ITS
Institut
Teknologi
Sepuluh Nopember

14 LIFE BELOW WATER

Life Below Water

Sustainable Development Goals
Report *2023*

"The two SDGs that look at the broader ecosystem divide it into Life Below Water and Life on Land. The oceans, and the rivers and watersheds that link to them are the largest part of our ecosystem. 40% of the world's population lives within 100km of the coast, and we all rely — directly or indirectly – on the sea."

THE Impact Rankings

Life Below Water

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STATISTICS

188

Number of publications 2019-2023

ITS' Marine Technology Breakthroughs: Leading Indonesia's Maritime Innovation

ITS demonstrated excellence in marine technology through three groundbreaking initiatives that strengthen Indonesia's maritime capabilities and environmental sustainability. First, the AISITS Maritime Safety System, developed by PUI Kekal, revolutionizes maritime safety and environmental protection through real-time monitoring and carbon footprint tracking. Implemented at Pertamina facilities and recognized with the IAFMI Innovation Award 2023, this system features a 100-kilometre monitoring range and advanced early warning capabilities, effectively preventing underwater accidents and protecting marine conservation areas.

Second, the Ocean FarmITS Innovation combines offshore aquaculture with marine tourism through a dual-purpose floating structure. Built entirely with domestic components, it features tourist accommodations above and aquaculture facilities below, cultivating high-value species while offering unique tourism experiences. The sustainable design incorporates solar power, ensures quick investment recovery within 7-12 months, and demonstrates Indonesia's capability in maritime engineering.

Third, ROV W-101 Development, a collaboration between ITS, BRIN, and PT. Aquamarine Divindo Inspection showcases advanced underwater technology capabilities. Led by Ir. Wasis Dwi Aryawan, this autonomous vessel features cutting-edge imaging systems and precise manoeuvrability. Its modular, cost-effective design democratizes access to marine research technology, enabling broader participation in underwater exploration and research activities.

ITS Leads Maritime Innovation Through Strategic Partnerships

ITS also leads in maritime innovation through multiple strategic initiatives, partnerships, and technological developments that strengthen Indonesia's maritime sector while gaining international recognition. First, the PIANC Partnership for Maritime Excellence ITS has forged a strategic alliance with the Permanent International Association of Navigation Congresses (PIANC) during SENTA 2023, themed "Autonomous and Smart Innovation in Marine Science and Technology." This collaboration connects Indonesian maritime professionals with global expertise through PIANC's network, established in 1885. The partnership focuses on developing tailored solutions for Indonesia's maritime challenges while integrating global standards into local practices through specialized training programs and international project involvement.

Second, Maritime Innovation Hub with IDSurvey in collaboration with IDSurvey, ITS established a cutting-edge innovation hub at the National Ship Design and Engineering Center (NaSDEC). The 15x15-meter facility serves dual purposes as an industry service centre and research facility, including offices for the Indonesian Offshore Marine Industry Association (Iperindo). This initiative aims to accelerate Indigenous maritime solutions while streamlining the commercialization of innovations through improved certification and licensing processes.

Third, ITS, in collaboration with University College London and Universitas Pattimura, received the 2023 RINA-LR Maritime Safety Award for their innovative "Kora-Kora" ship stability monitoring app. Supported by the Newton Fund, this smartphone-based solution, tested in Ambon in October 2022, offers offline functionality and color-coded safety indicators, marking ITS as the first Indonesian institution to earn this prestigious award and highlighting its commitment to maritime safety.

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Advancing Maritime Science and Innovation Through Strategic Partnership, Research, and Technology Transfer

ITS has fortified its maritime and industrial education framework through a groundbreaking partnership with South Korea's Mokpo National University (MNU). What began as a focused collaboration in maritime studies has evolved into a comprehensive academic alliance, encompassing industrial engineering, information technology, and electronics through innovative Double Degree and Joint Degree programs. This strategic partnership harnesses the combined strengths of ITS' prestigious Naval Engineering Department and MNU's position as the leading maritime institution in Jeollanam-do. Together, they have created a dynamic educational ecosystem that seamlessly integrates theoretical expertise with practical industry applications.

The excellence of this collaboration is exemplified by ITS Faculty of Marine Technology (FTK), recently honored as the "Best Academic Excellence Center in the Maritime Sector of the Year 2023" by IPERINDO. FTK's success is built upon three fundamental pillars: the advancement of scientific knowledge, the development of research capacity, and effective technology transfer. Through its carefully crafted curriculum, which balances advanced marine technology concepts with hands-on applications, FTK consistently produces industry-ready graduates who make immediate and meaningful contributions to the maritime sector.

Empowering Communities Through Sustainable Water Ecosystem Management: ITS Initiatives in East Java

ITS implemented two groundbreaking water management initiatives that blend technological innovation with community empowerment. In Setrohadi Village, Gresik, ITS addressed water quality challenges through an integrated aeration-filtration system using natural materials like silica sand, carbon, and zeolite. Simultaneously, they developed a Smart Water Quality Monitoring System (WQMS) for aquaculture communities, employing IoT-enabled sensors to track vital water parameters in real time.

The success of these initiatives lies in their comprehensive approach to community engagement. Through knowledge transfer programs, local communities gain the expertise to maintain and operate these systems independently. This combination of technological solutions and community empowerment has created a replicable model for sustainable water resource management, demonstrating how environmental protection and community development can be achieved simultaneously. The results include improved water quality, enhanced aquaculture productivity, and strengthened community resilience, establishing a sustainable framework for water ecosystem management that other communities can adopt.