M., Environmental impacts of community-based forest management in the Philippines. *International Journal of Environment and Sustainable Development*, 2006, 5(1):46-56.
- 2005 Barber, C.V., Persson, R., Gonzalez, P., Hassan, R., McCallum, I., Nilsson, S., Pulhin, J., Rosenburg, B., & Sastry, C., Chapter 21: Forest and Woodland Systems. *Ecosystems and Human Wellbeing: Current State and Trends*, Eds. R. Hassan, R. Scholes, N. Ash, 2005:585-621.  
Lasco, R.D., Pulhin, F.B., Cruz, R.V.O., Pulhin, J.M., & Roy, S.S.N., Carbon Budgets Of Terrestrial Ecosystems in the Pantabangan-Carranglan Watershed. *AIACC Working Papers, Assessment of Impacts and Adaptations of Climate Change (AIACC)*, 2005, 10.  
Pulhin, J.M., & Ramirez, M.A.M., Behind the Fragile Enterprise: Community-based Timber Utilization in Southern Philippines. *ITTO, Forest Trends, RECOFTC, RRI*, 2005.  
Cruz, R.V.O., & Tapia, M.A., A Review of the Multi-Sectoral Forest Protection Committees in the Philippines. *Overseas Development Institute (ODI) Forestry Briefing*, 2005(6).
- 2004 Thomalla, F., Cruz, R.V., Espaldon, V.O., Hilario, F., Klein, R.J.T., Lansigan, F., Lasco, R., Magcale-Macandog, D.B., Mallion, F.K., Zoleta-Nantes, D.B., Perez, R.T., Pulhin, F., Pulhin, J., & Ranola, R., Jr., A Comparative Analysis of Vulnerabilities, Responses and Adaptation Strategies to Tropical Cyclones in Asia: Defining the Philippines Country Study. *Proceedings of the Coastal Zone Asia Pacific Conference (CZAP)*, Brisbane, Queensland, Australia, 2004:647-653.  
Pulhin, J.M., Consensus with Local Communities: Experiences and Challenges in

Philippine Forestry Relevant to CDM Implementation. Kyoto Mechanism and the Conservation of Tropical Forest Ecosystem, Eds. T. Okuda, Y. Matsumoto, 2004.

2001

Lasco, R.D., Visco, R.G., & Pulhin, J.M., Secondary forests in the Philippines: Formation and transformation in the 20th century. *Journal of Tropical Forest Science*, 2001, 13(4):652-670.

Guiang, E.S., Borlagdan, S.B., & Pulhin, J.M., Community-Based Forest Management in the Philippines: A Preliminary Assessment. A publication of the Institute of Philippine Culture (IPC), Ateneo de Manila University, in collaboration with the College of Forestry and Natural Resources, University of the Philippines Los Baños, 2001.

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Doctor of Science (Mathematical and Systems Engineering), Shizuoka University, Graduate School of Science and Technology, Shizuoka University, Hamamatsu City, Shizuoka, Japan (ongoing until March 2016)

Social Entrepreneurship, Online and Distance Learning (10 CATS credits), University of Oxford, Department of Continuing Education, University of Oxford, United Kingdom 2015

Professional Certificate in Online Education (Instruction), Focus on Teaching using hybrid/blended learning, University of Wisconsin-Madison, Division of Continuing Studies, University of Wisconsin-Madison, USA 2014

Master of Science in Applied Mathematics, University of the Philippines, Institute of Mathematics, College of Science, University of the Philippines, Diliman, Quezon City, Philippines 2012

Bachelor of Science in Applied Mathematics (Operations Research), University of the Philippines, Mathematics Division, Institute of Mathematical Sciences and Physics, College of Arts and Sciences, University of the Philippines Los Baños, Laguna, Philippines 2006

**Fields of Specialization**

Applied Mathematics

Systems Biology

Mathematical Modeling

Theoretical Science and Mathematical Philosophy

Evolutionary Biology

Ecology

**Employment**

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Assistant Professor 5, Institute of Mathematical Sciences and Physics, University of the Philippines Los Baños

UPLB Bee Program Research Staff, University of the Philippines Los Baños, 2009-present

Instructor, Institute of Mathematical Sciences and Physics, University of the Philippines Los Baños

Professional Service, Climate Unit, Crop and Environmental Sciences Division, International Rice Research Institute (IRRI), 2008

Corporate Planning Assistant, The Insular Life Assurance Company, Ltd., 2006-2008  
Student Trainee, Climate Unit, International Rice Research Institute (IRRI), 2005 (Summer)

### **Association Membership**

Member, University of Wisconsin-Madison Alumni Association (WAA)  
Member, Mathematical Society of the Philippines (MSP) CALABARZON Chapter  
Member, Royal Economic Society  
Member, Society for Industrial and Applied Mathematics (SIAM)  
Member, Institute of Electrical and Electronics Engineers (IEEE)  
Member, Society for Mathematical Biology (SMB)  
Member, Beekeepers' Network Philippines (BEENET)  
Member, Philippine Society for the Study of Nature (PSSN)  
Member, International Association of Engineers (IAENG)  
Lifetime Open Member, International Society for Philosophers  
Member, (former Junior Executive and former Treasurer), Society of Applied Mathematics of UPLB (SAM-UP)  
Member, The Navigators  
Member, CFC Singles for Christ

