Industrial University of Ho Chi Minh City

SDG 14
LIFE BELOW WATER

IUH RANKINGS MANAGEMENT

SDG 14

LIFE BELOW WATER

MARINE RESOURCES AND ENVIRONMENT

THE Sustainability Impact Ratings 2027

Reporting year	Metrics	Indicators
2025	4	15

IUH contributions to aquatic ecosystem conservation through education, research, sustainable water management and community collaboration.

NATURAL RESOURCES GROUP

SDG Working Group • 7 members



Đỗ Hoài Vũ

GROUP LEADER

Vice Dean · Faculty of Fundamental Sciences



Bùi Thị Hảo

MEMBER · VICE DEAN

Faculty of Law and Political Sciences



Cao Thu Thủy

MEMBER · LECTURER

Institute of Environmental Science, Engineering and Management - IESEM



Nguyễn Khôi Nguyên

MEMBER · LECTURER

Faculty of Automotive Engineering Technology



Đinh Thị Hoa

MEMBER · LECTURER

Faculty of Foreign Languages



Lê Thị Hồng Nhung

MEMBER · SPECIALIST

Office of Testing and Quality Assurance



Lý Xuân Hải

MEMBER · SPECIALIST

Office of Testing and Quality assurance

Industrial University of Ho Chi Minh City

GROUP 14.2 – Supporting aquatic ecosystems through education

SDG 14 LIFE BELOW WATER

14.2.1 Fresh-water ecosystems (community outreach)

Community outreach programmes on fresh-water ecosystems, water management and conservation.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 2: Promoting Community Connection and Service	Expanding community connection activities towards active citizenship (Enhancing social and environmental awareness activities; Community satisfaction rating)	Develop and organize a series of free green training workshops, webinars, and extracurricular classes for the local community, high school students, and nearby residents on freshwater source protection, household water storage and conservation techniques, and urban canal ecosystem conservation.	Implementation Plan for Freshwater Ecosystem Education Series 2025; Set of lecture slides, guidance materials, and promotional videos; Roster of external participants and certificates of completion.	Institute of Environmental Science, Engineering and Management, Youth Union – Student Association, Office of Communications and Admissions	Q1 – Q4/2025
Thrust 1: Pioneering in Education and Research & Thrust 2: Serving Community	Promoting technology transfer & Developing pro-bono advisory and professional services (Free project count)	Transfer technical documents and guidelines to local farmers and agricultural producers on applying water-saving irrigation technologies (drip irrigation, soil moisture sensors) to reduce groundwater depletion and protect surface water quality.	Technical guidelines on sustainable irrigation; Handover minutes and roster of trained farming households/cooperatives.	Institute of Biotechnology and Food Technology, Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q2 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Diversifying communication channels and content (News items count; Social media interaction counts)	Produce a series of infographics, short video clips, and the digital handbook "Protecting Domestic Water Sources - Keeping Hometown Watercourses Clean" distributed free of charge on the IUH web portal, social media fanpages, and grassroots radio networks.	Public URL link for the dedicated open educational resource portal on freshwater ecosystems; Digitized communication media package freely accessible to the public.	Information and Communication Center, Institute of Environmental Science, Engineering and Management	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Encouraging student community service participation (Campaign count; Community satisfaction rating)	Organize the "Water Day Outreach" science experience event on campus welcoming high school students to experience biological water filtration models and conduct water cleanliness testing experiments.	Event dossier for Water Day Outreach 2025 (plan, invitation letters to high schools, pre- and post-test student knowledge survey forms, documentary photo report).	Youth Union – Student Association, Institute of Environmental Science, Engineering and Management, Office of Communications and Admissions	Q1 & Q3/2025
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects (Number of beneficiaries; Community satisfaction rating)	Synthesize beneficiary data from external participants in 2025 freshwater ecosystem education programmes; conduct knowledge absorption evaluation surveys and compile a summary report for THE Portal submission (confirming 100% free of charge).	Summary Report 2025 on IUH Community Freshwater Ecosystem Education Programmes with attached beneficiary rosters and satisfaction rates.	Institute of Environmental Science, Engineering and Management, Office of Political Affairs and Student Support	Q4/2025

Industrial University of Ho Chi Minh City

GROUP 14.2 – Supporting aquatic ecosystems through education

SDG 14 LIFE BELOW WATER

14.2.1 Fresh-water ecosystems (community outreach)

ACTIVITY EVIDENCE



Article title 1

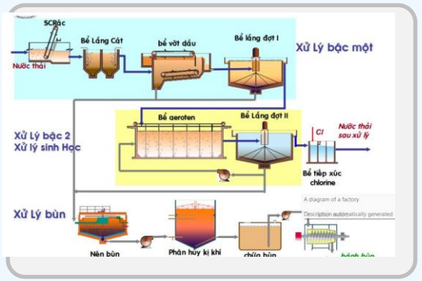
Course: Environment and Humanity

Evidence link

https://drive.google.com/drive/folders/1q31aL_42LP-qzSXPxukG5ItiXGVSZVSe?usp=sharing

Activity description

The course consists of 6 chapters, starting with Chapter 1 which introduces basic concepts, roles, and fundamental environmental elements, moving on to environmental components such as soil, water, and air, modern global environmental issues, human activities, and their impacts on the environment.
The subsequent chapters combine classroom lectures with practical sessions covering topics such as: Protection of water resources and clean water; Air quality and health; Solid waste and the circular economy; Clean energy; and Trees and forests in climate regulation.
In addition, students are encouraged to cultivate the habit of deep independent research and teamwork through open-ended projects (related to the major theme of each recently studied chapter). This aims to foster their ability to collaborate effectively in group activities, develop comprehensive and synthetic thinking skills, and enhance presentation skills.



Article title 2

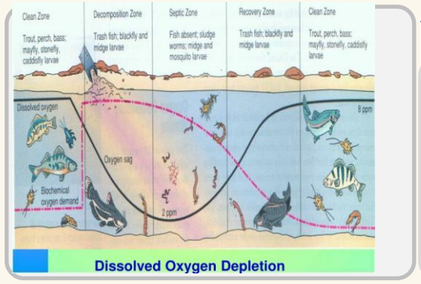
Course: Wastewater Treatment Engineering

Evidence link

https://drive.google.com/drive/folders/1q31aL_42LP-qzSXPxukG5ItiXGVSZVSe?usp=sharing

Activity description

The Wastewater Treatment Engineering course (45 theory periods) is a core subject for Environmental Engineering Technology students, serving to bridge technical expertise with the mission of protecting freshwater ecosystems. The course provides terminology and principles of wastewater treatment while cultivating skills in proposing and designing pollution control structures. Through this, learners proficiently apply specialized knowledge to minimize discharge impacts, enhance awareness of water resource conservation, and disseminate sustainable development solutions within the community.



Article title 3

Course: Water Treatment Engineering

Evidence link

https://drive.google.com/drive/folders/1q31aL_42LP-qzSXPxukG5ItiXGVSZVSe?usp=sharing

Activity description

Within the Community Education Program on Water Conservation, the Water Supply Treatment Engineering course bridges technical expertise with water resource preservation. The course delivers key practical values:

Practical Technical Foundation: Master treatment principles to protect freshwater from pollution.

Solution-Oriented Thinking: Propose safe treatment processes and operations to secure clean water and preserve ecosystems.

Professional Ethics: Cultivate environmental responsibility toward sustainable development and rational water use.

Community Knowledge Dissemination: Build research capacity, empowering learners to act as core agents in local water education and management.

Industrial University of Ho Chi Minh City

GROUP 14.2 – Supporting aquatic ecosystems through education

SDG 14 LIFE BELOW WATER

14.2.2 Sustainable fisheries (community outreach)

Community outreach programmes on sustainable fisheries, aquaculture and tourism

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects & Expanding external community links (Number of links; Participating staff count)	Collaborate with the Fisheries Sub-Department, Fisheries Association, and coastal/riverine local authorities to conduct technical training classes on biosecure aquaculture (VietGAP aquaculture), minimizing antibiotic usage, and recirculating aquaculture water.	Plan and dossier for organizing sustainable aquaculture training courses; Roster of participating farming households/cooperatives; Course completion certificates.	Institute of Biotechnology and Food Technology, Institute of Environmental Science, Engineering and Management	Q1 – Q3/2025
Thrust 1: Pioneering in Education and Research	Innovating training methods linked to practical reality & Promoting technology transfer	Compile and publish the guidance handbook "Riverine Ecotourism Development Linked with Landscape and Native Species Conservation" dedicated to tourism businesses, homestays, and local community operators.	Publication of Sustainable Aquatic Ecotourism Handbook (printed copies and PDF edition); Handover minutes of materials to community tourism sites.	Faculty of Commercial and Tourism, Institute of Environmental Science, Engineering and Management	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Expanding community connection activities towards active citizenship	Organize a series of panel discussions and fisheries extension workshops on "Applying Water Environment Treatment Technologies in Aquaculture to Prevent Diseases" providing pro-bono support for shrimp and fish farming establishments in the Southern region.	Symposium program; Proceedings/materials of fisheries extension workshops; Delegate and farmer participant rosters; Professional feedback reports.	Institute of Biotechnology and Food Technology, Institute of Environmental Science, Engineering and Management	Q2 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Diversifying media channels (Content diversity; Engagement counts)	Release online special media features guiding fishermen on post-harvest aquatic product preservation procedures to ensure food safety, reduce post-harvest losses, and increase sustainable economic value.	Public URL links for technical articles and video tutorials on aquatic product preservation published on the university website and social media.	Information and Communication Center, Institute of Biotechnology and Food Technology, Institute of Environmental Science, Engineering and Management	Q3/2025
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects (Community satisfaction rating)	Compile the Summary Report 2025 on community training and outreach programmes in fisheries management and aquatic ecotourism (clearly specifying external beneficiaries, training formats, and pro-bono commitment).	Summary Report 2025 on community training activities for sustainable fisheries and aquatic ecotourism for THE Portal verification.	Institute of Biotechnology and Food Technology, Institute of Environmental Science, Engineering and Management	Q4/2025

Industrial University of Ho Chi Minh City

GROUP 14.2 – Supporting aquatic ecosystems through education

SDG 14 LIFE BELOW WATER

14.2.2 Sustainable fisheries (community outreach)

ACTIVITY EVIDENCE



Article title 1

Developing forest care maps to support conservation tourism development in the Can Gio Mangrove Biosphere Reserve

Evidence link

https://www.facebook.com/share/p/19vT7c1otW/

Activity description

The study utilized Sentinel satellite imagery and an unsupervised classification method to successfully build a "forest stewardship" map, enabling an accurate assessment of the potential and area of zones suitable for conservation tourism. The results achieved high accuracy, with a Kappa coefficient of up to 93.6%. Notably, the study identified sub-regions requiring stewardship, covering an area of up to 85.56 km², and analyzed the accessibility of these areas from transportation routes, providing a practical solution for the development of conservation tourism in the Can Gio mangrove forest.



Article title 2

Summerschool - Sustainable Environmental Technologies

https://www.facebook.com/share/p/1DeNimMKf4/

Activity description

The International Summer School on "Sustainable Environmental Solutions," co-organized by Ho Chi Minh City University of Industry (IUH), Magdeburg-Stendal University of Applied Sciences, and Hof University (Germany) with sponsorship from the German Academic Exchange Service (DAAD), is an educational and training model focusing on environmental technology and resource management. The program emphasizes safe, resource-efficient food production solutions with a core focus on sustainable aquaculture. Participants are equipped with professional knowledge combined with practical experiences through theoretical lectures, field surveys at shrimp farms, and a simulation game on designing aquaculture management models. Through these activities, the program addresses challenges in pollutant control, closing water loops, and optimizing production systems. Additionally, the course expands into water resource management, plastic waste treatment, and renewable energy to enhance the practical capacity of participants and young scientists.



Article title 3

APPLYING NATURE-BASED SOLUTIONS (NbS) FOR SUSTAINABLE URBAN WATER MANAGEMENT

Evidence link

https://www.facebook.com/share/p/1Cia5PNmjL/

Activity description

The thematic session on "Nature-based Solutions (NbS) for Sustainable Urban Water Management" was held at Industrial University of Ho Chi Minh City (IUH) under the project "Knowledge Connection - Building an Asian Youth Community." Presented by Prof. Nguyen Phuoc Dan (VNU-HCM), the session highlighted key takeaways:
Core Concept of NbS: Utilizes natural processes as a complementary approach to traditional infrastructure to tackle urban challenges like flooding, water pollution, and the heat island effect.
Practical Models & Global Cases: Explored solutions such as rain gardens, green roofs, constructed wetlands, and blue-green infrastructure, referencing successful models in Singapore, China, Vietnam, and Europe.
Experimental Research: Showcased empirical studies on constructed wetlands and bamboo filter beds at HCMUT, demonstrating their effectiveness in wastewater treatment, water reuse, and urban greening.
Holistic Evaluation: Emphasized that assessing NbS requires a comprehensive approach considering technical, environmental, economic, and social aspects.

Industrial University of Ho Chi Minh City

GROUP 14.2 – Supporting aquatic ecosystems through education

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14.2.3 Overfishing (community outreach)

Community outreach educational activities on overfishing, IUU fishing and destructive fishing practices.

