WALAILAK UNIVERSITY

SDG REPORT 2025-2026



Times Higher Education Sustainability Impact Ratings 2026

SUSTAINABLE DEVELOPMENT GOALS

14 LIFE BELOW WATER



1. BUILDING NATURE-BASED WEIRS FOR WATER SECURITY AND BIODIVERSITY CONSERVATION
2. COMMUNITY OUTREACH ON SUSTAINABLE FISHERIES AND LOW-CARBON TOURISM
3. MONITORING THE HEALTH OF ENDANGERED MARINE ANIMALS THROUGH AERIAL SURVEYS
4. STRENGTHENING MARINE PROTECTED AREAS AND ARTIFICIAL HABITATS

14 LIFE BELOW WATER

SDG 14 : LIFE BELOW WATER

BUILDING NATURE-BASED WEIRS FOR WATER SECURITY AND BIODIVERSITY CONSERVATION



Communities in Na Mai Phai Subdistrict, Thung Song District, Nakhon Si Thammarat Province, face seasonal water shortages, unpredictable rainfall, riverbank erosion, and degradation of freshwater habitats.

Although the area is connected to coastal and marine ecosystems that support local aquaculture, environmental changes, fluctuations in water disease risks, and the availability of suitable habitats can affect the health and survival of aquatic animals. These challenges require a systematic diagnostic assessment of marine animal populations, aquaculture conditions, and the environmental factors affecting aquatic animal health and productivity. Efforts are also needed to strengthen community knowledge and capacity in marine animal conservation and sustainable aquaculture practices to support ecosystem health and the long-term sustainability of local livelihoods.

Community-Based Freshwater Ecosystem Conservation

For more than five years, WU has continuously implemented the Building Nature-Based Weirs in Na Mai Phai Subdistrict Project, locally known as the “Living Weir Project”. The project is implemented in collaboration with local residents, community leaders, local government agencies, non-governmental organizations (NGOs), and international partners.



The project functions as both a freshwater ecosystem restoration initiative and a free educational programme for local communities. WU transfers practical knowledge about freshwater conservation, water resource management, irrigation and water-retention practices, riverbank protection, aquatic biodiversity, ecological restoration, and monitoring environmental changes.

Collaborative Planning for Sustainable Water Management

In 2026, WU continued the Living Weir Project through close collaboration with the partners. Community meetings were organized to review previous restoration activities, identify continuing water-management challenges, and develop plans for further restoration. Local residents reported encouraging signs of ecological recovery, including a gradual increase in aquatic animals, such as Giant freshwater prawn, minnows and red cheek barbs compared with previous years.

At the same time, the community identified limitations affecting the performance of existing weirs. Several structures had been partially damaged or washed away by strong monsoon currents, reducing their ability to retain water during the dry season. These observations demonstrated the importance of combining local environmental knowledge and scientific assessment when planning freshwater ecosystem restoration.

Hands-On Learning Through Nature-Based Weir Construction



Participants gain practical experience by assisting with the construction and restoration of nature-based weirs using locally available and environmentally friendly materials, including small boulders, bamboo, coconut leaves, and sandbags. The structures are designed as stepped and permeable systems rather than rigid barriers, allowing water to flow gradually downstream.

The project also promotes community-based learning and knowledge transfer. By involving local people directly in surveying, planning, construction, and restoration, WU helps develop local skills that can be applied beyond the individual project sites. Community members can subsequently contribute to the maintenance of existing weirs and the development of similar freshwater conservation activities in other locations.

Free Educational Programme on Freshwater Ecosystems

A key component of the Living Weir Project is the provision of a free educational programme on freshwater ecosystems and sustainable water management. The programme is designed for local residents, community leaders, local government officers, and WU student volunteers, providing opportunities for participants to learn directly from researchers and through practical field activities. Educational activities cover freshwater ecosystem conservation, water management, water conservation, irrigation practices, aquatic biodiversity, erosion prevention, and water retention.





