



Department of Environmental Science
Faculty of Science, Chulalongkorn University



RESEARCH HIGHLIGHTS 2024



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Department of Environmental Science

Faculty of Science, Chulalongkorn University

254 Payathai Road, Wang Mai, Pathumwan, Bangkok 10330 Thailand

Tel: +66 2 218 5181-2

Email: EnviSciCU@gmail.com

www.envisci.sc.chula.ac.th

<https://www.facebook.com/chulatox>

PREFACE

The Department of Environmental Science was established in 1966, originally named the General Science Department. For many years, our undergraduate program has provided strong interdisciplinary education, integrating double majors in science. This approach has enabled students to develop independent judgment and creative thought, essential for navigating modern society and the environment.

Recently, we expanded our undergraduate offerings to include two branches for the B.Sc. degree in Environmental Science: 1) Environmental Science and Technology, and 2) Environmental and Natural Resource Management. We launched M.Sc. and Ph.D. programs in Industrial Toxicology and Risk Assessment, now in their eighth year, combining coursework and research to integrate knowledge of safety, environment, and health.

Our annual publication, Research Highlights, showcases faculty research, academic promotions, and new publications. This book includes comprehensive details and the latest publications, accessible online via international scientific databases and our department website at www.envisci.sc.chula.ac.th. It shows the spectrum of research conducted by our faculty and serves as a valuable resource for those interested in our faculty's research.

Last year, we celebrated our 60th anniversary. As we look to the future in 2024, our vision is to lead in addressing global environmental challenges through innovative research, interdisciplinary collaboration, and sustainable solutions. We are committed to advancing knowledge and educating the next generation of environmental scientists to create a more sustainable and resilient world.

Associate Professor Pasicha Chaikaew, Ph.D.
Head of the Department of Environmental Science

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PROFESSOR

WANIDA JINSART



Professor

☎ +66-1-837-5127

✉ Jwanida2013@gmail.com

Ph.D. La Trobe University 1993

M.Sc. Chulalongkorn University 1986

B.Sc. Kasetsart University 1981

Areas of Research Interest

Air Pollution, Environmental Health, Environmental Epidemiology and Industrial toxicology

Professional Experiences

Chulalongkorn University staff since 1982

Scientist, 1982-1994

Lecturer, 1994-1996

Assistant Professor, 1996-2001

Associate Professor, 2001-2012

Professor, 2012- present

Head department, 2002-2005 and 2018-2020

President of Thai Society of Higher Education Institutes on the Environment, 2017-2021

Chair Industrial toxicology impact assessment Post Graduate Program, 2018-2020

Editor in chief, Environment Asia (Scopus Journal), 2017-2021

Research Emphasis

My research focuses on Air pollution and health effect, for more detailed research outcomes, see selected publications. Currently, my work is in the application of air modeling and climate change including the weather and the impact modeling.

Measure of Esteem

Professor award, Chulalongkorn University, 2017

Selected Publications

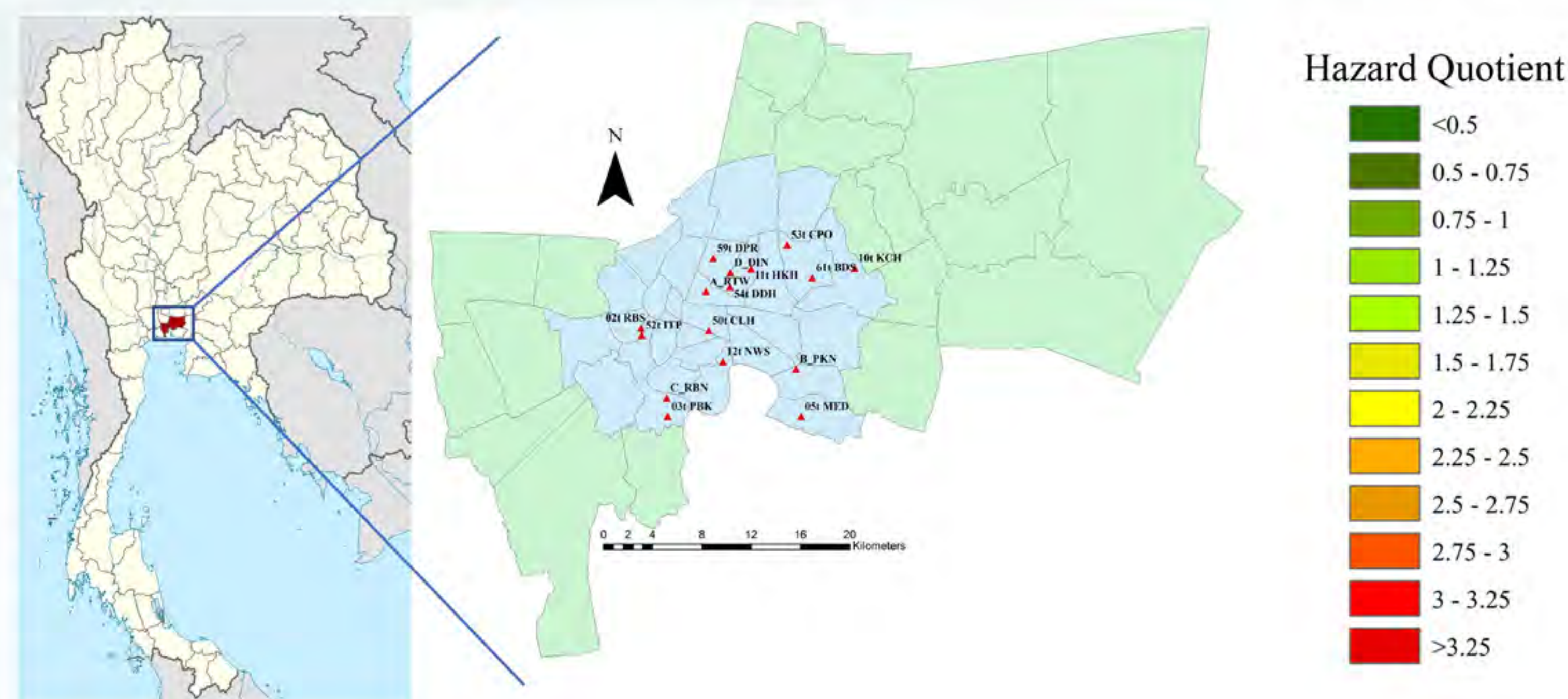
1. Dutta, A., Jinsart, W., Das, U. C., & Dutta, G. (2023). An empirical analysis of Delhi's air quality throughout different COVID-19 pandemic waves. *Journal of Applied and Natural Science*, 15(1), 325-339.

Selected Publications (Cont.)

2. Dutta, Abhishek, and Wanida Jinsart. "Air pollution in Delhi, India: It's status and association with respiratory diseases." *Plos one* 17.9 (2022): e0274444.
3. Kenyota, Prayad, and Wanida Jinsart. "Health Risk Assessment of Workers Exposed to Particulate Matter and Heavy Metal in Industrial Waste Treatment." *EnvironmentAsia* 15 (2022).
4. Dutta, Abhishek, and Wanida Jinsart. "Air quality, atmospheric variables and spread of COVID-19 in Delhi (India): an analysis." *Aerosol and Air Quality Research* 21.3 (2021): 200417.
5. Dutta, Abhishek, and Wanida Jinsart. "Air Pollution in Indian Cities and Comparison of MLR, ANN and CART Models for Predicting PM10 Concentrations in Guwahati, India." *Asian Journal of Atmospheric Environment (AJAE)* 15.1 (2021).
6. Dutta, Abhishek, and Wanida Jinsart. "Assessing short-term effects of ambient air pollution on respiratory diseases in Guwahati, India with the application of the generalized additive model." *Human and Ecological Risk Assessment: An International Journal* 27.7 (2021): 1786-1807.
7. Dutta, Abhishek, and Wanida Jinsart. "Gaseous and particulate matter emissions from road transport: the case of Kolkata, India." *Environmental and Climate Technologies* 25.1 (2021): 717-735.
8. Dutta, Abhishek, and Wanida Jinsart. "Risks to health from ambient particulate matter (PM_{2.5}) to the residents of Guwahati city, India: An analysis of prediction model." *Human and Ecological Risk Assessment: An International Journal* 27.4 (2021): 1094-1111.
9. Sukjit, N., Thepanondh, S., Kwonpongsagoon, S., Jinsart, W., Punya, L., & Hanma, P. (2021). Source contribution of 1, 3 butadiene in the vicinity of petrochemical industrial area. *Applied Environmental Research*, 43(4), 29-38.
10. Dutta, Abhishek, and Wanida Jinsart. "Application and comparison of MLR, ANN and CART models for predicting PM10 concentration level of Guwahati city (India)." (2020).
11. Punvitayakul, Nareerat, and Wanida Jinsart. "Health Risk Assessment of Passive Air Sampler-derived Polychlorinated biphenyl and Polycyclic Aromatic Hydrocarbons in Bangkok and Chiang Mai, Thailand." *2020 International Conference and Utility Exhibition on Energy, Environment and Climate Change (ICUE)*. IEEE, 2020.

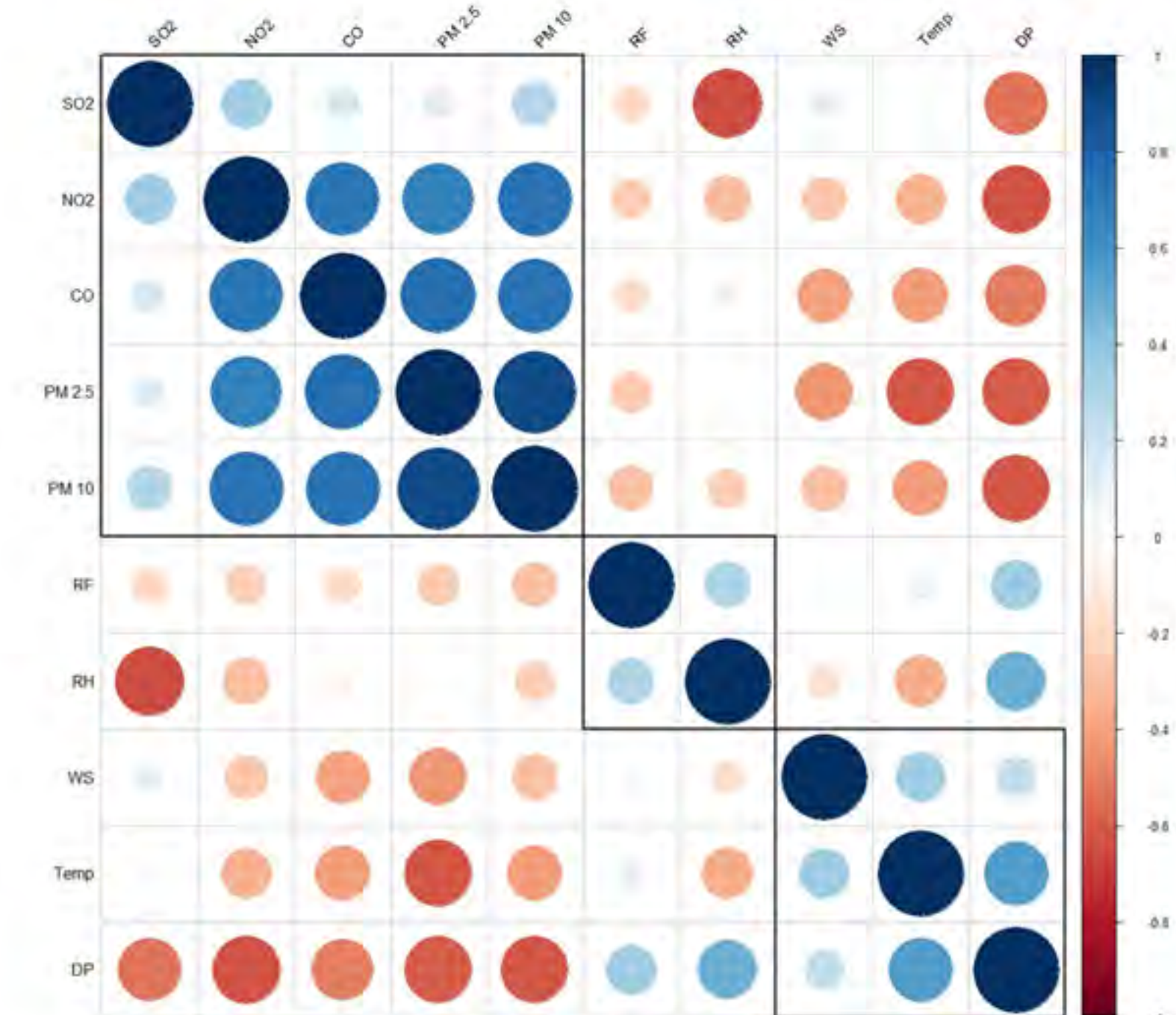
Selected Publications (Cont.)

12. Dutta A and Jinsart W. 2020 "Waste generation and management status in the fast-expanding Indian cities: A review" JAWMA, 70(5), 491-503
13. Thongthammachart, Tin, and Wanida Jinsart. "Estimating PM_{2.5} concentrations with statistical distribution techniques for health risk assessment in Bangkok." (2020).
14. Thongthammachart, Tin, and Wanida Jinsart. (2019). "Estimating PM_{2.5} concentrations with statistical distribution techniques for health risk assessment in Bangkok." *Human and Ecological Risk Assessment: An International Journal*.
15. Thammasaroj, Paphinwit, and Wanida Jinsart. (2019) "Effects of Overcrowded Traffic and Road Construction Activities in Bangkok on PM 2.5, PM 10 and Heavy Metal Composition." *EnvironmentAsia*, 12.
16. Suwannapun, P. Suksang, K., and Jinsart, W. "Decreasing of PM₁₀ and PM_{2.5} and PAHs Exposures and Health Risk in Urban Parks of Bangkok" Proceedings of the 5th EnvironmentAsia International Conference. 13-15 June 2019



GIS-based maps of the HQs of PM_{2.5} in the CBD of Bangkok.

From Thongthammachart, T., & Jinsart, W. (2019).



Pearson correlation matrix, 2016–2018, Delhi generated using R program.

*ASSOCIATE
PROFESSOR*

NAIYANAN ARIYAKANON



Associate Professor

☎ +66 2 218 5190

✉ Naiyanan.A@chula.ac.th

Ph.D. The University of Tokyo 2000

M.Sc. Chulalongkorn University 1995

B.Sc. (2nd Honor) Chulalongkorn University 1993

Areas of Research Interest

Phytoremediation, Remediation technology and Soil pollution

Professional Experiences

Associate Professor, Chulalongkorn University, 2017 – present

Assistant Professor, Chulalongkorn University, 2006 – 2016

Lecturer, Chulalongkorn University, 1995 – 2006

Research Emphasis

My research focuses on the removal/transformation of the pollutants in soil, water, and air into less toxic forms using local plants. The research also involved human health risk assessment and ecological risk assessment. The current research is related to the application of wetlands for sustainable wastewater treatment and carbon storage in peat soil.

Measure of Esteem

Best Paper Award from International Journal of Science and Innovative Technology, 2021.

Outstanding Advisor Award from the Faculty of Science, Chulalongkorn University, 2014.

Selected Publications

1. Ariyakanon, N. (2023). Application of local species for sustainable phytoremediation. *Environment and Natural Resources Journal (EnNRJ)*, 21(5), 381-389.
2. Kliangklaio, P., & Ariyakanon, N. (2022). Human Health Risk Assessment of Heavy Metal Accumulation in Aquatic Plants Grown in the Tha Chin River. *EnvironmentAsia*, 15(2).



Selected Publications (Cont.)

3. Ariyakanon, N. (2021). Correlation of water quality and heavy metal concentration in Chao Phraya River Basin: An effect on human health. *International Journal of Science and Innovative Technology*, 4(2), 18-24.
4. Wattanapanich, C., Durongpongton, N., & Ariyakanon, N. (2020). Performance of Water Hyacinth (*Eichhornia crassipes*) in the Treatment of Residential and Surimi wastewater. *EnvironmentAsia*, 12(2).
5. Ariyakanon, N. Water hyacinth for wastewater treatment. (2018) *Environmental Journal*. 22(3): 49-55.
6. Ariyakanon, N., & Vikrompanitkul, C. (2018). Application of agricultural waste biochar for canteen wastewater treatment in Chulalongkorn University.



Figure 1. Natural Wetland in Thailand



Figure 2. Sunflower is a hyperaccumulator plant for removing heavy metals from soil.

NUTA SUPAKATA



Associate Professor

☎ +66 2 218 5187

✉ Nuta.S@chula.ac.th

Ph.D. Kasetsart University 2011

M.S. Colorado School of Mines 1999

B.Ed. Chulalongkorn University 1995

Areas of Research Interest

Waste utilization and Environmental communication and education

Professional Experiences

Associate Professor, Chulalongkorn University, 2017-present

Assistant Professor, Chulalongkorn University, 2014-2017

Lecturer, Chulalongkorn University, 2000-2014

Research Emphasis

With an increase of waste worldwide, to be one part to tackle this waste problem and to sustain our communities and environment, my research focuses on two major approaches: waste utilization and environmental communication and education. In waste utilization, my current research on this area focuses on alternative waste recycling based on bio-circular-green economy model. This involves the circulation of solid waste to agricultural and construction resources/materials. In environmental communication and education, my current research focuses on the use of motivational tools and practices to enhance waste separation and reduction in the communities.

Measure of Esteem

Honorary Award in Academic Teaching from Faculty of Science, Chulalongkorn University, 2014

Outstanding Young Lecturer Award from Chulalongkorn University, 2014

Selected Publications

1. Oludoye, O.O., Supakata, N. (2024). Breaking the plastic habit: Drivers of single-use plastic reduction among Thai university students. PLoS ONE 19(5): e0299877.
2. Oludoye O.O., Supakata, N., Srithongouthai, S., Kanokkantapong, V., Broucke, S., Ogunyebi, L., Lubell, M. (2024). Pro-environmental behavior regarding single-use plastics reduction in urban-rural communities of Thailand: Implication for public policy. Scientific Reports 14: 4713.

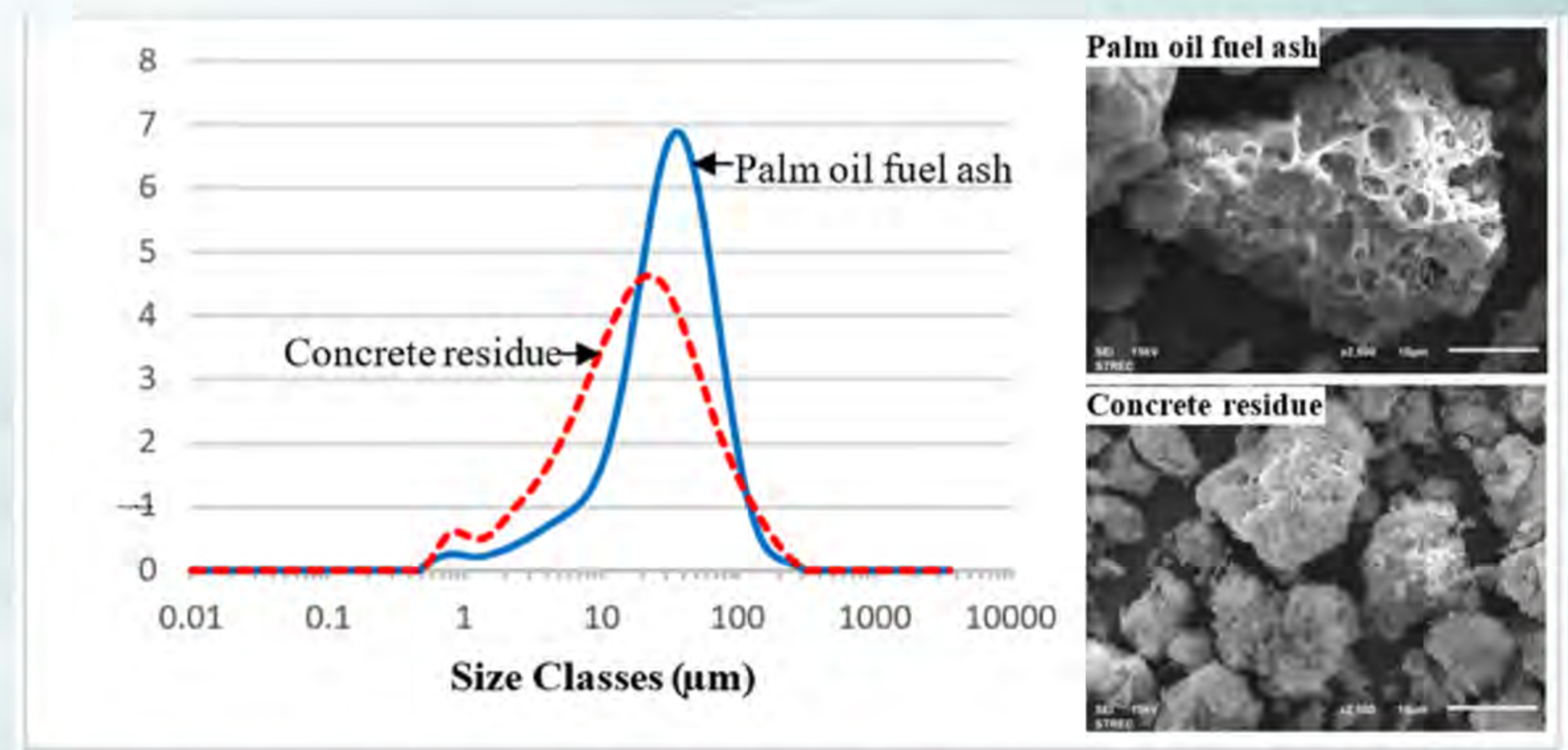


Selected Publications (Cont.)

3. Kumpueng, P., Phutthimethakul, L. & Supakata, N. (2024). Production of Cement mortars from glass powder and municipal incinerated bottom ash. *Scientific Reports* 14: 1569.
4. Srinok, K., Supakata, N., & Papong, S. (2024). Assessment of greenhouse gas emissions from waste management in the shopping center: A case study of the Central Plaza Rattanathibet, Thailand. *Journal of Advanced Development in Engineering and Science* 13(38).
5. Oludoye, O.O., Broucke, S., Chen, X., Supakata, N., Ogunyebi, A., Njoku, K. (2023). Identifying the determinants of face mask disposal behavior and policy implications: An application of the extended Theory of Planned Behavior. *Resources, Conservation & Recycling Advances* 18: 200148.
6. Kwanyun, P., Praditwattana, N., Phutthimethakul, L., Chart-asa, C.; Intaravicha, N., Supakata, N. (2023). Characteristics of Soil Amendment Material from Food Waste Disposed of in Bioplastic Bags. *Fermentation* 9:
7. Sukma, P., Srinok, K., Papong, S., Supakata, N. (2022). Chula model for sustainable municipal solid waste management in university canteens. *Heliyon* 8:e10975.
8. Phutthimethakul, L. and Supakata, N. (2022). Partial Replacement of Municipal Incinerated Bottom Ash and PET Pellets as Fine Aggregate in Cement Mortars. *Polymers* 14: 2597.
9. Klomklang, U., Kulsirilak, N., Intaravicha, N., and Supakata, N. (2021). Vermicompost from Chula Zero Waste Cup and Rain Tree (Samanea Saman) Leaves. *Engineering Journal* (25): 1-10.
10. Chalerm Sakulkit, W., and Supakata, N. (2021). Effect of Using Flue-Gas Desulfurization Gypsum and Water Treatment Sludge on Compressive Strength of Cement Mortar. *Key Engineering Materials* 897: 143-149.
11. Phutthimethakul, L., Kumpueng, P., Supakata, N. (2020). Use of Flue Gas Desulfurization Gypsum, Construction and Demolition Waste, and Oil Palm Waste Trunks to Produce Concrete Bricks. *Crystals* 10:709.
12. Apithanyasai, S., Supakata, N., and Papong, S. (2020). The potential of industrial waste: using foundry sand with fly ash and electric arc furnace slag for geopolymer brick production. *Heliyon* 6: e03697.
13. Dontriros, S., Nooaek, P., and Supakata, N. (2020). Geopolymer Bricks from Concrete Residue and Palm Oil Fuel Ash: Evaluating Physical-mechanical Properties, Life Cycle Assessment and Economic Feasibility. *EnvironmentAsia* 13 (1): 150-162.