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 2: Promoting Community Connection and Service	Expanding community connection activities towards active citizenship (Enhancing legal and social awareness)	Organize legal dissemination campaigns and community training: "Say no to illegal, unreported and unregulated fishing, and non-compliant reporting (Combating IUU fishing)" for coastal fisherman communities and local youth	Implementation plan for the 2025 IUU fishing combat campaign; Set of leaflets, posters communicating regulations prohibiting destructive fishing; Roster of participating fishermen	Youth Union – Student Association, Institute of Environmental Science, Engineering and Management, Office of Human Resources and Administration, Institute of Biotechnology and Food Technology	Q1 – Q3/2025
Thrust 1: Pioneering in Education and Research & Thrust 2: Serving Community	Research publications & Pro-bono advisory and professional services (Recipient satisfaction rate)	Organize scientific conferences and expert seminars: "Solutions to Protect Aquatic Resources and Eliminate Destructive Fishing Methods (Electric Shock, Toxic Substances, Fine Mesh Nets)" in collaboration with fisheries management agencies.	Scientific conference proceedings; Policy recommendation reports on overfishing control submitted to state fisheries management authorities.	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs, Institute of Biotechnology and Food Technology	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Diversifying media channels (Content diversity; Engagement counts)	Produce a series of short video reports and visual infographics explaining the consequences of overfishing on food security and marine biodiversity; launch the campaign message "Smart Consumers - Boycott Products from Destructive Harvesting".	Set of anti-overfishing promotional infographics and video clips; Public URL links for feature articles on university website and fanpage.	Information and Communication Center, Youth Union – Student Association	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Encouraging student community movement participation (Participating student count)	Organize the media design and student initiative competition "Joining Hands to Remove the IUU Yellow Card for Vietnamese Seafood", attracting student author groups and high school students.	Competition rules; Decision commending outstanding entries; Exhibition dossier of media products raising public awareness.	Youth Union – Student Association, University Trade Union	Q2 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects (Community satisfaction rating)	Survey community awareness before and after media campaigns; synthesize the Activity Report on Educational Outreach regarding Overfishing and IUU Fishing in 2025 for THE Portal submission.	Summary Report 2025 on community educational activities combating overfishing and IUU fishing: audience reach, awareness change survey results.	Youth Union – Student Association, University Trade Union, Institute of Environmental Science, Engineering and Management, Institute of Biotechnology and Food Technology	Q4/2025

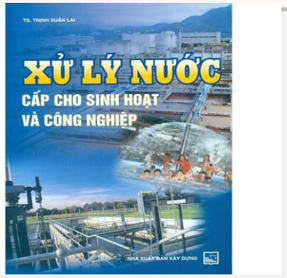
Industrial University of Ho Chi Minh City

GROUP 14.2 – Supporting aquatic ecosystems through education

SDG 14 LIFE BELOW WATER

14.2.3 Overfishing (community outreach)

ACTIVITY EVIDENCE



Article title 1

Course: Water Treatment Engineering

Evidence link

https://drive.google.com/file/d/12ly0209XnqLb2SEV93Y_DogW9UZQwJ3Q/view?usp=sharing
https://drive.google.com/file/d/1O5vTgnS23CNvieX0T8oz4rNI7Hy-Qmwa/view?usp=sharing

Activity description

Course Objectives
Fundamental Knowledge: Introduce key water treatment terms, definitions, and principles.
Technical Skills: Equip learners to propose treatment technologies and design treatment structures.
Professional Ethics: Cultivate environmental responsibility and professional integrity in water treatment.
Self-Development: Foster independent research and continuous professional growth.
Course Description
Core Role: A vital specialized subject in Environmental Engineering Technology that enables students to apply professional knowledge and skills.
Key Content: Provides fundamental principles of water treatment along with competencies in proposing and calculating water treatment systems.



Article title 2

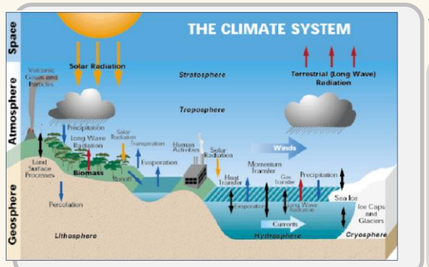
Course: Environmental Impact Assessment.

Evidence link

https://drive.google.com/drive/folders/10PjhF-tXfXmaFBkT3PqT7vOl8kMWPwRt?usp=sharing

Activity description

Course Objectives
Impact Analysis: Equip students to identify, assess, and forecast environmental impacts and propose protection measures for investment projects.
Professional Competencies: Develop skills in writing, consulting, reviewing, and appraising Environmental Impact Assessment (EIA) reports.
Soft Skills & Growth: Foster independent research, teamwork, and continuous professional development in environmental management.
Course Description
Core Role: An essential module in Natural Resources and Environmental Management that enables students to master skills for preparing EIA reports in compliance with MONRE regulations.



Article title 3

Climate Change and Environmental Impacts

Evidence link

https://drive.google.com/drive/folders/1eBn1UZMJM89fMGLSuuUUluFMXwxfKTTF?usp=sharing

Activity description

Course Objectives & Description
Core Knowledge: Equip students with in-depth knowledge of climate change impacts on marine ecosystems and fishery resources.
Community Education: Raise awareness to combat overexploitation, IUU fishing, and destructive fishing practices.
Practical Skills: Develop competencies in assessing climate change risks and formulating sustainable adaptation solutions.
Social Responsibility & Communication: Foster professional ethics and communication skills, enabling students to act as core advocates for eco-friendly practices, legal compliance, and marine conservation.

Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.1

Conservation and sustainable utilisation of the oceans (events)

Organizing or supporting events promoting conservation and sustainable utilization of oceans, lakes, rivers, and aquatic resources.

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 2: Promoting Community Connection and Service	Encouraging student community service participation (Organized campaign count; Participating student count; Satisfaction rating)	Organize the campaign series "Let's Clean Up Our Seas and Hometown Rivers" (Clean-up Days): mobilizing union members, students, and local residents to collect waste along urban canals and beaches in Can Gio / Vung Tau	Implementation plan for the 2025 water environment clean-up event series; Roster of participating volunteers and local residents; Statistical report on collected waste volume; Fieldwork photo documentation	Youth Union – Student Association, University Trade Union, Institute of Environmental Science, Engineering and Management	Q1 – Q4/2025
Thrust 1: Pioneering in Education and Research & Thrust 2: Serving Community	Technology transfer & Expanding community connection activities (Number of environmental awareness raising events)	Organize World Oceans Day and Vietnam Sea and Islands Week 2025 at IUH: a series of marine biodiversity photo exhibitions, alongside policy dialogue forums on sustainable marine resource utilization.	World Oceans Day 2025 event dossier (plan, invitation letters to external delegates, media reports, dialogue proceedings).	Institute of Environmental Science, Engineering and Management, Information and Communication Center	Q2/2025
Thrust 2: Promoting Community Connection and Service	Increasing external community links (Number of links; Participating staff count)	Co-organize and professionally sponsor the event "Nhieu Loc - Thi Nghe Canal Clean-Up Day" alongside urban district authorities and environmental volunteer organizations.	Co-organization agreement document for urban canal clean-up events; Appreciation letter from local authorities for IUH human resource and technical support.	Office of Political Affairs and Student Support, Youth Union – Student Association	Q2 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Diversifying media channels (Content diversity; Engagement counts)	Broadly publicize marine and water resource conservation events on the university website, student portal, and external press; launch call-to-action messages for ocean protection.	Public URL links for news coverage on water resource conservation events; School radio broadcasts and event recap videos.	Information and Communication Center	Q1 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects (Number of beneficiaries; Community satisfaction rating)	Synthesize quantitative data on water resource conservation events in 2025: participant turnouts, tons of waste collected from water bodies, length of cleaned canal banks, and compile a summary report for THE submission.	Summary Report 2025 on Events Promoting Conservation and Sustainable Utilization of Oceans, Lakes, and Rivers at IUH.	Institute of Environmental Science, Engineering and Management, Youth Union – Student Association	Q4/2025

Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.1 Conservation and sustainable utilisation of the oceans (events)

ACTIVITY EVIDENCE



Article title 1

2023 Euréka Institutional-Level Science Research Award for Students

Evidence link

https://www.facebook.com/share/p/1BWnCusKaW/

Activity description

2023 EURÉKA INSTITUTIONAL FINALS
Projects presented by the Institute of Science, Technology and Environmental Management:

Microplastic Removal: Flotation application using natural foaming agents.

Drought Simulation: Modeling drought in Dak Nong province using Artificial Neural Networks (ANN).



Article title 2

Thematic Module: Nature Conservation and Sustainable Development

Evidence link

https://www.facebook.com/share/p/19Pnqs5xWD/

Activity description

PROGRAM SERIES: KNOWLEDGE CONNECTION & SUSTAINABLE DEVELOPMENT
The international project "Knowledge Connection – Building an Asian Youth Community for Sustainable Harmony between Humans and the Environment" has officially launched!
Under the theme "Nature Conservation and Sustainable Development"—a core topic closely integrated with foundational knowledge from the Environment and Human course—students will gain a deeper understanding of the relationship among humans, natural resources, and sustainable development.



Article title 3

"Climate change adaptation in the water supply and drainage sector in Vietnam"

Evidence link

https://www.facebook.com/share/p/18PoyxYQxA/

Activity description

Online discussion on the theme "Climate Change Adaptation in the Water Supply and Drainage Sector in Vietnam", held on March 24, 2022, from 13:30 to 17:30. The program was organized by Gemus Nordic Consulting in collaboration with Finnish partners..

Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.2 Food from aquatic ecosystems (policies)

Policies ensuring food from aquatic ecosystems is harvested or farmed sustainably.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 3: Modern and Comfortable Facilities	Building a green campus & Infrastructure management and maintenance	Formulate and issue IUH's Sustainable Seafood Sourcing Policy: mandating 100% of seafood served at canteens and conferences to have traceable origins, meet sustainability certifications (ASC, MSC, VietGAP), or not belong to threatened aquatic species lists.	Decision issuing University Sustainable Seafood Sourcing Policy (explicitly defining Policy Created and Policy Reviewed within 2022–2026 per THE standards).	Office of Planning and Investment, Office of Dormitory Management and Services	Q1 – Q2/2025
Thrust 5: Strengthening Sustainable Financial Autonomy	Reasonable investment in education and facilities (Procurement of materials and services)	Incorporate mandatory terms on sustainable seafood origin into Bidding Documents (HSMT) and Business Contract Addenda for all canteen and campus dining service operators operating on IUH campuses.	Contracts and contract addenda for school dining services containing clauses committing to supply legally and sustainably harvested/farmed seafood.	Office of Planning and Investment, Office of Finance and Accounting	Q2/2025
Thrust 3: Modern and Comfortable Facilities	Increasing utility services for students (% satisfaction with canteen services, food safety)	Establish monthly periodic and unannounced inspection mechanisms for seafood supplies at campus dining kitchens and canteens: checking invoices, traceability documentation, quarantine certificates, and legal harvest permits.	Inspection minutes for seafood sourcing at canteens; Tracking log for seafood raw materials imported into the university in 2025.	Office of Dormitory Management and Services	Q1 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Expanding community connection activities towards active citizenship	Train kitchen staff and canteen managers on identifying sustainable seafood eco-labels; publicly post information at food counters regarding responsible seafood origins to inform student choices.	Training materials on identifying sustainable seafood; Clean seafood origin notice board publicly posted at IUH canteens.	Institute of Biotechnology and Food Technology, Office of Dormitory Management and Services	Q2 – Q3/2025
Thrust 3: Modern Facilities & Thrust 2: Communication	Service environment evaluation & Diversifying public communication	Publicly release the full text of the policy on the IUH web portal; compile the Annual Monitoring Report 2025 evaluating compliance with sustainable seafood consumption policy university-wide.	Public URL link of policy document on website; Sustainable Seafood Policy Compliance Monitoring Report 2025.	Information and Communication Center, Office of Planning and Investment	Q4/2025

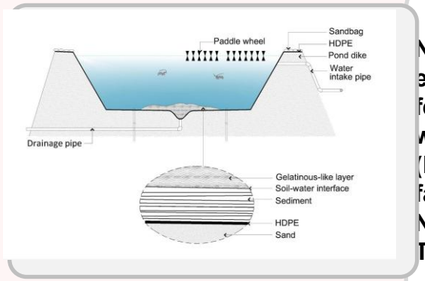
Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.2 Food from aquatic ecosystems (policies)

ACTIVITY EVIDENCE



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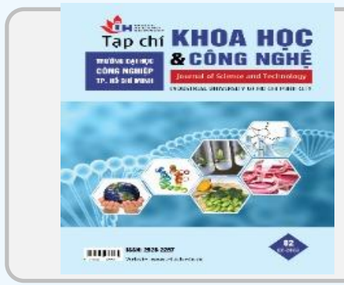
Nutrient dynamics, environmental impacts, and feed efficiency in intensive whiteleg shrimp (Litopenaeus vannamei) farming on sandy soils in Ninh Thuan, Vietnam

Evidence link

https://doi.org/10.1016/j.aqrep.2025.103050

Activity description

Whiteleg shrimp (Litopenaeus vannamei) farming has expanded rapidly on sandy coastal soils in Vietnam's South Central region. These permeable soils, combined with high feed input and limited waste treatment, raise concerns about nutrient pollution and environmental degradation. This study assessed nutrient dynamics and environmental impacts in a typical intensive shrimp pond system in Ninh Thuan province over a 66-day culture cycle. Physical, chemical, and biological parameters were monitored, including temperature, salinity, total suspended solids, chemical and biological oxygen demand, total nitrogen, total phosphorus, ammonium, microalgae composition, and bacterial counts. A nutrient mass balance showed that commercial feed contributed 81.9 % of total nitrogen and 87.8 % of total phosphorus inputs. However, nutrient utilization was low: only 13.8 % of nitrogen and 11.4 % of phosphorus were retained in shrimp biomass. The remaining nutrients were lost through multiple pathways: 23.2 % of nitrogen and 1.8 % of phosphorus in effluent, 10.3 % of nitrogen and 2.5 % of phosphorus in pond sludge, and over 50 % of nitrogen and 84 % of phosphorus unaccounted for due to volatilization, denitrification, and sedimentation. 1000 kg of shrimp harvested discharged approximately 263.6 kg of nitrogen, 5.02 kg of phosphorus, and 12,175 liters of nutrient-rich wastewater. Although sludge represented only 5 % of total discharged water, it carried a disproportionately high nutrient load, posing risks to soil, groundwater, and nearby coastal ecosystems. These results highlight critical inefficiencies in nutrient use and significant environmental risks. Effective strategies, including lower feed conversion ratio, improved feed management, and dedicated sludge and wastewater treatment systems, are essential for sustainable shrimp aquaculture on sandy soils.