The promotion of sustainable aquaculture practices provides an approach to conserving and managing aquatic resources. By improving aquaculture conditions and protecting aquatic habitats, these efforts can help enhance the survival, growth, and health of marine animals. The resulting improvements support sustainable aquaculture production, conserve marine biodiversity, and strengthen local livelihoods.

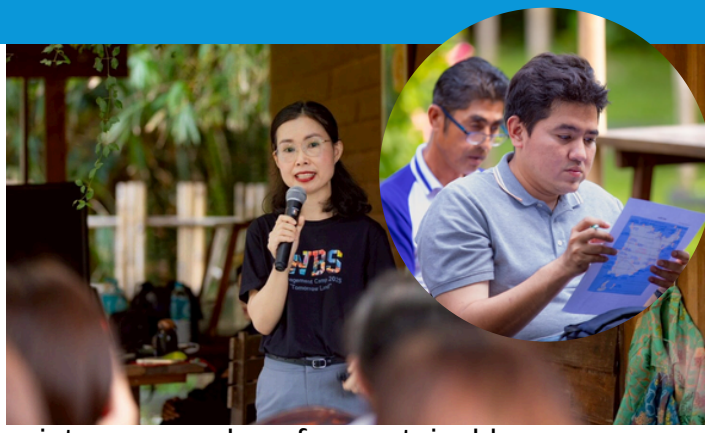
The structures also contribute to riverbank stabilization, erosion control, soil moisture retention, and flood-risk reduction. By reducing the velocity of flowing water, nature-based weirs can help minimize the impacts of intense water flows on riverbanks while supporting the recovery of riparian vegetation.

Freshwater Biodiversity Conservation and Ecosystem Restoration

Freshwater biodiversity is an important component of healthy aquatic ecosystems. Stable water conditions and improved freshwater habitats can support fish, freshwater invertebrates, aquatic insects, riparian vegetation, and other aquatic organisms. The nature-based design of the weirs allows water to continue moving downstream and provides habitat conditions that are more compatible with aquatic ecosystems.

Local communities have observed a gradual increase in aquatic animals compared with previous years, providing an encouraging indication of ecological recovery. These observations also demonstrate the value of involving communities in environmental monitoring and freshwater biodiversity conservation, as local residents can contribute important knowledge about changes in aquatic ecosystems over time.

COMMUNITY OUTREACH ON SUSTAINABLE FISHERIES AND LOW-CARBON TOURISM



Coastal and marine communities face growing challenges from the degradation of marine and coastal resources, unsustainable resource use, climate change, pollution, and increasing tourism activities. In particular, tourism activities can increase carbon emissions and resource consumption while placing additional pressure on sensitive coastal environments.

To diagnose these challenges and identify appropriate approaches for sustainable resource management, WU has undertaken community outreach and educational activities that promote sustainable fisheries and coastal resource management while connecting fisheries, aquaculture, marine conservation, and sustainable tourism with local economic development.



In 2025, WU organized educational and participatory programs to develop sustainable tourism management and low-carbon tourism (Low-Carbon Tourism) in Koh Samui, Surat Thani Province. The programs were conducted under the project “Blue Crab Bank as an Integrated Coastal Resource Management Tool for Sustainable Utilization”, which aims to strengthen the use of blue crab banks as a community-based mechanism for managing marine and coastal resources. Through workshops and community outreach, participants gained knowledge of sustainable tourism, sustainable fisheries, coastal resource management, marine conservation, blue crab conservation, blue economy, climate change adaptation, carbon reduction, and sustainable livelihoods.

The outreach programme also involved participatory planning for low-carbon tourism routes designed to support sustainable management of marine and coastal resources. Participants were encouraged to apply the ADAPT-REDUCE-OFFSET approach. ADAPT focuses on adapting tourism

activities, seasons, and spatial use to climate change. REDUCE focuses on reducing carbon emissions through walking, cycling, shared transportation, efficient energy use, waste and plastic reduction, and the use of seasonal local food. OFFSET promotes carbon compensation through activities such as mangrove and coastal vegetation restoration.