Used shot blast



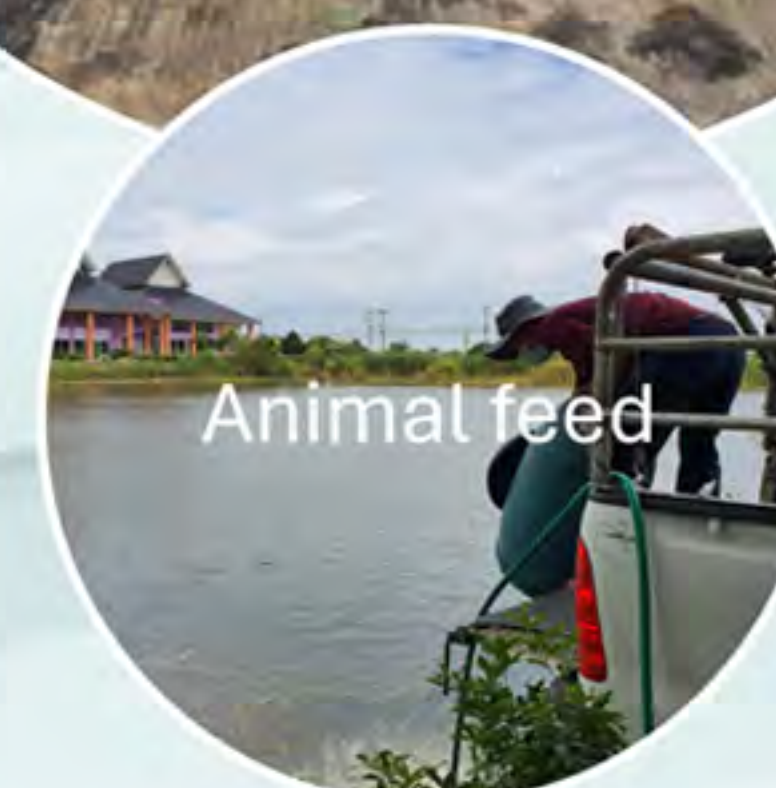
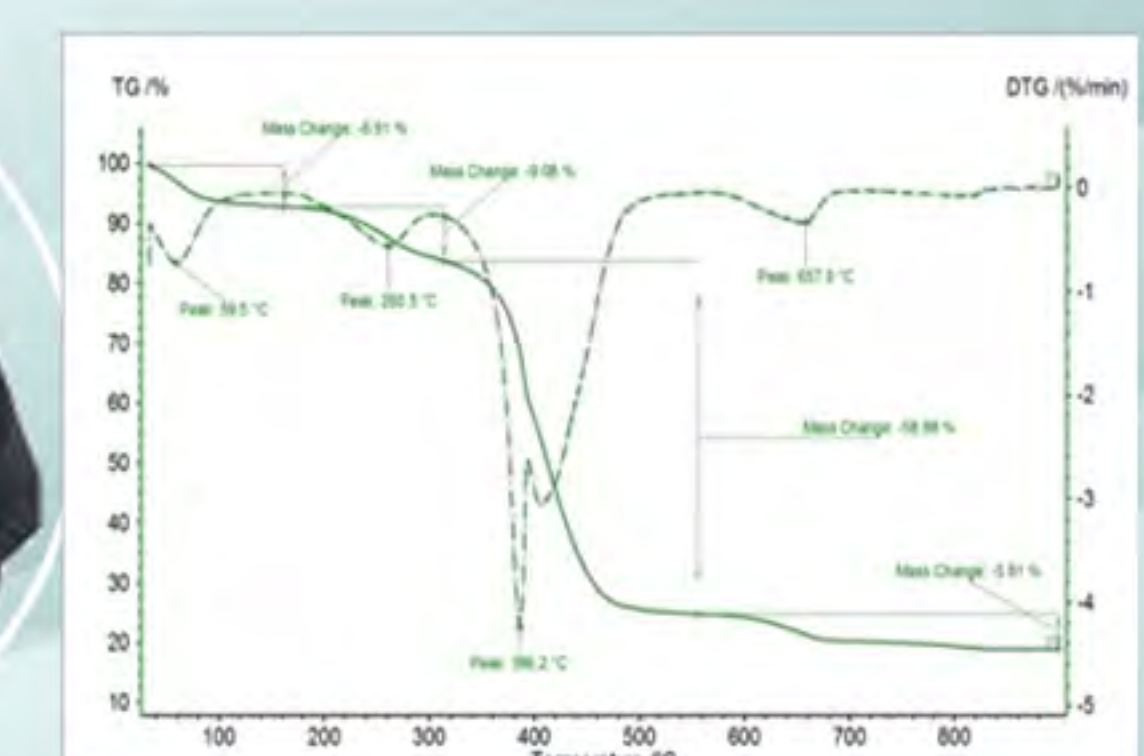
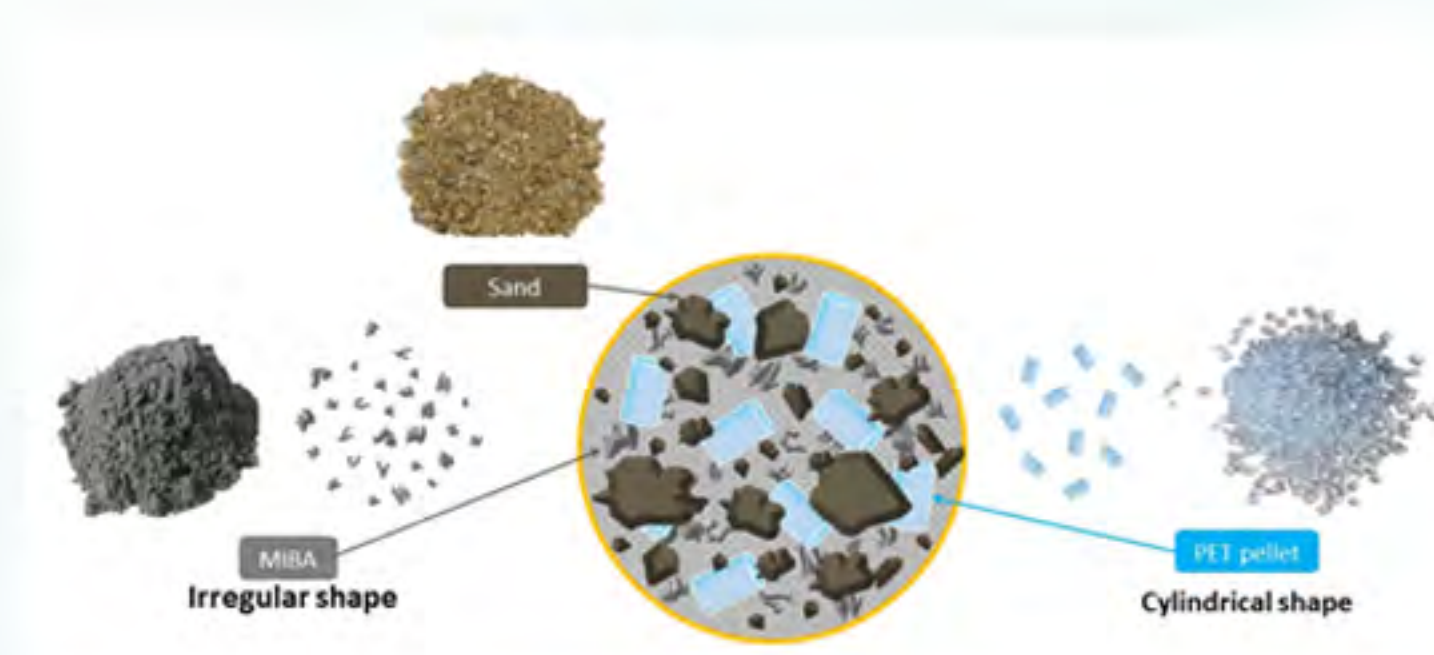
The use of community waste for briquette production

Selected Publications (Cont.)

14. Chaisuwan, N., Kansai, N., Supakata, N., and Papong, S. (2020). The Comparison of Environmental Impacts of Carbonized Briquettes from Rain Tree Residues and Coffee Grounds/Tea Waste and Traditional Waste Management. International Journal of Environmental Science and Development 11 (1): 48-53.



Environmental
communication and education



ROONGKAN NUISIN



Associate Professor

☎ +66 2 218 5199

✉ Roongkan.N@chula.ac.th

Ph.D. Chulalongkorn University 2003

M.Sc. Chulalongkorn University 1999

B.Sc. Chiang Mai University 1996

Areas of Research Interest

Polymeric substrate for environmental applications, Biopolymers in environment and Polymer synthesis

Professional Experiences

Associate Professor, Chulalongkorn University, 2019-present

Assistant Professor, Chulalongkorn University, 2010-2019

Lecturer, Chulalongkorn University, 2004-2010

Research Emphasis

My research interests focused on manufacture of bio-based polymers and their application in environmental applications, such as hydrogel for soil amendment media, absorbent for wastewater treatment, and bio-active molecules immobilization carriers.

Measure of Esteem

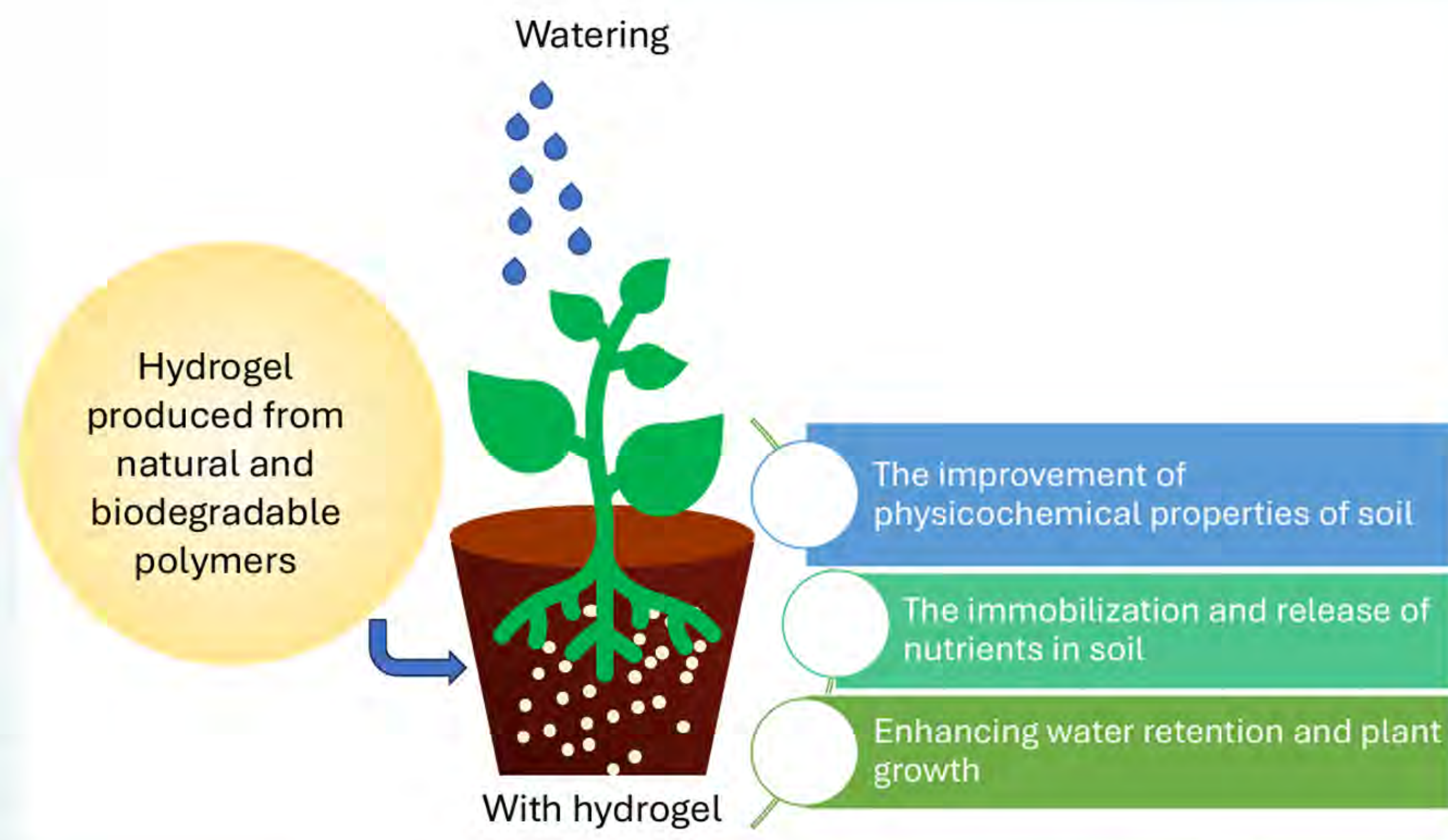
Chulalongkorn University Distinguished Award in Student Affairs (Academic Year 2015, March 22, 2016)

Selected Publications

1. Watcharamul, S., Lerddamrongchai, S., Siripongpreda, T., Rodtassana, C., Nuisin, R., Kiatkamjornwong, S. 2022. Effects of carboxymethyl cellulose/nano-calcium carbonate hydrogel amendment of loamy sand soil for maize growth. ACS Agricultural Science & Technology, 2(5), 1071-1080.
2. Nuisin, R., Siripongpreda, T., Watcharamul, S., Siralertmukul, K., Kiatkamjornwong, S. 2022. Facile syntheses of physically crosslinked carboxymethyl cellulose hydrogels and nanocomposite hydrogels for enhancing water absorbency and adsorption of sappan wood dye. ChemistrySelect, 7(10), e202104598

Selected Publications (Cont.)

3. Hanh Le, T.M., Nuisin, R., Mongkolnavin, R., Painmanakul, P., Sairiam, S. 2022. Enhancing dye wastewater treatment efficiency in ozonation membrane contactors by chloro- and fluoro-organosilanes' functionality on hydrophobic PVDF membrane modification, Separation and Purification Technology, 120711
4. Asavasuthiphan, V., Nuisin, R., Kraiya, C., Sukwattanasinitt, M., Rashatasakhon, P. 2021. Ratio metric fluorescent sensor for copper(II) and phosphate ions from aminopyrene derivatives. Photochemistry and Photobiology. doi: 10.1111/php.13569.
5. Siralertmukul, K., Yuenyaw, N., Watcharamul, S., Nuisin, R. 2021. Facile fabrication of chitosan/starch composite films with fumed silica as an additive, Engineering Journal, 25(9), 45-53.
6. Hanh Le, T.M., Singto, S., Sajomsang, W., Mongkolnavin, R., Nuisin, R., Painmanakul, P., Sairiam, S. 2021. Hydrophobic PVDF hollow fiber membrane modified with pulse inductively coupling plasma activation and chloroalkylsilanes for efficient dye wastewater treatment by ozonation membrane contactor, Journal of Membrane Science, 635,
7. Saelim, T., Sairiam, S., Siralertmukul, K., Watcharamul, S., Nuisin, R. 2020. Chitosan beads as the adsorbent for glyphosate removal from an aqueous solution. Journal of Metals, Materials, and Minerals, 30(3), 72-82.



Hydrogel produced from natural and biodegradable polymers

TASSANEE CHETWITTAYACHAN



Associate Professor

☎ +66 2 218 5196

✉ Tassanee.C@chula.ac.th

Ph.D. The University of Tokyo 2001

M.Sc. Chulalongkorn University 1996

B.Sc. Chulalongkorn University 1992

Areas of Research Interest

Ambient and indoor air pollution and Environmental health risk assessment

Professional Experiences

Assistant Professor, Chulalongkorn University, 2014 – present

Lecturer, Chulalongkorn University, 1997 – 2013

Research Emphasis

My research focuses on air pollution either in ambient or indoor air environments. The examples listed below highlight my research topics related to air pollution and health risk assessment.

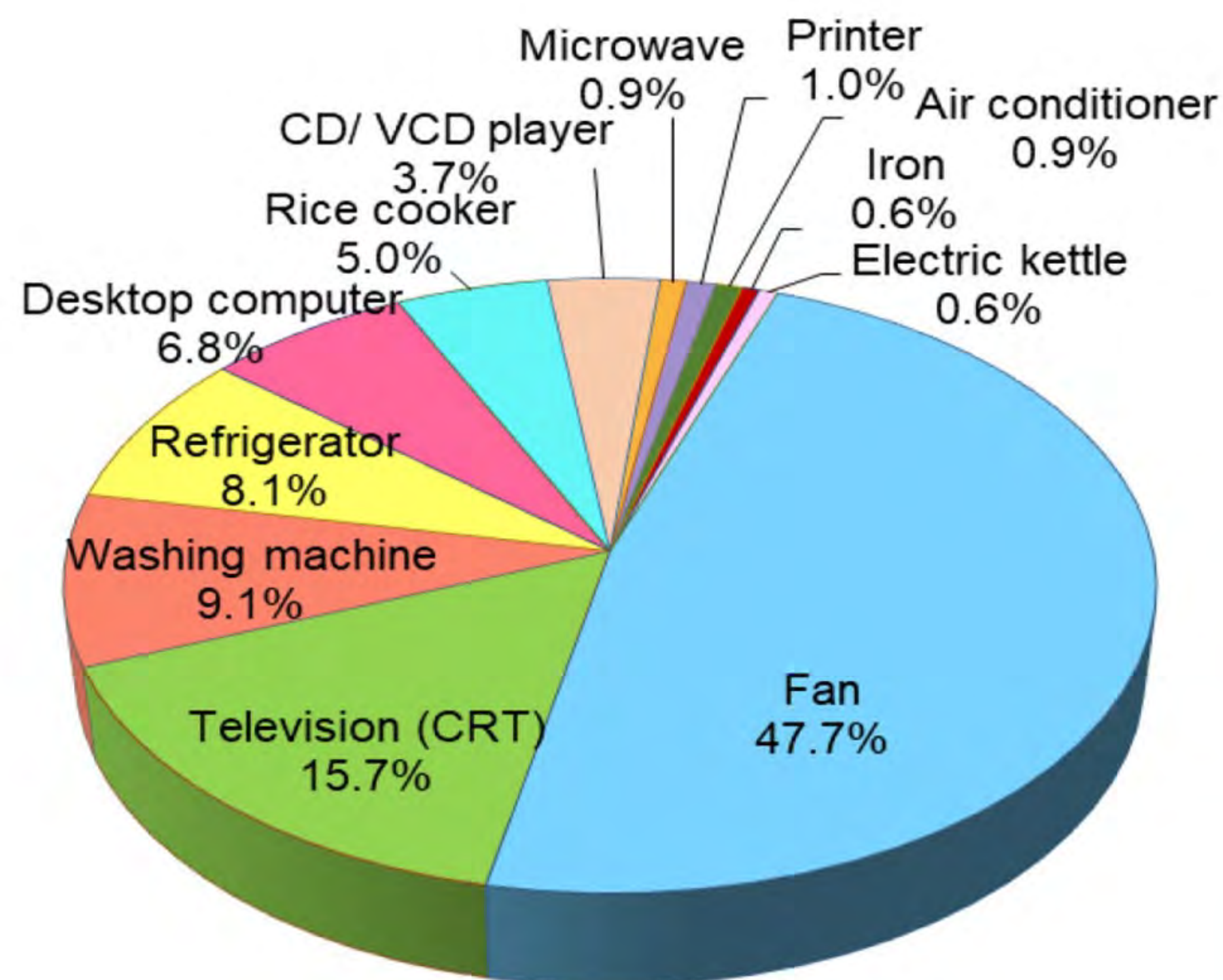
- Determination of ambient and indoor air concentrations of particulate matters, gases and volatile organic compounds
- Analysis of inorganic and organic composition (i.e. heavy metals, polycyclic aromatic hydrocarbons, etc.) of particulate matters distributed both in indoor and outdoor environments.
- Investigation on spatial and temporal variation of air pollutants particularly in urban air environment
- Estimation of inhalation exposure and health risk levels to key pollutants released from indoor and outdoor sources of residential, workplace, industrial and general areas

Selected Publications

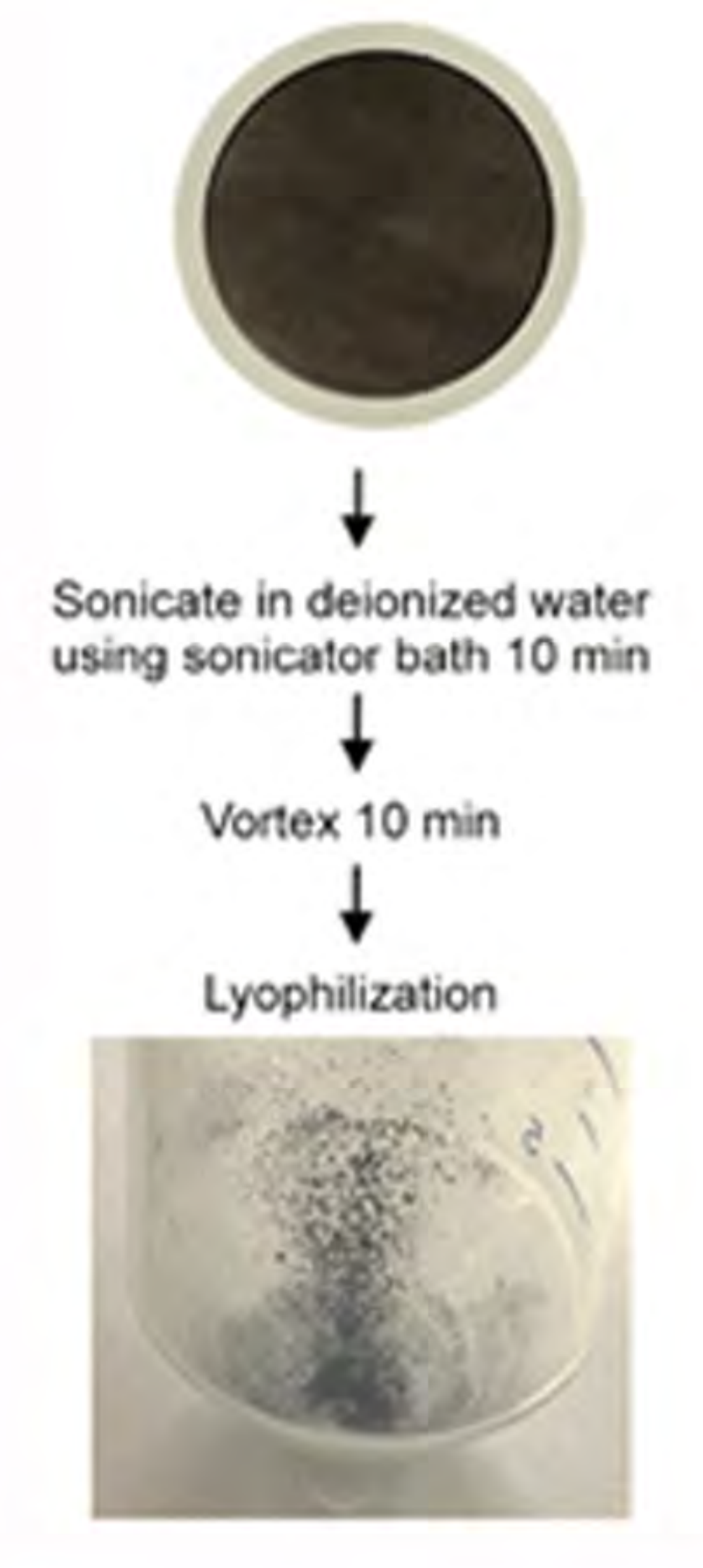
1. Kewcharoenwong, C., Khongmee, A., Nithichanon, A., Palaga, T., Prueksasit, T., Mudway, I. S., ... & Lertmemongkolchai, G. (2023). Vitamin D3 regulates PM-driven primary human neutrophil inflammatory responses. *Scientific Reports*, 13(1), 15850.
2. Kuson, M., Mahujchariyawong, J., Satapanajaru, T., & Prueksasit, T. (2023). Assessment and Management of Air Pollutant Emissions from Vehicles in the Bangkok Metropolitan Region. *Science & Technology Asia*, 144-155.