Article title

2

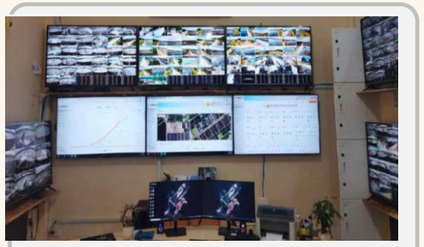
A Comparison of Environmental Issues Between Super-Intensive and Intensive - Semi-Intensive Shrimp Farming Models in Bac Lieu Province"

Evidence link

https://doi.org/10.54607/hcmue.js.20.12.4057(2023)

Activity description

The rapid expansion of super-intensive (SI) shrimp farming in Bac Lieu province has driven a shift from traditional intensive and semi-intensive (I-SI) models. This study compares the wastewater and sludge quality, as well as environmental management practices, between SI and I-SI shrimp farming models based on sample analyses from 120 facilities and surveys across 286 farming households.The findings reveal that: (1) Wastewater parameter concentrations were generally higher in I-SI ponds, with significant differences ($p < 0.05$) in pH and TSS; (2) Sludge accumulation of T-N, T-P, and TOC was slightly higher in SI ponds, though statistically insignificant ($p > 0.05$), while salinity and arsenic showed significant differences; and (3) Environmental management practices—such as bottom siphoning, wastewater treatment, and water recycling—were significantly more prevalent in SI systems ($p < 0.05$). Consequently, transitioning from I-SI to high-tech SI farming models should be promoted in Bac Lieu province to balance economic growth with environmental sustainability.



Article title

3

Applying modern technology for sustainable aquaculture. Authors: Do Doan Dung, Nguyen Nhat Tuan, Le Hung Anh, Do Phuong Khanh (2025). "Application of an IoT platform for automation in shrimp farming in Vietnam."

Evidence link

DOI: https://doi.org/10.59266/houjs.2025.844

Activity description

To address challenges in disease management, environmental conditions, and manual operations within the shrimp industry, this study proposes an IoT-based automation system (TOMOTA-IoTs) for industrial shrimp farming. The system monitors water quality, feeding processes, and local climate. Implemented at Minh Phu – Loc An, it achieved a >90% reduction in electrical incidents and saved approximately 200 tons of feed annually (approximately 50 tons/crop across 4 crops) via an AI-powered feeding model, thereby enhancing management efficiency and fostering sustainable aquaculture development.

Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.3

Maintain ecosystems and their biodiversity (direct work)

Direct research or collaboration to maintain and expand aquatic ecosystems and biodiversity.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 1: Pioneering in Education and Research	Increasing quantity and quality of domestic and international publications (Scopus/WoS articles)	Approve and execute University-level and Ministry-level scientific research projects on assessing aquatic biodiversity status, plankton community structures, mangrove vegetation, and proposing endangered species conservation measures in Southern river basins and coastal areas.	Decision approving scientific research projects; Summary report of aquatic biodiversity conservation research projects in 2025; Reputable international scientific papers (Scopus/WoS).	Office of Science Management and International Affairs, Institute of Environmental Science, Engineering and Management	Q1 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Increasing external community links (Number of links; Participating staff count) & Promoting technology transfer	Collaborate with Can Gio Protection Forest Management Board / Tram Chim National Park to execute field projects: planting and restoring mangrove areas, enriching native aquatic vegetation to regenerate spawning grounds and aquatic animal habitats.	Memorandum of Understanding (MOU) / Field contract with Conservation Zone Management Board; Acceptance report for restored mangrove forest area / aquatic habitat in 2025.	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q1 – Q4/2025
Thrust 1: Pioneering in Education and Research	Enforcing research collaboration support policies (Fieldwork research funding)	Conduct intensive field survey trips: collecting and identifying aquatic flora and fauna samples, measuring biodiversity indices (Shannon-Wiener), mapping the distribution of rare aquatic species in surveyed areas.	Fieldwork dataset; Catalog of identified aquatic species and mapped habitat distributions.	Institute of Environmental Science, Engineering and Management, Biodiversity Expert Group	Q2 – Q3/2025
Thrust 1: Pioneering in Education and Research & Thrust 2: Serving Community	Applying Project-Based Learning (PBL) & Encouraging students to participate in practical projects	Engage Environmental Management and Biology students directly in on-site conservation activities: nursing mangrove seedlings, releasing native fingerlings to regenerate aquatic resources in natural water bodies.	Student field activity plan; List of students participating in conservation projects; Acceptance report on planted trees / regenerated fingerlings.	Institute of Environmental Science, Engineering and Management, Youth Union – Student Association	Q2 – Q4/2025
Thrust 1: Pioneering in Education and Research	Research publications & Diversifying public communication	Compile the Summary Report on Intervention Results and Direct Work to Maintain Aquatic Ecosystems 2025: demonstrating number of protected species, restored habitat area, and relevant scientific papers for THE Portal verification.	Summary Report 2025 on Direct Actions to Maintain and Expand Aquatic Ecosystems at IUH (Direct Work Report 2025).	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q4/2025

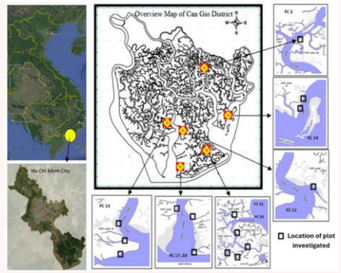
Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.3 Maintain ecosystems and their biodiversity (direct work)

ACTIVITY EVIDENCE



Article title 1

BIOMASS, CARBON STOCK, CARBON UPTAKE, AND OXYGEN PRODUCTION OF SONNERATIA ALBA: ESTIMATING VALUES FOR MANGROVE FOREST ENVIRONMENTAL SERVICE IN CAN GIO, VIETNAM

Evidence link

https://doi.org/10.26525/jtfs2025.37.4.463

Activity description

Sonneratia alba J.E. Smith is a key mangrove species contributing to forest structure along tropical Southeast Asian coasts. This study aims to quantify the ecosystem service value of natural S. alba populations through biomass, carbon stock, carbon uptake, and oxygen production, using a case study in the Can Gio Mangrove Biosphere Reserve, Vietnam. To our knowledge, this is the first study to provide a species-specific economic valuation of both carbon uptake and oxygen production for S. alba in this region. Fifty sample plots were established to investigate above-ground biomass and carbon accumulation across diameter classes. Allometric equations were developed to estimate the above-ground biomass and carbon stock. Belowground values were assessed using standard conversion factors. Carbon uptake and oxygen production were calculated based on total carbon accumulation. The results show a total biomass of 88.25 metric tons per hectare (t ha-1), a total carbon stock of 37.95 t ha-1, a carbon uptake of 139.27 t ha-1, and an oxygen production of 101.32 t ha-1. The estimated economic values of S. alba include 696.3 USD ha-1 for carbon uptake and 6079.2 USD ha-1 for oxygen production. These results contribute to the understanding of mangrove ecosystems and offer practical input for payment for environmental services schemes and conservation policies.


Acta Agrobotanica

2023 vol. 76 Get citation CC-BY 4.0 Stats

ORIGINAL RESEARCH

Differential biochemical and metabolic responses of contrast rice cultivars (*Oryza sativa* L.) under salt stress

Cuong Quoc Duong [1,2,3], Anh Lan Bui [1,2], Thia Hong Le [4], Truc Thanh Tran [5], Nam Ngoc Trinh [3]

Article title 2

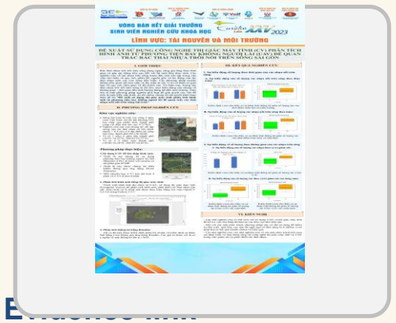
Differential biochemical and metabolic responses of contrast rice cultivars (Oryza sativa L.) under salt stress

Evidence link

DOI: https://doi.org/10.5586/aa/172513

Activity description

More than half of the global population uses rice as the fundamental staple food; therefore, it is one of the most popular crops in the world. However, it is susceptible to salt stress, particularly among monocot crops, which reduces rice cultivation yield and threatens global food security. This research investigates the role of some factors, including amino acids, antioxidant enzymes, and sugars, in the response to the salinity stress of three contrasting rice cultivars, Dai Thom 8 (salt-sensitive), OC 10 (moderately salt-tolerant), and OM 9577 (salt-tolerant) in the seedling stage. The salt-tolerant varieties exhibited remarkable differences in physiological and biochemical traits, including enhancement of growth capacity, reduction of cell membrane damage via lowering lipid peroxidation, minimization of ROS generation, enhancement of free radical scavenging activity, and SOD, POD, and CAT enzyme activities. Additionally, the study analyzed the presence of 13 sugars using GC-MS and found that all three rice cultivars shared seven common sugars in similar quantities. However, OM 9577 had a higher content of the other six sugars compared to OC 10 and Dai Thom 8. It is one of the important biochemical factors responsible for the difference in the response mechanism to NaCl stress among rice varieties, specifically lyxofuranose (3.268%), a-D-xylopyranose (5.727%), mannopyranose (12.86%), α-D-glucopyranose (6.399%), ß-D-glucopyranose (5.509%), and D-arabinose (1.512%). Furthermore, the quantification of 20 amino acids through HPLC-DAD revealed that the salt-tolerant rice cultivars had higher concentrations of 11 amino acids than the salt-sensitive ones, including proline, isoleucine, serine, ornithine, histidine, glutamic acid, asparagine, alpha-alanine, aspartic acid, glutamine, and valine. .



Article title 3

Proposing the use of computer vision (CV) technology to analyze imagery from unmanned aerial vehicles (UAVs) for the purpose of monitoring plastic waste in the Saigon River.

Evidence link

https://www.facebook.com/photo/?fbid=314469441337264&set=a.314495184668023

Activity description

Previous research on riverine plastic waste has primarily focused on understanding the scale, distribution, sources, and impacts of plastic debris as it travels from rivers into the ocean. Given the urgent need for an appropriate research methodology to address these issues, our team has decided to undertake the project: “Proposing the Use of Computer Vision to Analyze Imagery from Unmanned Aerial Vehicles (UAVs) for Monitoring Floating Plastic Waste in the Saigon River.”

Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.4

Technologies towards aquatic ecosystem damage prevention (direct work)

Research and collaborative technologies or practices helping marine industries minimize aquatic ecosystem damage.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 1: Pioneering in Education and Research	Promoting technology transfer (Number of technology transfer contracts; Revenue from transfer)	Research, manufacture, and pilot test wastewater treatment systems integrating membrane filtration / advanced oxidation technologies for offshore fishing vessels and coastal seafood processing plants to prevent direct discharge of pollution into the sea.	Technical documentation and design drawings of wastewater treatment systems for marine industries; Pilot test results meeting marine discharge standards.	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q1 – Q4/2025
Thrust 1: Pioneering in Education and Research	Technology transfer & Strengthening collaboration with enterprises	Sign R&D / technology transfer contracts with aquaculture enterprises: applying microbial technology to treat bottom sludge in super-intensive shrimp ponds, recirculating water (RAS) to help aquaculture reduce 90% of wastewater discharge into natural environments.	Technology transfer contract for recirculating aquaculture water treatment; Acceptance minutes for technology application at partner aquaculture facilities.	Institute of Biotechnology and Food Technology, Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q2 – Q4/2025
Thrust 1: Pioneering in Education and Research	Increasing reputable publications & Patent / utility solution registration	Develop IoT sensor technology solutions for automated monitoring of salinity, dissolved oxygen, and early warning of oil spills / chemical incidents at seaports and vessel anchorages.	Patent / Utility Solution Application for water environment monitoring devices; Scientific paper publishing results of sensor technology application for ocean protection.	Institute of Environmental Science, Engineering and Management, Institute of Biotechnology and Food Technology	Q1 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Developing pro-bono advisory and professional services (Recipient satisfaction rate)	Organize training workshops and advisory transfer sessions on "Cleaner Production and Resource Savings in Coastal Seafood Processing Industry" for small and medium enterprises.	Cleaner production technology training workshop proceedings; List of participating seafood enterprises and satisfaction feedback forms.	Institute of Environmental Science, Engineering and Management, Institute of Biotechnology and Food Technology	Q3/2025
Thrust 1: Pioneering in Education and Research	Promoting technology transfer (Report on scientific/technological transfer products)	Compile the Summary Report 2025 on technologies and technical solutions developed by IUH helping marine/aquaculture industries prevent aquatic ecosystem damage for THE Portal verification.	Summary Report 2025 on Development and Transfer of Marine Environmental Protection Technologies at IUH attached with practical application contract documentation.	Office of Science Management and International Affairs, Institute of Environmental Science, Engineering and Management	Q4/2025

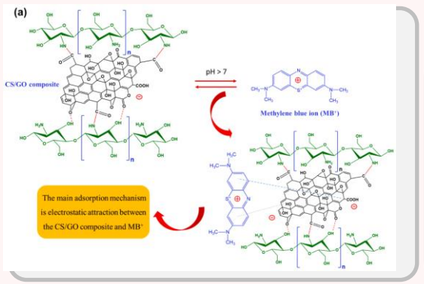
Industrial University of Ho Chi Minh City

GROUP 14.3 – Supporting aquatic ecosystems through action

SDG 14 LIFE BELOW WATER

14.3.4 Technologies towards aquatic ecosystem damage prevention (direct work)

ACTIVITY EVIDENCE



Article title 1

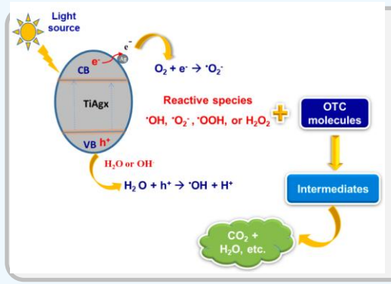
Graphene oxide crosslinked chitosan composites for enhanced adsorption of cationic dye from aqueous solutions

Evidence link

https://doi.org/10.1016/j.jtice.2023.104678

Activity description

In this study, we combined chitosan (CS) – considered a green adsorbent, and graphene oxide (GO) – an excellent adsorbent, to synthesize CS/GO composites with different GO contents. These composites promised the synergic effect of two materials and broadening the adsorption ability for water treatment.
The characteristic data proved the successful cross-linking between CS and GO where CS molecules might deposit on GO sheets via amide linkage and hydrogen bonding. The effects of operating conditions and co-existing ions on batch-mode adsorption performance of methylene blue (MB) on the composites were studied.



Article title 2

Facile synthesis of reusable Ag/TiO2 composites for efficient removal of antibiotic oxytetracycline under UV and solar light irradiation

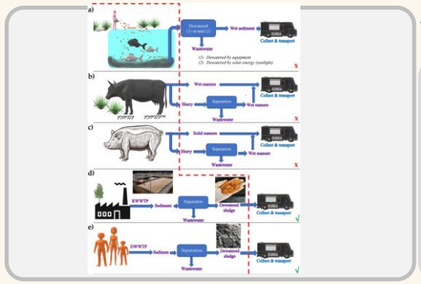
Evidence link

https://doi.org/10.1016/j.jtice.2023.104825

Activity description

In this work, Ag-doped TiO2 nanomaterials (TiAgx, where x denotes the weight percentage of Ag) were prepared using a facile one-step sol-gel technique. The combination of Ag with TiO2 promises to enhance the lifetime of photogenerated electron-hole pairs and widen the photocatalytic activity in the visible light region, leading to improved photocatalytic activity.

The synthesized materials were characterized using different analyses and afterwards applied as photocatalysts to degrade oxytetracycline (OTC) in aqueous solution under ultraviolet (UV) and solar light illumination.



Article title 3

Phosphorus in waste sources in Southern Vietnam: potential for recovery

Evidence link

https://doi.org/10.1186/s42834-023-00169-8

Activity description

The potential for phosphorus (P) recovery from various sources in Southern Vietnam has been assessed in this study. Five types of waste were studied, namely sediment from catfish pond, manure from cattle and pig farming, and also sludge from domestic and rubber-latex processing wastewater-treatment plants. The study identifies P-reserve and assesses factors related to P recovery from waste sources such as distribution, collection, transportation conditions, and composition of wastes. P-reserve from catfish farming is estimated about 17.7 kt yr^{-1} while reserve from pig farming is the highest, about 21.7 kt yr^{-1}. Total P-reserves from studied wastes are estimated about 50 kt yr^{-1}, equivalent to 37% of Vietnam's imported nutrient P quantity in 2019. Generated sludge from rubber-latex processing wastewater-treatment plants has the highest potential and favorable properties for P recovery. It turns out to be feasible to collect and recover P from this waste source under Vietnam's current conditions.

Industrial University of Ho Chi Minh City

GROUP 14.4 – Water sensitive waste disposal

SDG 14 LIFE BELOW WATER

14.4.1

Water discharge guidelines and standards

Water discharge standards and guidelines to protect aquatic ecosystems, wildlife, and human health.

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 3: Modern and Comfortable Facilities	Building a green campus & Infrastructure management and maintenance	Issue Internal Regulations and Technical Guidance Handbooks for operating IUH wastewater collection and treatment systems: stipulating threshold standards and quality control procedures for treated wastewater to meet National Technical Regulations (QCVN 14:2008/BTNMT Column A and QCVN 28:2010/BTNMT)	Decision issuing IUH Wastewater Discharge Quality Standards and Discharge Control Standard Operating Procedures (SOP) effective in 2025	Office of Planning and Investment, Institute of Environmental Science, Engineering and Management, Board of Rectors	Q1 – Q2/2025
Thrust 3: Modern and Comfortable Facilities	Upgrading infrastructure (Upgrading centralized wastewater treatment plant)	Perform periodic maintenance and technology upgrades for the university's centralized wastewater treatment plant (capacity meeting total domestic and laboratory effluent volume); install secondary disinfection units ensuring complete sterilization before discharging into municipal sewers.	Maintenance acceptance dossier and technical inspection records for IUH centralized wastewater treatment plant in 2025; Operational log and treatment chemical usage log.	Office of Facilities Management, Office of Planning and Investment	Q1 – Q4/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Environmental quality inspection)	Contract with an independent inspection entity licensed by MONRE (VIMCERTS) to perform quarterly wastewater monitoring: testing all parameters including pH, BOD5, COD, TSS, Total Coliforms, Ammonium, and Animal/Vegetable Oils.	Quarterly Wastewater Analysis Test Result Sheets for 2025 (100% meeting Column A standards); Environmental monitoring contract and partner VIMCERTS license.	Office of Planning and Investment, Institute of Environmental Science, Engineering and Management	Q1 – Q4/2025
Thrust 1: Pioneering in Education and Research & Thrust 4: Workplace Environment	Safe teaching and learning & Safe workplace environment	Conduct training on procedures for segregation and preliminary neutralization of chemical laboratory wastewater before directing to the common collection system; issue regulations strictly prohibiting direct disposal of solvents and concentrated chemicals into sinks.	Discharge safety regulations document for laboratories and practical workshops; Periodic chemical safety inspection minutes.	Institute of Environmental Science, Engineering and Management, Specialized Faculties / Institutes	Q2/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Green school environmental standards)	Compile the Periodic Environmental Protection Work Report 2025 submitted to HCMC Department of Natural Resources and Environment (DONRE); explaining discharge standards systems and risk prevention measures for receiving water bodies.	IUH Environmental Protection Report 2025 with official receipt acknowledgment from state environmental management authorities.	Institute of Environmental Science, Engineering and Management, Office of Planning and Investment	Q4/2025

Industrial University of Ho Chi Minh City

GROUP 14.4 – Water sensitive waste disposal

SDG 14 LIFE BELOW WATER

14.4.1 Water discharge guidelines and standards

ACTIVITY EVIDENCE

1

No	Parameters	Unit	Result water after treatment	QCVN 28:2010/BTNMT, column A, K=1,2	Monitoring results	QCVN 08:2023/BTNMT, level D
1	pH	--	6.23	6.5-8.5	6.58	<6.0 or >8.5
2	TSS	mg/L	47	60	KPH	>5
3	BOD_5	mg/L	30	36	8	>10
4	COD	mg/L	83	120	16	>20
5	Amoni	mg/L	4.9	6	0.23	0.3
6	Nitrat	mg/L	4.8	36	3.2	--
7	Phosphate	mg/L	3.4	7.2	KPH	--
8	Coliform	MPN/100mL	2.700	3.000	4.700	7.500
9	DO	mg/L	--	--	5.23	≥2

Article title

Suitability of the hospital wastewater treatment system in Binh Duong province to the environmental carrying capacity

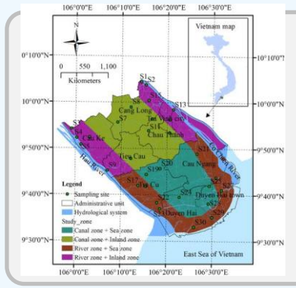
Evidence link

DOI:10.1002/clen.202300042

Activity description

River water pollution with potentially toxic elements can be quantified via hydrological studies, while its potential impacts on the ecosystem and human health can be assessed via the indices of ecological risk (RI) and human health hazard (HI). This study aims to assess potential ecological and human health risks of trace-element pollution of the Saigon River surface water, based on seasonal, position, and tidal changes. Surface water samples are taken during dry and rainy seasons and analyzed for Cu, Cr, Mn, Pb, Ni, and Zn. The trace-element concentrations are used to compute RI and HI. Of the six elements, Cu accounted for 87.7 and 12.5% of the total variance of RI and HI, respectively. The RI and HI values are strongly correlated and are higher in dry season than in rainy season. The HI value of >1 for children suggests that children's health may be sensitive to the adverse impacts of the current status of the trace-element pollution. Overall, the trace-element pollution of the river surface water is at a moderate ecological risk in dry season but at a low ecological risk in rainy season.

2



Article title

Spatial and temporal analysis and quantification of pollution sources of the surface water quality in a coastal province in Vietnam

Evidence link

https://doi.org/10.1007/s10661-023-11026-x

Activity description

The surface water quality in coastal areas may be highly vulnerable to degradation due to various pollution sources such as seawater intrusion and anthropogenic activities. The current study sought to spatially and temporally analyze and quantify pollution sources of the surface water system in the coastal province of Tra Vinh, Vietnam. A total of 600 surface water samples were taken from 30 monitoring sites distributed over 4 spatial zones. Water samples were collected in four campaigns each year during the dry and rainy seasons from 2016 to 2020 and analyzed for 10 physiochemical and biological parameters. The analyzed data were calculated for the water quality index (WQI). Two-way analysis of variance, principal component analysis/factor analysis (PCA/FA), and multivariable regression analysis (MRA) were conducted over the whole dataset. The results showed that the WQI decreased from the inland zone to the coastal area, was greater in the river zone than in the canal zone, and was higher in the dry season than in the rainy season.

3

Sources	Method	Period	WQI (Avg ± StdDev)	WQI2 (Avg ± StdDev)	Note
Current Study	One-stage	Grow-out	0.80 ± 0.08	0.63 ± 0.07	★
	One-stage	Nursery	0.76 ± 0.06	0.67 ± 0.06	★
	Two-stage	Grow-out	0.70 ± 0.21	0.74 ± 0.04	●
	Two-stage	Nursery	0.64 ± 0.18	0.74 ± 0.04	●
Ma et al. [44]	Traditional (4 months)	Grow-out	0.30	-	▲
	Traditional (4 months)	Nursery	0.50	-	▲
Ferreira et al. [52]	Traditional (4 months)	-	HI: 5.5	CCME-WQI: 70	★
Srilert and Van [18]	One-stage	Grow-out	0.78 ± 0.09	0.62 ± 0.06	★
	One-stage	Nursery	0.80 ± 0.08	0.64 ± 0.05	★
Uddin et al. [54]	Two-stage	Grow-out	0.73 ± 0.11	0.68 ± 0.07	●
	Two-stage	Nursery	0.71 ± 0.12	0.70 ± 0.09	●

★: One-stage systems with stable WQI and moderate variability in WQI2, particularly in nursery phases.
●: Two-stage systems showing higher WQI variability but consistent WQI2, reflecting water quality resilience.
▲: Traditional systems with significantly lower WQI values, indicating less effective water quality management.

Article title

Evaluation of water quality and key factors influencing water quality in intensive shrimp farming systems using principal component analysis-fuzzy approach

Evidence link

10.1016/j.dwt.2025.101002

Activity description

The evaluation of water quality is a crucial process for preventing and managing adverse events in aquaculture systems. This study aimed to develop a novel water quality index (WQI) using multivariate statistical techniques, including principal component analysis (PCA) and a fuzzy inference system, to assess water quality in two shrimp farming techniques. A total of 1179 daily water samples were analyzed for 17 key parameters: temperature, pH, salinity, total dissolved solids (TDS), turbidity, dissolved oxygen (DO), transparency, alkalinity, hardness, total ammonia nitrogen (TAN), nitrite, nitrate, phosphate, silica, calcium (Ca), magnesium (Mg) and potassium (K). PCA identified salinity and silica as the primary factors contributing to water quality deterioration. The results showed that the two-stage shrimp farming technique had a WQI of 0.70 during the grow-out period and 0.64 during the nursery period, compared to 0.80 and 0.76 for the one-stage technique. Water quality was significantly better during the rainy season, with a WQI of 0.69, compared to 0.77 in the dry season. This study demonstrates the effectiveness of the fuzzy inference system for real-time water quality monitoring and management, offering valuable insights for enhancing shrimp production through timely interventions under polluted conditions.

