



Template for Evidence(s) UI GreenMetric Questionnaire

University : Songkhla Rajabhat University
Country : Thailand
Web Address : www.skru.ac.th

[4] Water (WR)

[4.7] Impact of Water Management programs in supporting the Sustainable Development Goals (SDGs)



Retention ponds and stormwater storage areas at the Main Campus.



Green University learning area, planting plots, and reused container planters.



Description:

Songkhla Rajabhat University implements an integrated water management system across the Songkhla Campus and Satun Campus as part of its Green University development strategy. The system combines rainwater retention, stormwater management, permeable landscapes, water recycling and reuse, treated-water utilization for approved non-potable purposes, water-efficient appliances, wastewater treatment, pollution prevention, ecological water-quality improvement, solar-powered aeration, monitoring, environmental learning, and institutional cooperation.

The Songkhla Campus has an official area of 710,857.2 m² and the Satun Campus has an official area of 543,740 m², giving a combined assessed campus area of 1,254,597.2 m². The university manages a total of 17 retention ponds and stormwater-storage areas. The Songkhla Campus contains 10 ponds with a combined surface area of 50,350 m² and an estimated storage capacity of 151,050 m³, based on an average operational depth of 3 metres. The Satun Campus contains 7 ponds with a combined surface area of 89,717 m² and an estimated storage capacity of 269,151 m³. Collectively, the pond system has a total surface area of 140,067 m² and an estimated storage capacity of approximately 420,201 m³, equivalent to 420.20 million litres.

The retention-pond network is integrated with grass-covered areas, open soil, permeable surfaces, drainage channels, vegetated buffers, and planted landscapes. For the strict water-absorption assessment, excluding planted vegetation, the university has 191,941 m² of open soil, grass-covered, and permeable areas, representing 15.30% of the combined campus area. These areas support rainfall infiltration, runoff attenuation, sediment retention, delayed discharge, and reduced pressure on public drainage infrastructure during intense rainfall events.

At the Songkhla Campus, water management emphasizes the integration of retention ponds, ecological treatment ponds, drainage channels, aquatic plants, wastewater conditioning and disinfection, building-level wastewater treatment, grease control, laboratory wastewater segregation, and aeration systems. These measures reduce pollutant loads from academic buildings, laboratories, cafeterias, dormitories, roads, parking areas, and service facilities before water is reused for appropriate non-potable purposes or discharged through the campus drainage network.

At the Satun Campus, water management is closely associated with the campus's larger green landscape, retention ponds, open permeable areas, agricultural learning plots, water-storage facilities, and the Thung Yai Saraphi Model. This model functions as a living-learning area for sustainable agriculture, water reuse, resource efficiency, and community-oriented innovation. Treated or quality-improved water is used for approved non-potable activities, including landscape irrigation, plant watering, green-area maintenance, ecological pond support, and agricultural learning activities.

The university also applies solar-powered aeration systems in open drainage channels, campus canals, and retention ponds at no fewer than 30 locations. These systems improve water circulation and dissolved oxygen, support aerobic microbial decomposition of organic matter, reduce stagnant-water conditions and odour, and strengthen the self-purification capacity of campus water bodies. In combination with aquatic plants, sedimentation, retention ponds, drainage maintenance, and water-quality monitoring, the aeration system contributes to ecological water-quality improvement while reducing reliance on grid electricity.

The impact of these programs is classified as **Very High**, supporting 14 Sustainable Development Goals through direct operational outcomes, enabling environmental benefits, and institutional learning and partnership mechanisms. The strongest direct contributions are made to SDGs 3, 4, 6, 7, 9, 11, 12, 13, 14, 15, and 17, while the programs also provide enabling contributions to SDGs 1, 2, and 8.

The program contributes to **SDG 1: No Poverty** by reducing vulnerability to flood-related disruption and by lowering institutional expenditure on potable water for non-potable activities. Reduced flooding, lower water demand, and more efficient landscape management contribute indirectly to the resilience of campus users, surrounding communities, and local service systems.