Selected Publications (Cont.)

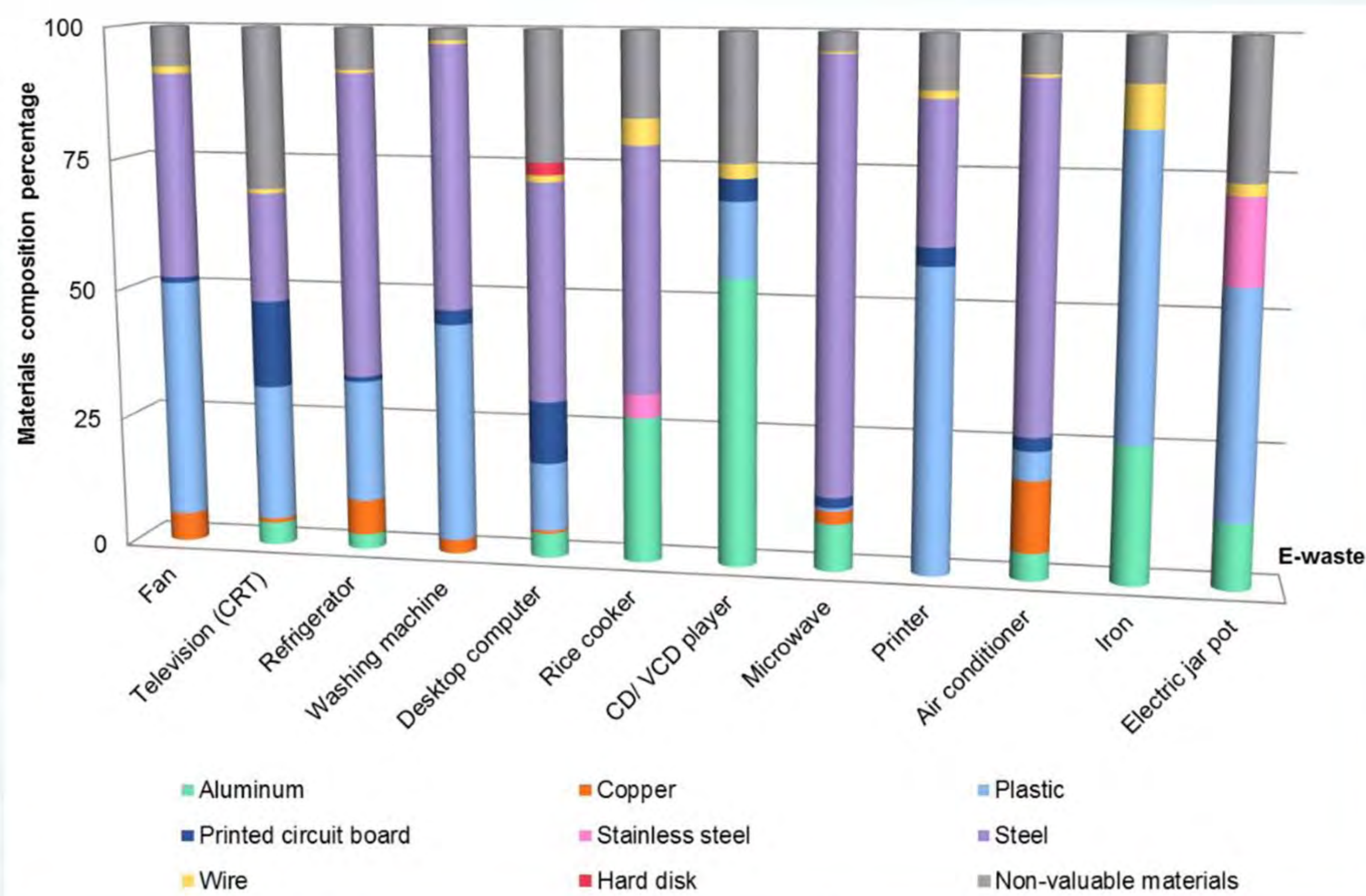
3. Jirabanjerdsiri, B., Sriratanasak, N., Towiwat, P., Prueksasit, T., Sukrong, S., & Chanvorachote, P. (2022). Standardized *Thunbergia laurifolia* Extract Inhibits PM_{2.5}-Induced Oxidative Stress by Regulating p62–KEAP1–NRF2 Signaling Pathway. *in vivo*, 36(6), 2730-2739.
4. Thongkaow, P., Prueksasit, T., & Siri Wong, W. (2022). Activity-based exposure levels and lifetime cancer risk for workers exposed to polychlorinated biphenyls during electronic waste dismantling in Buriram province, Thailand. *Atmospheric Environment*, 287, 119289.
5. Thongkaow, P., Prueksasit, T., & Siri Wong, W. (2022). Quantification and characterization of recovered materials in the cycle of the informal household electronic waste dismantling in Buriram province, Thailand: A challenge towards sustainable management and circular economy. *Waste Management & Research*, 40(12), 1766-1776.
6. Kanjanasiranont, N., Prueksasit, T., & Sahanavin, N. (2021). Ambient and indoor pm₁₀ and pm₁₀-bound pahs around the vicinity of an industrial estate in rayong, thailand: Concentration and source identification. *Applied Environmental Research*, 43(2), 15-29.
7. Makkwao, K., & Prueksasit, T. (2021). PM₁₀ concentration emitted from blasting and crushing processes of limestone mines in Saraburi Province, Thailand. *International Scholarly and Scientific Research & Innovation*, 15(1), 44-51.
8. Amphalop, N., Suwantararat, N., Prueksasit, T., Yachusri, C., & Srithongouthai, S. (2020). Ecological risk assessment of arsenic, cadmium, copper, and lead contamination in soil in e-waste separating household area, Buriram province, Thailand. *Environmental Science and Pollution Research*, 27, 44396-44411.
9. Amphalop, N., Prueksasit, T., & Assawadithalerd, M. (2020). Spatial Variation of Heavy Metals Contamination in Soil at E-waste Dismantling Site, Buriram Province, Thailand. In *Sustainable Development of Water and Environment: Proceedings of the ICSDWE2020* (pp. 333-343). Springer International Publishing.
10. Prueksasit, T., Chanthahong, S., & Kanghae, Y. (2020). Appraisement of PM₁₀ concentrations at residential areas influenced by informal E-waste dismantling activity, Buriram Province, Thailand. *Air, Soil and Water Research*, 13, 1178622120931081.
11. Somprasong, K., Chitwiwat, S., Assawadithalerd, M., & Prueksasit, T. (2020). Geographic Information System and Integrated Spatial Analysis on Area Selection for WEEE Collection Site at Buriram Province, Thailand. In *Sustainable Development of Water and Environment: Proceedings of the ICSDWE2020* (pp. 201-211). Springer International Publishing.
12. Sirichai, T., Prueksasit, T., & Sangsuthum, S. (2020). Blood lead and cadmium levels of e-waste dismantling workers, Buriram Province, Thailand. In *Sustainable Development of Water and Environment: Proceedings of the ICSDWE2020* (pp. 381-390). Springer International Publishing.
13. Bungadaeng, S., Prueksasit, T., & Siri Wong, W. (2019). Inhalation exposure to respirable particulate matter among workers in relation to their e-waste open burning activities in Buriram Province, Thailand. *Sustainable Environment Research*, 29, 1-12.
14. Chowjarean, V., Prueksasit, T., Joyjamras, K., & Chanvorachote, P. (2019). Isovitexin increases stem cell properties and protects against PM_{2.5} in keratinocytes. *in vivo*, 33(6), 1833-1841.
15. Puangprasert, S., & Prueksasit, T. (2019). Health risk assessment of airborne Cd, Cu, Ni and Pb for electronic waste dismantling workers in Buriram Province, Thailand. *Journal of environmental management*, 252, 109601.



Contribution of each e-waste for dismantling in the study area.



Flowchart of PM2.5 extraction.



Contribution (% by mass) of the materials separated from e-waste.

PASICHA CHAIKAEW



Associate Professor

☎ +66 2 218 5191

✉ Pasicha.C@chula.ac.th

Ph.D. University of Florida 2014

M.Sc. Mahidol University 2005

BBA. Maejo University 2004

Areas of Research Interest

Pedometrics, Environmental mapping and modeling, Soil carbon sequestration and carbon efflux, Integration of soil science to other disciplines

Professional Experiences

Associate Professor, Chulalongkorn University, 2020-present

Assistant Professor, Chulalongkorn University, 2017-2020

Lecturer, Chulalongkorn, 2014-2017

Research Emphasis

My research focuses on the carbon sequestration and efflux in various soil types across continents, from tropical to the Antarctic geographical zones. My work emphasizes investigating the biogeochemical processes that control soil organic carbon stabilization and the factors influencing carbon efflux. My research also involves applying advanced statistical and geostatistical techniques, as well as predictive models, to analyze spatial and temporal variations in various environmental patterns in relation to climate change and human activities.

Selected Publications

1. Mehrotra, R., ChaikaeW, P., Haskin, E., Magson, K., Scott, C.M, Doherty, R. (2024). Environmental and ecological factors associated with stinging jellyfish at a tourism hotspot in the Gulf of Thailand. *Estuarine, Coastal and Shelf Science*, [Under peer-reviewing process].
2. Singrakphon, V., Chart-asa, C., ChaikaeW, P. (2024). Meteorological conditions and PM2.5 impact on COVID-19 case fatality ratios (CFR) in Bangkok Metropolitan Region. *Applied Environmental Research*, 46(2), 016.



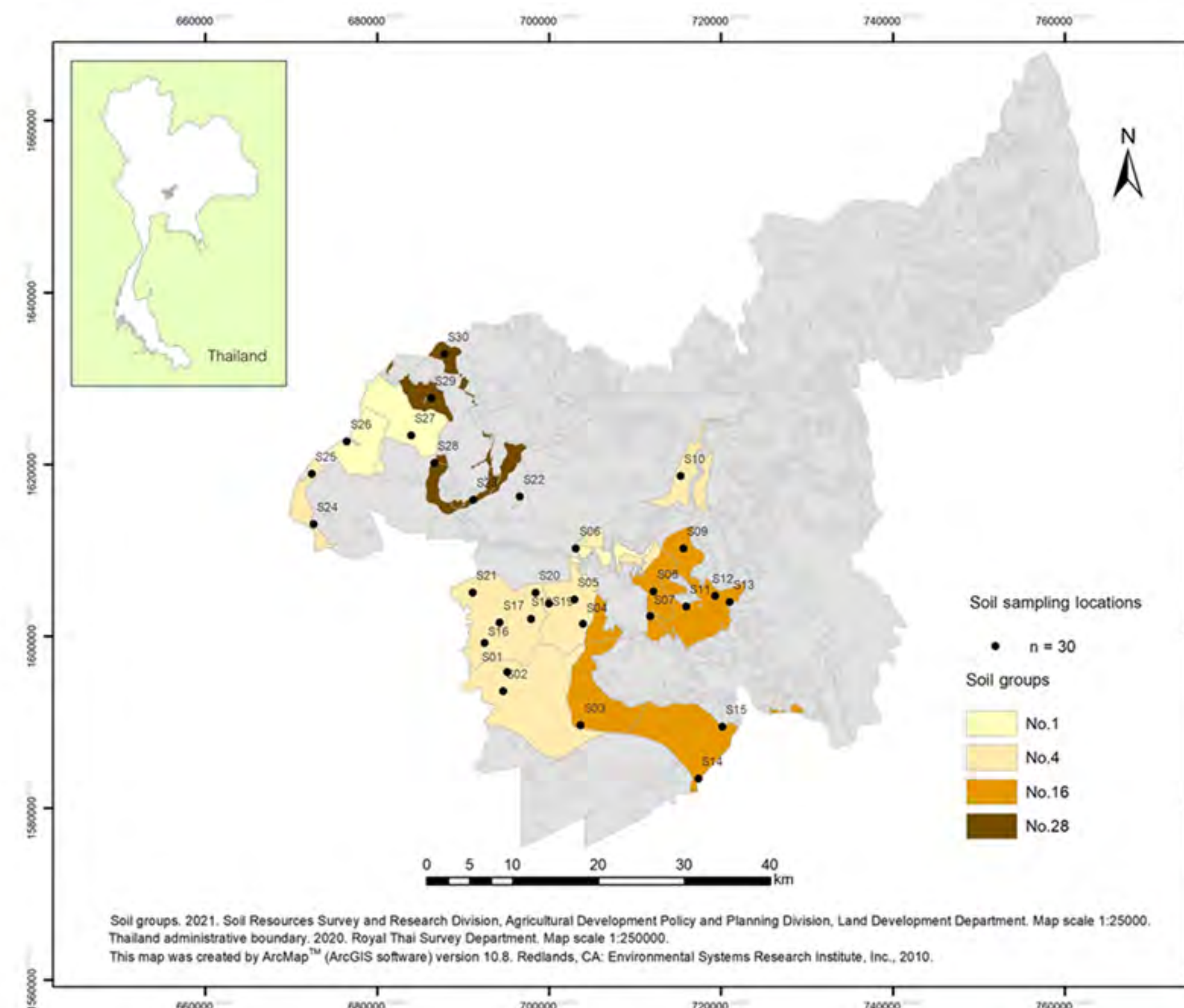
Selected Publications (Cont.)

3. Wongkiew, S., Chaikaew, P., Takrattanasaran, N., Khamkajorn, T. (2022). Evaluation of nutrient characteristics and bacterial community in agricultural soil groups for sustainable land management. *Scientific Reports*, 12(1), 7368.
4. Toolkiattiwong, P., Chaikaew, P., Chart-asa, C. (2022). Comparative human-ecotoxicological impacts and willingness to pay: A case of pesticide transition from paraquat to atrazine in sweet corn cultivation in Thailand. *EnvironmentalAsia*, 50-55.
5. Moonrut, N., Takrattanasaran, N., Khamkajorn, T., Chaikaew, P. (2021). Integrated remote sensing and GIS approaches for land degradation neutrality (LDN) assessment in the agricultural area. *IOP Conference Series: Earth and Environmental Science*, 626(1), 012025.
6. Chaikaew, P., Adeyemi, O., Hamilton, A.O., Clifford, O. (2020). Spatial characteristics and economic value of threatened species (*Khaya ivorensis*). *Scientific Reports*, 10(1), 6266.
7. Adeyemi, O., Chriwa, P.W., Babalola, F.D., Chaikaew, P. (2020). Detecting trade-offs, synergies and bundles among ecosystem services demand using sociodemographic data in Omo Biosphere Reserve, Nigeria. *Environment, Development and Sustainability*, 23, 7310-7325.
8. Chaikaew P., Rugkarn, N., Pongpipatwattana, V., Kanokkantapong, V. (2019). Enhancing ecological economic efficiency of intensive shrimp farm through in-out nutrient budget and feed conservation ratio. *Sustainable Environment Research*, 29, 1-11.
9. Yottiam, A., Chaikaew, P., Srithongouthai, S. (2019). Arsenic pollution assessment in surface sediment of the inner Gulf of Thailand. *IOP Conference Series: Earth and Environmental Science*, 345(1), 012010.

Research Outreach

1. Appleby, D., Yamabe-Ledoux, A.M., Watabe, A., Arisman, Chaikaew P., Diola, B.L., Phong, D.D., Sadie, N.T., Supakata, N. (2024). Breaking the plastic habit: A guidance note and practical toolkit, Lessons from single-use plastic behaviour change interventions in Indonesia, the Philippines, Thailand, and Viet Nam. Available at: <https://www.iges.or.jp/en/pub/breaking-plastic-habit-guidance-note-and-practical-toolkit-lessons-single-use-plastic-behaviour>
2. Chaikaew, P., Bunditsakulchai, P, Pongkijvorasin, S. (2022). In: Nonthaburi in 2023: Envisioning 1.5-Degree Lifestyles. Policy Report. Institute for Global Environmental Strategies, Hayama, Japan. Available at: <https://www.oneplanetnetwork.org/knowledge-centre/resources/nonthaburi-2030-envisioning-15-degree-lifestyles>

Selected Publications (Cont.)



Evaluation of nutrient characteristics and bacterial community in agricultural soil groups for sustainable land management



A researcher conducted soil surveys and sampling at the Antarctic Peninsula to study soil carbon stocks, CO₂ efflux, and related soil properties

SERMPONG SAIRIAM



Associate Professor

☎ +66 2 218 5183

✉ Sermpong.S@chula.ac.th

Ph.D. Chulalongkorn University	2013
M.Sc. Chulalongkorn University	2009
B.Sc. Chulalongkorn University	2007

Areas of Research Interest

Wastewater treatment technology by Advanced Oxidation Processes (AOPs) and membrane technology

Professional Experiences

Associate Professor, Chulalongkorn University, 2022 – present

Assistant Professor, Chulalongkorn University, 2020 – 2022

Lecturer, Chulalongkorn University, 2015 – 2020

Research Emphasis

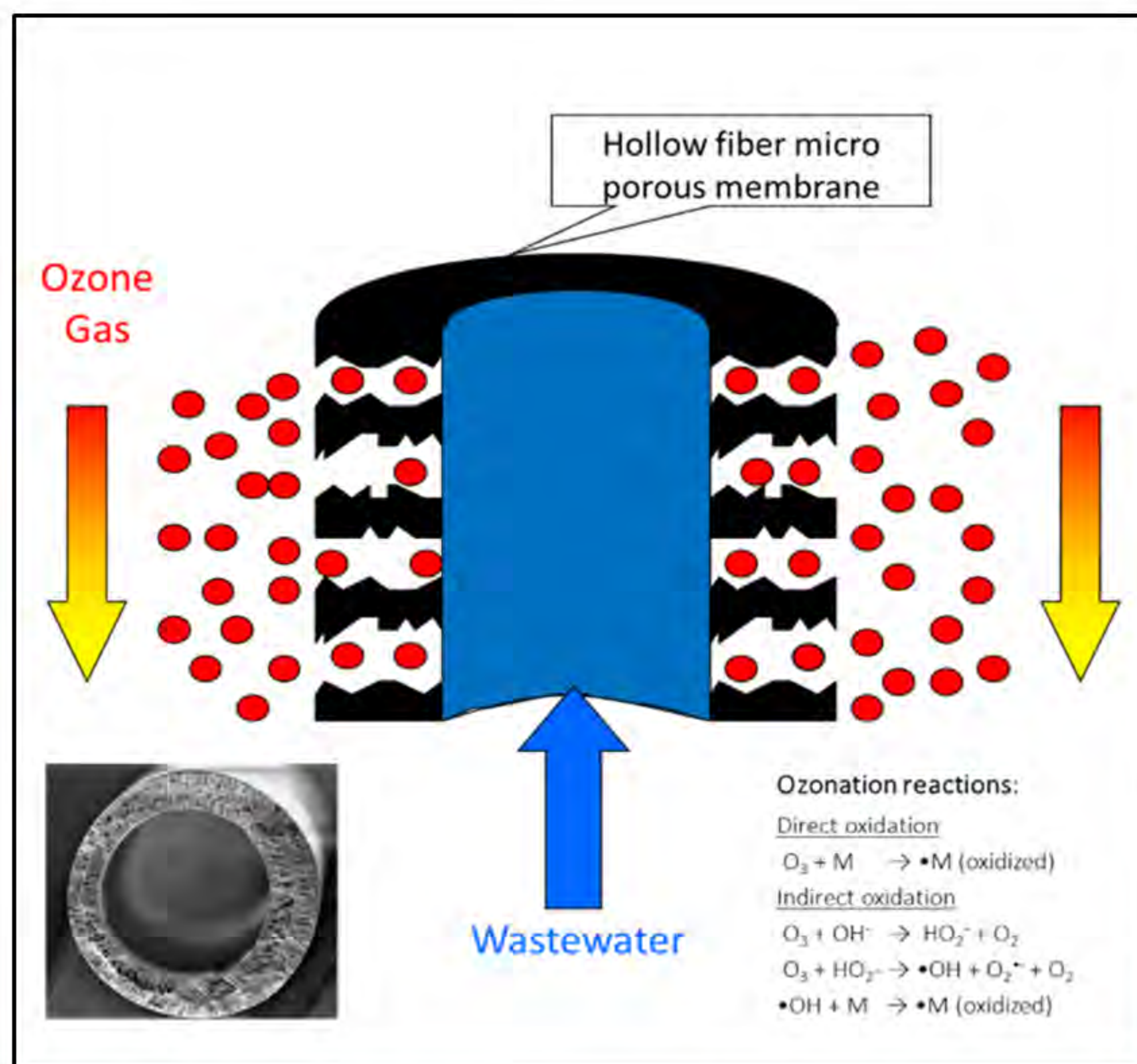
As a consequence of the wastewater issues, control of wastewater emission from the industries is very important on these days. My research focus is to treat wastewater from the various industries such as textile industry by Advanced Oxidation Processes (AOPs) including Fenton processes and photocatalytic oxidation. Recently, AOPs and membrane technologies have received great attention to combine for increase the efficiency of wastewater treatment such as photocatalytic membrane and membrane contacting process with ozonation. The great efforts are to modify the suitable membrane properties for application. Modification is focused on addition of modifying agents or metals on the membrane surface and functionalization of membrane surface via chemical methods.