### **Honors / Awards**

Jury's Choice Poster award, Hands-on Research in Complex Systems School, Trieste, Italy 2014  
Scholarship: MONBUKAGAKUSHO: MEXT, Japanese Government 2013  
2012 UPLB Outstanding Mathematics Instructor, University of the Philippines Los Baños 2012  
Best Research Paper, Philippine Society for the Study of Nature 2011  
DOST Scholarship, PCIEERD/PCASTRD, Department of Science and Technology 2009  
President Gloria Macapagal-Arroyo Leadership Award, Philippine Government 2001

### **Papers Presented**

2015 Rabajante, J.F. (2015). Mathematical modeling of host-parasite coevolution: Red Queen and Court Jester, Advanced Researches of the Present and Past Doctor Course Students in Shizuoka University, Shizuoka University.  
2014 Rabajante, J.F., Talaue, C.O., & Aguda, B.D. (2014). Mathematical analysis of a multistable switch model of cell differentiation, International Congress of Mathematicians.  
2014 Rabajante, J.F., Babierra, A.L., & Talaue, C.O. (2014). Branching and Oscillations in Cell-Fate Determination, 2014 Hands-on Research in Complex Systems School, ICTP, Trieste, Italy.  
2013 Rabajante, J.F., & Gavina, M.K.A. (2013). Probabilistic and Fuzzy Model for

- Determining the Best Location of Beehives to Minimize Intercolony Resource Competition, 2013 Mathematical Society of the Philippines (MSP) Annual Convention. Puerto Princesa, Palawan.
- 2013 Rabajante, J.F., Talabis, D.A.S.J., & Manay, E.J.V. (2013). Population Dynamics of the Philippines: A Quantitative Study, 2013 Mathematical Society of the Philippines (MSP) Annual Convention. Puerto Princesa, Palawan.
- 2013 Rabajante, J.F., Walican, J.P.J., Leyeza, M.B.E.L., Fajardo, A.C., Jr., Jose, E.C. (2013). Spatial Distribution Over a Modified Hexagonal Cellular Automaton, 2013 Mathematical Society of the Philippines (MSP) Annual Convention. Puerto Princesa, Palawan.
- 2012 Rabajante, J.F. (2012). Bézier Curves: Integrating Math, Arts and Technology, 2012 Annual Convention of the Mathematics Teachers Association of the Philippines (MTAP) - Tertiary Level, University of the Philippines Visayas, Iloilo City Campus.
- 2012 Rabajante, J.F., Talaue, C.O., & Aguda, B.D. (2012). The Flow of the Cinquin-Demongeot Model of Cellular Differentiation, 2012 Mathematical Society of the Philippines Annual Convention. De La Salle Lipa, Lipa, Batangas.
- 2012 Rabajante, J.F., Fajardo, A.C., & Cervancia, C.R. (2012). Mathematical strategies for determining the best location of beehives to minimize resource competition, 11th Asian Apicultural Association Conference, ApiExpo and Workshop. Kuala Terengganu, Malaysia.
- 2012 Rabajante, J.F. (2012). Exogenous stimulus can induce transdifferentiation and can assure unipotency towards the desired cell lineage, 5th UPLB-CAS Student-Faculty Research Conference. UP Los Baños.
- 2012 Rabajante, J.F., Talabis, D.A.S.J., & Manay, E.J.V. (2012). A Numerical Study on the effect of imposing an n-child policy: The Philippine Case, 5th UPLB-CAS Student-Faculty Research Conference. UPLB.
- 2011 Rabajante, J.F., Soriano, M.A.P., & Otsuka, Y.T. (2011). Parameter variability and state stochasticity in information evolution modeling, Mathematical Society of the Philippines CALABARZON First Annual Regional Convention. De La Salle Lipa, Lipa City.
- 2011 Rabajante, J.F., Otsuka, Y.T., & Umali, R.E.D.C. (2011). Mathematical Models of Rumor Propagation for Disaster Management, 11th Philippine Society for the Study of Nature National Annual Scientific Convention. UP Open University and UPLB, Philippines.
- 2011 Rabajante, J.F. (2011). Pollen Shape Analysis using Bézier Curves, 17th BEENET Conference and Techno-fora. Development Academy of the Philippines, Tagaytay City, Cavite.
- 2011 Rabajante, J.F., & Otsuka, Y.T. (2011). An ODE Approach to Decision Making Involving Pairwise Comparison of Choices, 4th UPLB-CAS Student-Faculty Conference. UPLB.
- 2011 Bosaing, A.A.D., Rabajante, J.F., & De Lara, M.L.D. (2011). Assignment Problems with Weighted and Nonweighted Neighborhood Constraints in  $3^6$ ,  $4^4$  and  $6^3$  Tilings, International Conference in Mathematics and Applications. University of Economics and Law, Ho Chi Minh City, Vietnam.
- 2010 Rabajante, J.F., Saldua, M.L., Jacildo, A.J., Mariano, V.Y., Paterno, M.C.S., & Fajardo, A.C., Jr. (2010). Counting Stingless Bees, *Trigona biroi*, Using Image