It supports **SDG 2: Zero Hunger** through water-efficient agricultural learning plots, irrigation for planting areas, and the Thung Yai Saraphi Model at the Satun Campus. These activities strengthen practical understanding of sustainable food production, water-smart agriculture, and local food-security awareness.



The program contributes to **SDG 3: Good Health and Well-being** by reducing risks associated with untreated wastewater, stagnant water, odour, poor drainage, and polluted runoff. Wastewater treatment, aeration, grease control, drainage maintenance, and water-quality monitoring improve sanitary conditions and support a healthier campus environment.

It directly supports **SDG 4: Quality Education** because the ponds, drainage systems, water-storage tanks, aerators, aquatic plants, treatment facilities, and agricultural learning plots function as living laboratories. Students, staff, and community participants can learn through field observation, water-quality monitoring, environmental science activities, climate-adaptation projects, and Green University initiatives.

The program makes its strongest contribution to **SDG 6: Clean Water and Sanitation** through water conservation, stormwater retention, wastewater treatment, pollution prevention, water recycling, treated-water reuse for approved non-potable purposes, and water-efficiency measures. These actions promote more sustainable use, protection, and management of campus water resources.

The use of solar-powered aeration systems supports **SDG 7: Affordable and Clean Energy**. Solar energy is used to operate aeration equipment that improves water quality in canals, ponds, and retention areas, demonstrating the integration of renewable energy with environmental infrastructure.

The program contributes to **SDG 8: Decent Work and Economic Growth** through the development of green skills and environmental-management competencies among facilities personnel, environmental engineering staff, students, and community participants. Water-system operation, maintenance, monitoring, agricultural learning, and sustainability reporting create practical capacity for green employment and environmental services.

It advances **SDG 9: Industry, Innovation and Infrastructure** through decentralized water infrastructure, including retention ponds, wastewater treatment facilities, storage tanks, pipe-distribution systems, solar-powered aerators, ecological treatment systems, and monitoring arrangements. These systems demonstrate resilient and nature-based infrastructure suitable for climate-sensitive campus development.

The program supports **SDG 11: Sustainable Cities and Communities** by reducing peak runoff, delaying stormwater discharge, mitigating localized flooding, improving drainage performance, and reducing pollutant transport to downstream areas. The university therefore functions as a model of resilient water management that can support surrounding communities and local authorities.

It contributes to **SDG 12: Responsible Consumption and Production** by reducing dependence on treated tap water for non-potable uses, promoting water reuse, encouraging efficient fixtures, applying circular-resource principles, and integrating reused water with landscape maintenance and agricultural learning activities.

The retention ponds, permeable surfaces, vegetated buffers, and drainage-management systems contribute to **SDG 13: Climate Action** by increasing the capacity of both campuses to adapt to intense rainfall, flooding, drought conditions, and climate-related variability. The system provides decentralized storage, infiltration, runoff control, and ecological buffering during extreme weather events.

The water pollution-control program supports **SDG 14: Life Below Water** by reducing the movement of sediments, nutrients, organic matter, oil and grease, litter, and contaminated runoff into downstream drainage systems and connected aquatic environments. Wastewater treatment, grease control, sedimentation, aquatic plants, and monitoring reduce pollution risks to receiving waters.

The program contributes to **SDG 15: Life on Land** by protecting soil functions, maintaining vegetated buffers, improving moisture retention, reducing erosion, supporting aquatic and terrestrial habitats, and strengthening ecological connectivity within the university landscape. Ponds, aquatic plants, grass-covered areas, and green spaces together provide important ecosystem services.

Finally, the program supports **SDG 17: Partnerships for the Goals** through cooperation among university administrators, facilities and maintenance units, environmental engineering personnel, academic departments, students, Green University committees, local authorities, and community partners. These partnerships strengthen monitoring, environmental education, infrastructure maintenance, evidence-based reporting, and continuous improvement.

Overall, Songkhla Rajabhat University demonstrates that water management is not solely an operational service but a cross-cutting sustainability strategy. By integrating policy, physical infrastructure, ecological



treatment, renewable energy, monitoring, education, community learning, and institutional cooperation, the university's water management programs support 14 SDGs: SDGs 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, and 17.

