



SDG 12 Responsible Consumption and Production

Overview

UQ actively supports SDG 12 through policies, operational measures, and impactful research. UQ's Procurement Policy emphasises ethical sourcing, sustainability, and responsible supplier engagement. Waste management initiatives and programs like UQ Unwrapped promote plastic-free lifestyles, more than 100 recycling stations support waste reduction for campus retailers, and annual waste audits are undertaken to help identify opportunities for improvement and track progress toward waste reduction goals. UQ extends sustainability practices to outsourced services and suppliers, aligning procurement with environmental and social responsibility.

Research at UQ advances SDG 12 through innovations in mine waste monitoring, sustainable alternatives to a range of products including plastic, and wastewater toxin reduction. The Biosustainability Hub and Australian Research Council Training Centre for Bioplastics and Biocomposites develop eco-friendly materials and scalable bioplastic solutions. Projects like biodegradable fruit packaging and marine bioplastic degradation studies showcase UQ's commitment to reducing plastic pollution.

Progress made in 2024 towards SDG 12 is reported here with reference to the following domains and enablers from UQ's Strategic Plan 2022-2025:

- Learning and student experience
- Research and innovation
- Enriching our communities
- Our global profile.

Related SDGs

- [SDG 1 No poverty](#)
- [SDG 2 Zero hunger](#)
- [SDG 8 Decent work and economic growth](#)
- [SDG 9 Industry, innovation and infrastructure](#)
- [SDG 13 Climate action](#)
- [SDG 14 Life below water](#)
- [SDG 15 Life on land](#).

Learning and student experience

UQ students benefit from diverse learning opportunities related broadly to SDG 12. Recognising that environmental sustainability is not just a scientific challenge, but a business imperative, the UQ School of the Environment delivers the [Sustainable Business](#)

[Practice](#) course, which bridges the gap between environmental science and corporate strategy, giving students the skills to drive sustainable decision-making in businesses and organisations. The course equips students with cutting-edge environmental, social and governance frameworks, real case studies, and industry best practices. Students explore key topics like corporate social responsibility, environmental impact assessments, and sustainable supply chains, learning how companies can reduce their ecological footprint while staying competitive. Another course offered is [Foundations of Sustainable Development](#), which draws on numerous case studies from around the world to illustrate the complexity of sustainable development issues, including those specifically associated with resources and waste, and the circular economy. These courses were offered in 2024 as both undergraduate offerings and in the [Master of Environmental Management](#) postgraduate program.

UQ is the only university in Australia to have bachelor, master and doctoral level programs in Tourism [certified by the United Nations World Tourism Organization \(UNWTO\)](#). The UNWTO promotes responsible, sustainable and universally accessible tourism. This certification ensures high quality offerings for UQ students in relevant courses and programs. Examples include the UQ Business School's [Master of Tourism, Hotel and Event Management](#) program which includes a course on [Tourism in Developing Economies](#), and the [Bachelor of Tourism, Hospitality and Event Management](#) program which includes a core course on [Sustainability in Tourism, Hospitality and Events](#). It examines the potential positive and negative impacts of tourism, hospitality and events on communities, economies and the environment, and provides students with strategies to manage these based on the principles of sustainable development.

Outside of the formal curricular of their degree programs, UQ students have opportunities to contribute progress towards SDG 12 via these initiatives:

- The [UQ Innovation and Entrepreneurship Society](#) (UQIES), a UQ Student Union facilitated club, ran the **Sustainability Innovation Challenge** from 15-17 March 2024. The challenge invited students to develop creative solutions to pressing environmental issues. Problem areas included circular design innovation, resource use and efficiency, and waste management solutions. The challenge was student-led and collaborative, involving UQ Ventures and UQ Sustainable Innovators Club. It provided hands-on experience in sustainable innovation and encouraged interdisciplinary teamwork, fostering leadership and environmental awareness among UQ's student community.
- The UQ Student Union facilitates the [UQ Sustainable Innovators Club](#), centred around promoting sustainability on real-world issues, covering agriculture, water, energy and waste. In 2024 the Club ran events to improve and promote sustainable practices within the UQ community.
- The **UQ Green Ambassador Program 2024** empowered students to lead sustainability initiatives across campus. Through workshops and volunteering, ambassadors promoted environmental awareness and community engagement. The program focused on leadership development and practical action, helping students contribute to UQ's sustainability goals. Managed by the UQ Sustainability Office, the program provided a platform for students to collaborate, advocate, and inspire change within the University and beyond.