- Analysis, 10th Philippine Computing Science Congress. Davao City, Philippines.
- 2010 Rabajante, J.F., Villadelrey, M.C., & Esteves, E.J. (2010). Optimal migration strategy of species foraging on patchily distributed food sources, Mathematical Society of the Philippines Annual Convention. Cebu City, Philippines.
- 2010 Rabajante, J.F., & Nazareno, A.L. (2010). Strategy Analysis for the Control of Epidemics, 16th Annual BEENET Conference and Technofora. University of Southern Philippines, Davao City.
- 2010 Rabajante, J.F., & Cortez, M.J.V. (2010). Modeling the Dynamics of Disease Contagion, 16th Annual BEENET Conference and Technofora. University of Southern Philippines, Davao City.
- 2010 Rabajante, J.F., & De Lara, M.L.D. (2010). Population assignments in grids with neighborhood constraint, 2010 International Industrial Engineering Conference: Research, Applications and Best Practices. Cebu Parklane International Hotel, Cebu City.
- 2010 Rabajante, J.F., Esteves, R.J.P., Reyes, S.M., & Villadelrey, M.C. (2010). Event study on the effect of severe weather conditions in Manila on the Philippine Stock Price Index (PSEI) from January 1998 to September 2010, 10th Annual National Convention of the Philippine Society for the Study of Nature. University of the Philippines Baguio.
- 2010 Castilan, M.G.D., Naanod, G.R.K., Otsuka, Y.T., & Rabajante, J.F. (2010). From Numbers to Nature, 10th Annual National Convention of the Philippine Society for the Study of Nature. University of the Philippines Baguio.
- 2010 Rabajante, J.F., & Otsuka, Y.T. (2010). A model of information propagation in social networks, 8th National Conference on Information Technology Education (NCITE), Boracay, Aklan.
- 2010 Rabajante, J.F. (2010). Strategic management of corporate grapevine, 4th National Conference of the Operations Research Society of the Philippines. Eastwood Richmond Hotel, Quezon City.
- 2010 Rabajante, J.F., Jacildo, A.J., Saldua, M.L., Manalastas, J.C., Mariano, V.Y., Paterno, M.C.S., & Fajardo, A.C. (2010). Automated Counting and Tracking of Stingless Bees, *Trigona biroi*, Friese, Using Image Processing and Video Analysis, 10th Asian Apicultural Association Conference and Api Expo. Busan, South Korea.
- 2010 Rabajante, J.F., Figueroa, R.B., Jr., Jacildo, A.C., Ciar, R.R., Bonto, L.S., Bayer, M.P., Cervancia, C.R. (2010). Simulation of Bee Foraging Behavior Using Biroi Preference Algorithm and Assimilation of Data form Wet Lab Experiments, 10th Asian Apicultural Association Conference and Api Expo. Busan, South Korea.
- 2009 Figueroa, R.B., Jacildo, A.J., Rabajante, J.F. (2009). Simulation of Bee Foraging Behavior using Biroi Preference Algorithm, 15th Beekeepers' Network Philippines (BEENET) Conference and Techno-fora, Hotel Agripino, Salagdoong, Maria, Siquijor, Philippines.
- 2009 Rabajante, J.F. (2009). An Analogy of Chaotic System and Organizational Sociogram, International Conference of Management Education and Practice (ICMEP).
- 2009 Rabajante, J.F., Fajardo, A.C., Jr. (2009). On training *Trigona biroi*: Behavioral complexity and apparent patterns, 15th BEENET Conference and Techno-fora. Hotel Agripino, Salagdoong, Maria, Siquijor, Philippines.