Selected Publications

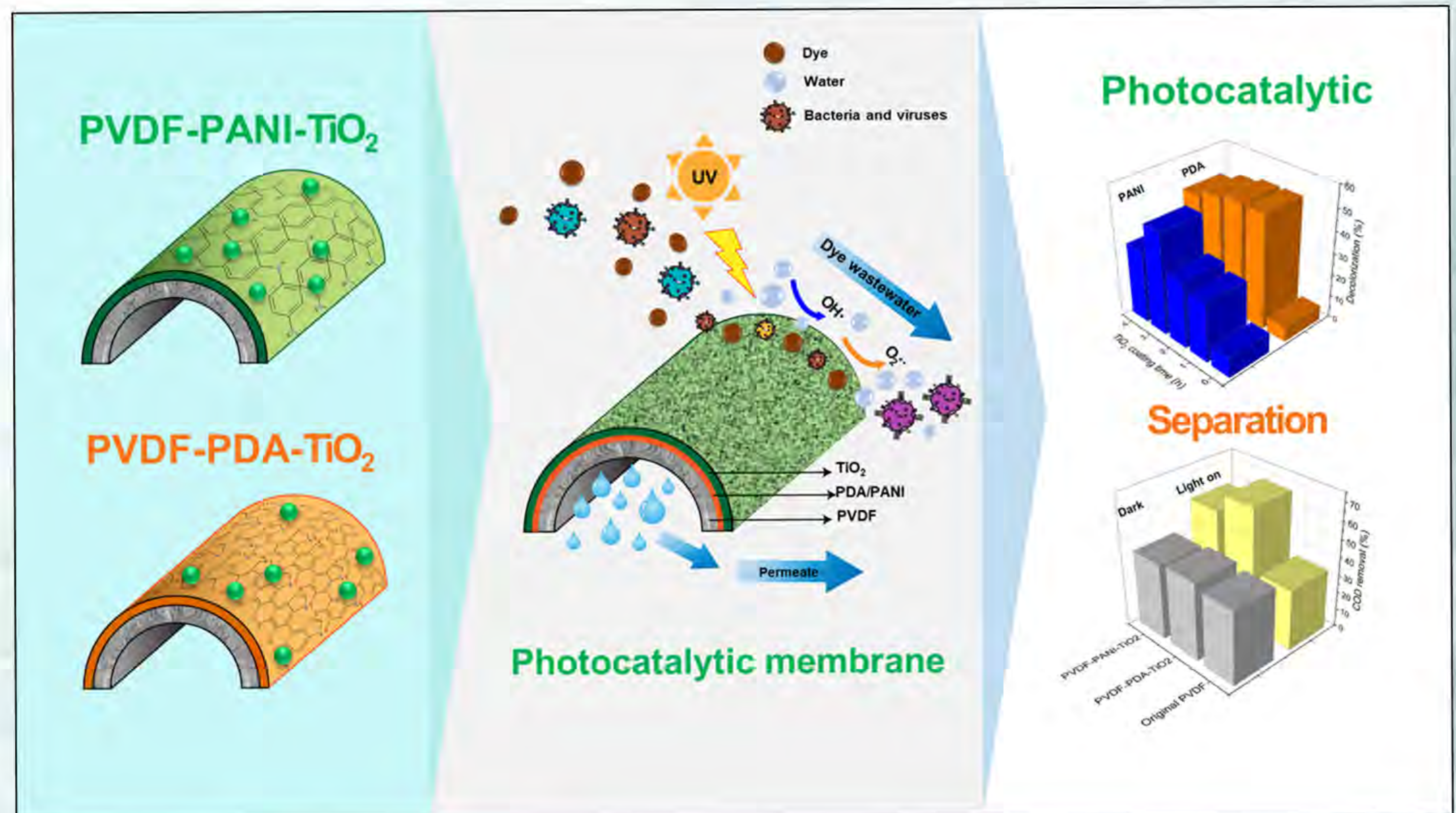
1. Le, T. M. H., Wang, R., & Sairiam, S. (2023). Self-protecting PVDF-PDA-TiO₂ membranes towards highly efficient and prolonged dye wastewater treatment by photocatalytic membranes. *Journal of Membrane Science*, 683, 121789.
2. Le, T. M. H., Nuisin, R., Mongkolnavin, R., Painmanakul, P., & Sairiam, S. (2022). Enhancing dye wastewater treatment efficiency in ozonation membrane contactors by chloro- and fluoro-organosilanes' functionality on hydrophobic PVDF membrane modification. *Separation and Purification Technology*, 288, 120711.

Selected Publications (Cont.)

3. Khruetakham, A., Masomboon, J., Roongruang, J., & Sairiam, S. (2021). Efficient reactive blue 19 decolorization by the comparison of ozonation membrane contacting process and Fenton oxidation. *RSC advances*, 11(29), 17775-17788.
4. Le, T. M. H., Singto, S., Sajomsang, W., Mongkolnavin, R., Nuisin, R., Painmanakul, P., & Sairiam, S. (2021). Hydrophobic PVDF hollow fiber membrane modified with pulse inductively coupling plasma activation and chloroalkylsilanes for efficient dye wastewater treatment by ozonation membrane contactor. *Journal of Membrane Science*, 635, 119443.
5. Khruetakham, A., Srithai, P. U., Samree, K., Painmanakul, P., & Sairiam, S. (2020). Treatment of wastewater containing Reactive Red 239 using Fenton oxidation processes with photo-assisted re generation of Fe^{2+} catalyst. *Desalination and Water Treatment*, 207, 437-445.
6. Rongwong, W., & Sairiam, S. (2020). A modeling study on the effects of pH and partial wetting on the removal of ammonia nitrogen from wastewater by membrane contactors. *Journal of Environmental Chemical Engineering*, 8(5), 104240.
7. Samree, K., Srithai, P. U., Kotchaplai, P., Thuptimrang, P., Painmanakul, P., Hunsom, M., & Sairiam, S. (2020). Enhancing the antibacterial properties of PVDF membrane by hydrophilic surface modification using titanium dioxide and silver nanoparticles. *Membranes*, 10(10), 289.



Membrane contacting process with ozonation



PANTANA TOR-NGERN



Associate Professor

Ph.D. Duke University 2015

M.S. Duke University 2010

B.S.E Duke University 2009

☎ +66 2 218 5175

✉ Pantana.t@chula.ac.th

🌐 <https://forestfluxgroup.org>

Areas of Research Interest

Hydrological and carbon cycling in forest ecosystems; Ecophysiological responses of trees and forests to environmental changes; Sap flow measurement; Canopy photosynthesis and ecosystem modelling; Impacts of climate change and climate variability on hydrological and carbon cycles in forest ecosystems.

Professional Experiences

Associate Professor, Department of Environmental Science, Chulalongkorn University, 2019-Present

Assistant Professor, Department of Environmental Science, Chulalongkorn University, 2017-2019

Lecturer, Department of Environmental Science, Chulalongkorn University, 2015 – 2017

Research Emphasis

Dr. Tor-ngern is an environmental scientist working in the field of forest ecophysiology which explores the responses of forests to the changing environments. Her research focuses on the impacts of climate variability and change on the water and carbon cycles in forests. Specifically, she monitors water flow in trees, with custom-made sensors, which can be used to estimate forest water use and productivity. Both variables represent forest functions that are relevant to forests' climate regulation service. They also vary with climate change, such as the projected increasing drought, thus affecting the ecosystem services forests provide. During her graduate study in the United States, she had extensive research experience in various forests at high- and mid-latitudes and had established strong collaborative research with many international researchers by providing training and the research setup in their countries. In 2015, she began her career in Thailand and built up her research experience in tropical settings, both in natural and urban forests. However, it is challenging to investigate similar questions regarding how forests would respond to the changing climates, especially in tropical forests of Southeast Asia (SEA) where previous land-use changes resulted in complex characteristics which may yield different responses to climate change. In late 2020, she started a long-term monitoring of water flow in trees, using the custom-made sensors, to investigate canopy transpiration of two successional forests in Khao Yai National Park, a UNESCO heritage site in Thailand. This technique allows data collection at high temporal resolution, potentially rendering large data set if being continued for decades. Such data set will prove valuable for studying climate change impacts on water and carbon cycles involving terrestrial ecosystems, which is still a big puzzle, especially in SEA region.



Measure of Esteem

1. L'Oréal – UNESCO For Women in Science International Rising Talents award (15 awardees worldwide), 2022
2. L'Oréal Thailand For Women in Science Fellowship in Biological Science, 2021
3. Best Mid-career Researcher Award in Biological Science, Faculty of Science, Chulalongkorn University, 2021
4. Best New Faculty Researcher Award in Biological Science, Faculty of Science, Chulalongkorn University, 2018

Selected Publications (Cont.)

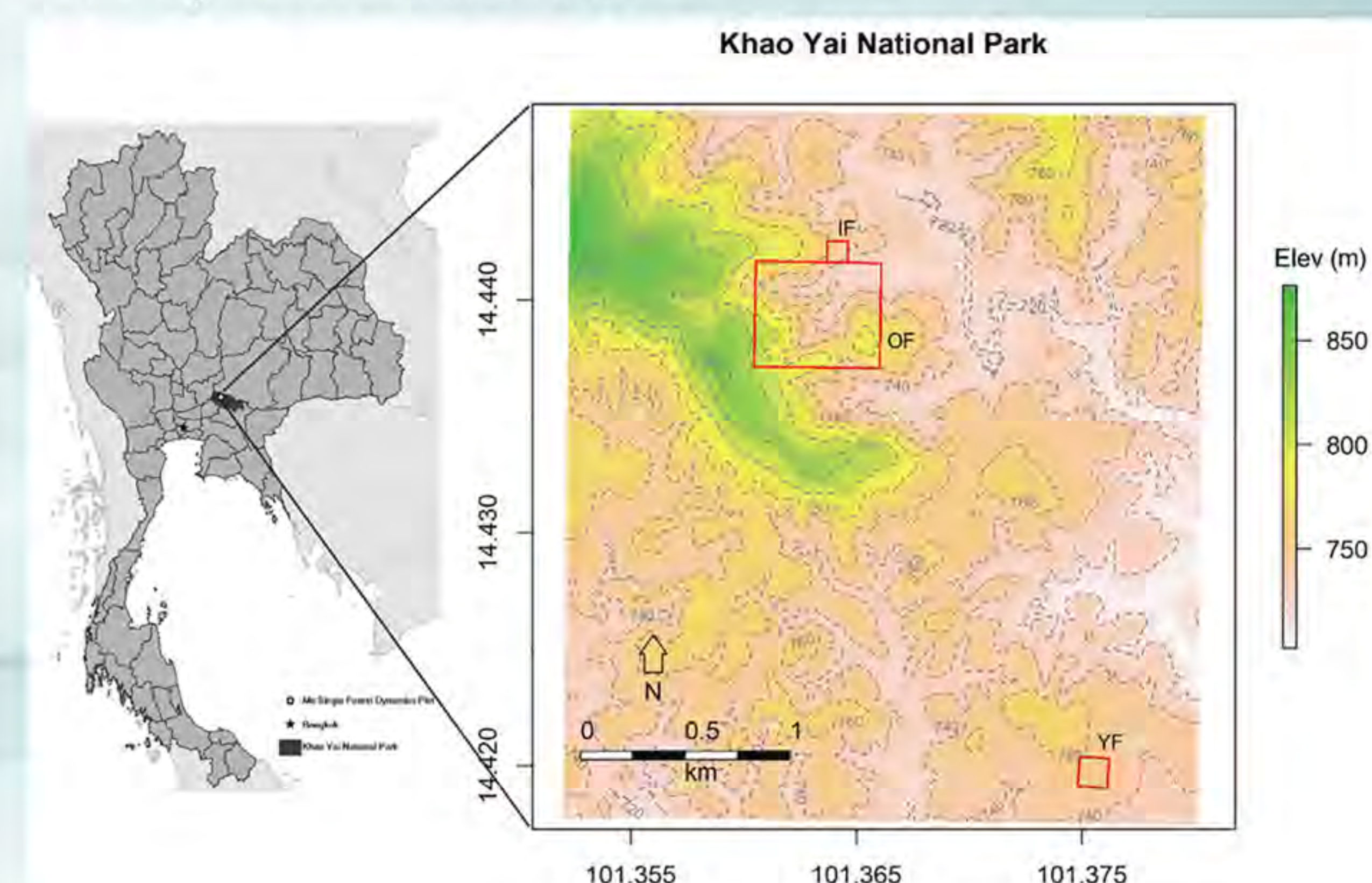
1. Kulsirilak, N., Ampornpitak, R., Kasikam, N., Tor-ngern, P*. Investigating leaf gas exchanges of common trees in two urban parks with different periods of establishment in Bangkok, Thailand. *Tropical Ecology* (January 2024)
2. Ampornpitak, R., Nathalang, A., Tor-ngern, P.* Water-use characteristics of *Syzygium antisepticum* and *Adinandra integerrima* in a secondary forest of Khao Yai National Park in Thailand with implications for environmental management. *PeerJ* (November 2023) 11:e16525.
3. Ampornpitak, R., Khobpee, P., Unawong, W., Leksungnoen, N., Tor-ngern, P.* An urban tree (*Tabebuia argentea*) exhibits higher sensitivity to environmental conditions than an urban palm (*Ptychosperma macarthurii*) growing in the same roof garden: an implication for sustainable urban water use. *Applied Environmental Research* (March 2023) 45, 1: 003.
4. Yarnvudhi, A., Leksungnoen, N.*, Andriyas, T., Tor-ngern, P., Premashthira, A., Wachrinrat, C., Marod, D., Hermhuk, S., Pattahakiat, S., Nakashizuka, T., Kjellgren, R. Assessing the cooling and air pollution tolerance among urban tree species in a tropical climate. *Plants* (November 2022) 11: 3074.
5. Yarnvudhi, A., Leksungnoen, N.*, Siri, S.*, Ponpithuk, Y., Sukmasuang, R., Duengkae, P., Pongcharoen, C., Sutummawong, N., Marod, D., Wachrinrat, C., Premashthira, A., Tor-ngern, P., Pongcharean, S., Hermhuk, S., Kachina, P. Monetary evaluation of supporting ecosystem services as a habitat provider for birds in Thailand urban park. *Biodiversitas* (September 2022) 23, 9: 4747-4758.
6. Yaemphum, S., Unawong, W., Tor-ngern, P.* Sapwood area of 14 common tree species in a successional tropical forest in Thailand. *Forestry: An International Journal of Forest Research* (October 2022) 95, 4: 562-571.
7. Unawong, W., Yaemphum, S., Nathalang, A., Chen, Y., Domec, J-C., Tor-ngern, P.* Variations in leaf water status and drought tolerance of dominant tree species among three successional forests in Southeast Asia. *Scientific Reports* (April 2022) 12: 6882.
8. Yarnvudhi, A., Leksungnoen, N.*, Tor-ngern, P., Premashthira, A., Thinkampheang, S., Hermhuk, S. Evaluation of regulating and provisioning services provided by a park designed to be resilient to climate change in Bangkok, Thailand. *Sustainability* (December 2021) 13: 13624.
9. Yarnvudhi, A., Leksungnoen, N.*, Tor-ngern, P., Premashthira, A. Evaluating cultural services: A case study about willingness to pay for urban green space in Bangkok, Thailand. *Journal of Tropical Forest Research* (December 2021) 5, 2: 20-34.

Selected Publications (Cont.)

10. Surayothee, W., Buajan, S., Fu, P., Pumijumnong, N., Fan, Z., Panthi, S., Finnegan, P.M., Zhang, Y., Chen, Y., Tor-ngern, P., Chanthorn, W., Nathalang, A., Brockelman, W.Y. Growth-climate relationships and long-term growth trends of the tropical forest tree *Choerospondias axillaris* (Anacardiaceae) in East-Central Thailand. *Forests* (December 2021) 12, 12: 1655.
11. Rodtassana, C., Unawong, W., Yaemphum, S., Chanthorn, W., Chawchai, S., Nathalang, A., Brockelman, W., Tor-ngern, P.* Different responses of soil respiration to environmental factors across forest stages in a Southeast Asian forest. *Ecology and Evolution* (October 2021) 11, 21: 15430-15443.
12. Gutierrez Lopez, J.*, Tor-ngern, P., Oren, R., Kozii, N., Laudon, H., Hasselquist, N.J. How tree species, tree size, and topographical location influenced tree transpiration in northern boreal forests during the historic 2018 drought. *Global Change Biology* (July 2021) 27, 13: 3066-3078.
13. Poyatos R.*, Granda V., Flo V., Adams M.A., Adorján B., Aguadé D., Aidar M.P.M. et al. Global transpiration data from sap flow measurements: the SAPFLUXNET database. *Earth System Science Data* (June 2021) 13: 2607-2649.
14. Tor-ngern, P.*, Chart-asa, C., Chanthorn, W., Rodtassana, C., Yampum, S., Unawong, W., Nathalang, A., Brockelman, W., Srinoppawan, K., Chen, Y., Hasselquist, N.J. Variation of leaf-level gas exchange rates and leaf functional traits of dominant trees across three successional stages in a Southeast Asian tropical forest. *Forest Ecology and Management* (March 2021) 489: 119101.
15. Andriyas, T., Leksungnoen, N., Tor-ngern, P.* Comparison of water-use characteristics of tropical tree saplings with implications for forest restoration. *Scientific Reports* (January 2021) 11, 1745
16. Tarvainen, L.*, Wallin, G., Linder, S., Näsholm, T., Oren, R., Ottoson-Löfvenius, M., Räntfors, M., Tor-ngern, P., Marshall, J.D. Limited vertical CO₂ transport in stems of mature boreal *Pinus sylvestris* trees. *Tree Physiology* (January 2021) 41, 1: 63-75.
17. Vernay, A.*, Tian, X., Chi, J., Linder, S., Mäkelä, A., Oren, R., Peichl, M., Stangl, Z.R., Tor-ngern, P., Marshall, J.D. Estimating canopy gross primary production by combining phloem stable isotopes with canopy and mesophyll conductances. *Plant, Cell and Environment* (June 2020) 43, 9: 2124-2142.
18. Kozii, N., Haahti, K., Tor-ngern, P., Chi, J., Hasselquist E.M., Laudon, H., Launiainen, S., Oren, R., Peichl, M., Wallerman, J., Hasselquist, N.J.* Partitioning growing season water balance within a forested boreal catchment using sap flux, eddy covariance, and a process-based model. *Hydrology and Earth System Sciences* (June 2020) 24: 2999-3014.

Study sites in a young (YF), an intermediate (IF) and an old growth (OF) forest in Khao Yai National Park, Thailand. The IF plot refers to intermediate, stem-exclusion stage forest with no tower

(Figure from Tor-ngern et al., 2021).



*ASSISTANT
PROFESSOR*

CHOKCHAI YACHUSRI



Assistant Professor

☎ +66 2 218 5197

✉ Chokchai.Y@chula.ac.th

M.Sc. Chulalongkorn University 1992

B.Sc. Thammasat University 1989

Areas of Research Interest

Air pollution control, Noise pollution and occupational noise assessment and control and Vibration exposure

Professional Experiences

Assistant Professor, Chulalongkorn University, 2006 – present

Lecturer, Chulalongkorn University, 1996 – 2006

Research Emphasis

Noise, disturbing and unpleasant sound, does not affect only hearing organs, but also physiological body functions e.g. disruptive effects on concentration and sleep, heart rate, blood pressure, and respiratory rate. Excessive noise and impulse noise particularly cause occupational diseases. People can find low noise levels annoying as well. On the other hand, vibration exposures are transferred from a tool/machine to individual's body. Typical symptoms from vibration include white finger, numbness, lower back pain. What people exposes to noise and vibration is up to the individual. The assessments of noise and vibration are crucial not only to comply with the National Occupational Safety and Health legislation to specifies safety zone for workplace exposure levels, but also demands the employer's responsibilities to protect their workers' health.

Textbook

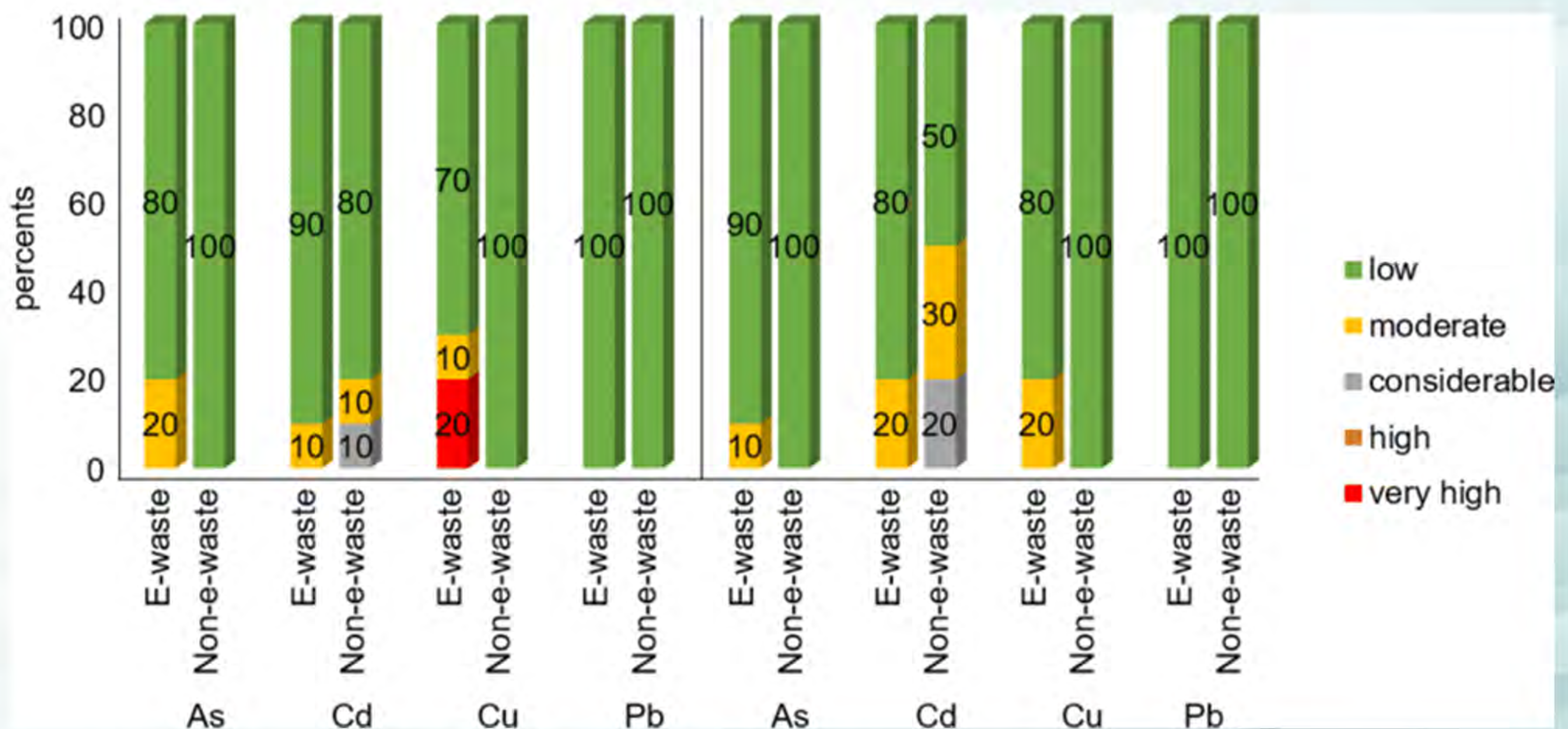
Department of Environmental Science. 2013. Environmental science laboratory. Chulalongkorn University Press, 160 pages (in Thai).

Supervised Senior Projects

- 1.Chanprasit, K. and Yachusri, C., 2015. Efficiency of microalgae *Chlorella* sp. on the removal of pollutants from canteen wastewater.
- 2.Charatchiripat, K. and Yachusri, C., 2015. Sound absorption coefficient of rubber concrete mixed with fly ash.

Supervised Senior Projects (Cont.)

3. Kaewpradap, N. and Yachusri, C., 2014. Efficiency of acoustic absorption board from bagasse filled natural rubber latex foam.
4. Mueanaop, A. and Yachusri, C., 2013. Determined nitrogen dioxide concentration on buses in Bangkok using passive gas sampler.
5. Lelaphaisan, K., Sukgosa, A. and Yachusri, C., 2013. The Study of efficiency of acoustic board produced by Rice husk and Coir fibers.
6. Intharapong, N. and Yachusri, C., 2013. Contents of heavy metals in particulate matter less than 2.5 micronsexpose to police and pedestrians around Bangkok's intersections.
7. Kaechat, P. and Yachusri, C., 2013. Exposure of parking lot security guards to particulate matter less than 2.5 microns in Bangkok.
8. Amphalop, N., Suwantararat, N., Prueksasit, T., Yachusri, C., & Srithongouthai, S. 2020. Ecological risk assessment of arsenic, cadmium, copper, and lead contamination in soil in e-waste separating household area, Buriram province, Thailand. *Environmental Science and Pollution Research*, 27, 44396-44411.



Percent contribution of the houses with different ecological risk categories.