WU also conducted the “LOW CARBON JOURNEY SAMUI” training programme at the Ban Tai Blue Swimming Crab Bank, providing knowledge on sustainable tourism and carbon reduction to tourism operators, tourism communities, and relevant agencies. The programme demonstrated how community tourism can be connected with sustainable fisheries and marine resource management, using the blue crab bank as a practical tool for coastal conservation and sustainable resource utilization.

The programme further demonstrates how sustainable fisheries, aquaculture, and tourism can be addressed through integrated community outreach. The blue crab bank approach supports the restoration and sustainable utilization of marine resources while contributing to marine biodiversity conservation, sustainable fisheries management, food security, blue economy development, community livelihoods, and low-carbon coastal development.



Through these educational programmes, WU has strengthened community knowledge and stakeholder capacity for sustainable fisheries, aquaculture, marine and coastal resource management, and sustainable tourism. The initiatives have encouraged cooperation among fishing communities, tourism operators, businesses, government agencies, and other stakeholders, while promoting the blue crab bank as a practical community-based tool for sustainable coastal resource management. The programme also contributes to local economic development by creating opportunities for fishing communities and local tourism operators to generate income through sustainable fisheries and community-based tourism. As a result, the programme contributes to supporting the sustainable use and conservation of oceans, seas, and marine resources, while also contributing to promoting sustainable fisheries and food resources, strengthening local economic opportunities, and supporting low-carbon and resilient coastal community development.



MONITORING THE HEALTH OF ENDANGERED MARINE ANIMALS THROUGH AERIAL SURVEYS



Marine and coastal ecosystems provide essential habitats for biodiversity and support ecological balance, but rare marine animals such as dugongs, sea turtles, and dolphins face increasing pressures from habitat degradation, changes in marine resources, fishing activities, and marine debris. Effective conservation therefore requires continuous monitoring of aquatic ecosystems, including population size, species distribution, habitat use, and animal health. To address these challenges, WU collaborated with the Lower Andaman Marine and Coastal Resources Research Center and the Lower Gulf of Thailand Marine and Coastal Resources Research Center to diagnose the status and health of rare marine animals and strengthen evidence-based marine and coastal ecosystem management.

WU participated in a comprehensive marine wildlife survey and aquatic ecosystem monitoring programme in Trang Province, covering areas around Koh Libong, Koh Muk, Pak Meng Beach, Ban Pak Khlong, Sikao Bay, Laem Sai, Koh Sukorn, Koh Petra, and surrounding islands. The survey combined aerial surveys, boat-based surveys, line-transect methods, and unmanned aerial vehicles (Multirotor UAVs) to monitor the abundance, distribution, habitat use, and health condition of rare marine animals. Fixed-wing aircraft, including two double aircraft, were used for aerial line-transect surveys, while UAV technology was applied to survey areas around Ao Ban Phrao and Laem Chu Hoi on Koh Libong. The total aerial survey area covered approximately 616 square kilometres, providing systematic spatial data for marine biodiversity and ecosystem assessment.



The programme also incorporated marine animal health assessment through direct visual observation. Dugongs were observed swimming and feeding over seagrass meadows, demonstrating the ecological importance of healthy seagrass habitats for marine wildlife. Their observed respiration rate was approximately 3–5 breaths per five minutes. Body condition assessment showed that six dugongs had a low body condition score (BCS 2/5), nine were in good condition (BCS 3/5), and four were relatively well-conditioned (BCS 4/5). The observation of a mother-calf pair of Indo-Pacific humpback dolphins provided evidence of reproductive activity and indicated that the surveyed marine environment continues to support important biological functions of marine wildlife.

