Annual Report

SDG 17 Partnerships for the Goals

Partnerships to Advance SDG 12 Responsible Consumption and Production

1. Introduction

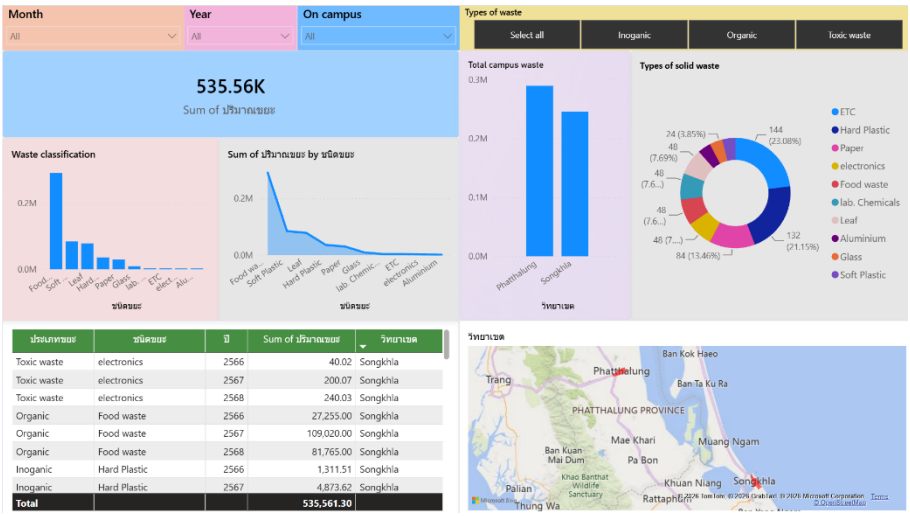
Thaksin University works with university units, communities, local authorities, and research partners to promote responsible consumption and production. Its initiatives connect waste monitoring, recycling, community technology transfer, and research on resource recovery. Together, these partnerships support more efficient resource use and practical approaches to a circular economy.

2. Partnership Objectives

The partnerships aim to reduce waste, improve separation and recycling, turn discarded materials into useful products, and strengthen community skills in managing waste at source. Research cooperation also supports resource recovery and more sustainable production. Progress is reflected in waste records, training, demonstrations, and research findings, with further monitoring needed to assess long-term benefits.

3. Collaboration within the University

The university records waste generation, recycling, and disposal to monitor performance and identify opportunities for improvement.



ประเภทขยะ	ชนิดขยะ	ปี	Sum of ปริมาณขยะ	วิทยาเขต
Toxic waste	electronics	2566	40.02	Songkhla
Toxic waste	electronics	2567	200.07	Songkhla
Toxic waste	electronics	2568	240.03	Songkhla
Organic	Food waste	2566	27,255.00	Songkhla
Organic	Food waste	2567	109,020.00	Songkhla
Organic	Food waste	2568	81,765.00	Songkhla
Inoganic	Hard Plastic	2566	1,311.51	Songkhla
Inoganic	Hard Plastic	2567	4,873.62	Songkhla
Total			535,561.30	

Waste monitoring dashboard:

https://app.powerbi.com/view?r=eyJrIjoiMGZiMDU2NjgtY2Y3ZS00NjEyLTkyN2UtMWRjNTFhODNlMDU5IiwidCI6IjNkYTdmOTQ3LTY3NTAtNDYzMC04MDk2LWJiYTlmNzZlMjZhOCIsImMiOjEwfQ%3D%3D

The University Administration Office and Faculty of Engineering established a Plastic Waste Management Center to turn discarded bottle caps into tables, chairs, and other products. General waste sent to landfill decreased from 300.02 tonnes in 2024 to 284.87 tonnes in 2025, a reduction of 15.15 tonnes (5.05%).



Supporting Evidence

https://www.tsu.ac.th/home/details.php?id=5530

4. Community and Local Partnerships

The university works with communities and local authorities across southern Thailand to develop practical waste management approaches. Its contributions include needs assessments, research, technical training, and demonstrations that help communities recover value from waste.

4.1 Household Organic Waste in Nakhon Si Thammarat and Songkhla

The university supports anaerobic digestion of household organic waste to produce biofertiliser. Activities include community needs assessments, technical training, and demonstrations of system installation, operation, and maintenance. The approach encourages waste separation at source and the reuse of nutrients in farming, with the aim of reducing disposal needs and fertiliser costs.

4.2 Biofertiliser and Biogas in Pattani and Yala

The university develops and shares technologies that convert household and agricultural organic residues into biofertiliser and biogas. Activities include system design, farmer training, and practical demonstrations. The biofertiliser initiative targets training for 80 farmers and demonstrations for 120 households, aiming to improve resource efficiency and reduce reliance on chemical fertilisers.

4.3 Sedge Processing Waste for Wastewater Treatment in Phatthalung

Researchers investigate the use of Krajood (sedge) residues from local handicraft production as low-cost adsorbents for wastewater treatment. The work includes material

preparation, characterisation, and performance testing, exploring how local biomass waste can become a useful treatment material.