SITTHICHOK PUANGTHONGTHUB



Assistant Professor

☎ +66 2 218 5189

✉ Sitthichok.P@chula.ac.th

Ph.D. University of North Carolina at Chapel Hill 2006

M.Sc. University of North Carolina at Chapel Hill 2002

M.Sc. Mahidol University 1999

B.Sc. Mahidol University 1995

Areas of Research Interest

Climate change to enhance air pollution, Health risk assessment related to occupational and air pollution exposure and Environmental epidemiology of landfill and electronic waste communities

Professional Experiences

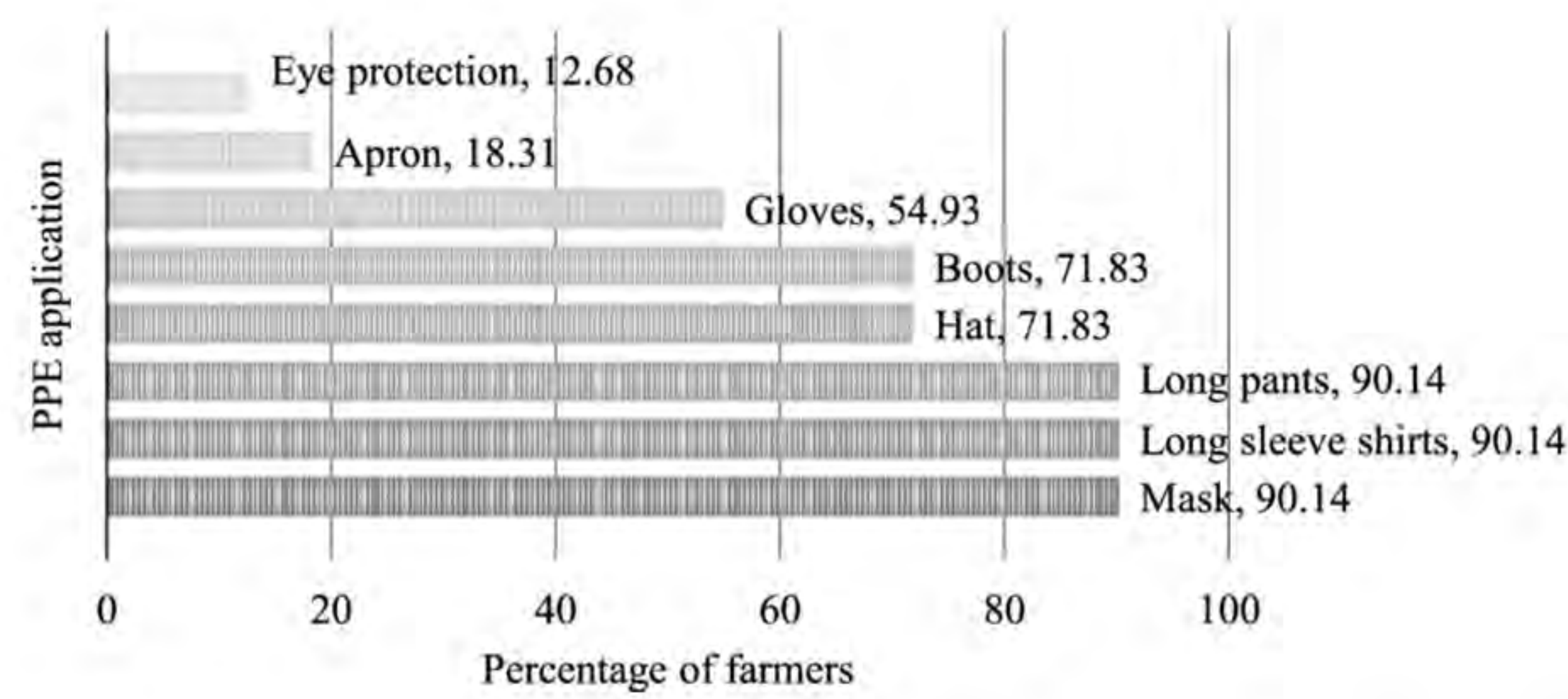
- Board of Directors, The Thai Society of Higher Education Institute on Environment, 2013-present
- Head, Department of Environmental Science, Chulalongkorn University, 2014-2018
- Working committee, The 2nd, 3rd and 4th EnvironmentAsia International Conferences, 2013, 2015, and 2017
- Working committee of Thai Qualifications Framework for Higher Education (Environmental Science), The Higher Education Commission, 2013-2014
- Environmental and Health Impact Assessment (EHIA) working committee of The Independent Commission on Environment and Health to review a Phenol Production Facility (Extension 2) by PTT Phenol Company Limited, 2012
- Secretary, Department of Environmental Science, Chulalongkorn University, 2006-2010
- Occupational Health and Safety Officer, The CPAC Roof Tile Company Limited, Siam Cement Group, 1995-1996

Research Emphasis

I am currently working on how to predict ambient air pollutants such as ozone and fine particulate matters using data over decades of their co-pollutants and metrological parameters through multivariate regression models. Results can be used to understand how these pollutants would be fluctuating over different climate change conditions and for authorities to plan to mitigate community's related health risks. Also, I have recently investigated the associated increased risks of sensitive population residing in communities of solid-waste landfills and electronic waste sites such as pre-school and school children and pregnant women of unfavorable outcomes of nervous system disorders, respiratory symptoms, and adverse birth outcomes. Its findings could be used for policy makers to alleviate specific factors posting to health risks of those.

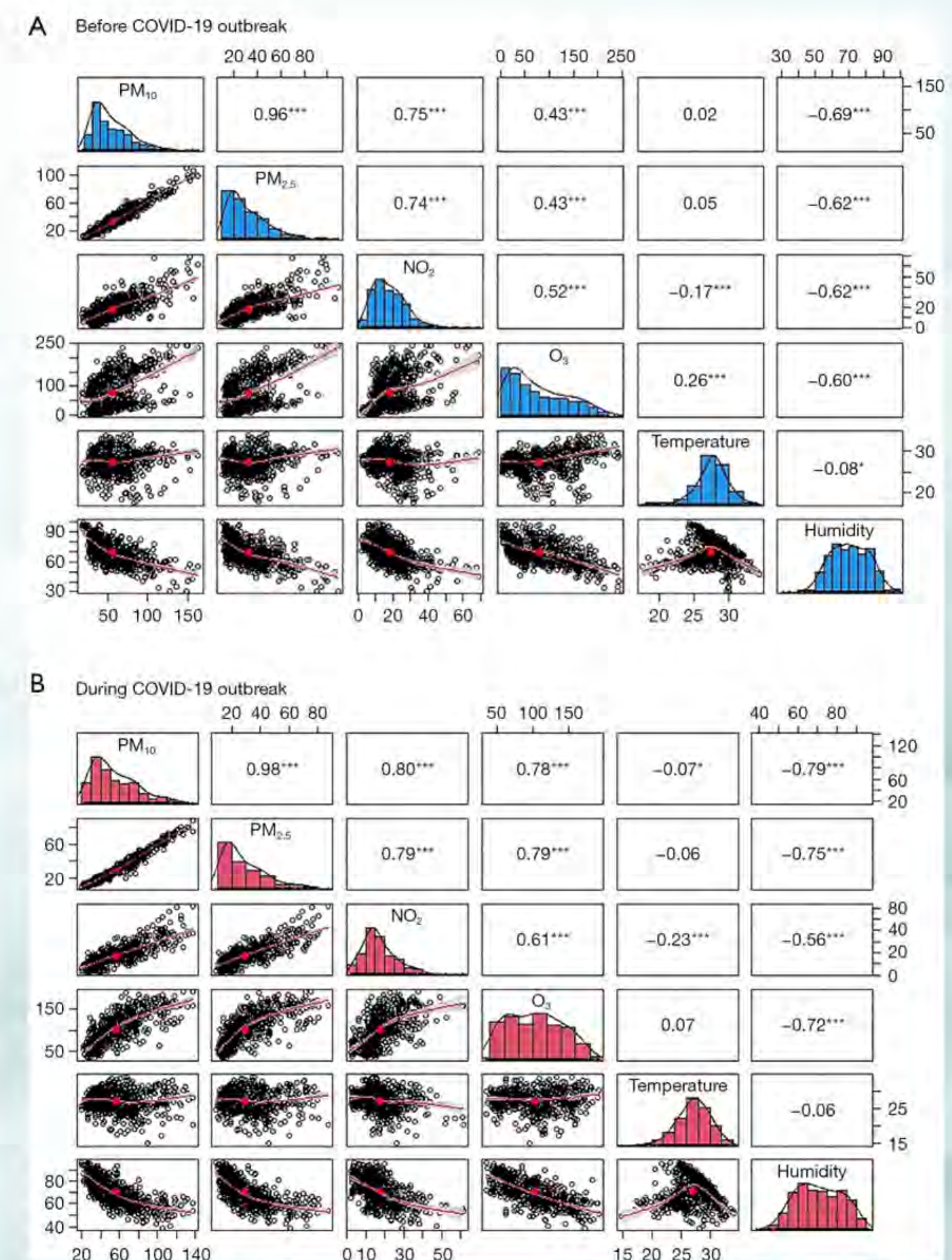
Selected Publications

1. Roudreo, B., & Puangthongthub, S. (2024). A decreased impact of air pollution on hospital pneumonia visits during COVID-19 outbreak in northeastern Thailand. *Journal of Thoracic Disease*, 16(1), 133.
2. Roudreo, B., & Puangthongthub, S. (2024). Alleviation of PM_{2.5}-associated Risk of Daily Influenza Hospitalization by COVID-19 Lockdown Measures: A Time-series study in northeastern Thailand. *Journal of Preventive Medicine and Public Health*= Yebang Uihakhoe chi.
3. Sombatsawat, E., Siriwong, W., & Puangthongthub, S. (2023). Risk factors, erythrocyte acetylcholinesterase inhibition, and self-reported symptoms of pesticide intoxication among farmers in Thailand: a cross-sectional study. *Roczniki Państwowego Zakładu Higieny*, 74(1).



Personal protective equipment (PPE) application (n=71)

Spearman correlation coefficient for air pollutants concentration and meteorological factors, the data from 2018–2019 (before the COVID-19 outbreak) (A) and 2020–2021 (during the COVID-19 outbreak) (B). *, $P < 0.05$; ***, $P < 0.001$. COVID-19, coronavirus disease 2019.



SARAWUT SRITHONGTHAI



Assistant Professor

+66 2 218 5194

Sarawut.Sr@chula.ac.th

Ph.D. Ehime University 2004

M.Sc. Kagawa University 2001

B.Sc. Kasetsart University 1996

Areas of Research Interest

Water pollution and thier effects on aquatic ecology, Aquatic toxicology and risk assessment, Eco-friendly technologies for wastewater treatment and Applied microscopic bubbles for mari-culture management

Professional Experiences

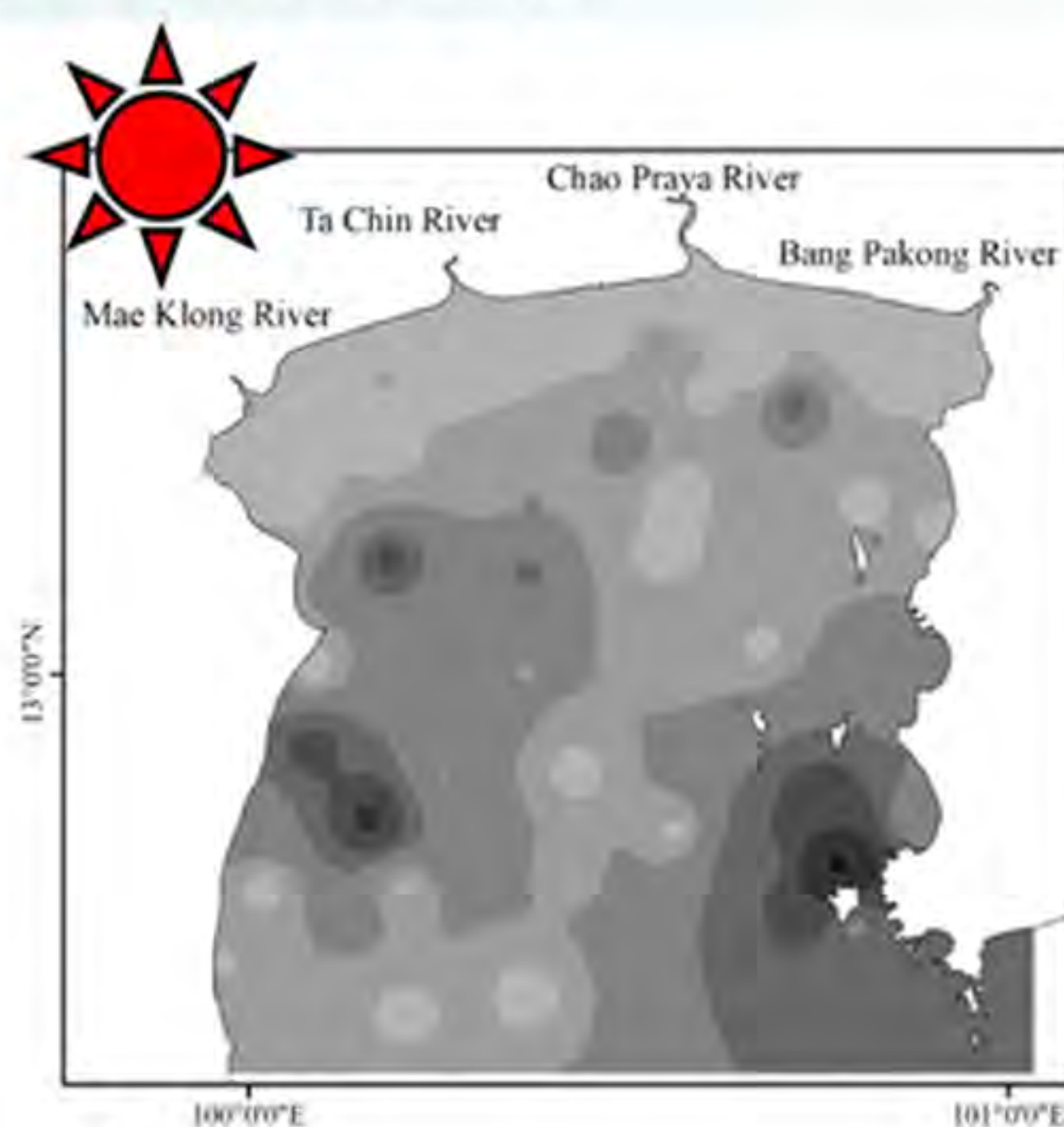
Assistant Professor, Department of Environmental Science, Chulalongkorn University, 2016-present

Lecturer, Department of Environmental Science, Chulalongkorn University, 2008-2016

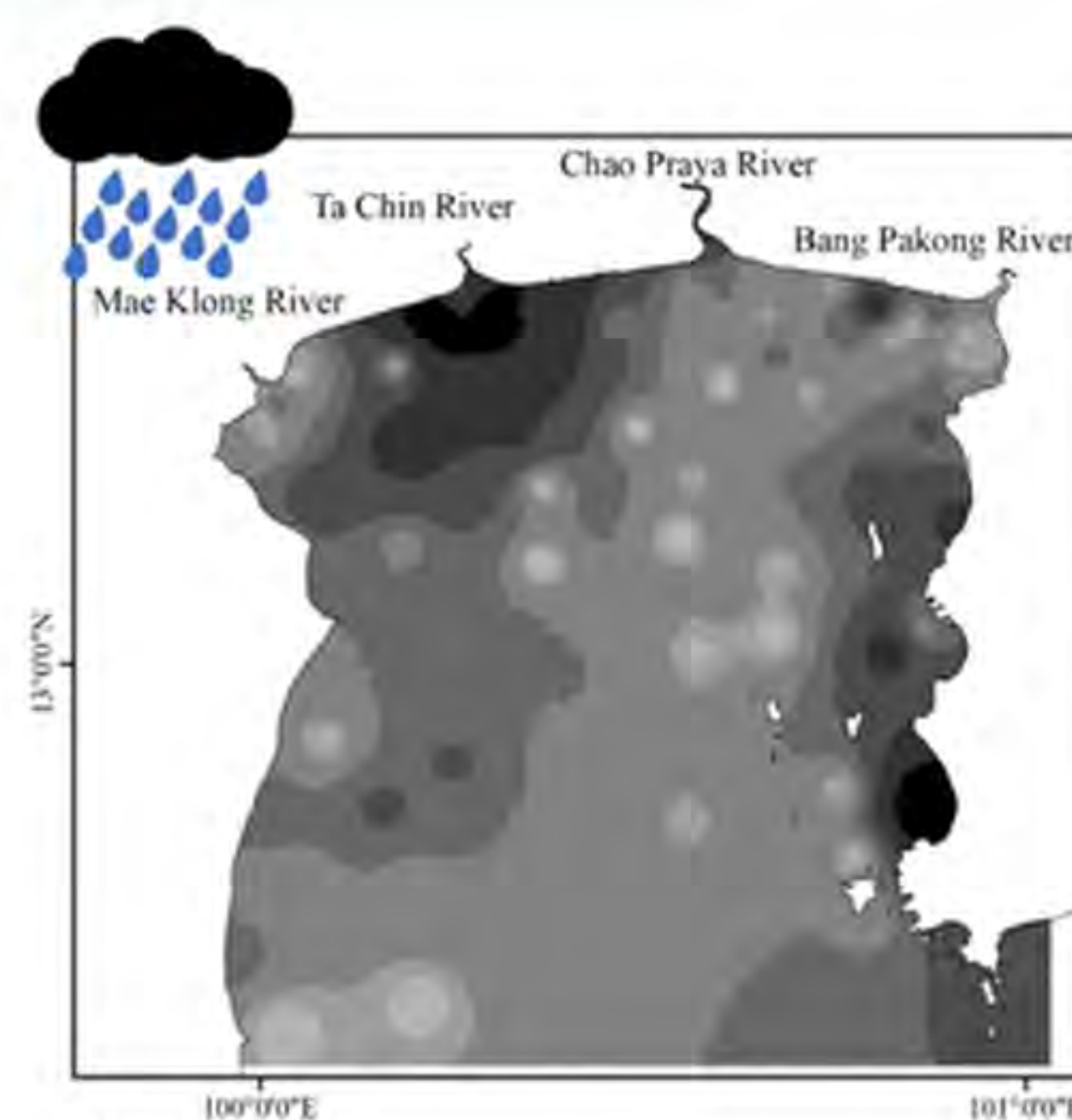
Post Doctorial Researcher, Prefectural University of Kumamoto, Japan, 2004-2008

Research Emphasis

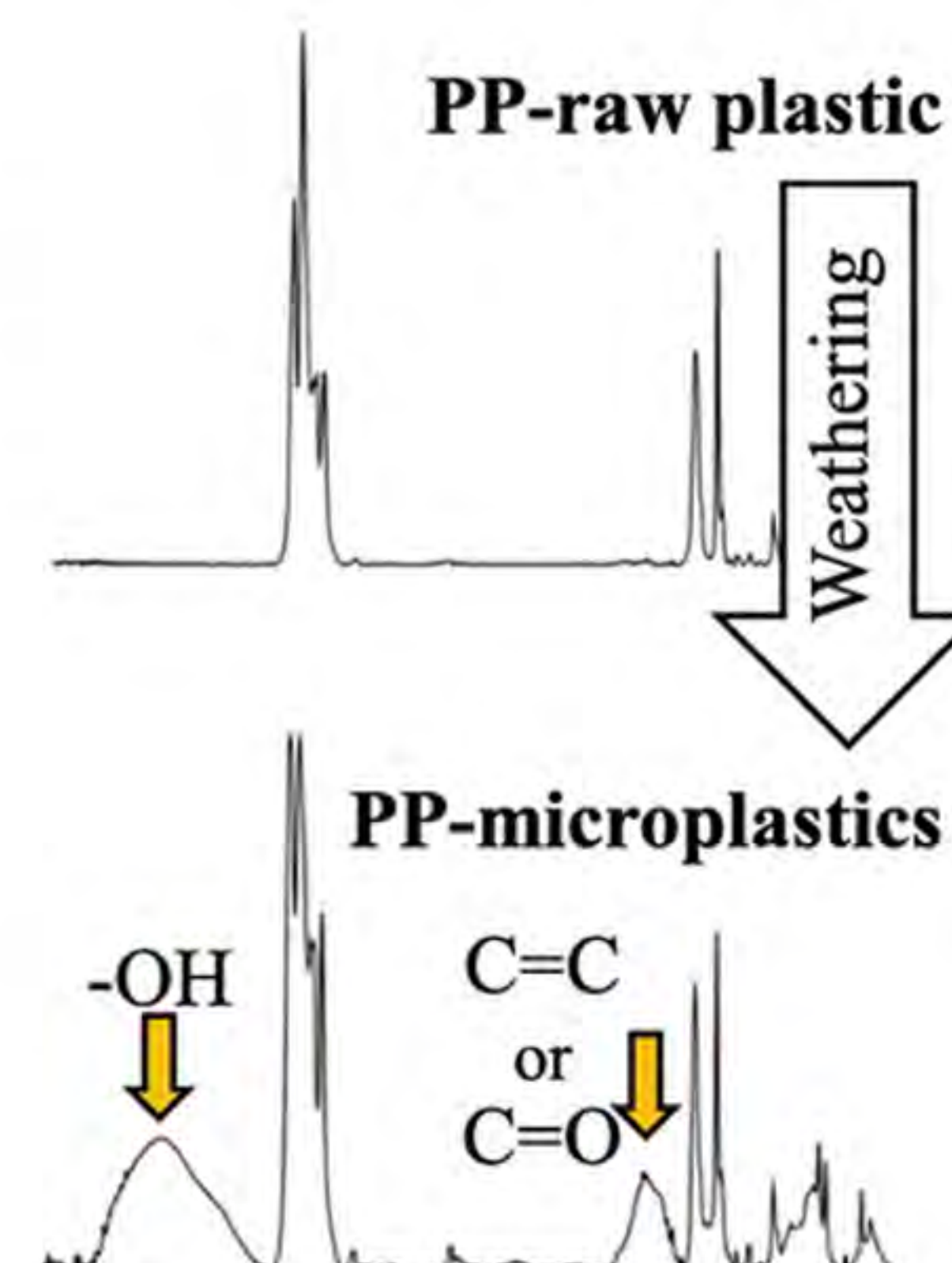
MP contamination poses significant problems for coastal ecosystems, as evidenced by the study conducted in the inner Gulf of Thailand. The seasonal variations, particularly increased freshwater runoff during the wet season, lead to higher concentrations of MPs in coastal waters. These MPs, primarily composed of PP and PE, can undergo chemical transformations, forming new functional groups that may enhance their toxicity.