Overall, the visual health assessment indicated that the observed marine animals were generally in normal condition. No abnormal behaviours, visible injuries, or signs of entanglement in fishing gear or marine debris were detected during the survey. The information collected through population monitoring, species distribution surveys, health assessment, habitat observation, aerial monitoring, UAV surveys, line-transect surveys, and photo-identification (Photo-ID) will be used to identify individual dugongs and improve estimates of the actual population size of rare marine animals in Trang Province.

Through this collaborative monitoring programme, WU has strengthened the scientific measurement of marine ecosystem health by generating systematic data on species abundance, distribution, population characteristics, habitat use, reproductive activity, physical condition, and potential threats. The results provide a baseline for future surveys and enable changes in marine wildlife populations and health to be tracked over time. By combining field observation, aerial technology, UAVs, line-transect methodology, and Photo-ID, WU contributes to evidence-based monitoring of aquatic ecosystems and sustainable marine and coastal resource management, supporting the long-term conservation of endangered marine animals and the ecological health of Thailand's coastal waters.

STRENGTHENING MARINE PROTECTED AREAS AND ARTIFICIAL HABITATS



Coastal and marine ecosystems in Tha Sala District, Nakhon Si Thammarat Province, face increasing pressures from overfishing, habitat degradation, destructive fishing practices, and the declining abundance of juvenile aquatic animals. These pressures can disrupt marine food webs, reduce biodiversity, and threaten the livelihoods of small-scale fishing communities that depend on healthy coastal resources. To address these challenges, WU has worked directly with local communities, government agencies, and marine-industry partners to diagnose threats to coastal ecosystems and develop practical conservation measures that maintain and restore marine habitats, protect aquatic biodiversity, and support sustainable fisheries.

In 2025, WU organized environmental education and community engagement activities focused on the construction of artificial fish habitats in the coastal waters of Tha Sala District. The initiative brought together local fishermen, community members, local government organizations, the Thai Frozen Foods Association as a marine-industry partner, and the Ban Nai Thung Fisherfolk Association.



The artificial habitats were constructed using environmentally appropriate materials and deployed in the Ban Nai Thung Sea, an area recognized for its marine biodiversity and importance as a nursery ground for juvenile aquatic animals. These structures provide shelter for young fish, shellfish, and other marine organisms, reducing exposure to predators and creating favorable conditions for growth and survival. They can also provide surfaces for coral, seaweed, and other marine organisms to colonize, contributing to habitat restoration, ecological connectivity, biodiversity conservation, and greater resilience of coastal ecosystems.

WU also emphasized that artificial habitats should be established within appropriately designated conservation areas where fishing activities are controlled or prohibited. Such areas can function as safe zones for the natural nursery and replenishment of aquatic species, allowing juvenile animals to mature before contributing to surrounding fishing grounds. This approach links habitat restoration with sustainable fisheries management, marine resource conservation, ecosystem-based management, and the long-term recovery of economically important species such as blue swimming crabs, shrimps and fish.

Beyond individual habitat-restoration activities, WU has also worked with government agencies and community representatives to strengthen community-based marine conservation. The University participated in consultations on transforming community conservation zones into community-based marine protected areas in Tha Sala District.



A key outcome of this participatory process was the development of a Memorandum of Understanding (MOU) for the community-based management and protection of marine and coastal resources in Ban Nai Thung, Ban Sa Bua, and Ban Na Thap. The agreement provides a framework for cooperation among communities, government agencies, and other stakeholders to maintain conservation areas, protect nursery grounds, restore aquatic populations, monitor illegal activities, and promote sustainable utilization of marine resources.





The results demonstrate the practical value of WU's direct engagement in marine and coastal biodiversity conservation. Artificial habitats provide physical refuges and potential nursery areas, while community conservation zones establish longer-term mechanisms for protecting marine resources and regulating their use. Through ongoing ecological monitoring, habitat restoration, and measurement of changes in aquatic populations, WU can assess the effectiveness of these interventions and continuously improve marine conservation practices in Tha Sala and surrounding coastal areas. The event also enacted an MOU agreement on community marine protection under the Locally Managed Marine Area (LMMA) initiative.