Impact of Water Management Programs in Supporting the SDGs

SDG	Type of Contribution	Water Management Program / Activity	Key Impact
SDG 1: No Poverty	Enabling	Flood retention ponds, stormwater control, and reduced potable-water use for non-potable activities	Reduces vulnerability to flood-related disruption and supports more efficient use of institutional resources.
SDG 2: Zero Hunger	Enabling	Thung Yai Saraphi Model, agricultural learning plots, and reused water for irrigation	Supports water-smart agriculture, food-production learning, and awareness of local food security.
SDG 3: Good Health and Well-being	Direct	Wastewater treatment, drainage maintenance, aeration, grease control, and water-quality monitoring	Reduces pollution, odour, stagnant-water conditions, sanitation risks, and exposure to contaminated runoff.
SDG 4: Quality Education	Direct	Green University learning areas, water-quality monitoring, ponds, treatment systems, and agricultural demonstration plots	Provides living laboratories for environmental science, hydrology, climate adaptation, and sustainable water management.
SDG 6: Clean Water and Sanitation	Direct	Water conservation, wastewater treatment, water reuse, treated-water consumption, water-efficient fixtures, and pollution control	Improves water-use efficiency, water quality, wastewater management, and sustainable water-resource use.
SDG 7: Affordable and Clean Energy	Direct	Solar-powered aeration systems in ponds, canals, and drainage channels	Integrates renewable energy into water-quality improvement and reduces reliance on grid electricity.
SDG 8: Decent Work and Economic Growth	Enabling	System operation, water-quality monitoring, maintenance, environmental engineering, and sustainability reporting	Builds green skills and practical competencies for staff, students, and community participants.
SDG 9: Industry, Innovation and Infrastructure	Direct	Retention ponds, wastewater-treatment facilities, storage tanks, pipe systems, solar aerators, and monitoring systems	Strengthens decentralized, resilient, and nature-based water infrastructure.
SDG 11: Sustainable Cities and Communities	Direct	Stormwater retention, permeable landscapes, drainage systems, and flood-risk management	Reduces peak runoff, delays discharge, mitigates localized flooding, and improves campus resilience.
SDG 12: Responsible Consumption and Production	Direct	Water recycling, treated-water reuse, water-efficient appliances, and reuse for landscape irrigation	Reduces dependence on treated tap water and promotes circular water-resource management.



SDG	Type of Contribution	Water Management Program / Activity	Key Impact
SDG 13: Climate Action	Direct	Retention ponds, green infrastructure, permeable surfaces, water storage, and runoff control	Strengthens adaptation to intense rainfall, flooding, drought, and climate-related water variability.
SDG 14: Life Below Water	Direct	Wastewater treatment, grease control, aquatic plants, sedimentation, aeration, and outlet monitoring	Reduces pollutant loads, sediment, nutrients, oil and grease entering downstream water bodies.
SDG 15: Life on Land	Direct	Vegetated buffers, ponds, aquatic plants, permeable areas, and ecological landscape management	Supports soil conservation, biodiversity, habitat functions, moisture retention, and reduced erosion.
SDG 17: Partnerships for the Goals	Direct	Collaboration among university management, facilities units, environmental engineering personnel, academic units, students, local authorities, and communities	Strengthens shared implementation, monitoring, environmental learning, and continuous improvement.
Overall Impact	—	Integrated water conservation, recycling, treated-water use, pollution control, ecological treatment, renewable energy, monitoring, and learning	Supports 14 SDGs: SDGs 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, and 17.

UI GreenMetric WR.7 Classification

Songkhla Rajabhat University's water management programs demonstrate direct contributions to 11 SDGs and enabling contributions to 3 additional SDGs. The integrated implementation of retention ponds, permeable landscapes, treated-water reuse, solar-powered aeration, wastewater treatment, pollution control, monitoring, environmental education, and institutional partnerships supports **a total of 14 Sustainable Development Goals**.

Very High Impact (supporting 14–17 SDGs)