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EDUCATION

2012-2018	Ph.D.	Graduate Institute of Environmental Engineering, National Taiwan University, Taiwan
2002-2004	M.S.	Graduate Institute of Environmental Engineering, National Taiwan University, Taiwan
1995-1999	B.A.	Department of Water Resources and Environmental Engineering, Tamkang University, Taiwan

EMPLOYMENT

2018-present	Postdoctoral Researcher •Graduate Institute of Environmental Engineering, National Taiwan University
2006-2011	Technician •Department of Environmental Protection, Taipei City Government
1999-2006	Assistant Researcher • Institute of Environment and Resources (IER)

HONORS & AWARDS

2019	MOST Research Award for Postdoc. Fellow
2019	MOST Postdoctoral Research Abroad Program Award
2018	Taiwan Association of Environmental and Resource Economics Award for the Best Thesis
2017	MOST Graduate Students Study Abroad Program Award

RESEARCH INTEREST

I am driven by trying to close the gap between the natural system and the human system. This drive has seen my focus on the intersection of the human system and natural system, with an aim to mitigate environmental and social risks and optimize potential benefits. My research has been working in two key areas: 1. Modeling and mapping the changes in natural ecosystems and developing well-prioritized strategies to ensure our natural resources are used sustainably. 2. Reducing the threats posed by food, energy, and water nexus through indicators investigation, solutions exploration, and tools development.

RESEARCH HIGHLIGHTS

Theme one: Modeling and mapping the changes in natural ecosystems and developing well-prioritized strategies to ensure our natural resources are used sustainably.

Ecosystem services and sustainable development: The maintenance of the total natural capital stocks has received increased attention worldwide for its ability to achieve sustainable development. However, the claim that ecosystem services contribute to sustainability has not been sufficiently verified. In this study, we explore how major ecosystem functions affect food, energy, and water sustainability. This research addresses the importance of ecosystems and services provided, which sustainability depends on. The results show that ecosystem services are indispensable keys to successfully achieving sustainable development goals.

Understanding synergies and trade-offs between water and energy nexus: This study analyzes the links between water-energy nexus at a restored landfill site in Taipei City, Taiwan. The study tracks leachate and methane production at the site over the time periods when the landfill was actively receiving waste and after its closure and since its restoration. The results of model simulation of leachate yield and methane collection under different conditions show that energy and water production changed considerably during the time span under consideration. We identify a synergy between energy generation and water volume during the operation phase, and show that no trade-offs between energy generation and water volume were observed during any of the phases studied.

Embedding scarcity in urban water tariffs: The objective of this work is to design a water-pricing model that better signals the value of water scarcity by considering water supply and demand at the same time. The case **study** of the Taipei Water Resource Domain, Taiwan is used to illustrate the method. By calculating the supply, demand, and budget of water resources in northern Taiwan, this study also determines the visible spatial distribution of water scarcity. This demonstration illustrates a pathway for the implementation of a proposed scarcity-based pricing policy as a signal for users to adjust their water consumption in a proactive manner.

Theme two: Reducing the threats posed by food, energy, and water nexus through indicators investigation, solutions exploration, and tools development.

Developing indicators for the monitoring of the sustainability of food, energy, and water: In this study, a transparent methodology that can be used to develop a set of newly linked indicators that can be used to compare water-food-energy sustainability in different geographical areas is developed. By focusing on providing a general picture of the food-energy-water sustainability, this study proposes an indicator on a national scale. The resulting “Linked Indicators for FEW AvailabilitY” (LIFEWAY) is an integrated indicator that

measures the sustainability achievements for a country. This study provides an overview of the FEW sustainability for 42 developed and developing countries. It can be used to analyze specific issues, and allows regional and national solutions to be developed.

Measuring urban food-energy-water nexus sustainability: This study develops an indicator system to guide the implementations and optimize urban sustainability. A qualitative approach is employed to form the priority strategies in in four selected cities: Amsterdam, Eindhoven, Taipei, and Tainan. The results show that renewable energy plays an essential role in the food-energy-water nexus. In addition, we also observed that future work should focus on technological innovation. The results can guide managers to develop possible solutions that ensure resources are applied successfully according to the visions of multiple perspectives and help the relevant ministries to improve future consultation plans.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. Mei-Hua Yuan, Pei-Te Chiueh, Shang-Lien Lo (2021), " Measuring urban food-energy-water nexus sustainability: Finding solutions for cities." Science of The Total Environment 752 (1920): 141954. (SCI)
2. • Mei-Hua Yuan, Shang-Lien Lo (2020), "Ecosystem services and sustainable development: Perspectives from the food-energy-water nexus." Ecosystem Services 46. (SCI)
3. • Mei-Hua Yuan, Shang-Lien Lo, (2020) " Developing indicators for the monitoring of the sustainability of food, energy, and water." Renewable and Sustainable Energy Reviews 109565. (SCI)
4. • Mei-Hua Yuan, Pei-Te Chiueh, Shang-Lien Lo, (2019) " Understanding synergies and trade-offs between water and energy production at landfill sites." Science of The Total Environment 687 (10), 152-160. (SCI)
5. • Mei-Hua Yuan, Pei-Te Chiueh, Shang-Lien Lo, (2019) " Embedding scarcity in urban water tariffs: mapping supply and demand in North Taiwan." Environmental Earth Sciences 78(10), 325. (SCI)
6. • Xin Liua, Yebao Wang, Robert Costanza, Ida Kubiszewski, Ning Xu, Meihua Yuan, Ruiying Geng, (2019) "The value of China’s coastal wetlands and seawalls for storm protection" Ecosystem Services 36. (SCI)
7. • Xin Liu, YebaoWang, Robert Costanza, Ida Kubiszewski, Ning Xu, Zhiqiang Gao, Meng Liu, Ruiying Geng, Mei-Hua Yuan, (2019) "Is China's coastal engineered defences valuable for storm protection? " Science of The Total Environment 657, 109-107. (SCI)
8. • Liu, Xin, Yebao Wang, Robert Costanza, Ida Kubiszewski, Ning Xu, Zhiqiang Gao, Meihua Yuan, Ruiying Geng, He Chen, and Xiaoke, (2019) "Rice Paddy Fields’ Hidden Value for Typhoon Protection in Coastal Areas." Ecological Indicators 107, 105610. (SCI)

9. • Mei-Hua Yuan, Shang-Lien Lo, Chih-Kai Yang, (2017) "Integrating ecosystem services in terrestrial conservation planning." Environmental Science and Pollution Research 24(13), 12144-12154. (SCI)
10. • Mei-Hua Yuan, Shang-Lien Lo, Yu-Chien Cheng, (2016) "The ecological value of liugongjun restoration: Assessment for cultural assets." Journal of the Chinese Institute of Civil and hydraulic engineering 28(3), 195-203. (EI)