Avg.
8.70 MPs/L



Avg.
34.59 MPs/L

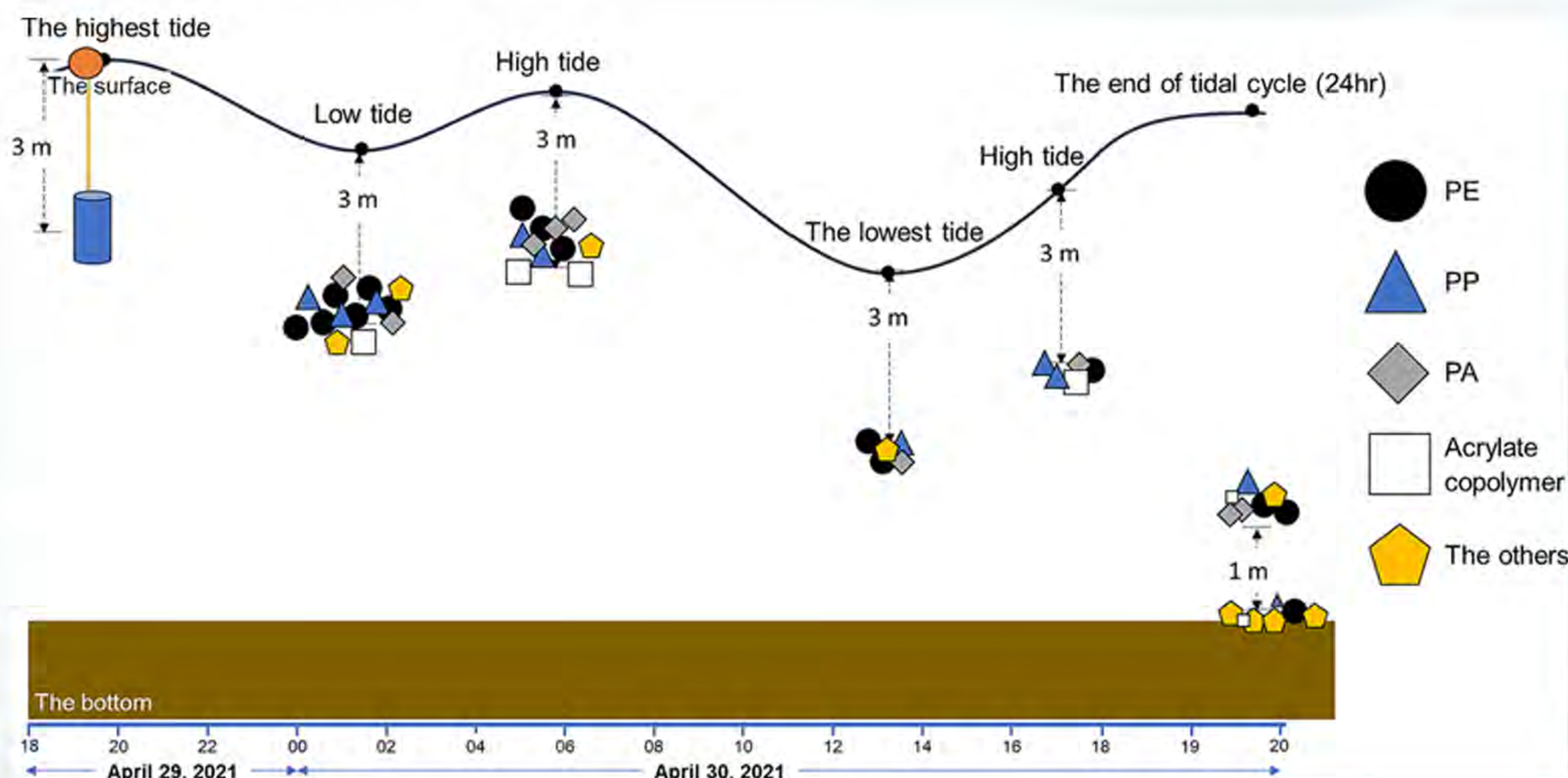


Graphical abstract of Influence of seasonal variations on the distribution characteristics of microplastics in the surface



Selected Publications

1. Oludoye, O. O., Supakata, N., Srithongouthai, S., Kanokkantapong, V., Van den Broucke, S., Ogunyebi, L., & Lubell, M. (2024). Pro-environmental behavior regarding single-use plastics reduction in urban–rural communities of Thailand: Implication for public policy. *Scientific Reports*, 14(1), 4713.
2. Vibhatabandhu, P., Prachayakul, T., Tang-Siri, J., Benmas, P., Srithongouthai, S., & Kanokkantapong, V. (2024). Effect of tidal current on the settling and accumulation of microplastics in the Chao Phraya River estuary, Thailand. *Marine Pollution Bulletin*, 200, 116068.
3. Suksomjit, M., Vichkovitten, T., Chatyapa, P., Leelakul, P., & Srithongouthai, S. (2023). Abundance and Chemical Speciation of Phosphorus in Marine Surface Sediment of the Inner Gulf of Thailand. *Burapha Science Journal*, 248-262.
4. Amphalop, N., Suwantararat, N., Prueksasit, T., Yachusri, C., & Srithongouthai, S. (2020). Ecological risk assessment of arsenic, cadmium, copper, and lead contamination in soil in e-waste separating household area, Buriram province, Thailand. *Environmental Science and Pollution Research*, 27, 44396-44411.
5. Pathompong, V., & Sarawut, S. (2022). Abundance and Characteristics of Microplastics Contaminating the Surface Water of the Inner Gulf of Thailand. *Water, Air and Soil Pollution*, 233(2).
6. Vibhatabandhu, P., & Srithongouthai, S. (2022). Influence of seasonal variations on the distribution characteristics of microplastics in the surface water of the Inner Gulf of Thailand. *Marine pollution bulletin*, 180, 113747.



Graphical abstract of
Effect of tidal current on the
settling and accumulation of
microplastics in the Chao
Phraya River
estuary, Thailand

VORAPOT KANOKKANTAPONG



Assistant Professor

☎ +66 2 218 5186

✉ Vorapot.Ka@chula.ac.th

Ph.D.	Chulalongkorn University	2005
M.Eng.	Kasetsart University	2001
B.Eng.	Kasetsart University	1998
B.PH.	Sukhothai Thammathirat Open University	2006

Areas of Research Interest

Wastewater treatment technology, Waste management and utilization, Carbon footprint and storage, Life cycle assessment

Professional Experiences

Assistant Professor, Chulalongkorn University, 2017 – Present

Lecturer, Chulalongkorn University, 2014 – 2017

Lecturer, Mahidol University, 2012 – 2014

Lecturer, Huachiew Chalermprakiet University, 2004 – 2010

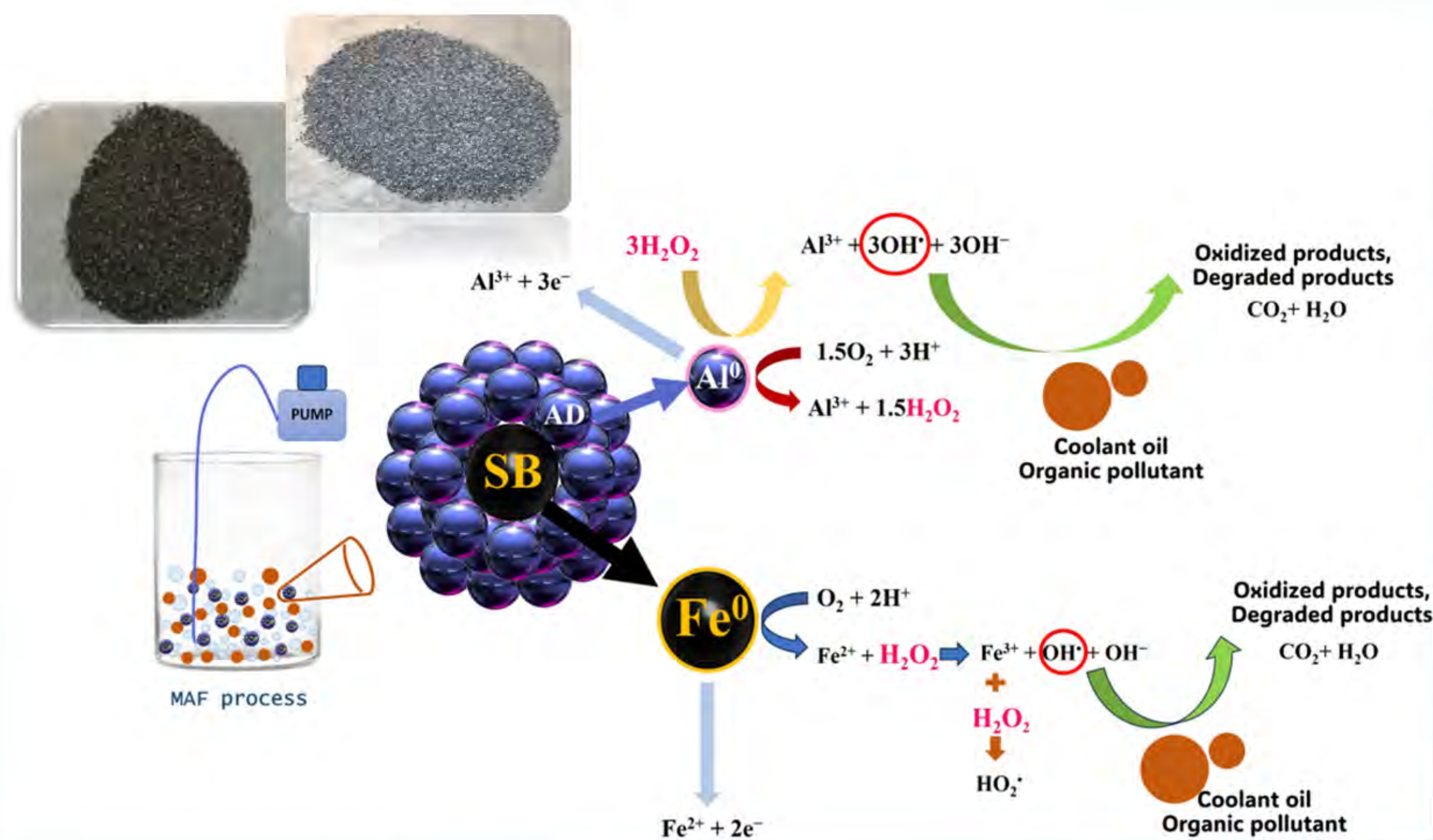
Selected Publications

1. Oludoye, O. O., Supakata, N., Srithongouthai, S., Kanokkantapong, V., Van den Broucke, S., Ogunyebi, L., & Lubell, M. (2024). Pro-environmental behavior regarding single-use plastics reduction in urban-rural communities of Thailand: Implication for public policy. *Scientific Reports*, 14(1), 4713.
2. Vibhatabandhu, P., Prachayakul, T., Tang-Siri, J., Benmas, P., Srithongouthai, S., & Kanokkantapong, V. (2024). Effect of tidal current on the settling and accumulation of microplastics in the Chao Phraya River estuary, Thailand. *Marine Pollution Bulletin*, 200, 116068.
3. Wongkiew, S., Aksorn, S., Amnuaychaichana, S., Polprasert, C., Noophan, P. L., Kanokkantapong, V., ... & Khanal, S. K. (2024). Bioponic systems with biochar: Insights into nutrient recovery, heavy metal reduction, and microbial interactions in digestate-based biaponics. *Waste Management*, 178, 267-279.
4. Suwannasung, K., Kanokkantapong, V., & Wongkiew, S. (2023). Modified air-Fenton with MIL-88A for chemical oxygen demand treatment in used coolant oil. *Environmental Science and Pollution Research*, 30(48), 105429-105439.

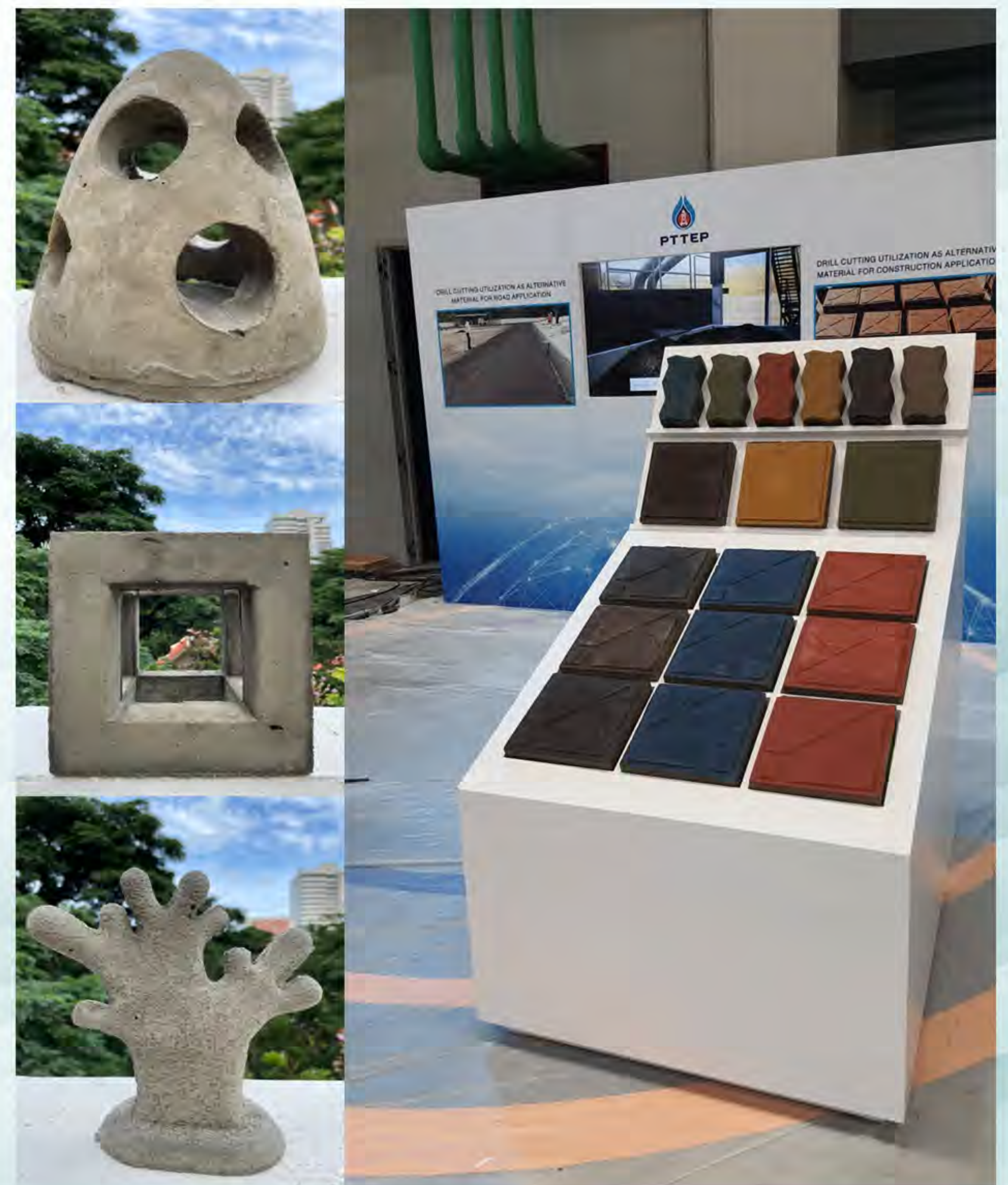


Selected Publications (Cont.)

6. Aksorn, S., Kanokkantapong, V., Polprasert, C., Noophan, P. L., Khanal, S. K., & Wongkiew, S. (2022). Effects of Cu and Zn contamination on chicken manure-based bioponics: Nitrogen recovery, bioaccumulation, microbial community, and health risk assessment. *Journal of Environmental Management*, 311, 114837.
7. Chukaew, P., Nakason, K., Kuboon, S., Kraithong, W., Panyapinyopol, B., Kanokkantapong, V., & Fund, E. (2022). Conversion of cassava rhizome to alternative biofuels via catalytic hydrothermal liquefaction. *Asia-Pacific Journal of Science and Technology*, 27(2), APST-27.
8. Srimoke, W., Kanokkantapong, V., Supakata, N., & Limmun, W. (2022). Optimising zero-valent iron from industrial waste using a modified air-Fenton system to treat cutting oil wastewater using response surface methodology. *Arabian Journal of Chemistry*, 15(11), 104213.
9. Chukaew, P., Nakason, K., Kuboon, S., Kraithong, W., Panyapinyopol, B., & Kanokkantapong, V. (2021). Conversion of cassava rhizome to biocrude oil via hydrothermal liquefaction. *International Energy Journal*, 21(3), 269-280.



Coolant oil treatment mechanism of modified air Fenton with bimetallic particles from used shot blast and aluminum dross



Artificial corals and pavement block with CO₂ storage

SUMETH WONGKIEW



Assistant Professor

☎ +66 99 458 7500

✉ Sumeth.W@chula.ac.th

Ph.D.	University of Hawai'i at Mānoa	2018
M.Eng.	Asian Institute of Technology (AIT)	2013
B.Eng.	Chiang Mai University	2011
B.Sc.	Sukhothai Thammathirat Open University	2024

Areas of Research Interest

Biological treatment, Resource recovery, Nitrogen cycle, Aquaponics and biaponics, Wastewater engineering

Professional Experiences

Assistant Professor , Chulalongkorn University, 2022 - Present

Lecturer, Chulalongkorn University, 2019 - 2022

Research assistant, Asian Institute of Technology, 2011 and 2013

Research Emphasis

My research focuses on bio-environmental processes including biological treatment, resource recovery, bio-engineering, soilless agriculture, and applied environmental toxicology and risk assessment, with emphasis on development of sustainable innovations that fit to the way of Bio-Circular-Green (BCG) economic model. My current studies are in the field of organic waste recycling technology, namely aquaponics, biaponics, and organic smart farming using nutrient recovery approaches, which are the integrations of environmental biotechnology, agriculture, and environmental science & engineering.

Selected Publications

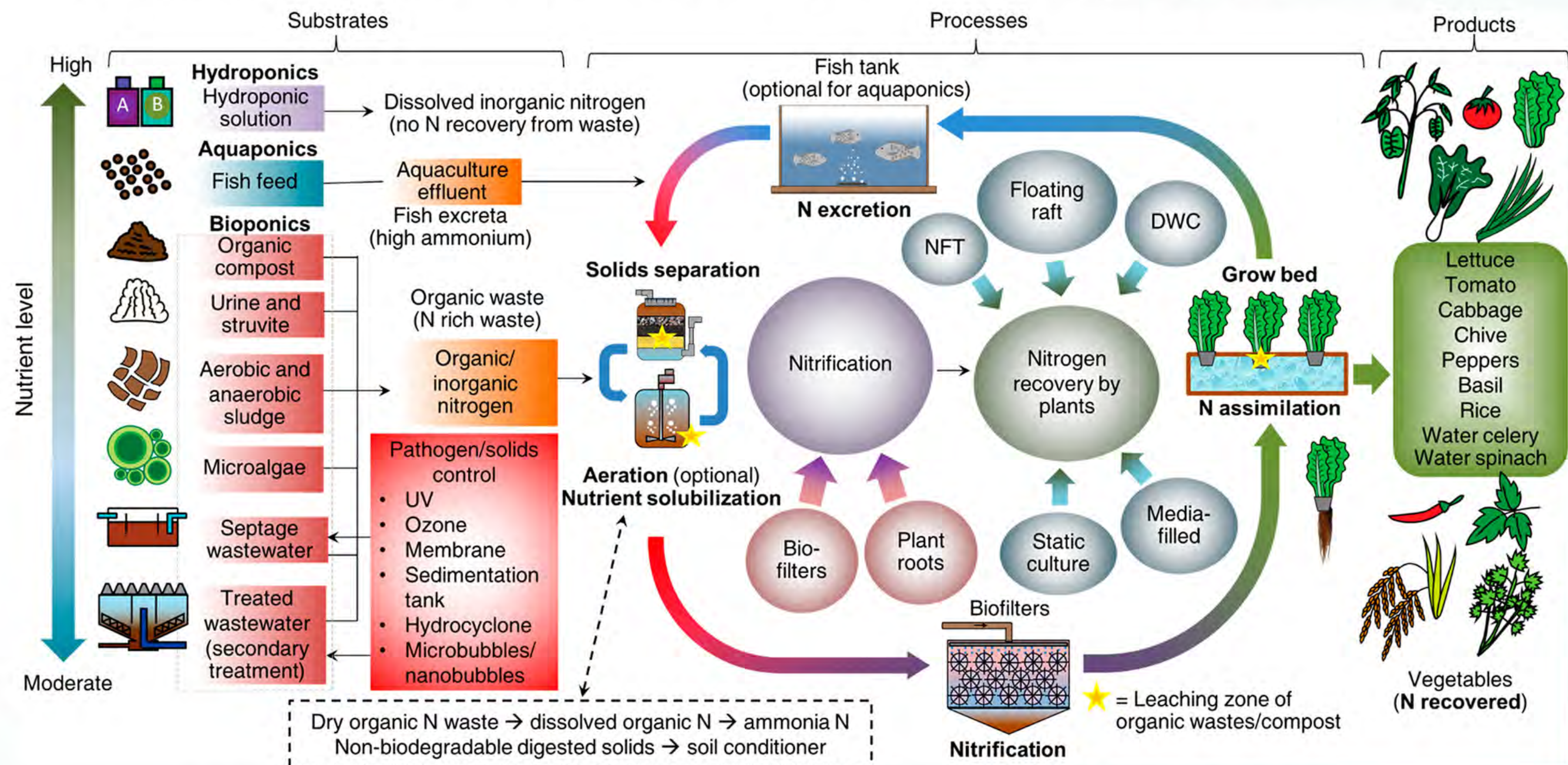
1. Wongkiew, S., Aksorn, S., Amnuaychaichana, S., Polprasert, C., Noophan, P. L., Kanokkantapong, V., ... & Khanal, S. K. (2024). Bioponic systems with biochar: Insights into nutrient recovery, heavy metal reduction, and microbial interactions in digestate-based biaponics. *Waste Management*, 178, 267-279.
2. Marcelino, K. R., Ling, L., Wongkiew, S., Nhan, H. T., Surendra, K. C., Shitanaka, T., ... & Khanal, S. K. (2023). Nanobubble technology applications in environmental and agricultural systems: Opportunities and challenges. *Critical Reviews in Environmental Science and Technology*, 53(14),

Selected Publications (cont.)