- 2009 Rabajante, J.F. (2009). Prediction of a math class' exam performance using the Passing Rate Simulator, MATHTED 2009: An International Conference in Mathematics Education (The 7th Biennial Conference of the Philippine Council of Mathematics Teacher Educators (MATHTED), Inc.). Palawan State University, Puerto Princesa City, Palawan, Philippines.
- 2009 Rabajante, J.F., Figueroa, R.B., Jr., Jacildo, A.J. (2009). Modeling the area restrict searching strategy of stingless bees, *Trigona biroi*, as a quasi-random walk process, 9th Annual National Convention, Philippine Society for the Study of Nature. MSU-IIT Iligan City, Mindanao, Philippines.
- 2009 Rabajante, J.F., Villadelrey, M.C., & Esteves, R.J. (2009). Determining the optimal distribution of bee colony locations to avoid overpopulation using mixed integer programming, 9th Annual National Convention, Philippine Society for the Study of Nature. MSU-IIT Iligan City, Mindanao, Philippines.
- 2009 Rabajante, J.F. (2009). Analysis of foraging behavior of *Trigona biroi* Friese: Distance, Directionality and Height, 9th Annual National Convention, Philippine Society for the Study of Nature. MSU-IIT Iligan City, Mindanao, Philippines.
- 2009 Rabajante, J.F., Herrera, M.U., & Elumbre, A.L. (2009). Fractals in the 2006 Philippines Family Annual Income Distribution Data, 2nd UPLB-CAS Student-Faculty Research Conference. University of the Philippines Los Baños, Philippines.
- 2009 Rabajante, J.F., Herrera, M.U., Forio, H.R.E., & Gocatek, C.Z. (2009). Fractals in Age-Sex Population Distribution of the Philippines using Post-Second World War Census Data, 2nd UPLB-CAS Student-Faculty Research Conference. University of the Philippines Los Baños, Philippines.
- 2008 Rabajante, J.F. (2008). Optimal Deployment of Community Police Force, 1st UPLB-CAS Student-Faculty Research Conference, University of the Philippines Los Baños, Philippines.

## Publications

- 2015 Tubay, J.M., Suzuki, K., Uehara, T., Kakishima, S., Ito, H., Ishida, A., Yoshida, K., Mori, S., Rabajante, J.F., Morita, S., Yokozawa, M., & Yoshimura, J., Microhabitat locality allows multi-species coexistence in terrestrial plant communities. *Scientific Reports*, 2015, 5.
- Rabajante, J.F., Babierra, A.L., Tubay, J.M., & Jose, E.C., Mathematical modeling of cell-fate specification: From simple to complex epigenetics. *Stem Cell Epigenetics*, 2015, 2:e752.
- Rabajante, J.F., & Gavina, M.K.A., Producing oscillatory decisions. *Neuroscience Communications*, 2015, 2:e859.
- Rabajante, J.F., & Talaue, C.O., Equilibrium switching and mathematical properties of nonlinear interaction networks with concurrent antagonism and self-stimulation. *Chaos, Solitons & Fractals. Nonlinear Science, and Nonequilibrium and Complex Phenomena*, 2015, 73:166-182.
- Rabajante, J.F., Tubay, J.M., Uehara, T., Morita, S., Ebert, D., & Yoshimura, J., Red Queen dynamics in multi-host and multi-parasite interaction system. *Scientific Reports*, 2015, 5:10004.
- Rabajante, J.F., & Babierra, A.L., Branching and oscillations in the epigenetic landscape of cell-fate determination. *Progress in Biophysics and Molecular Biology*, 2015, 117(2-3):240-249.
- Walican, J.P.J., Leyeza, M.B.E.L., Jose, E.C., Rabajante, J.F., & Fajardo, A.C., Jr., *Varroa destructor*: Spatial Distribution Over A Modified Cellular Automaton.

- Proceedings of the 11th Taiwan-Philippines Symposium on Analysis, 2015.
- 2014 Gavina, M.K.A., Rabajante, J.F., & Cervancia, C.R., Mathematical Programming Models for Determining the Optimal Location of Beehives. *Bulletin of Mathematical Biology*, 2014, 76(5):997-1016.
- 2013 Talabis, D.A.S.J., Manay, E.J.V., Babierra, A.L., Flores, J.J.M., & Rabajante, J.F., A Numerical Model of Philippine Population Growth: Child Policy, Quantitative Insights and Challenges. *IAMURE International Journal of Social Sciences*, 2013, 8:45-71.
- 2012 Rabajante, J.F., Investigating the Propagation and Death of Information in Human Subpopulation Networks. *International Journal of Applied Mathematical Research*, 2012, 1(4):433-451.
- Bosaing, A.A.D., Rabajante, J.F., & De Lara, M.L.D., Assignment Problems with Weighted and Nonweighted Neighborhood Constraints in  $3^6$ ,  $4^4$  and  $6^3$  Tilings. *Southeast Asian Journal of Sciences*, 2012, 1(1):55-77.
- 2011 Castilan, M.G.D., Naanod, G.R.K., Otsuka, Y.T., & Rabajante, J.F., From Numbers to Nature. *Journal of Nature Studies*, 2011, 9(2)/10(1):35-39.
- Rabajante, J.F., & Umali, R.E.D.C., A Mathematical Model of Rumor Propagation for Disaster Management. *Journal of Nature Studies*, 2011, 10(2):61-70.
- Tambaoan, R.S., Rabajante, J.F., Esteves, R.J.P., & Villadelrey, M.C., Prediction of Migration Path of a Colony of Bounded-Rational Species Foraging on Patchily Distributed Resources. *Advanced Studies in Biology*, 2011, 3(7):333-345.
- 2010 Rabajante, J.F., & Otsuka, Y., A Model of Information Propagation in Social Networks. *Proceedings of the 8th National Conference on Information Technology Education (NCITE 2010)*, Boracay, Aklan, Philippines, 2010.
- Figuroa, R.B., Jr., Jacildo, A.J., & Rabajante, J.F., Simulating the foraging behavior of *Trigona biroi* using Multi-Agent Systems. *Proceedings of the 10th Philippine Computing Science Congress*, 2010.
- Esteves, R.J.P., Villadelrey, M.C., & Rabajante, J.F., Determining the optimal distribution of bee colony locations to avoid overpopulation using mixed integer programming. *Journal of Nature Studies*, 2010, 9(1):79-82.
- Figuroa, R.B., Jr., Jacildo, A.J., & Rabajante, J.F., Simulating the foraging behavior of *Trigona biroi* using Multi-Agent Systems. *Proceedings of the 10th Philippine Computing Science Congress*, Davao City, Philippines, 2010.
- 2009 Rabajante, J.F., Figuroa, R.B., Jr., & Jacildo, A.J., Modeling the area restrict searching strategy of stingless bees, *Trigona biroi*, as a quasi-random walk process. *Journal of Nature Studies*, 2009, 8(2):15-21.
- Nazareno, A.L., & Rabajante, J.F., When the customer writes his own story: A segmentation scheme for the life insurance market. *Proceedings of the 4th International Conference of the Asian Academy of Applied Business (AAAB) 2009*, Asian Institute of Management Conference Center, Manila, 2009.