4.4 Waste Management in Island Communities in Trang

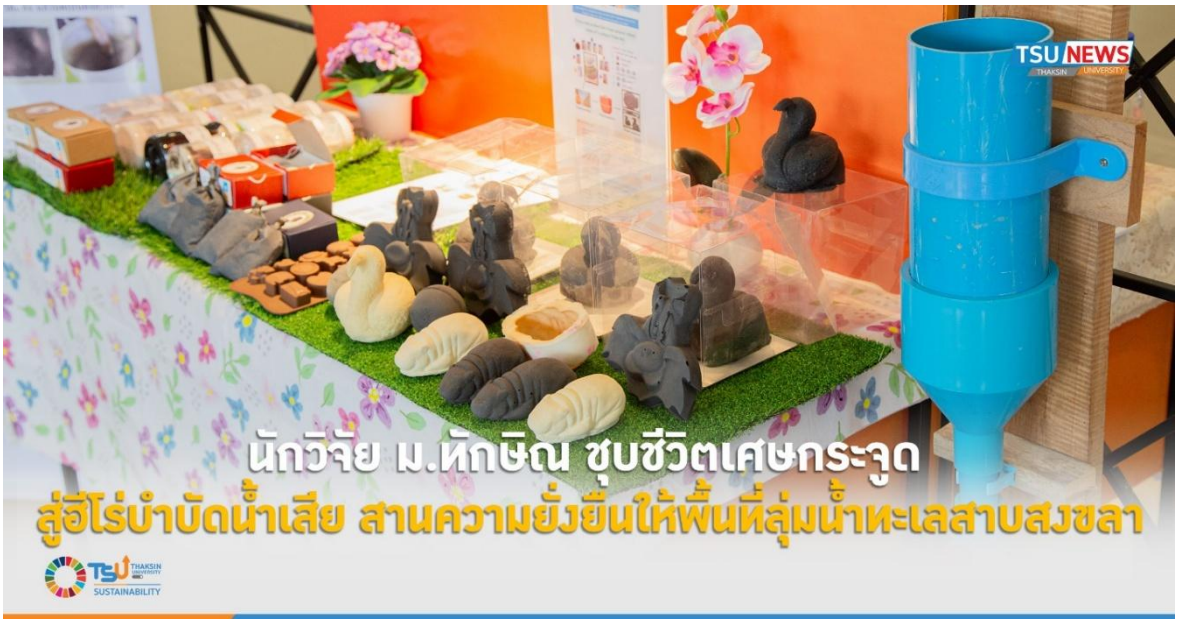
On Libong and Sukorn islands, the university supports waste assessments, separation, recycling, technology transfer, and community training. Complementary activities explore biofertiliser production from organic waste. These approaches respond to high transport costs, limited disposal facilities, and sensitive coastal environments, while supporting responsible community tourism.

Supporting Evidence

https://explore.nrct.go.th/search_detail/result/15860

https://www.tsu.ac.th/home/details.php?id=5572

https://www.kohsukorn.go.th/albums/activities.php?salb_id=326







5. National and International Research Cooperation

The report identifies research publications on recycling, waste treatment, resource recovery, and sustainable production. The studies below illustrate relevant research themes; the cited work spans 2022–2025.

5.1 Plastics and Organic Waste Treatment

Research on commercial and landfill-recovered plastics in Songkhla examines material properties relevant to recycling and resource recovery.

Supporting publication: Thongham et al. (2025), *RSC Advances*, 15(30), 24424–24434.

A study of two-stage anaerobic co-digestion of greasy sludge and waste activated sludge explores improved waste treatment and biogas recovery.

Supporting publication: Sani et al. (2022), "Deploying two-stage anaerobic process to co-digest greasy sludge and waste activated sludge for effective waste treatment and biogas recovery," *Journal of Environmental Management*, 316, 115307.

5.2 Agricultural Residues and Packaging Materials

Research on co-pyrolysis of oil palm empty fruit bunches and rubber wood sawdust assesses technical, economic, and environmental aspects of biomass conversion.

Supporting publication: Promraksa et al. (2025), *Current Research in Environmental Sustainability*, 9, 100288.

Research on pectin recovery from plantain peels explores the conversion of agricultural by-products into reinforced packaging films.

Supporting publication: Xie et al. (2023), "Pectin from plantain peels: Green recovery for transformation into reinforced packaging films," *Waste Management*, 161, 225–233.

5.3 Waste Derived Fuels and Recycled Polymers

Studies examine latex waste sludge and mixed agricultural biomass as feedstocks for fuel briquettes.

Supporting publications:

Intarat and Phatcharasit (2025), *ASEAN Journal of Scientific and Technological Reports*, 28(2), e256410.

Nikhom et al. (2025), *Biomass Conversion and Biorefinery*, 15(3), 4477–4487.

Research on irradiation treatment examines ways to improve the performance of polypropylene and recycled polyethylene terephthalate (r-PET) composites containing dolomite.

Supporting publication: Ibrahim et al. (2025), "Exploring Irradiation as a Means to Toughen and Improve the Impact Resistance of Dolomite Filled PP/r-PET Composites," *Springer Proceedings in Physics*, 418, 295–302.

5.4 Methane Mitigation in Agriculture

Research on enriched anoxic methanotrophic consortia explores biological approaches to reducing methane emissions in rainfed agricultural systems.

Supporting publication: Leamdum et al. (2025), "Enriched anoxic methanotrophic consortium augmentation for mitigating methane emissions in rainfed systems and climate-neutral rice production," *Journal of Environmental Management*, 379, 124831.

5.5 Renewable Energy and Resource Efficiency

A wind power study assesses the technical and economic feasibility of dual-rotor generation systems, contributing knowledge relevant to renewable energy and resource efficiency.

Supporting publication: Khunpetch et al. (2024), "Techno-Economic Assessment of Utility-Scale Dual-Rotor Wind Power Generation: A Case Study of Siam Eastern Industrial Park, Rayong Province, Thailand," *ASEAN Journal of Scientific and Technological Reports*, 27(3), e251675.