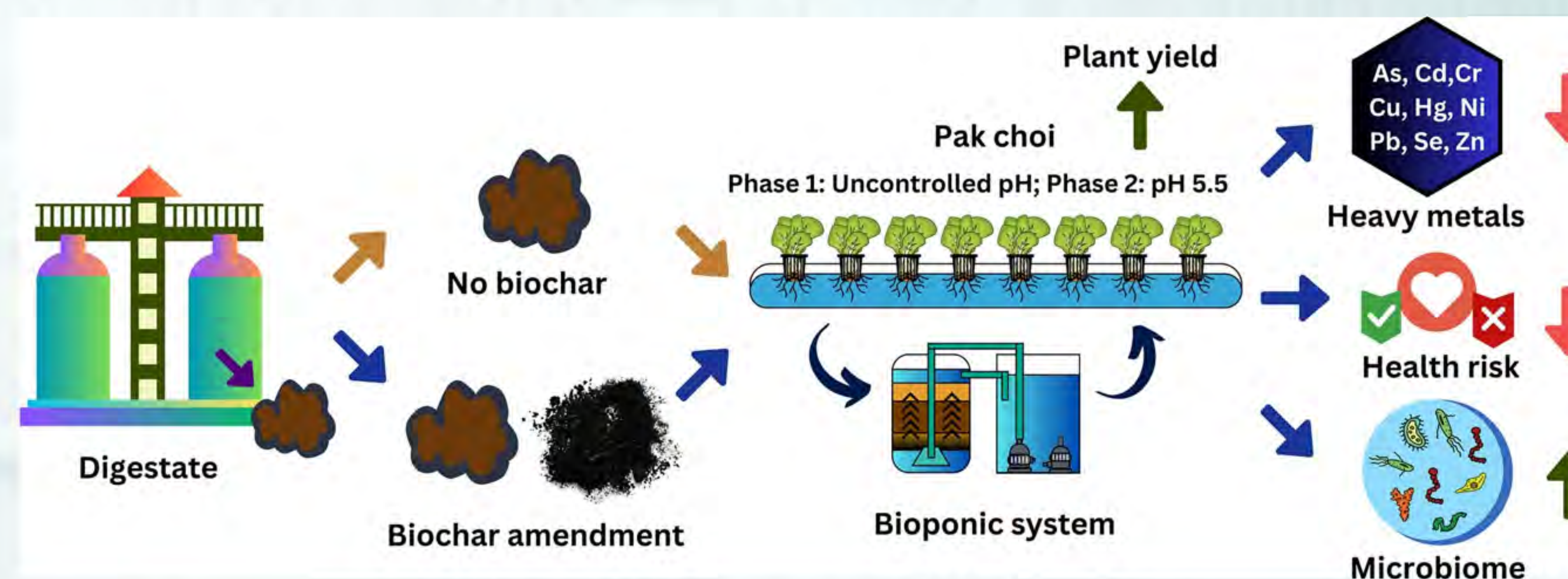
3. Chaiwong, C., Koottatep, T., Chirasuwannaphot, Y., Thanasrilungkul, C., Panchai, P., Chanamarn, W., ... & Polprasert, C. (2024). Novel Multifunctional Sewage Sludge-based Adsorbents For Treatment Of Municipal Wastewater. *Journal of Applied Science and Engineering (Taiwan)*, 27(9), 3127-3146.
4. Homyok, P., Rongsayamanont, C., Wongkiew, S., & Limpiyakorn, T. (2024). Sludge floc characteristics and microbial community in high-rate activated sludge and high-rate membrane bioreactor for organic recovery. *Science of The Total Environment*, 906, 167387.
5. Marcelino, K. R., Wongkiew, S., Shitanaka, T., Surendra, K. C., Song, B., & Khanal, S. K. (2023). Micronanobubble Aeration Enhances Plant Yield and Nitrification in Aquaponic Systems. *ACS ES&T Engineering*, 3(11), 2081-2096.
6. Suwannasung, K., Kanokkantapong, V., & Wongkiew, S. (2023). Modified air-Fenton with MIL-88A for chemical oxygen demand treatment in used coolant oil. *Environmental Science and Pollution Research*, 30(48), 105429-105439.
7. Wongkiew, S., Polprasert, C., Noophan, P. L., Koottatep, T., Kanokkantapong, V., Surendra, K. C., & Khanal, S. K. (2023). Effects of vermicompost leachate on nitrogen, phosphorus, and microbiome in a food waste bioponic system. *Journal of Environmental Management*, 339, 117860.
8. Aksorn, S., Kanokkantapong, V., Polprasert, C., Noophan, P. L., Khanal, S. K., & Wongkiew, S. (2022). Effects of Cu and Zn contamination on chicken manure-based bioponics: Nitrogen recovery, bioaccumulation, microbial community, and health risk assessment. *Journal of Environmental Management*, 311, 114837.
9. Wongkiew, S., Chaikaew, P., Takrattanasaran, N., & Khamkajorn, T. (2022). Evaluation of nutrient characteristics and bacterial community in agricultural soil groups for sustainable land management. *Scientific reports*, 12(1), 7368.
10. Wongkiew, S., Polprasert, C., Koottatep, T., Limpiyakorn, T., Surendra, K. C., & Khanal, S. K. (2022). Chicken manure-based bioponics: Effects of acetic acid supplementation on nitrogen and phosphorus recoveries and microbial communities. *Waste Management*, 137, 264-274.
11. Zhou, S., Marcelino, K. R., Wongkiew, S., Sun, L., Guo, W., Khanal, S. K., & Lu, H. (2022). Untapped potential: Applying microbubble and nanobubble technology in water and wastewater treatment and ecological restoration. *ACS ES&T Engineering*, 2(9), 1558-1573.

Selected Publications (cont.)

12. Wongkiew, S., Hu, Z., Lee, J. W., Chandran, K., Nhan, H. T., Marcelino, K. R., & Khanal, S. K. (2021). Nitrogen recovery via aquaponics–bioponics: Engineering considerations and perspectives. *ACS ES&T Engineering*, 1(3), 326-339.
13. Wongkiew, S., Koottatep, T., Polprasert, C., Prombutara, P., Jinsart, W., & Khanal, S. K. (2021). Bioponic system for nitrogen and phosphorus recovery from chicken manure: Evaluation of manure loading and microbial communities. *Waste Management*, 125, 67-76.



Conceptual diagram of aquaponic–bioponic systems for nitrogen recovery.



Bioponic systems with biochar

LECTURER

SUPAWIN WATCHARAMUL



Lecturer

☎ +66 2 218 5185

✉ Supawin.W@chula.ac.th

Ph.D. University of Newcastle upon Tyne 2005

M.Sc. Chulalongkorn University 1996

B.Sc. Chulalongkorn University 1992

Areas of Research Interest

Environmental biotechnology, Biodegradation and bioremediation, Environmental toxicology, and Soil microbial ecology

Professional Experiences

Lecturer, Chulalongkorn University, 1996 – present

Head, Department of Environmental Science, 2010-2014

Assistant Dean for Academic Affairs, Faculty of Science, 2015-2023

Assistant Dean for Research Affairs, Faculty of Science, 2007-2010

Assistant Dean for International Affairs, Faculty of Science, 2007-2010

Secretary, The Science Dean Consortium of Thailand, 2005-2007

Assistant Dean for Student Affairs, Faculty of Science, 1997-2000

Research Emphasis

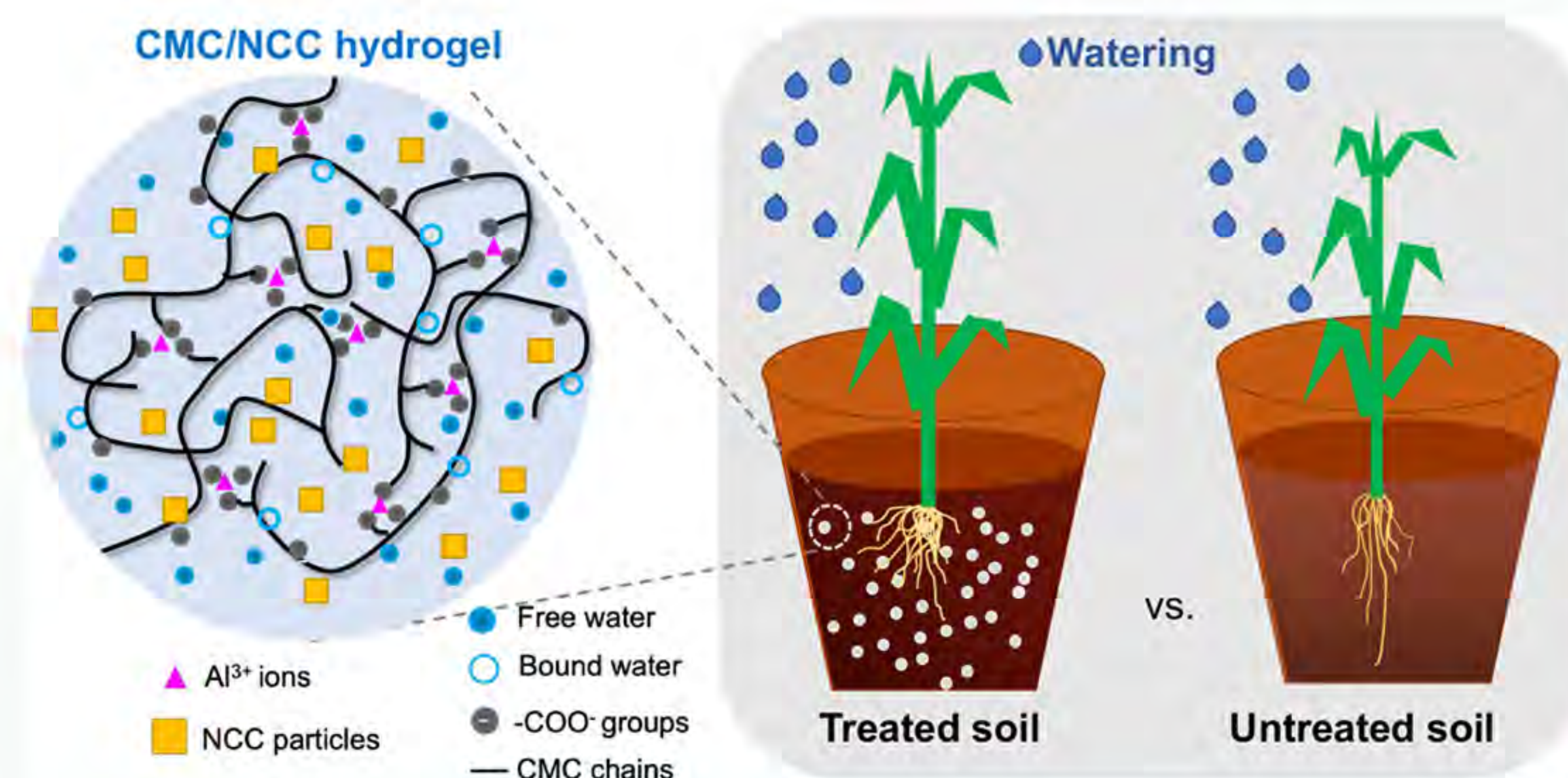
The plant cell wall (PCW) is a complex macromolecule comprising crystalline cellulose imbedded in matrix polysaccharides such as pectins, xylans and mannans. In view of the complex nature of the substrate, PCW-degrading microorganisms synthesize a vast array of different glycoside hydrolases and esterases, which act synergistically to elicit complete saccharification of this recalcitrant macromolecule. Typically, PCW-degrading bacteria express endo-acting mannanases, cellulases (endoglucanases and cellobiohydrolases), xylanases, polygalacturonic acid hydrolases (and lyases) rhamnogalacturan hydrolases (and lyases) and an array of biocatalysts that remove the side chains from decorated hemicellulases and pectins. In addition, PCW-degrading microorganisms express numerous iso-forms of all the major endo-acting and certain key side-chain cleaving enzyme species. These iso-enzymes are not derivatives of a specific protein but are encoded by extensive multigene families. My research emphasizes on the diversity of these cellulases in Thai rice-field soils as determined using environmental cloning techniques in which community DNA extracted directly from a range of Thai soils has been amplified using PCR primers designed to target cellulases which belong to Glycosyl Hydrolase Families. Following construction of a clone library in pCR-TOPO, the clones were screened using a combination of denaturing gradient gel electrophoresis (DGGE) and restriction digest analysis to identify unique clones. Unique clones were sequenced and analyzed phylogenetically. These sequences have been used to design nucleic acid probes and these have been used in combination with phospholipid fatty acid analysis (PLFA), BIOLOG and microbial biomass analysis to monitor changes in the size, activity and diversity of microbial communities during the decomposition of rice straw. These highlights are providing new insights into the microbiology of decomposition in tropical soils and provide exciting new opportunities for the biotechnological exploitation of cellulases in Thailand.

Measure of Esteem

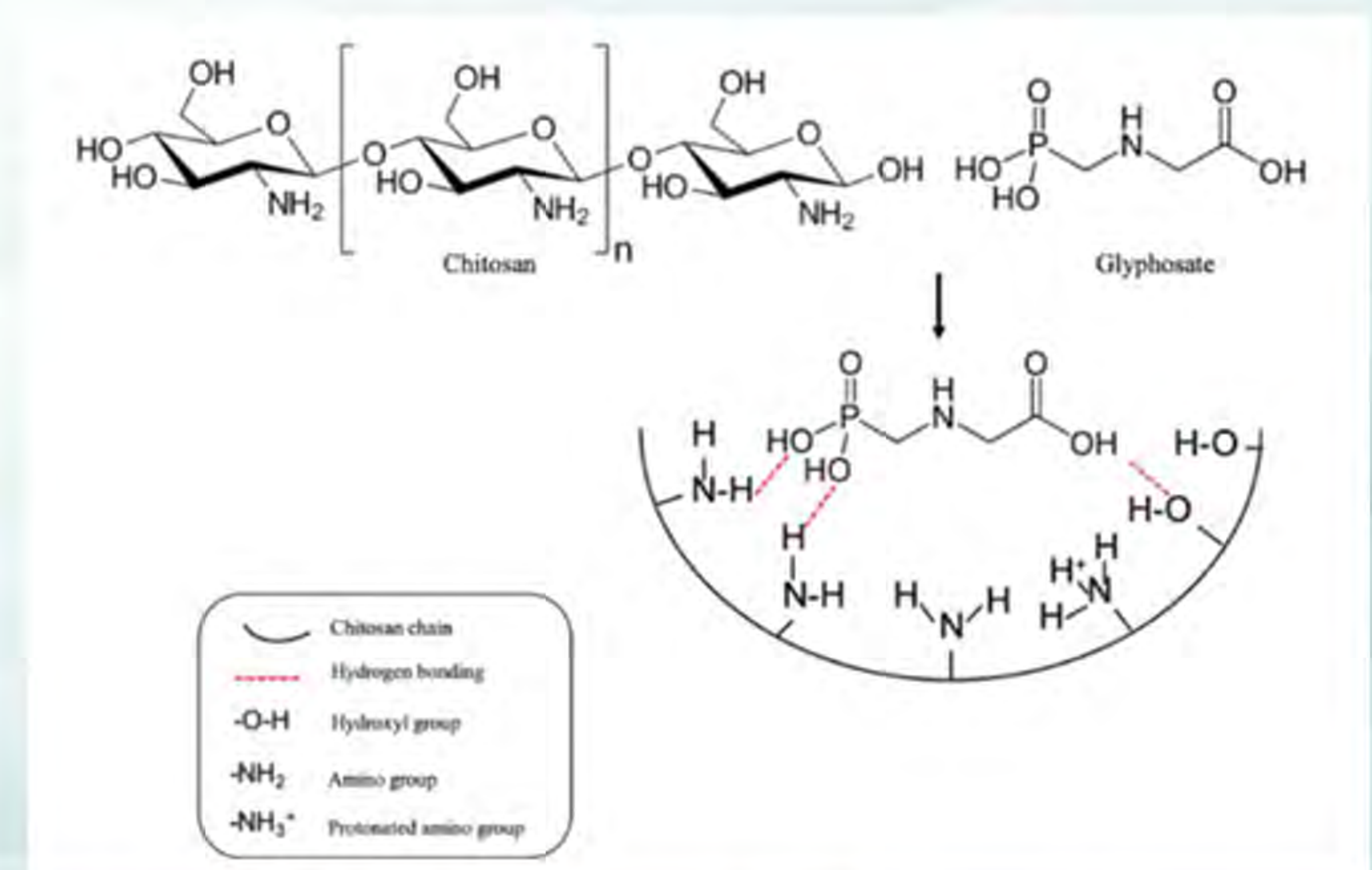
1. University Recognition Award for Student Affairs Excellence, Chulalongkorn University, 2018
2. Faculty Recognition Award for Student Affairs Excellence, Faculty of Science, 2012

Selected Publications

1. Watcharamul, S., Lerddamrongchai, S., Siripongpreda, T., Rodtassana, C., Nuisin, R., & Kiatkamjornwong, S. (2022). Effects of carboxymethyl cellulose/nano-calcium carbonate hydrogel amendment of loamy sand soil for maize growth. *ACS Agricultural Science & Technology*, 2(5), 1071-1080.
2. Nuisin, R., Siripongpreda, T., Watcharamul, S., Siralertmukul, K., & Kiatkamjornwong, S. (2022). Facile syntheses of physically crosslinked carboxymethyl cellulose hydrogels and nanocomposite hydrogels for enhancing water absorbency and adsorption of sappan wood dye. *ChemistrySelect*, 7(10), e202104598.
3. Siralertmukul, K., Yuenyaw, N., Watcharamul, S., & Nuisin, R. (2021). Facile Fabrication of Chitosan/Starch Composite Films with Fumed Silica as an Additive. *Engineering Journal*, 25(9), 45-53.
4. Saelim, T., Sairiam, S., Siralertmukul, K., Watcharamul, S., & Nuisin, R. (2020). Chitosan beads as the adsorbent for glyphosate removal from an aqueous solution. *Journal of Metals, Materials and Minerals*, 30(3).



Effects of Carboxymethyl Cellulose/Nano-Calcium Carbonate Hydrogel Amendment of Loamy Sand Soil for Maize Growth
(Watcharamul et al., 2022)



Swelling capacity curve for water adsorption by the chitosan beads. Data are shown as the mean + SD, derived from 3 replicates
(Saelim et al., 2020)

CHIDSANUPHONG CHART-ASA



Lecturer

☎ +66 2 218 5192

✉ Chidsanuphong.C@chula.ac.th

Ph.D. The University of North Carolina at Chapel Hill	2014
M.Sc. Mahidol University	2005
B.Sc. Thammasat University	2001
B.Sc. Sukhothai Thammathirat Open University	2024

Areas of Research Interest

Environmental data analysis and Environmental burden of disease assessment

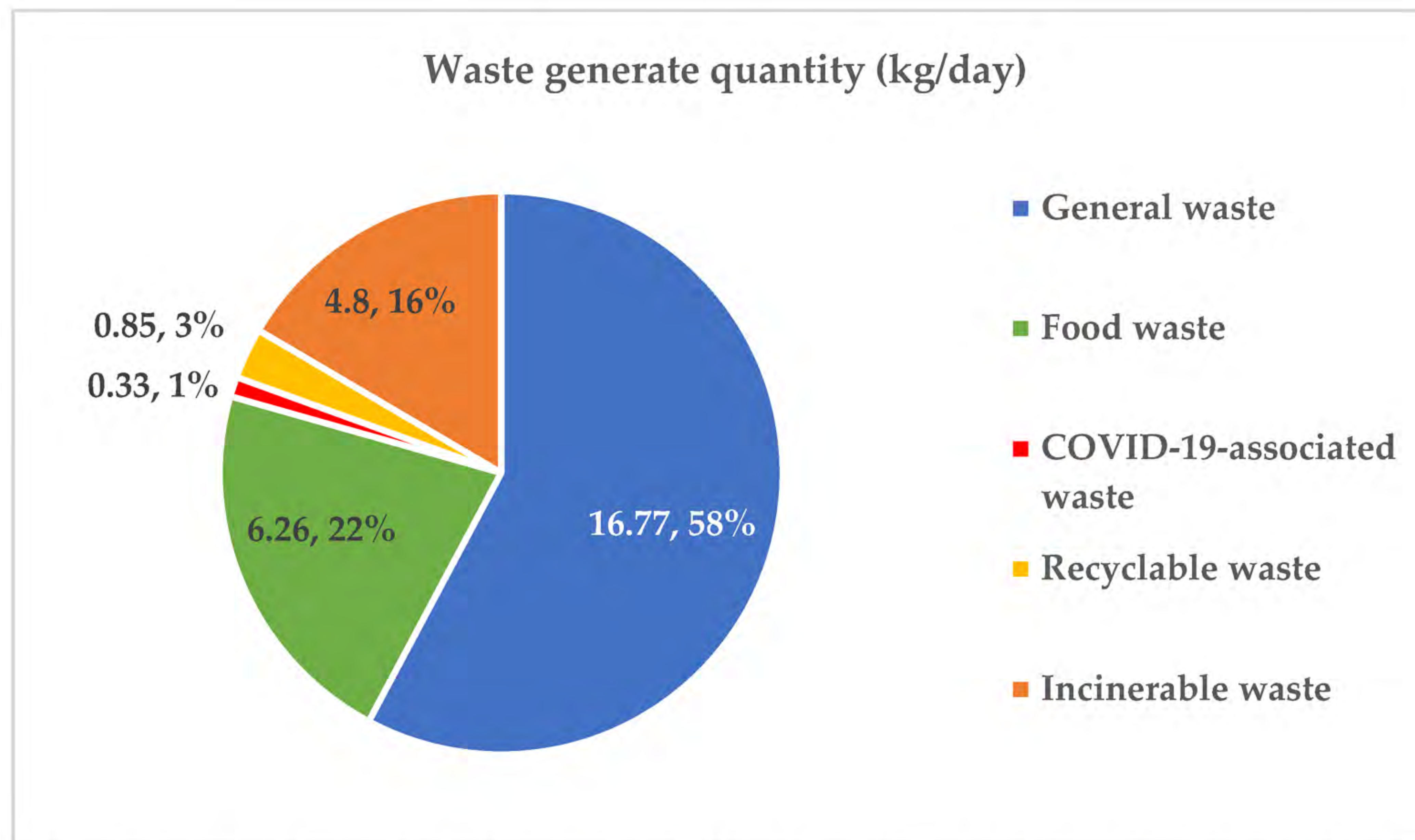
Professional Experiences

Lecturer, Chulalongkorn University, 2018-present

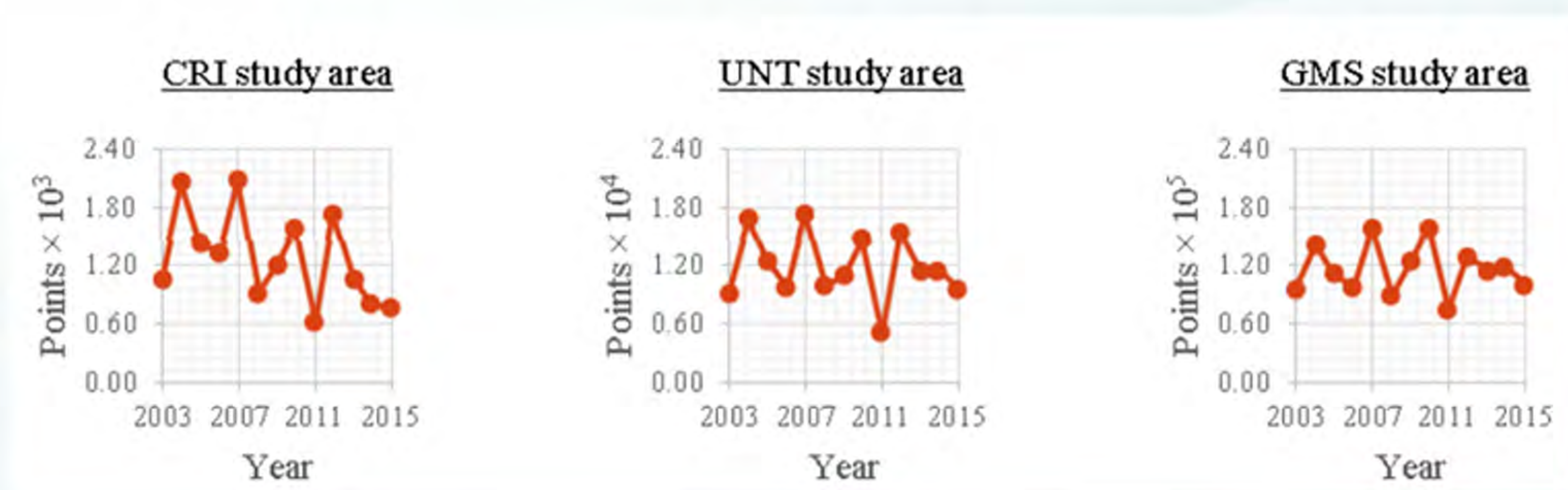
Lecturer, Mae Fah Luang University, 2014-2018

Selected Publications

1. Kwanyun, P., Praditwattana, N., Phutthimethakul, L., Chart-Asa, C., Intaravicha, N., & Supakata, N. (2023). Characteristics of Soil Amendment Material from Food Waste Disposed of in Bioplastic Bags. *Fermentation*, 9(2), 97.
2. Toolkiattiwong, P., Chaikaew, P., & Chart-Asa, C. (2022). Comparative Human-Ecotoxicological Impacts and Willingness to Pay: A Case of Pesticide Transition from Paraquat to Atrazine in Sweet Corn Cultivation in Thailand. *EnvironmentAsia*, 15.
3. Chart-asa, C. (2021). Spatial-temporal patterns of MODIS active fire/hotspots in Chiang Rai, upper northern Thailand and the greater mekong subregion countries during 2003-2015. *Applied Environmental Research*, 43(3), 121-131.
4. Tor-ngern, P., Chart-asa, C., Chanthorn, W., Rodtassana, C., Yampum, S., Unawong, W., ... & Hasselquist, N. J. (2021). Variation of leaf-level gas exchange rates and leaf functional traits of dominant trees across three successional stages in a Southeast Asian tropical forest. *Forest Ecology and Management*, 489, 119101.