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**Organizational Affiliations**

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**Fields of Specialization**

Biological Science

Restoration ecology

Mangrove ecology and management

Integrated Coastal Zone Management

**Publications**

- 2012 Shinmura, Y., Wee, A.K.S., Takayama, K., Meenakshisundaram, S.H., Asakawa, T., Onrizal, Adjie, B., Ardli, E.R., Sungkaew, S., Malekal, N.B., Tung, N.X., Salmo III, S.G., Yllano, O.B., Saleh, M.N., Soe, K.K., Oguri, E., Murakami, N., Watano, Y., Baba, S., Webb, E.L., & Kajita, T., Isolation and characterization of 14 microsatellite markers for *Rhizophora mucronata* (Rhizophoraceae) and their potential use in range-wide population studies. *Conservation and Genetics Resources*, 2012, 4(4):951-954.
- Shinmura, Y., Wee, A.K.S., Takayama, K., Asakawa, T., Yllano, O.B., Salmo III, S.G., Ardli, E.R., Tung, N.X., Malekal, N.B., Onrizal, Meenakshisundaram, S.H., Sungkaew, S., Saleh, M.N., Adjie, B., Shoe, K.K., Oguri, E., Murakami, N., Watano, Y., Baba, S., Webb, E.K., & Kajita, T., Development and characterization of 15 polymorphic microsatellite loci in *Sonneratia alba* (Lythraceae) using next-generation sequencing. *Conservation and Genetics Resources*, 2012, 4(3):811-814.
- 2010 Salmo III, S.G., & Duke, N.C., Establishing mollusks colonization and assemblage patterns in planted mangrove stands of different ages in Lingayen Gulf, Philippines. *Wetlands Ecology and Management*, 2010, 18(6):745-754.
- Polidoro, B.A., Carpenter, K.E., Collins, L., Duke, N.C., Ellison, A.M., Ellison, J.C., Farnsworth, E.J., Fernando, E.S., Kathiresan, K., Koedam, N.E., Livingstone, S.R., Miyagi, T., Moore, G.E., Nam, V.N., Ong, J.E., Primavera, J.H., Salmo III, S.G., Sanciangco, J.C., Sukardo, S., Wang, Y., & Yong, J.W.H., The Loss of Species: Mangrove Extinction Risk and Geographic Areas of Global Concern. *PLoS ONE*, 2010, 5(4):e10095.
- 2007 Salmo III, S.G., Torio, D.D., & Esteban, J.M.A., Evaluation of rehabilitation strategies and management schemes for the improvement of mangrove management programs in Lingayen Gulf. *Science Diliman*, 2007, 19(1):24-34.
- 2002 Salmo III, S.G., Carranza, R., Juinio-Meñez, M.A.R., & Estepa, N.G., Mangrove reforestation program in Bolinao, Pangasinan: Partnerships Among Local and Government Institutions. *VSO Philippines*, 2002.
- 2001 Salmo III, S.G., & Juinio-Meñez, M.A.R., Community-based mangrove reforestation: coastal resources management tools. *Marine Science Institute. University of the Philippines Diliman*, 2001:44p.