Industrial University of Ho Chi Minh City

GROUP 14.4 – Water sensitive waste disposal

SDG 14 LIFE BELOW WATER

14.4.2

Action plan to reducing plastic waste

Campus plastic waste reduction action plan.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Building Green Campus: Waste conversion and recycling)	Formulate and issue the IUH Campus Plastic Waste Reduction Action Plan 2025–2028: defining quantitative targets to cut 80% of single-use plastics, 100% of plastic waste sorted for recycling, attached with detailed implementation roadmap.	Decision issuing University Campus Plastic Waste Reduction Action Plan; Task allocation matrix, milestone timeline, and resource allocation scheme.	Office of Planning and Investment, Institute of Environmental Science, Engineering and Management, Office of Services, Office of Facilities Management	Q1 – Q2/2025
Thrust 3: Modern and Comfortable Facilities	Increasing utility services for students & Upgrading infrastructure utilities	Systematically install purified water refill stations and place separate collection bins for recyclable plastic bottles/cans across all academic blocks, library, and sports grounds.	Acceptance record for water refill infrastructure installation; Map of recyclable plastic waste sorting points across campus.	Office of Planning and Investment, Office of Facilities Management	Q1 – Q3/2025
Thrust 2: Promoting Community Connection and Service & Thrust 3: Modern Facilities	Infrastructure and service investment & Student canteen service management	Enforce the "Single-Use Plastic Free Green Canteen" regulations: replacing all styrofoam containers, plastic cups, and plastic utensils with sugarcane bagasse, paper, or reusable trays; offering beverage discounts for individuals bringing personal bottles.	Canteen business contract addendum mandating compliance with Plastic Reduction Plan; Discount incentive notice posted for customers bringing personal cups.	Office of Dormitory Management and Services, Office of Services, Office of Planning and Investment	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Active citizenship awareness education & Encouraging student participation	Organize the festival series "Exchange Plastic Waste for Green Gifts", the competition "Design Plastic Recycling Models", and multi-channel communication campaigns promoting school plastic waste reduction.	Plan and dossier for organizing the Plastic Exchange Festival; Participant roster of Youth Union members/students; Statistics on plastic bottles collected for recycling.	Youth Union – Student Association, University Trade Union, Information and Communication Center	Q2 – Q4/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Campus waste reduction KPI)	Inventory and measure the volume of recycled plastic waste collected and actual count of single-use plastic bottles eliminated in 2025; compile an evaluation report on progress of the Plastic Waste Reduction Action Plan.	Progress Summary Report 2025 on IUH Campus Plastic Waste Reduction Action Plan for THE Portal verification.	Institute of Environmental Science, Engineering and Management, Office of Planning and Investment	Q4/2025

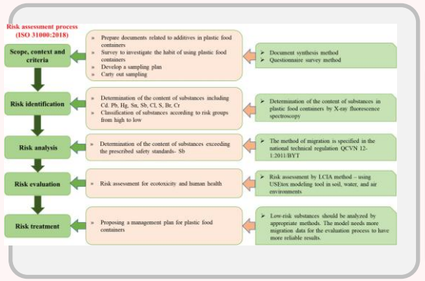
Industrial University of Ho Chi Minh City

GROUP 14.4 – Water sensitive waste disposal

SDG 14 LIFE BELOW WATER

14.4.2 Action plan to reducing plastic waste

ACTIVITY EVIDENCE



Article title 1

A regional approach for health risk assessment of toxicants in plastic food containers

Evidence link

https://link.springer.com/article/10.1007/s43188-023-00194-0#citeas

Activity description

This study investigates hazardous substances in plastic food containers in Go Vap district, Vietnam. Analyzing 59 collected samples via X-ray fluorescence spectroscopy revealed that 91.5% contained 8/9 tested heavy metals and elements, categorized into high (Sb, Cl, S), medium (Cr, Br, Hg), and low (Cd, Pb, Sn) hazard groups. Although most concentrations remained below standard thresholds, Sb migration was further evaluated as it is regulated under QCVN 12-1:2011/BYT.


IUH tham gia dự án "Nâng cao khả năng hiểu biết về phân loại rác tại nguồn và xử lý chất thải cơ bản đối với trẻ em tiểu học – tương tác kiềng ba chân nhà trường, gia đình và địa phương" tại tỉnh Đồng Tháp

10/03/2022

Article title 2

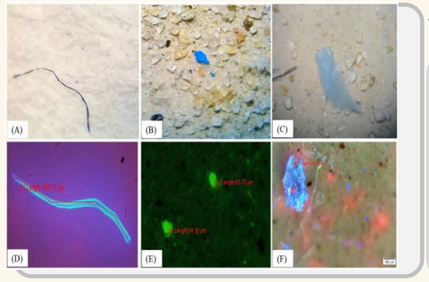
Enhancing primary school children's understanding of waste sorting at the source and basic waste management: A tripartite approach involving schools, families, and the local community.

Evidence link

https://qn.iuh.edu.vn/tin-tuc-su-kien/iuh-tham-gia-du-an-nang-cao-kha-nang-hieu-biet-ve-phan-loai-rac-tai-nguon-va-xu-ly-chat-thai-co-ban-doi-voi-tre-em-tieu-hoc-tuong-tac-kieng-ba-chan-nha-truong-gia-dinh-va-dia-phuong/

Activity description

The project, "Enhancing Understanding of Waste Sorting at the Source and Basic Waste Management among Primary School Children – A Three-Way Collaboration between Schools, Families, and the Local Community," is managed by Oxfam in Vietnam. Implemented by the Institute of Environmental Science, Engineering and Management (IESEM) at the Industrial University of Ho Chi Minh City—with funding from JIFF—the project ran from November 2021 to October 2022 in Dong Thap province. Its objective was to provide primary school children and the local community with specialized knowledge regarding waste sorting at the source and basic waste management practices.



Article title 3

Combining Fluorescence Microscope and FTIR to Investigate Microplastics in Sand at Vung Tau beaches

Evidence link

DOI:10.14456/ea.2023.28

Activity description

Microplastic pollution (plastic debris < 5 mm) has become a global environmental problem due to the accumulation of plastic debris in water bodies over the decades. The present study was conducted to determine the abundance, shape, color, size, and composition of microplastics in the sand collected at recreational beaches in Vung Tau city of Vietnam. Ten sand samples were collected, five from Front Beach and five from Back Beach. These samples were extracted and analyzed for microplastics with a dissecting microscope, Nile red staining and the Fourier Transform Infrared (FTIR) technique. Results showed that microplastics were present in all study areas, with concentrations ranging from 5 to 27 MPs/100 g of dry sand. Colored and fibers dominated in both beaches (70-80%), of which fibers shorter than 0.5 mm were commonly found. Many detected microplastics were black and blue with a similar percentage, 32.55 % and 34.66 %. The predominant microplastics were polyethylene (PE) and polypropylene (PP).

Industrial University of Ho Chi Minh City

GROUP 14.4 – Water sensitive waste disposal

SDG 14 LIFE BELOW WATER

14.4.3 Reducing marine pollution (policy)

Policy to prevent and reduce marine pollution, specifically from land-based activities.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Building Green Campus: Waste conversion and processing)	Formulate and issue IUH's Policy on Preventing Marine Pollution from Land-based Activities: identifying potential pollution sources (wastewater, plastic waste, chemicals, oils, surface runoff) and establishing upstream prevention mechanisms.	Decision issuing University Marine Pollution Prevention Policy (explicitly defining Policy Created and Policy Reviewed within 2022–2026 per THE standards).	Institute of Environmental Science, Engineering and Management, Office of Planning and Investment	Q1 – Q2/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus & Drainage infrastructure management	Invest in upgrading trash traps, sediment catch basins, and grease interceptor devices at kitchen dining halls and mechanical practice workshops prior to discharging into municipal sewers emptying into rivers and seas; periodically dredge internal water flow channels.	Acceptance record for grease interceptor equipment and surface trash screen installation; Periodic catch basin dredging schedule for 2025.	Office of Facilities Management, Office of Dormitory Management and Services	Q1 – Q3/2025
Thrust 3: Modern Facilities	Hazardous waste management & Laboratory safety	Strictly control 100% of hazardous chemicals and heavy metals generated from laboratories and research centers; transfer all to functional entities for compliant disposal/destruction, completely preventing leakage into surface water systems.	Hazardous waste transfer dossier 2025 (contracts, invoices, transfer manifests per MONRE regulations).	Office of Planning and Investment, Institute of Environmental Science, Engineering and Management	Q1 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Expanding community connection activities towards active citizenship	Deploy the communication campaign "From Campus Front Canals to the Blue Ocean": raising awareness against indiscriminate littering into drainage systems, protecting downstream ecosystems of Sai Gon - Dong Nai River system.	Communication materials for land-based pollution prevention campaign; Infographics and video clips publicly posted on IUH fanpages and website.	Information and Communication Center, Youth Union – Student Association	Q2 – Q4/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Campus environmental management)	Review and compile the Annual Report 2025 on executing the policy to prevent marine pollution from land-based sources: synthesizing wastewater quality data, grease and waste intercept volume.	Monitoring Report 2025 on Policy Enforcement for Marine Pollution Prevention for THE Portal verification.	Institute of Environmental Science, Engineering and Management, Office of Planning and Investment	Q4/2025

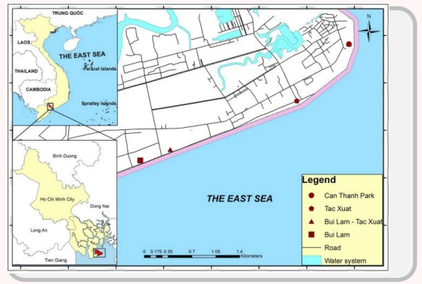
Industrial University of Ho Chi Minh City

GROUP 14.4 – Water sensitive waste disposal

SDG 14 LIFE BELOW WATER

14.4.3 Reducing marine pollution (policy)

ACTIVITY EVIDENCE



Article title 1

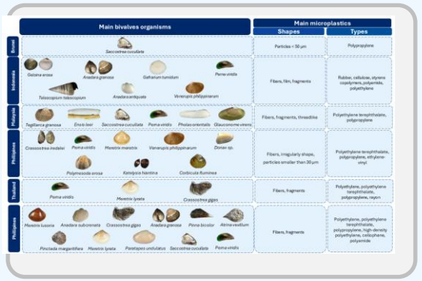
Understanding marine litter origin in a coastal area: Can Gio beaches, Ho Chi Minh City, Vietnam, as the case study

Evidence link

https://doi.org/10.1016/j.rsma.2024.103664

Activity description

To mitigate marine litter leakage, this study tracked the abundance, origin, and lifespan of bottles and single-use containers at four beaches in Can Gio, Ho Chi Minh City, using the Mergin Maps application. Among 522 recorded items, 60.5% bore identifiable brands, predominantly originating domestically in Vietnam (78.2%), followed by Thailand as the primary foreign source. Evidence from epibionts and bite marks indicated that these items drifted along regional ocean currents, highlighting the importance of tracing litter sources via trademarks for effective environmental management.



Article title 2

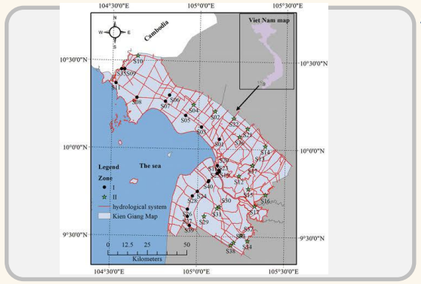
Research trends in microplastic contamination of bivalves across Southeast Asia: a comprehensive review on patterns, challenges and future directions

Evidence link

DOI:10.22034/iar.2025.2009345.1854

Activity description

This review synthesizes research on microplastic (MP) contamination in bivalves across Southeast Asia (Brunei, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam). Highlighting bivalves as effective bioindicators, findings show that MP concentrations vary significantly based on proximity to pollution sources and species traits. Fibers and fragments are the dominant ingested MP types, with polyethylene, polypropylene, and polyethylene terephthalate being the most prevalent polymers, underscoring critical waste management challenges in coastal regions



Article title 3

Spatiotemporal assessment and pollution-source identification and quantification of the surface water system in a coastal region of Vietnam

Evidence link

https://doi.org/10.1080/02626667.2023.2192352

Activity description

This study identified and quantified surface water pollution sources in a coastal region of Vietnam using 400 samples collected across 40 sites (2016–2020). Results revealed four primary pollution contributors: seawater intrusion, agricultural activities, domestic sewage, and hydrological modifications. Seawater intrusion accounted for 83.3% of water quality variations in the dry season and 35.3% in the rainy season. Degradation was more severe within 20 km of the coastline, highlighting the need for targeted management strategies to ensure sustainable water resource development.

Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.1

Minimizing alteration of aquatic ecosystems (plan)

Plan to minimize physical, chemical, and biological alteration of aquatic ecosystems associated with IUH.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 3: Modern and Comfortable Facilities	Building a green campus & Infrastructure maintenance and upgrading management	Formulate and issue the Plan to Manage and Minimize Impacts on Adjacent Aquatic Ecosystems of IUH in 2025: identifying receiving surface water bodies (Tham Luong - Ben Cat - Rach Nuoc Len Canal), assessing risks from construction activities and rainwater runoff, and establishing erosion and landslide control measures.	Decision issuing Plan to Minimize Alteration of Adjacent Aquatic Ecosystems around IUH Campus in 2025.	Office of Planning and Investment, Institute of Environmental Science, Engineering and Management	Q1 – Q2/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Increasing natural permeable surface area)	Deploy green infrastructure solutions to reduce physical and flow alterations: expanding permeable interlocking brick pavements, dredging campus landscape ponds as rainwater buffering retention basins to mitigate flood peak discharge into local canals.	Technical acceptance record for natural permeable drainage works and retention eco-ponds within IUH campus.	Office of Planning and Investment, Office of Facilities Management	Q2 – Q3/2025
Thrust 3: Modern and Comfortable Facilities	Water quality management & Campus environmental safety	Implement control measures against chemical and biological alterations: managing fertilizer/pesticide residue in green landscape care, utilizing bio-organic fertilizers to prevent water eutrophication, controlling and eradicating invasive alien species.	Non-toxic green landscape care procedures; Log of bio-products used for campus greenery maintenance.	Office of Facilities Management, Institute of Environmental Science, Engineering and Management, Office of Human Resources and Administration	Q1 – Q4/2025
Thrust 1: Pioneering in Education and Research	Increasing scientific publication count & Technology transfer	Organize periodic surveys and assessments regarding canal bank erosion risks, bottom siltation, and aquatic community structure alterations along the canal segment receiving IUH discharge; construct technical response scenarios.	Assessment Report 2025 on Physical-Chemical-Biological Impacts on Adjacent Receiving Water Bodies.	Institute of Environmental Science, Engineering and Management	Q2 – Q4/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus (Green Campus KPI)	Compile the Summary Report on Outcomes of the Plan to Minimize Local Aquatic Ecosystem Alterations in 2025: cross-checking discharge control indices and habitat stability for THE Portal submission.	Summary Report 2025 on Executing the Plan to Minimize Impacts on Adjacent Aquatic Ecosystems around IUH.	Institute of Environmental Science, Engineering and Management	Q4/2025

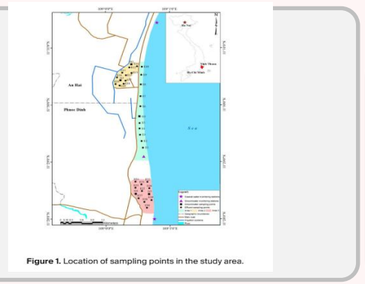
Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.1 Minimizing alteration of aquatic ecosystems (plan)

ACTIVITY EVIDENCE



Article title 1

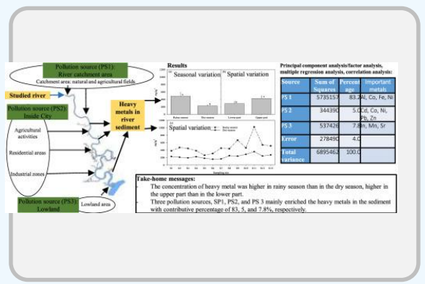
The integrating impacts of extreme weather events and shrimp farming practices on coastal water resource quality in ninh thuan province, Vietnam

Evidence link

https://doi.org/10.3390/su16135701

Activity description

This study evaluates water supply quality and shrimp farm effluent impacts in Ninh Thuan, Vietnam's hottest and driest coastal province. Combining qualitative data (secondary monitoring records, participatory rural appraisal, field observations) and quantitative measurements of groundwater and wastewater, the study identified four main drivers of pollution: extreme weather, farming practices, degraded infrastructure, and weak governance. Shrimp cultivation activities—such as feeding and chemical use—significantly elevated suspended solids, organic loads (BOD_5, COD), and nutrients (N, P, NO_x), confirming nutrient pollution in local coastal and groundwater resources.



Article title 2

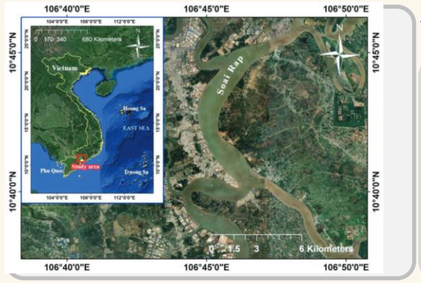
Seasonal, spatial variation, and pollution sources of heavy metals in the sediment of the Saigon River, Vietnam

Evidence link

10.1016/j.envpol.2019.113412

Activity description

This study investigated the spatial and seasonal distribution and sources of 11 heavy metals and metalloids (Al, B, Cd, Co, Fe, In, Mn, Ni, Pb, Sr, Zn) in 96 sediment samples from the lower Saigon River. Results revealed that total exchangeable concentrations were significantly higher in the rainy season and upstream sections. Multivariate analyses identified three primary pollution sources enriching the sediments: natural soil erosion from the catchment (83%), mixed agricultural runoff and urban activities within Ho Chi Minh City (6%), and contributions from lowland areas (7.8%).



Article title 3

Acute Toxicity of DDT on Embryo and Larval Growth of the Pacific Oyster, Crassostrea gigas... A Case Study in the Saigon–Dongnai River, Vietnam

Evidence link

https://li01.tci-thaijo.org/index.php/JFE/article/view/260171/178289

Activity description

Dichloro-Diphenyl-Trichloroethane (DDTs) are potent organic toxins widely used in agriculture and malaria prevention. The extensive use of DDTs has raised concerns about their adverse impacts. This study aimed to evaluate the toxicity of DDTs on Pacific oyster (Crassostrea gigas) larvae and embryos in the lower Sai Gon-Dong Nai River. We exposed oyster larvae and embryos to sediment samples containing DDT concentrations of 0.01, 0.05, 0.1, 0.5, and 1 mg·kg^{-1}, as well as artificial seawater samples with DDT levels of 0, 0.1, 1, 10, and 100 µg·L-1. The analysis results revealed a significant adverse impact of DDTs on the survival ratio of larvae and the cell division of embryos in both water and sediment samples compared to control samples. The Effective Concentrations in embryo cell division capacity (EC50) after 2 and 24 h of exposure were 66.88 and 4.62 µg·L-1 in artificial seawater and 1.1 and 0.3 mg·kg-1 in sediment, respectively. Lethal Concentrations (LC50) were 4.62 µg·L-1 and 0.3 mg·kg-1, respectively. Transmission Electron Microscopy (TEM) and Scanning Electron Microscope (SEM) images further confirmed the significant morphological disruptions caused by DDTs after 24 h of exposure. These findings indicate that DDT toxicity poses a threat to oyster farming in coastal areas, where chronic pesticide exposure is likely

Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.2

Monitoring the health of aquatic ecosystems

Monitoring the health of local aquatic ecosystems associated with IUH.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 1: Pioneering in Research	Increasing reputable publications & Technology transfer	Issue the Local Aquatic Ecosystem Health Monitoring Program 2025: establishing a sampling network of 5 periodic sampling locations along Ben Cat - Vam Thuat Canal segment passing through neighboring Go Vap District.	Decision issuing Local Aquatic Ecosystem Monitoring Program 2025; Map of water and biological sampling points.	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q1 – Q2/2025
Thrust 1: Pioneering in Education and Research	Research support policy & Promoting technology transfer	Conduct quarterly sampling and testing of physical-chemical water quality parameters (DO, pH, BOD5, COD, NH4+, heavy metals) at the university's ISO/IEC 17025 accredited laboratory.	Set of Water Quality Test Result Sheets across 2025 monitoring rounds; Laboratory analysis log at Environmental Institute.	Institute of Environmental Science, Engineering and Management	Q1 – Q4/2025
Thrust 1: Pioneering in Education and Research	Increasing reputable publications & Technology transfer	Conduct periodic bio-indicator surveys: collecting and identifying phytoplankton, zooplankton, and benthos; calculating biodiversity indices indicative of water quality.	Survey Report on Bio-indicator Aquatic Diversity; List of benthos and plankton species recorded in 2025.	Institute of Environmental Science, Engineering and Management, Aquatic Biology Research Group	Q2 & Q4/2025
Thrust 3: Modern and Comfortable Facilities	Advanced IT infrastructure (Big Data & IoTs)	Establish a digitized database tracking multi-year aquatic ecosystem health data series; integrate water quality trend visualization dashboards for research and data sharing.	IUH Local Aquatic Ecosystem Monitoring Digital Database System; Water quality trend visualization dashboard.	Institute of Environmental Science, Engineering and Management	Q3 – Q4/2025
Thrust 1: Pioneering in Research	Research publications & Environmental assessment	Publish the Annual Monitoring Report on Local Aquatic Ecosystem Health 2025: assessing environmental improvement trends, warning localized pollution risks, and recommending intervention measures.	Annual Report 2025: Health and Biodiversity Assessment of Adjacent Aquatic Ecosystems around IUH for THE Portal verification.	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q4/2025

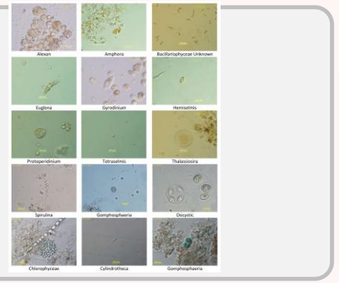
Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.2 Monitoring the health of aquatic ecosystems

ACTIVITY EVIDENCE



Article title 1

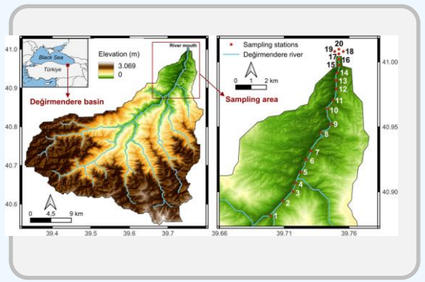
Nutrient dynamics, environmental impacts, and feed efficiency in intensive whiteleg shrimp (Litopenaeus vannamei) farming on sandy soils in Ninh Thuan, Vietnam

Evidence link

https://doi.org/10.1016/j.aqrep.2025.103050

Activity description

Whiteleg shrimp (Litopenaeus vannamei) farming has expanded rapidly on sandy coastal soils in Vietnam's South Central region. These permeable soils, combined with high feed input and limited waste treatment, raise concerns about nutrient pollution and environmental degradation. This study assessed nutrient dynamics and environmental impacts in a typical intensive shrimp pond system in Ninh Thuan province over a 66-day culture cycle. Physical, chemical, and biological parameters were monitored, including temperature, salinity, total suspended solids, chemical and biological oxygen demand, total nitrogen, total phosphorus, ammonium, microalgae composition, and bacterial counts. A nutrient mass balance showed that commercial feed contributed 81.9 % of total nitrogen and 87.8 % of total phosphorus inputs. However, nutrient utilization was low: only 13.8 % of nitrogen and 11.4 % of phosphorus were retained in shrimp biomass.



Article title 2

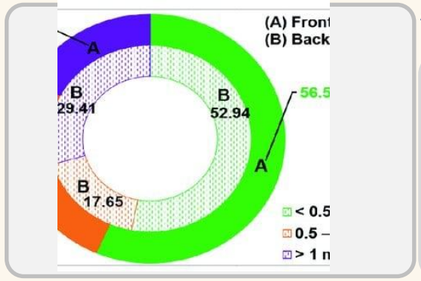
Seasonal assessment of ecological and human health risks of trace metals in the Saigon River surface water, Vietnam

Evidence link

https://doi.org/10.1002/clen.202300042

Activity description

River water pollution with potentially toxic elements can be quantified via hydrological studies, while its potential impacts on the ecosystem and human health can be assessed via the indices of ecological risk (RI) and human health hazard (HI). This study aims to assess potential ecological and human health risks of trace-element pollution of the Saigon River surface water, based on seasonal, position, and tidal changes. Surface water samples are taken during dry and rainy seasons and analyzed for Cu, Cr, Mn, Pb, Ni, and Zn. The trace-element concentrations are used to compute RI and HI. Of the six elements, Cu accounted for 87.7 and 12.5% of the total variance of RI and HI, respectively. The RI and HI values are strongly correlated and are higher in dry season than in rainy season. The HI value of >1 for children suggests that children's health may be sensitive to the adverse impacts of the current status of the trace-element pollution



Article title 3

Combining Fluorescence Microscope and FTIR to Investigate Microplastics in Sand at Vung Tau beaches

Evidence link

https://doi.org/10.14456/ea.2023.28

Activity description

Microplastic pollution (plastic debris < 5 mm) has become a global environmental problem due to the accumulation of plastic debris in water bodies over the decades. The present study was conducted to determine the abundance, shape, color, size, and composition of microplastics in the sand collected at recreational beaches in Vung Tau city of Vietnam. Ten sand samples were collected, five from Front Beach and five from Back Beach. These samples were extracted and analyzed for microplastics with a dissecting microscope, Nile red staining and the Fourier Transform Infrared (FTIR) technique. Results showed that microplastics were present in all study areas, with concentrations ranging from 5 to 27 MPs/100 g of dry sand. Colored and fibers dominated in both beaches (70-80%), of which fibers shorter than 0.5 mm were commonly found. Many detected microplastics were black and blue with a similar percentage, 32.55 % and 34.66 %.

Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.3

Programs towards good aquatic stewardship practices

Programmes and incentives promoting responsible aquatic stewardship, water utilization, and

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 2: Promoting Community Connection and Service	Expanding community connection activities towards active citizenship	Issue the ongoing IUH Aquatic Stewardship Program: establishing principles for equitable, sustainable water utilization and incentive mechanisms for water protection initiatives among students and staff.	Decision issuing University Aquatic Stewardship Program for 2023–2028 (confirming program as ongoing and continuous).	Institute of Environmental Science, Engineering and Management, Office of Political Affairs and Student Support	Q1 – Q2/2025
Thrust 1: Pioneering in Research	Research support policy & Student research investment	Establish Green Initiatives Incubation Grant and organize Innovation Contest "Protecting Water Sources and Aquatic Ecosystems": granting funding for 05 outstanding student/young lecturer applied research projects/models.	Decision establishing Water Initiatives Grant Fund; Decision awarding project funds to winning student teams; Model acceptance minutes.	Youth Union – Student Association, Office of Science Management and International Affairs, Office of Finance and Accounting	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Encouraging student community movement participation (Participating student count)	Deploy "Citizen Science for Water" program: training and guiding students and local residents to use rapid test kits to monitor canal water turbidity and pH, submitting data via management apps.	Implementation plan for Citizen Science Model 2025; Rapid test kit set distributed to volunteers; Dataset recorded from community participation.	Institute of Environmental Science, Engineering and Management, Youth Union – Student Association	Q2 – Q4/2025
Thrust 3: Modern and Comfortable Facilities	Building a green campus (% reduction in water consumption; Water reuse)	Apply recognition and "Smart Water User Unit" certification for building blocks, dormitories, faculties, and departments achieving over 15% water savings compared to previous period; install auto-shutoff taps and water-saving valves.	Decision commending outstanding water-saving units in 2025; Measurement report on actual water volume saved.	Office of Planning and Investment, Office of Facilities Management, University Trade Union	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects (Community satisfaction rating)	Compile the Summary Report 2025 on Programmes and Incentive Mechanisms for Responsible Aquatic Stewardship: recording participant counts, funded initiatives, and social impact for THE evidence.	Summary Report 2025 on IUH Aquatic Stewardship Program affirming ongoing nature and multi-stakeholder effectiveness.	Institute of Environmental Science, Engineering and Management, Office of Political Affairs and Student Support	Q4/2025

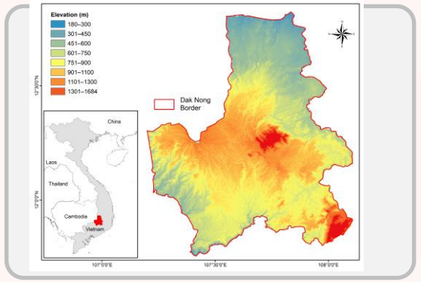
Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.3 Programs towards good aquatic stewardship practices

ACTIVITY EVIDENCE



Article title 1

Affecting of Nature and Human Activities on the Trend of Vegetation Health Indices in Dak Nong Province, Vietnam

Evidence link

DOI: 10.3390/su15075695

Activity description

This study aims to evaluate the effects of natural and human conditions on vegetation covers using VCI and TCI indices (the satellite-based Vegetation Health Indices (VHIs)) in Dak Nong province. Factors affecting the VHIs included in the analysis involve land use, soil, population, topography, distance to roads and surface water. The data analysis period is the dry season from 2000 to 2020. The trend of the VHIs' change in this study is analyzed using Sen's method with monitoring data from Modis. The effects of factors affecting the VHIs are based on logistic regression and discriminant analysis. The analysis results show that the VHIs are clear and show both increasing and decreasing trends. Based on logistic regression analysis, the influence of land use types on the trend of the VHIs in the direction of increasing from negative to positive will be from PdF, UnL, AnC, SpF, PtF, PeA and then to PdR. Corresponding to the soil will be from ACa, FRp, FRx, FRr, ACh, LVx, FLg and then to LVg. Based on the discriminant analysis method, it was found that there are only four primary factors affecting the trend of the VHIs in order of decreasing level of closure: population density, land use, soil and population growth rate and to the road. These results show that in places where labour resources are available, plants are interested in investment due to high profits, nutrient-rich soil and convenience for plant care; the VHIs tend to increase and vice versa



Article title 2

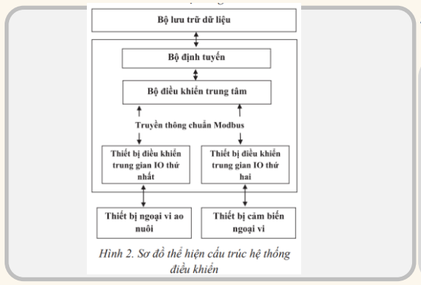
Developing a drought simulation model for Dak Nong Province using artificial neural networks (ANN).

Evidence link

https://iesem.edu.vn/chung-ket-eureka-cap-truong-2023-d400.html

Activity description

Dak Nong is one of the localities severely affected by agricultural drought, which causes significant economic losses and disrupts agricultural production. However, monitoring and forecasting efforts currently face major challenges, as the entire province is served by only two meteorological stations. To address this limitation, this project proposes the use of remote sensing imagery combined with an artificial neural network model (deep learning) to analyze correlations and accurately assess drought-affected areas.



Article title 3

Applying an IoT platform to automation in shrimp farming in VietnaApplying an IoT platform to automation in shrimp farming in Vietnam

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Evidence link

DOI:10.59266/houjs.2025.844

Activity description

Currently, the shrimp farming industry faces numerous challenges related to diseases, environmental conditions, and manual operational practices. Consequently, it is essential to enhance production efficiency and reduce farming costs. This research proposes an IoT-based automation system for the operation of industrial shrimp farms, in which the collection, processing, and transmission of data are managed through the TOMOTA-IoT system.

Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.4

Collaboration for shared aquatic ecosystems

Collaborating with local communities to maintain shared aquatic ecosystems.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects & Increasing external community links (Number of links)	Sign Inter-agency Cooperation Agreement (MOU) between IUH, Ward 4 People's Committee, Ward 5 People's Committee (Go Vap District), and Quarter Executive Boards under the joint program "Preserving and Cleaning Shared Canal Systems 2024–2026".	Inter-agency Memorandum of Understanding (MOU) between IUH and local government/community on maintaining and protecting shared aquatic ecosystems.	Office of Human Resources and Administration, Youth Union – Student Association	Q1 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Encouraging student community movement participation (Community satisfaction rating)	Periodically organize "Joint Green Sundays" alongside civic groups and local residents: removing water hyacinths, dredging sludge to clear drainage flows, planting trees to prevent canal bank erosion around campus areas.	Plan and inter-agency minutes for 2025 Green Sunday rollouts; Participant roster of residents and students; Field photo documentation.	Youth Union – Student Association, University Trade Union, Ward Youth Union	Q1 – Q4/2025
Thrust 1: Pioneering in Research & Thrust 2: Serving Community	Technology transfer & Pro-bono advisory and professional services	Dispatch IUH environmental expert delegations to provide technical guidance to local residents: treating household wastewater using micro-organisms, installing alleyway upstream trash traps to prevent waste dumping into canals.	Technical guidelines on protecting shared water bodies; Acceptance minutes for community trash trap models in residential alleys.	Institute of Environmental Science, Engineering and Management	Q2 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Expanding community connection activities towards active citizenship	Organize thematic dialogue sessions at neighborhood community halls: discussing water ecosystem importance, gathering resident feedback regarding pollution hotspots, and agreeing on joint action plans.	Minutes of thematic dialogue meetings with neighboring communities; Summary table of feedback and water pollution hotspot remediation plans.	Office of Political Affairs and Student Support, Youth Union – Student Association, Neighborhood Party Cell	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Strengthening community service projects (Community satisfaction rating)	Compile Summary Report 2025 on collaborative activities with local communities to maintain shared aquatic ecosystems: detailing local public roles, improved water surface areas, and satisfaction surveys.	Summary Report 2025 on IUH - Local Community Collaboration Model for Protecting Shared Water Ecosystems for THE Portal verification.	Institute of Environmental Science, Engineering and Management, Office of Human Resources and Administration	Q4/2025

Industrial University of Ho Chi Minh City

GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.4 Collaboration for shared aquatic ecosystems

ACTIVITY EVIDENCE



Article title 1

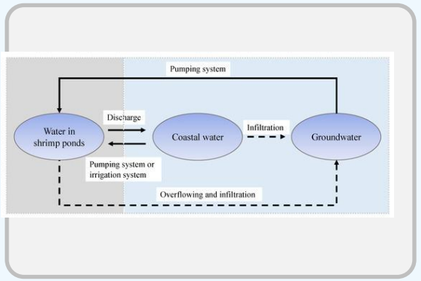
River pathway connectivity shapes water treatment facility vulnerability to climate-driven saltwater intrusion: spatiotemporal salinity patterns and infrastructure prioritisation in Ben Tre province, Vietnam

Evidence link

https://doi: 10.2166/wcc.2026.035

Activity description

Climate-driven saltwater intrusion threatens water security in the Mekong Delta, yet facility-level exposure patterns remain poorly characterised. This study assessed spatiotemporal salinity at 32 water treatment facilities in Ben Tre Province, Vietnam, to identify geographic vulnerability beyond conventional coastal-proximity heuristics. We analysed 6,696 raw water salinity observations from January 2024 to May 2025. Facilities were classified into three geographic zones based on intrusion-pathway exposure, and spatial clustering was assessed using Moran's I. A composite chronic exceedance index integrating intensity, frequency, and duration characterised persistence patterns. Overall, 77.3% of observations exceeded the 0.5‰ provincial threshold. Inland River Pathway facilities recorded the highest mean salinity (2.65 ‰), numerically 32% higher than Coastal facilities, despite being located 24–40 km from the coast.



Article title 2

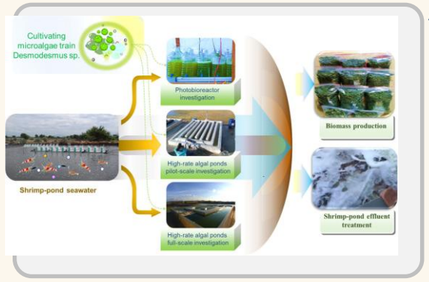
The integrating impacts of extreme weather events and shrimp farming practices on coastal water resource quality in ninh thuan province, Vietnam

Evidence link

https://doi.org/10.3390/su16135701

Activity description

Thuan is a coastal province in the central region of Vietnam and is characterized by a climate that is the hottest and driest in the country. Vietnam is also one of the top five countries most vulnerable to the effects of climate change worldwide. The objective of this study was a thorough evaluation of the quality of water supply sources and the impacts of water effluents from shrimp farms in Ninh Thuan province. The comprehensive evaluation was based on an understanding of the water–wastewater cycle employed in coastal shrimp cultivation. We combined qualitative and quantitative analyses in undertaking this study. Secondary data of groundwater and coastal water from the local periodic water quality monitoring program and national technical regulations were collected in the qualitative approach.



Article title 3

Dual-purpose shrimp-pond effluent treatment and biomass production for biodiesel using Desmodesmus sp

Evidence link

https://doi.org/10.1016/j.envc.2025.101273

Activity description

Intensive shrimp farming in Vietnam's coastal regions generates significant organic and nutrient pollution. This study optimizes Desmodesmus sp. cultivation for treating shrimp-pond wastewater and producing biodiesel in tropical conditions. Microalgae were cultivated in 4 L photobioreactors with 2–10 % (v/v) shrimp-pond sludge, identifying 6 % as the optimal concentration (growth rate: 0.378 day^{-1}). In a 40 m^3 high-rate algal pond (HRAP), Desmodesmus sp. achieved 90 % NH4-N, 76 % PO4-P, and 85 % COD removal over 4 days. Biomass harvesting via Ca(OH)2 flocculation at pH 10 was cost-effective, yielding biodiesel-grade biomass with 34 % oleic acid (C18:1) and 33 % palmitic acid (C16:0), meeting EU and US standards. This is the first study to demonstrate efficient treatment of high-salinity (33 g L^{-1}) shrimp-pond wastewater in large-scale HRAPs, offering a scalable, low-cost solution for environmental sustainability and economic benefits in aquaculture-intensive regions like Vietnam's Mekong Delta.

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GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.5

Watershed management strategy

Watershed management strategy based on local aquatic species diversity traits.