Overview of the distribution of the five types of waste generated.



Yearly sums of MODIS active fires/hotspots in the CRI, the UNT, and the GMS study areas during the burning seasons in 2003-2015.

JATUWAT SANGSANONT



Lecturer

☎ +66 2 218 5193

✉ Jatuwat.S@chula.ac.th

Ph.D. University of Tokyo 2011

M.Eng. University of Tokyo 2008

B.Eng. Chulalongkorn University 2006

Areas of Research Interest

Water disinfection, Microbial risk assessment, Microbial source tracking,
Health-related water microbiology

Professional Experiences

Lecturer, Chulalongkorn University, 2019 – present

Postdoctoral Researcher, University of Colorado Boulder, 2017-2018

Postdoctoral Researcher, University of Tokyo, 2012-2017

Research Emphasis

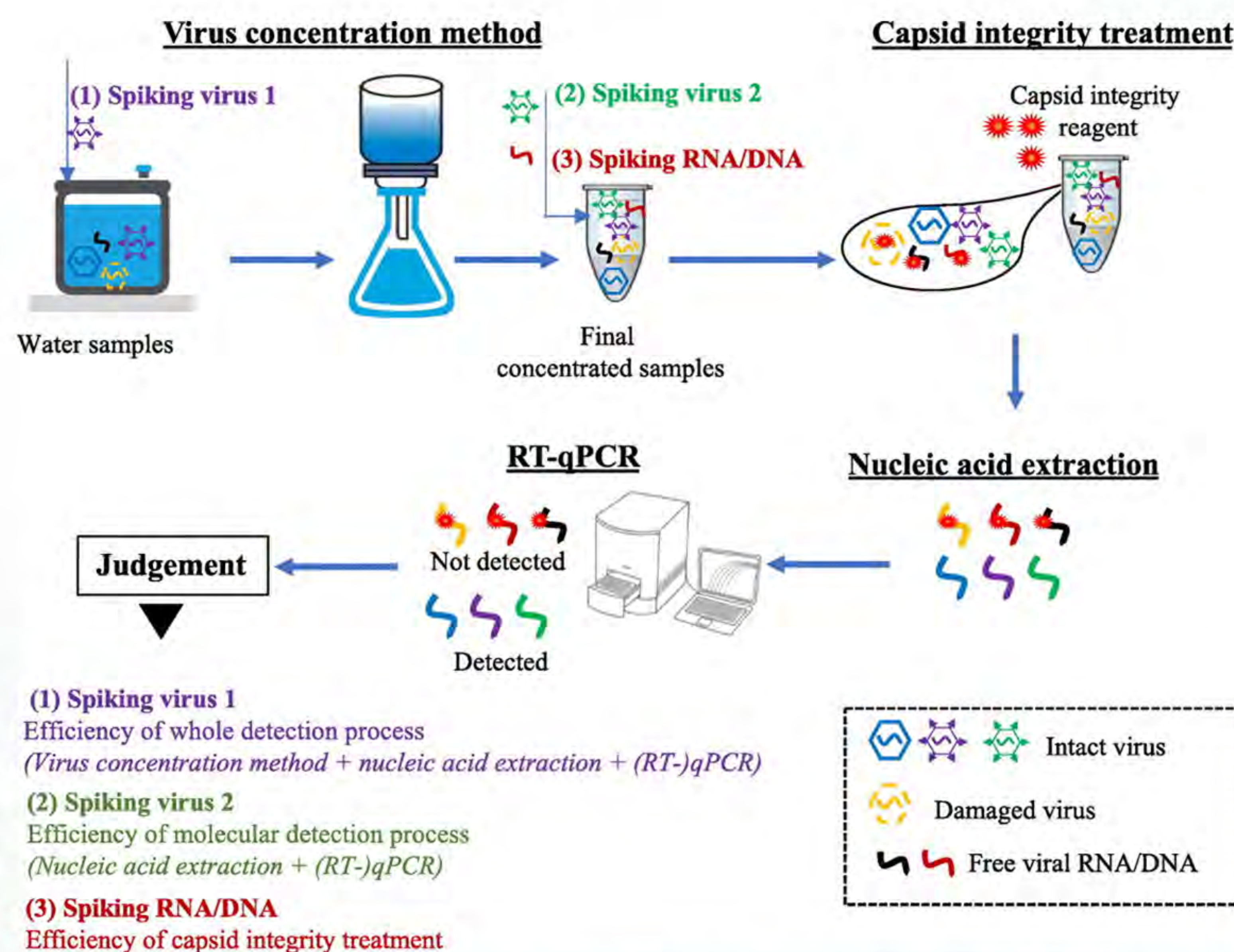
Jatuwat's research focused on wastewater-based epidemiology for waterborne pathogens, water disinfection, and microbial risk assessment. His study aims to prevent illnesses associated with human exposure to viral contaminated water and to quantify disease risks and burdens.

Selected Publications

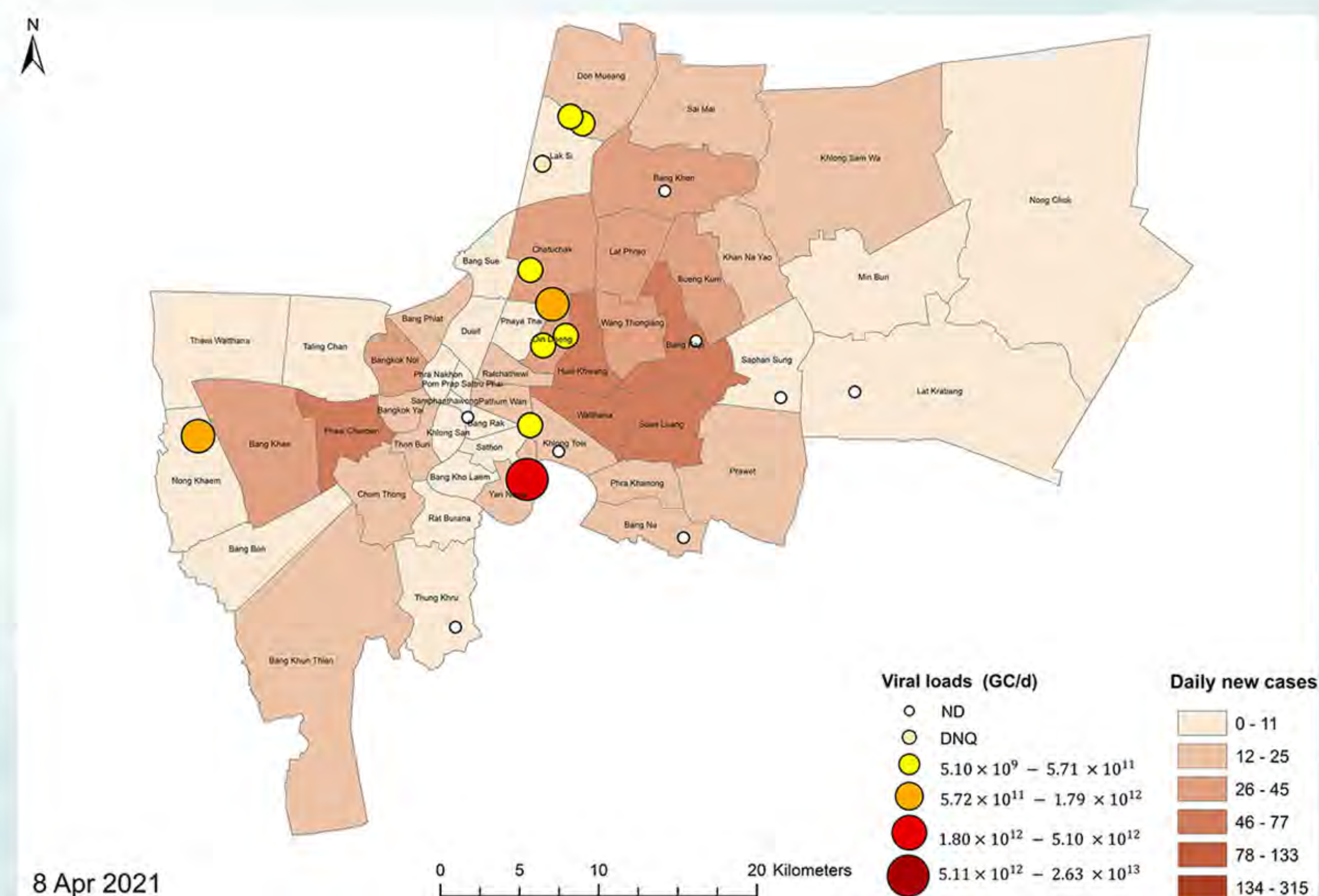
1. Oh, Y., Sangsanont, J., Woo, H., Boczek, L. A., Linden, K. G., & Ryu, H. (2024). Inactivation efficacy and mechanisms of wavelength-specific UV sources for various strains of *Legionella pneumophila* serogroup 1. *Science of The Total Environment*, 907, 167781.
2. Shrestha, S., Malla, B., Sangsanont, J., Sirikanchana, K., Ngo, H. T. T., Inson, J. G. M., ... & Haramoto, E. (2024). Detection of enteroviruses related to hand foot and mouth disease in wastewater of Asian communities. *Science of The Total Environment*, 912, 169375.
3. Sangsanont, J., Rattanakul, S., Makkaew, P., Precha, N., Rukthanapitak, P., Sresung, M., ... & Sirikanchana, K. (2023). Wastewater monitoring in tourist cities as potential sentinel sites for near real-time dynamics of imported SARS-CoV-2 variants. *Science of The Total Environment*, 860, 160317.

Selected Publications (Cont.)

4. Canh, V. D., Liu, M., Sangsanont, J., & Katayama, H. (2022). Capsid integrity detection of pathogenic viruses in waters: Recent progress and potential future applications. *Science of The Total Environment*, 827, 154258.
5. Intaraburt, W., Sangsanont, J., Limpiyakorn, T., Ruangrassamee, P., Suttinon, P., & Suwannasilp, B. B. (2022). Feasibility Study of Water Reclamation Projects in Industrial Parks Incorporating Environmental Benefits: A Case Study in Chonburi, Thailand. *Water*, 14(7), 1172.
6. Rodríguez, R. A., Navar, C., Sangsanont, J., & Linden, K. G. (2022). UV inactivation of sewage isolated human adenovirus. *Water Research*, 218, 118496.
7. Sangsanont, J., Rattanukul, S., Kongprajug, A., Chyerochana, N., Sresung, M., Sriporatana, N., ... & Sirikanchana, K. (2022). SARS-CoV-2 RNA surveillance in large to small centralized wastewater treatment plants preceding the third COVID-19 resurgence in Bangkok, Thailand. *Science of The Total Environment*, 809, 151169.
8. Sangsanont, J., Kurisu, F., Furumai, H., & Katayama, H. (2020). Ozone disinfection kinetics of poliovirus 1 determined by cell culture assay, RT-qPCR and ethidium monoazide qPCR reduction in a continuous quench-flow reactor. *Journal of Applied Microbiology*, 129(6), 1530-1540.



Graphical abstract of Capsid integrity detection of pathogenic viruses in waters: Recent progress and potential future applications



Graphical abstract of SARS-CoV-2 RNA surveillance in large to small centralized wastewater treatment plants preceding the third COVID-19 resurgence in Bangkok, Thailand

AKARAPAN ROJJANAPINUN



Lecturer

☎ +66 2 218 5181

✉ Akarapan.R@chula.ac.th

Ph.D. University of Massachusetts Lowell	2021
M.Sc. University of Massachusetts Lowell	2016
B.Sc. Chulalongkorn University	2012
Certificate of Completion in Environmentally Sustainable Health Systems, Valaya Alongkorn Rajabhat University	2024

Areas of Research Interest

Wastewater-based Epidemiology (WBE), Biosensor development for environmental monitoring, Low-cost Water Treatment Technology

Professional Experiences

Lecturer, Chulalongkorn University, 2024 – Present

Industrial Postdoctoral Researcher, National Nanotechnology Center (NANOTEC), 2023 - 2024

Postdoctoral Researcher, University of Massachusetts Lowell, 2021 - 2022

Research Assistant, University of Massachusetts Lowell, 2016 – 2022

Teaching Assistant, University of Massachusetts Lowell, 2016 – 2021

Environmental Scientist (EIA), Thai Environmental Technique Limited, 2012 - 2013

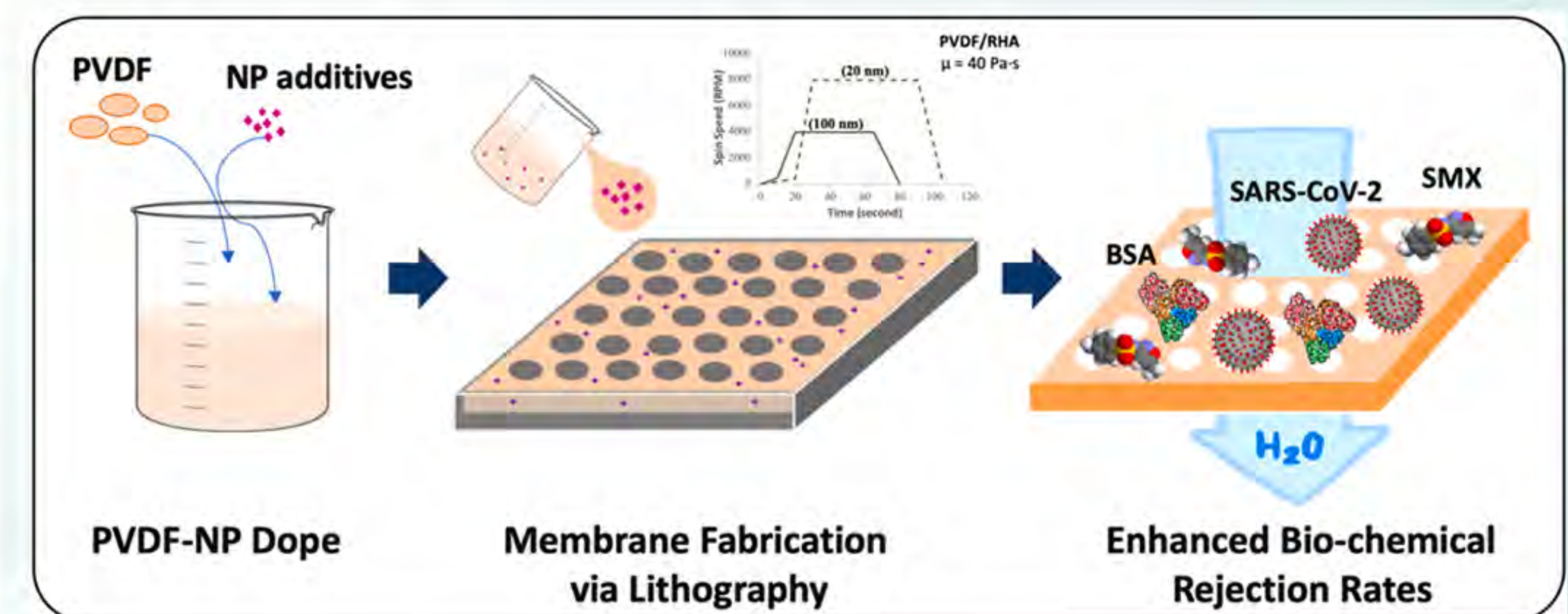
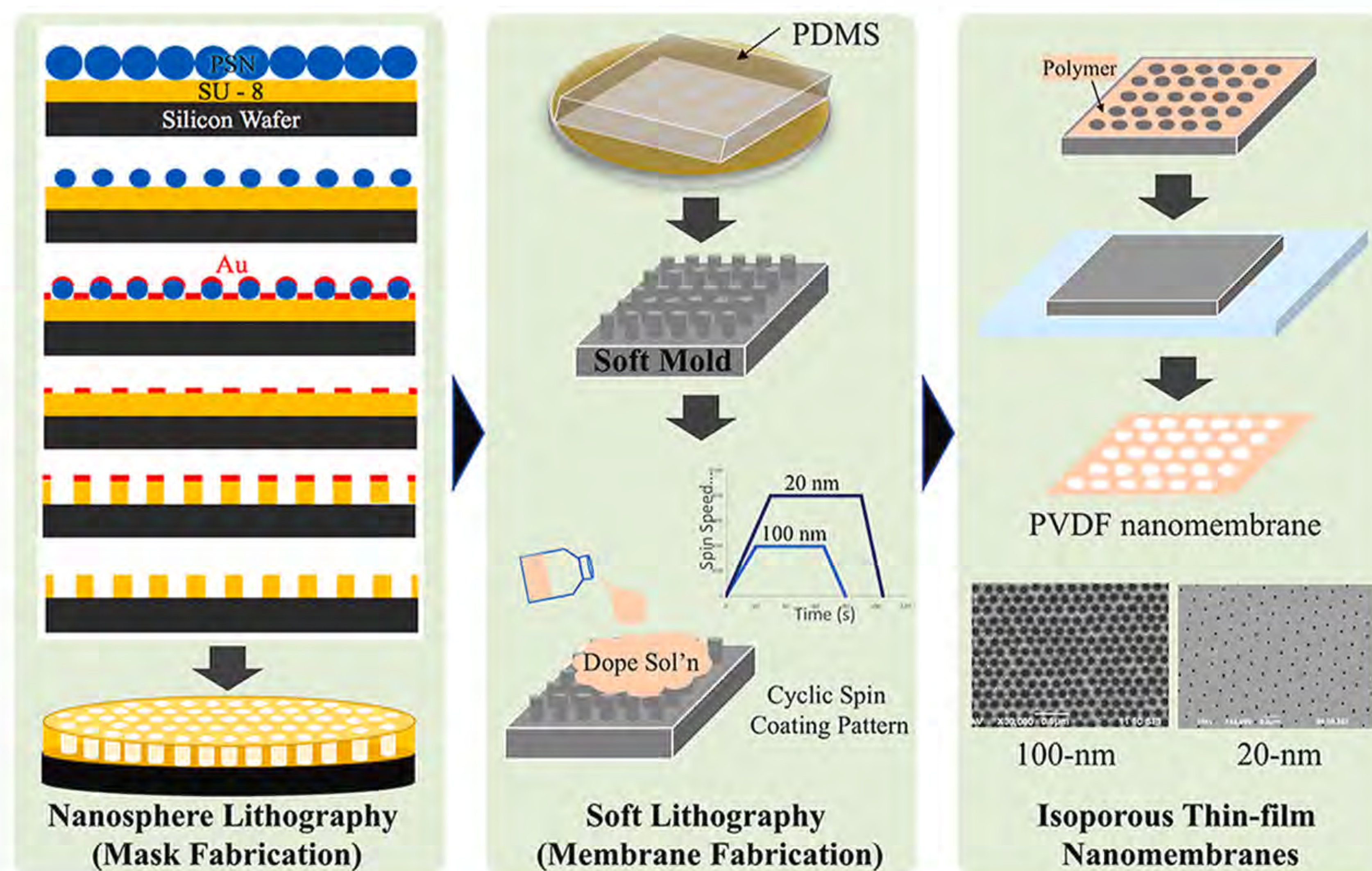
Research Emphasis

Her research focuses on environmental and health issues, particularly the health effects of emerging contaminants, the influence of human-environment interactions on water systems, and advancements in water treatment technologies.

She has been developing nanocomposite membranes using hybrid lithography for the removal of organic micropollutants from water. These nanocomposite membranes are enhanced with novel materials that provide superior durability and absorptive properties, with potential applications in standard filtration processes and the photocatalytic degradation of per- and polyfluorinated alkyl substances (PFAS) and antimicrobials. In addition, the lithographic approaches were further used to functionalize quartz crystal microbalance biosensors for wastewater-based epidemiology (WBE) applications. Currently, her interest lies in adapting WBE tools to detect pathogens and drug abuse in raw sewage samples. WBE can be highly cost-efficient as it allows for tracking the prevalence of emerging infections and estimating drug abuse consumption by testing a few wastewater samples. Monitoring drug use and the transmission of pathogens through WBE can correlate with the health lifestyles of community residents.

Selected Publications

1. Rojjanapinun, A., Pagsuyoin, S. A., Perman, J., & Sun, H. (2021). Low-cost nanofabrication of isoporous nanomembranes using hybrid lithography. *Polymer Testing*, 102, 107316.
2. Rojjanapinun, A., & Pagsuyoin, S. A. (2021). Rice husk ash and Zr-MOF nanoparticles improve the properties and ultrafiltration performance of PVDF nanomembranes. *Results in Materials*, 12, 100234.
3. Shi, X., Sadeghi, P., Lobandi, N., Emam, S., Abrishami, S. M. S., Martos-Repath, I., ... & Sun, N. X. (2023). Novel, accurate pathogen sensors for fast detection of SARS-CoV-2 in the aerosol in seconds for a breathalyzer platform. *Biosensors and Bioelectronics: X*, 14, 100369.
4. Rojjanapinun, A., Pagsuyoin, S., & Luo, J. (2019, April). Occurrence of Pharmaceuticals in WWTP Influent. In *2019 Systems and Information Engineering Design Symposium (SIEDS)* (pp. 1-5). IEEE.



Rice husk ash and Zr-MOF nanoparticles improve the properties and ultrafiltration performance of PVDF nanomembranes

Low-cost nanofabrication of isoporous nanomembranes using hybrid lithography

KWANMANAS MEETHAVORN



Lecturer

☎ +66 2 218 5181

✉ Kwanmanas.M@chula.ac.th

Ph.D.	Chulalongkorn University	2021
M.Sc.	The University of Nottingham	2013
B.Eng.	Chulalongkorn University	2011

Areas of Research Interest

Sustainability-related Policy, Environmental Management, Sustainability, Circular Economy, ESG risks management

Professional Experiences

Nov '22 - May '24

Consultant in Sustainability and Climate Center of Excellence, Deloitte (Thailand)

I worked closely with Stock Exchange of Thailand (SET) to facilitate listed companies in developing their sustainability approaches in the organization through training and workshop. The examples of training and workshop are sustainability report development complying with national and international standards (i.e. form 56-1 one report and GRI) as well as ESG risks management including emerging risks and climate risks. I also do research and update sustainability-related policies to support advisory service for clients in various industries such as carbon-pricing mechanism, CBAM, energy transition, Thailand Taxonomy.

Mar - Oct '22

Researcher, NXPO (Office of National Higher Education Science Research and Innovation Policy Council)

I was a team member in national water management project to reform water management structure working with TDRI and several relevant ministries. Besides, I experienced in CIRCO - circular design workshop from the Netherlands - collaborating with Global Compact Network Thailand (GCNT) to enhance sustainable products/services in Thai's factories.

Research Emphasis

I am interested in public policy research for environmental management including waste management, circular economy, decarbonization but not limited.

With my passion, I would like to explore waste management/up-cycling in garment/fashion industry in the basis of circular economy principal for sustainable fashion. Additionally, I am also fascinated in sustainable tourism especially environmental management in hospitality sectors.

Selected Publications

Kwanmanas Meethavorn, Chanathip Pharino (2021) Why Should Different City Characteristics Customize the Rate of Pollution Charge? Evidence of Factors Affecting Willingness-to-pay for Wastewater Management in Thailand, Applied Environmental Research, Vol 43, No.4, 2021

Articles:

Co-author - Articles: Coal Power Plant: Coal situation and technology of coal as a fuel by Chulalongkorn Engineering (4 chapters)



Published in 2024

Department of Environmental Science

Faculty of Science, Chulalongkorn University

254 Payathai Road, Wang Mai, Pathumwan, Bangkok 10330 Thailand

Tel: +66 2 218 5181-2

Email: EnviSciCU@gmail.com

www.envisci.sc.chula.ac.th

<https://www.facebook.com/chulatox>