- 2000 McManus, L.T., Yambao, A.C., Salmo III, S.G., & Aliño, P.M., Bolinao, northern Philippines: participatory planning for coastal development. *Cultivating Peace: Collaboration in Natural Resources Management*. ed. Buckles, D., International Development Research Center, Canada, 2000:151-162.
- Junio-Meñez, M.A.R., Salmo III, S.G., Tamayo, E., Estepa, N.G., Bangi, H.G.P., & Aliño, P.M., Bugsay, environmental education manual for coastal communities. *Community-Based Coastal Resources Management Program*, Marine Science Institute, University of the Philippines Diliman, 2000.
- 1999 Salmo III, S.G., Junio-Meñez, M.A.R., & Aliño, P.M., Milkfish (Chanos chanos) fry concession system in Bolinao, Pangasinan: implications to coastal resources management. *Science Diliman*, 1999, 12(2):59-66.
- Salmo III, S.G., Turion, R.A., Junio-Meñez, M.A.R., & Aliño, P.M., Establishment and implementation of the Balingasay Marine Protected Area: a community-based approach. *Science Diliman*, 1999, 12(2):121-128.
- 1998 Salmo III, S.G., Yambao, A.C., & Aliño, P.M., A preliminary assessment of coastal development planning in the municipal waters of Bolinao, Pangasinan, Philippines. *Out of the Shell - Coastal Resources Research Network Newsletter*, Halifax, Nova Scotia, Canada, 1998, 6(2).

**Name** Fitz Gerald Salazar Silao

**Gender** Male

**Organizational Affiliations**

Process Technologist (currently on Sabbatical leave), Nestlé Philippines, Inc.

**Education**

Doctor of Philosophy in Molecular Biosciences (On-going), Stockholm University, Universitetsvägen 10, 114 18 Stockholm, Sweden (On-going)

Master of Science in Microbiology, University of Perpetual Help System Laguna, Calamba, Laguna March 2011

Bachelor of Science in Biochemistry, University of the Philippines - Manila, Padre Faura, Ermita, Manila April 2006

**Fields of Specialization**

Molecular Biosciences

Biochemistry

Microbiology

Chemistry

**Employment**

Instructor (part-time), Malayan Colleges Laguna, June 2010-October 2010

Process Technologist, Assistant Manager, Nestlé Philippines, Inc., January 2009-present

Product Development Specialist, Supervisor II, Nestlé Philippines, Inc., May 2008-January 2009

Professorial Lecturer (part-time), Manila Review Institute, Inc., May 2007-May 2010

Corporate Management Trainee-Technical, Supervisor II, Nestlé Philippines, Inc., November 2006-May 2008

Instructor (part-time), Manila Doctors College, Pasay City, June 2006-October 2006

Peer Tutor (Volunteer), University of the Philippines-Manila, Learning Resource Centre, June 2005-March 2006

Assistant Coach, Philippine Chemistry Olympiad (Ad hoc), Pasay City South High School, May 2005-March 2006

Co-adviser, Investigatory Project (Ad hoc), Pasay City South High School, June 2004-March 2007

**Association Membership**

Member, Philippine Society for Microbiology (PSM)

Member, Philippine Association of Food Technologists (PAFT), Inc.

Member, Philippine Society of Biochemistry and Molecular Biology (PSBMB)

Member, American Society for Microbiology (ASM)

Regular Member, Integrated Chemists of the Philippines (ICP)  
Member, Philippine Association of Chemistry Students (PACS)  
Member, University of the Philippines Biochemistry Society (UP-BCS)  
Member, University of the Philippines Forensic Society (UP-FS)  
Member, Nestlé ASEAN Thermal/Aseptic Process Network  
Member, Nestlé Global RTD Community

### **Honors / Awards**

Marie Curie-Initial Training Network (MC-ITN ImResFun) Early Stage Researcher, Marie Curie-Initial Training Network April 2014 - Present  
1st Nestlé Philippines CEO ILAW Awards Grand Champion (As Project Lead), Nestlé Philippines, Inc. October 2013  
Meritissimus (Final Oral Exam), University of Perpetual Help System Laguna April 2011  
Outstanding Thesis, University of Perpetual Help System Laguna April 2011  
Best Thesis, University of the Philippines Manila April 2006  
R.A. 7687 Scholar (4 years), Department of Science and Technology (DOST) 2002 - 2006  
Scholar (4 years), Air Materials and Savings Wing and Loans Association 2002 - 2006

### **Trainings**

ASEAN Thermal Process Network Workshop, Nestlé Indonesia 2013  
Cleaning-in-Place (CIP) Management Workshop, Nestlé Philippines, Inc. 2012  
ASEAN Thermal Process Network Workshop, Nestle Vietnam 2012  
Ready-to-Drink Technology, Nestlé Product Technology Centre, USA 2010  
3rd ASEAN Aseptic Workshop, Global City, the Fort, Taguig, Philippines 2009  
Foundations of HACCP and Food Safety, Nestlé Philippines, Inc., Cabuyao 2009  
Nestlé Nutrition Foundation, Nestlé Philippines, Inc. Makati 2009

### **Researches**

#### **Completed**

Project lead - developed and implemented a modified batching process that increased the nominal rate (20,000L/Hr) of a batching line facility. This initiative was selected as the Grand Champion during the 1st company-wide CEO Innovation