Action plan

Strategic Direction (Thrust)	KPIs	Activities	Expected Results	Responsible Unit	Timeline
Thrust 1: Pioneering in Research & Thrust 2: Serving Community	Research publications & Community service projects	Formulate and issue the scheme "Vam Thuat - Ben Cat Canal Watershed Sustainable Management Strategy Based on Aquatic Biodiversity Traits" (IUH Watershed Management Strategy): integrating spatial biodiversity data across the watershed as a baseline for conservation planning.	Decision issuing University Watershed Management Strategy for 2025–2020 (establishing watershed scope and indicator native aquatic species catalog).	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q1 – Q2/2025
Thrust 1: Pioneering in Education and Research	Increasing publication quality in domestic and international journals & Technology transfer	Conduct a comprehensive aquatic biodiversity investigation across the watershed: mapping Ecological Sensitivity Maps zoning spawning grounds, native fish migration routes, and high pollution pressure areas.	1:5,000 scale watershed ecological zoning map; Seasonal aquatic species investigation dataset across sub-basin tributaries.	Institute of Environmental Science, Engineering and Management	Q1 – Q3/2025
Thrust 2: Promoting Community Connection and Service	Increasing external links & Technology transfer and pro-bono advisory	Transfer canal bank spatial planning recommendations and soft-engineering bank stabilization technical solutions protecting natural habitats to Department of Construction, Department of Planning and Architecture, and District People's Committee.	Expert advisory report attached with technical habitat protection solution files sent to urban management authorities with receipt confirmation.	Institute of Environmental Science, Engineering and Management, Office of Science Management and International Affairs	Q2 – Q4/2025
Thrust 2: Promoting Community Connection and Service	Active citizenship awareness education & Student movement participation	Establish a Community-based Watershed Committee: bringing together representatives from IUH, local government, neighborhood blocks, and riparian enterprises to jointly monitor illegal discharge hotspots.	Operational regulations and periodic meeting minutes of the Watershed Committee in 2025; List of illegal discharge hotspots detected and promptly handled.	Institute of Environmental Science, Engineering and Management, Youth Union – Student Association, Ward People's Committee	Q2 – Q4/2025
Thrust 1: Pioneering in Research	Research publications & Diversifying public communication	Publicly release Watershed Management Strategy documents on website; compile Annual Report 2025 evaluating aquatic community recovery efficiency and watershed water quality for THE Portal verification.	Public URL link of Watershed Management Strategy document on IUH website; Strategy Enforcement Monitoring Report 2025.	Information and Communication Center, Institute of Environmental Science, Engineering and Management	Q4/2025

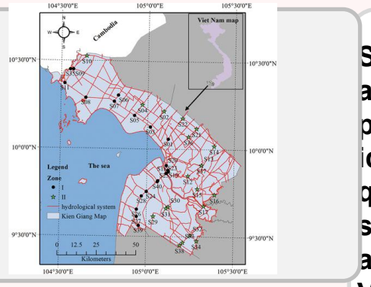
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GROUP 14.5 – Maintaining a local ecosystem

SDG 14 LIFE BELOW WATER

14.5.5 Watershed management strategy

ACTIVITY EVIDENCE



1

Article title

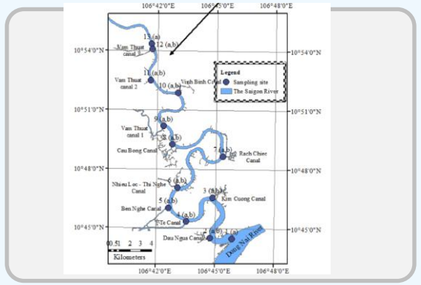
Spatiotemporal assessment and pollution-source identification and quantification of the surface water system in a coastal region of Vietnam

Evidence link

https://doi.org/10.1080/02626667.2023.2192352

Activity description

Surface water quality in coastal regions may be degraded due to various pollution sources, including seawater intrusion, dependent on season and distance from the coastline. This study aimed to fractionate and quantify pollution sources affecting surface water quality in a coastal region of Vietnam. Between 2016 and 2020, 400 surface water samples were collected from 40 sites during dry and rainy seasons and analysed for 15 parameters.



2

Article title

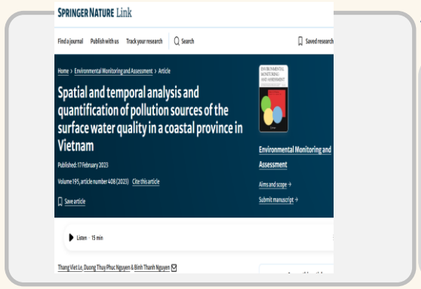
Seasonal assessment of ecological and human health risks of trace metals in the Saigon River surface water, Vietnam

Evidence link

DOI:10.1002/clen.202300042

Activity description

River water pollution with potentially toxic elements can be quantified via hydrological studies, while its potential impacts on the ecosystem and human health can be assessed via the indices of ecological risk (RI) and human health hazard (HI). This study aims to assess potential ecological and human health risks of trace-element pollution of the Saigon River surface water, based on seasonal, position, and tidal changes. Surface water samples are taken during dry and rainy seasons and analyzed for Cu, Cr, Mn, Pb, Ni, and Zn. The trace-element concentrations are used to compute RI and HI. Of the six elements, Cu accounted for 87.7 and 12.5% of the total variance of RI and HI, respectively. The RI and HI



3

Article title

Spatial and temporal analysis and quantification of pollution sources of the surface water quality in a coastal province in Vietnam

Evidence link

https://doi.org/10.1007/s10661-023-11026-x

Activity description

The surface water quality in coastal areas may be highly vulnerable to degradation due to various pollution sources such as seawater intrusion and anthropogenic activities. The current study sought to spatially and temporally analyze and quantify pollution sources of the surface water system in the coastal province of Tra Vinh, Vietnam. A total of 600 surface water samples were taken from 30 monitoring sites distributed over 4 spatial zones. Water samples were collected in four campaigns each year during the dry and rainy seasons from 2016 to 2020 and analyzed for 10 physiochemical and biological parameters. The analyzed data were calculated for the water quality index (WQI). Two-way analysis of variance, principal component analysis/factor analysis (PCA/FA), and multivariable regression analysis (MRA) were conducted over the whole dataset.

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IMPLEMENTATION RESULTS

OPERATIONAL EXECUTION IN VERIFIED DATA YEAR 2024–2025

Comprehensive Audit of Implemented Actions Across Key Indicators of SDG 14

SDG 14 LIFE BELOW WATER

1. AQUATIC ECOSYSTEM EDUCATION (14.2)

Freshwater Ecosystems & Water Stewardship (14.2.1):

• Published curriculum 'Environment and Humanity' (Assoc. Prof. Le Hung Anh ed.) and core modules in Water & Wastewater Treatment Engineering.

• Embedded open experiential projects coupling classroom theory with fieldwork, enhancing student competencies in water conservation and runoff abatement.

Sustainable Aquaculture & Conservation Tourism (14.2.2):

• Deployed Sentinel satellite remote sensing to map 85.56 km² of Can Gio mangrove biosphere reserves for eco-conservation tourism (Euréka Award).

• Partnered with DAAD and German Universities (Magdeburg-Stendal & Hof) delivering Summer Schools on recirculating aquaculture systems (RAS).

• Organized symposia on 'Nature-based Solutions (NbS)' with VNU-HCM, modeling constructed wetlands and urban blue-green infrastructure.

Combating Destructive Overfishing & IUU (14.2.3):

• Integrated specialized training in Environmental Impact Assessment (EIA) and climate change vulnerability on marine biodiversity and fish stocks.

2. ACTION ON MARINE POLLUTION & DISCHARGE (14.3 & 14.4)

Aquatic Conservation Events & River Plastic Tracking (14.3.1–3):

• Developed Computer Vision (CV) and UAV drone mapping to detect and quantify floating plastic debris on the Saigon River (Euréka Award).

• Valuated Can Gio mangrove ecosystem services (Sonneratia alba): sequestering 139.27 t CO2/ha and producing 101.32 t O2/ha.

Technology Preventing Ecosystem Damage (14.3.4):

• Deployed TOMOTA-IoTs automation in intensive shrimp farms (Minh Phu), cutting electrical failures by >90% and feed waste by 200 t/year.

• Synthesized bio-adsorbents (Chitosan/Graphene Oxide) and solar Ag/TiO2 catalysts for complete photodegradation of antibiotics (Oxytetracycline).

Water Discharge Compliance & Land-Based Prevention (14.4.1–3):

• Operated central WWTP compliant with QCVN 28:2010/BTNMT (Class A); evaluated trace metal ecological risks in the Saigon River.

• Mapped marine litter origins in Can Gio beaches via Mergin Maps; published regional reviews on microplastic bioaccumulation in marine bivalves.

3. MAINTAINING LOCAL AQUATIC ECOSYSTEMS (14.5)

Minimizing Alterations & Ecosystem Biomonitoring (14.5.1 & 14.5.2):

• Evaluated acute toxicity of DDT on Pacific oyster (Crassostrea gigas) larvae and embryo cleavage in the downstream Saigon–Dong Nai basin.

• Investigated spatial-seasonal distributions of 11 heavy metals in Saigon River sediments: 83% enriched via natural catchment weathering.

• Established water quality index (WQI) monitoring protocols and bio-indicator phytoplankton rosters in intensive aquaculture ponds.

Watershed Stewardship & Inter-Agency Alliances (14.5.3–5):

• Modeled nutrient circularity: recovered 17.7 kt/year phosphorus (P) from catfish pond sludge, mitigating eutrophication in Mekong waterways.

• Assessed saltwater intrusion vulnerability across 32 Ben Tre water treatment plants (77.3% salinity exceedance), advising intake relocation.

• Cultivated microalgae Desmodesmus sp. in high-salinity shrimp effluent, achieving 90% NH4-N and 85% COD removal while producing biodiesel.

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PERFORMANCE BENCHMARKING

Benchmarking Results Against THE Impact Ratings 2026 (Previous Cycle vs. Current Audit Cycle)

SDG 14 LIFE BELOW WATER

Indicator Category	Previous Cycle (THE 2026)	Current Audit (THE 2027)	Strategic Evolution & Outlook
Category 14.2 Supporting Ecosystems via Education (23% Weight)	Aquatic ecosystem curricula were fragmented; lacked structured international summer schools and direct community fisheries outreach.	Formally published core textbooks; organized DAAD-funded International Summer School on RAS; mapped 85.56 km² Can Gio mangroves via Sentinel imagery.	**Curriculum Institutionalization: Standardized water conservation into core curricula while scaling international tech-transfer training.**
Category 14.3 Action for Aquatic Ecosystems (27% Weight)	Aquatic damage prevention technologies remained lab-scale; lacked institutional sustainable seafood sourcing rules and IoT field pilots.	Deployed TOMOTA-IoTs cutting 200 t/year shrimp feed; quantified Saigon River floating plastics using UAV/AI; valuated Can Gio mangrove blue carbon.	**High-Tech Field Application: Pioneered IoT, computer vision drones, and solar nanomaterials to actively safeguard vulnerable aquatic biomes.**
Category 14.4 Water Sensitive Waste Disposal (27% Weight)	Effluent management was limited to baseline compliance; lacked systematic marine litter origin tracing and bioaccumulation risk audits.	Maintained Class-A compliant WWTP; tracked Can Gio coastal litter via Mergin Maps; reviewed microplastic contamination in Southeast Asian bivalves.	**Closed-Loop Discharge Control: Formalized zero-leakage chemical protocols alongside high-impact marine microplastic toxicology research.**
Category 14.5 Maintaining Local Ecosystems (23% Weight)	Lacked cohesive watershed management plans; ecotoxicology assessments and aquaculture nutrient circularity models were isolated.	Quantified DDT toxicity on oyster larvae; audited salinity intrusion across 32 Ben Tre water plants; cultured microalgae for effluent cleanup and biodiesel.	**Watershed Management Impact: Scaled trans-provincial ecological stewardship across the Mekong and Dong Nai basins, guiding public utility policy.**

Industrial University of Ho Chi Minh City

STRATEGIC PLAN FOR THE COMING YEAR

Four High-Impact Action Pillars to Position SDG 14 as a Premier Scoring Asset for IUH's Global Rank

SDG 14
LIFE BELOW WATER

1. CODIFYING SUSTAINABLE SEAFOOD & WATER PROTECTION POLICIES

- Promulgate the Presidential Decree enacting the institutional 'Sustainable Seafood Sourcing Policy' across 100% of campus canteens.
- Enact the university-wide Policy on Preventing Marine Pollution from Land-Based Activities, mandating strict chemical and oil runoff controls.
- Mandate certified sustainable seafood standards (VietGAP, ASC, MSC) in all institutional dining service concession tenders.
- Publicly disclose full policy charters on tqa.iuh.edu.vn and maintain audited annual review trails adhering to THE scoring guidelines.

2. ZERO-LEAKAGE DISCHARGE GOVERNANCE & SOURCE PLASTIC CONTROL

- Install automated grease interceptors across all dining facilities and engineered gross pollutant traps along campus runoff outfalls.
- Upgrade continuous real-time effluent telemetry at the central WWTP, transmitting compliance parameters directly to municipal DONRE.
- Enforce campus-wide bans on single-use plastics and non-biodegradable packaging across all institutional events and concessions.
- Archive 100% of licensed hazardous chemical waste manifests from science labs to guarantee zero contaminants reach surface aquifers.

3. LOCAL WATERSHED STEWARDSHIP & BIODIVERSITY MONITORING

- Promulgate the 'Vam Thuat - Ben Cat Watershed Sustainable Management Strategy' grounded in bio-indicator benthic and planktonic indices.
- Formalize joint environmental covenants with Go Vap district authorities to execute periodic riparian cleanup drives and canal desilting.
- Deploy an interactive WebGIS and public Dashboard monitoring spatial water quality trends across contiguous urban waterways.
- Expand campus blue-green infrastructure (permeable pavements, retention eco-ponds) to mitigate wet-season storm runoff discharge peaks.

4. SUSTAINABLE AQUACULTURE EXTENSION & BLUE-TECH TRANSFER

- Scale pro-bono farmer extension workshops on recirculating aquaculture systems (RAS) and probiotic sludge valorisation across the Mekong Delta.
- Deepen international academic alliances (DAAD/EU consortia) scaling microalgal bioremediation of hyper-saline effluent into bio-energy.
- Commercialize AI/UAV computer vision surveillance platforms for automated detection of floating riverine plastics for waterway agencies.
- Fund Scopus Q1/Q2 research chairs on marine ecotoxicology, trophic microplastic transfer, and Can Gio mangrove restoration ecology.