Technical lead - product commissioning and/or aseptic validation of processing lines in Nestlé Philippines' liquid dairy plant in Cabuyao, Laguna \* Batching line (~20,000 Li/Hr) \* A3 compact flex aseptic filler \* Aseptic tank 3 (30,000 Li)

Technical lead - product commissioning and aseptic/thermal validation of two co-manufacturing facilities for Nestlé Chuckie

Co-managed the development, industrialization and launching of the following Nestlé Ready-to-Drink (RTD)/Cream products: Chuckie, Bear Brand Sterilized with Ginseng or Ginkgo Biloba, MILO RTD, Nestlé Cream, Nestlé D'Lite (Soya-based cream)

Optimized process and manufacturing conditions for all products run in Nestlé Philippines liquid dairy plant ranging from reconstituted milk, chocolate milk drink, acidified milks and creams

Co-initiated the process mastery program in Production Department of liquid dairy plant resulting to significant improvement in product shelf-life stability and mitigation of quality-related defects

### Papers Presented

- 2015 Silao, F.G., Spohn, R., Wiesmueller, K.H., & Ljungdahl, P.O. (2015). NanoLuc™ Reporter Assay System for High-Throughput Screening of Small Molecule Modulators of SPS-Sensing Pathway in *Candida albicans*, HFP2013: Fifth Advanced Lecture Course on Human Fungal Pathogens – La Colle-sur-Loup, France.

### Publications

- 2014 Chen, Y.L., Yu, S.J., Huang, H.Y., Chang, Y.L., Lehman, V.N., Silao, F.G.S., Bigol, U.G., Bungay, A.C., Averette, A., & Heitman, J., Calcineurin controls hyphal growth, virulence, and drug tolerance of *Candida tropicalis*. *Eukaryotic Cell. American Society for Microbiology*, 2014, 13(7):844-854.
- 2012 Zhang, J., Silao, F.G.S., Bigol, U.G., Bungay, A.C., Nicolas, M.G., Heitman, J., & Chen, Y.L., Calcineurin is required for pseudohyphal growth, virulence, and drug resistance in *Candida lusitanae*. *PLoS ONE*, 2012, 7(8).
- Chen, Y.L., Konieczka, J.H., Springer, D.J., Bowen, S.E., Zhang, J., Silao, F.G., Bungay, A.A., Bigol, U.G., Nicolas, M.G., Abraham, S.N., Thompson, D.A., Regev, A., & Heitman, J., Convergent Evolution of Calcineurin Pathway Roles in Thermotolerance and Virulence in *Candida glabrata*. *G3 (Bethesda)*, 2012, 2(6):675-691.
- 2011 Chen, Y.L., Brand, A., Morrison, E.L., Silao, F.G., Bigol, U.G., Malbas, F.F. Jr., Nett, J.E., Andes, D.R., Solis, N.V., Filler, S.G., Averette, A., & Heitman, J., Calcineurin Controls Drug Tolerance, Hyphal Growth, and Virulence in *Candida dubliniensis*. *Eukaryotic Cell. American Society for Microbiology*, 2011, 10:803-819.
- 2006 Silao, F.G., Destura, R.V., Lirazan, M.B., Sevilleja, J.E., & Guerrant, R.L., Molecular Diagnosis of *Cryptosporidium parvum* and *Cryptosporidium hominis* Infection in Filipino Children by Nested PCR-RFLP Analysis of the 18S rRNA Gene. Proceedings of the 44th Annual Meeting of Infectious Disease Society of America (IDSA) Metro Toronto Convention Centre, Toronto, Canada, 2006.



**Name** Krista Danielle S. Yu

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**Organizational Affiliations**

Associate Professor, School of Economics, De La Salle University, 2401 Taft Ave., Manila

**Education**

Doctor of Philosophy in Economics, De La Salle University, 2401 Taft Avenue, Manila

**Fields of Specialization**

Input-output modelling

Computable general equilibrium analysis

Disaster risk analysis

Economics

Natural disasters

Disaster recovery

Applied economics

**Employment**

Associate Professor, De La Salle University - School of Economics, Taft Avenue, Manila

Visiting Researcher, George Washington University-Department of Engineering Management & Systems Engineering, Washington

**Publications**

2016

Nguyen, T.H., Le, Q.D., Promentilla, M.A.B., Yu, K.D.S., & Aviso, K.B., A model for multi-criterion disaster vulnerability assessment of economic systems: implications for Vietnam's bioethanol policy. *Clean Technologies and Environmental Policy*, 2016:1-13.

Bacudio, L.R., Benjamin, M.F.D., Eusebio, R.C.P., Holaysan, S.A.K., Promentilla, M.A.B., Yu, K.D.S., & Aviso, K.B., Analyzing barriers for implementing industrial symbiotic networks using DEMATEL. *Sustainable Production and Consumption*, 2016, 7:57-65.

Yu, K.D.S., Aviso, K.B., Promentilla, M.A.B., Santos, J.R., & Tan, R.R., A weighted fuzzy linear programming model in economic input-output analysis: an application to risk management of energy system disruptions. *Environment Systems & Decisions*, 2016, 36(2):183-195.

2015

Aviso, K.B., Amalin, D., Promentilla, M.A.B., Santos, J.R., Yu, K.D.S., & Tan, R.R., Risk assessment of the economic impacts of climate change on the implementation of mandatory biodiesel blending programs: A fuzzy inoperability input-output modeling (IIM) approach. *Biomass and Bioenergy*, 2015, 83:436-447.

Tan, R.R., Aviso, K.B., Cayamanda, C.D., Chiu, A.S.F., Promentilla, M.A.B., Ubando, A.T., & Yu, K.D.S., A Fuzzy Linear Programming Enterprise Input-Output Model for Optimal Crisis Operations in Industrial Complexes. *International Journal of Production Economics*, 2015.

Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Solis, F.D.B., Yu, K.D.S., & Santos, J.R., A Shock Absorption Index For Inoperability Input-Output Models. *Economic Systems*

- Research, 2015, 27(1).
- Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Yu, K.D.S., & Santos, J.R., Development of a fuzzy linear programming model for allocation of inoperability in economic sectors due to loss of natural resource inputs. *DLSU Business & Economics Review*, 2015, 24(2):1-12.
- Aviso, K.B., Chiu, A.S.F., Yu, K.D.S., Promentilla, M.A.B., Razon, L.F., Ubando, A.T., Sy, C.L., & Tan, R.R., P-graph for Optimising Industrial Symbiotic Networks. *Chemical Engineering Transactions*, 2015, 45:1345-1350.
- Tan, R.R., Aviso, K.B., Yu, K.D.S., Promentilla, M.A.B., & Santos, J.R., P-Graph Approach to Allocation of Inoperability in Urban Infrastructure Systems. *Chemical Engineering Transactions*, 2015, 45:1339-1344.
- Aviso, K.B., Amalin, D., Promentilla, M.A.B., Santos, J.R., Yu, K.D.S., & Tan, R.R., Risk assessment of the economic impacts of climate change on the implementation of mandatory biodiesel blending programs: A fuzzy inoperability input-output modeling (IIM) approach. *Biomass and Bioenergy*, 2015, 83:436-447.
- 2014 Aviso, K.B., Cayamanda, C., Solis, F.D., Promentilla, M.A.B., Yu, K.D.S., Santos, J.R., & Tan, R.R., P-graph Approach to Optimal Allocation of Electricity to Economic Sectors in Crisis Conditions. *Energy Procedia*, 2014, 61:675-678.
- Tan, R.R., Aviso, K.B., Promentilla, M.A.B., Yu, K.D.S., & Santos, J.R., Fuzzy Inoperability Input-output Analysis of Mandatory Biodiesel Blending Programs: The Philippine Case. *Energy Procedia*, 2014, 61:45-48.
- Aviso, K.B., Cayamanda, C.D., Solis, F.D.B., Danga, A.M.R., Promentilla, M.A.B., Yu, K.D.S., Santos, J.R., & Tan, R.R., P-graph approach for GDP-optimal allocation of resources, commodities and capital in economic systems under climate change-induced crisis conditions. *Journal of Cleaner Production*, 2014:92.
- Santos, J.R., Pagsuyoin, S.T., Herrera, L.C., Tan, R.R., & Yu, K.D.S., Analysis of drought risk management strategies using dynamic inoperability input–output modeling and event tree analysis. *Environmental Systems Decision*, 2014, 34(4):492-506.
- Santos, J.R., Herrera, L.C., Yu, K.D.S., Pagsuyoin, S.A.T., & Tan, R.R., State of the Art in Risk Analysis of Workforce Criticality Influencing Disaster Preparedness for Interdependent Systems. *Risk Analysis*, 2014, 34(6).
- Yu, K.D.S., Tan, R.R., Aviso, K.B., Promentilla, M.A.B., & Santos, J.R., A Vulnerability Index for Post-Disaster Key Sector Prioritization. *Economic Systems Research*, 2014, 26(1).
- Santos, J.R., Yu, K.D.S., Pagsuyoin, S.A.T., & Tan, R.R., Time-Varying Disaster Recovery Model for Interdependent Economic Systems Using Hybrid Input-Output and Event Tree Analysis. *Economic Systems Research*, 2014, 26(1).
- Rivera, J.P.R., Padama, E.L., Go, R.F., Yu, K.D.S., Solis, F.D.B., & Sayoc, R.A., An approximation of the internal rate of return of investment in selected undergraduate degree programs. *DLSU Business & Economics Review*, 2014, 23(2):88-114.
- 2013 Yu, K.D.S., Tan, R.R., & Santos, J.R., Impact estimation of flooding in Manila: An inoperability input-output approach. *Proceedings of the Systems and Information Engineering Design Symposium (SIEDS), IEEE*, 2013.

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