Research and innovation

UQ supports responsible consumption and production through research that promotes sustainability, waste reduction, and resource efficiency. Its work helps industries adopt cleaner practices, develop eco-friendly materials, and improve environmental outcomes. By fostering innovation and collaboration, UQ contributes to global efforts to reduce pollution, conserve resources, and build more sustainable systems. These initiatives reflect UQ's commitment to creating practical solutions for a healthier planet and a more resilient future.

Two themes of UQ's research relating to responsible consumption and production are:

- waste disposal and reuse
- sustainable alternatives for manufacturing and production.

Waste disposal and reuse

- **Drone and sensor technology to improve the monitoring of mine waste.** UQ researchers from the Faculty of Engineering, Architecture and Information Technology (EAIT) and the Sustainable Minerals Institute (SMI) are developing innovative drone and sensor technology to improve the monitoring of mine waste, and enhance safety and land rehabilitation. This method combines electromagnetic measurements and geochemical data and offers a more efficient alternative to costly, less accurate drilling techniques. The technology allows for 4D monitoring throughout the lifecycle of a mine, significantly reducing the need for laboratory testing. This development is being funded by Rio Tinto for 3 years from 2024 and will make progress towards a more sustainable approach to waste management and land rehabilitation in mining operations.
- **Reducing environmental toxins in wastewater, safeguarding public health.** UQ researchers partnered with Queensland Government-owned Urban Utilities, the Gold Coast City Council and South Australian Government-owned SA Water to develop a system to manage hydrogen sulphide in sewers, using smart algorithms to predict hydrogen sulphide buildup and deliver precise chemical doses to manage this issue. This reduces chemical use by more than 40%, with tests in Queensland's sewer networks showing the system helps extend infrastructure life, lowers maintenance costs, and reduces environmental toxins in wastewater, safeguarding public health. In 2024 this work won the Silver Project Innovation Award in the Smart Systems and the Digital Water Economy Category of the International Water Association Awards.
- **Biosustainability Hub.** In 2024 UQ announced the new UQ Biosustainability Hub, a \$60 million facility that will unite researchers, industry, and government to develop sustainable, economically viable biological solutions to global challenges. Based at UQ's Australian Institute for Bioengineering and Nanotechnology (AIBN), the Hub focuses on 5 key areas: agri-food innovation, gas fermentation, synbio mining, biofuels, and digital biology. By co-locating experts and stakeholders, the Hub accelerates the translation of synthetic biology into real-world applications. Government collaboration plays a vital role in supporting Australia's transition to net zero, positioning the Hub as a national leader in biomanufacturing and sustainable industrial transformation.

Sustainable alternatives

- **Alternatives to plastics:** UQ launched the [ARC Training Centre for Bioplastics and Biocomposites](#) in 2024, funded by the Australian Research Council and supported by a range of partner organisations, including Minderoo Foundation, Queensland Government and industry. Hosted in the EAIT Faculty, the centre is exploring eco-friendly alternatives, such as Polyhydroxyalkanoates (PHAs), biodegradable, bio-based polymers. PHAs are derived from renewable sources like sugarcane and decompose in various environments, offering a sustainable solution to plastic waste. Despite the promising potential of PHA development, challenges remain in scaling production. A global agreement to reduce plastic production is also crucial to tackle the issue effectively. The Training Centre is developing expertise and capacity in bioplastics and biocomposites development through the training of PhD students and researchers.
- **Biodegradable fruit packaging:** UQ hosted an Advance Queensland Industry Research Fellowship from 2020-2024 in the EAIT Faculty, focused on biodegradable fruit packaging that harnessed materials innovation to establish a new sustainability standard in mass-produced food packaging, such as fruit punnets. Collaborating with the Queensland Government, Queensland Strawberry Growers Association, communities, and industry, the project successfully delivered a commercially viable strawberry punnet, with over 200 units manufactured industrially in 2024. The final product is made from bacterially fermented bioplastic and reinforced with Australian wood fibres and offers all the sustainability benefits of a bio-sourced product while maintaining the same properties as conventional plastic packaging. This innovation has the potential to replace the existing 580 million plastic punnets used annually in Australia.
- **Improving timber production:** UQ researchers identified that improving timber production efficiencies by just 5% could enable the construction of an additional 8,000 homes annually in Australia. Research conducted at the ARC Advance Timber Hub led out of the EAIT Faculty is focussed on optimising the entire timber supply chain, from forests to building sites, using technologies like AI, robotics, and computer vision. Research is underway to increase the amount of usable timber per tree, reducing waste and making timber a more sustainable building material. This work is supporting progress towards affordable housing and sustainability and contributing to a circular economy and net-zero targets.

Enriching our communities

Beyond the direct impact of our education and research programs, UQ is committed to enriching communities by supporting and promoting the UN SDGs in both external engagement activities and campus operations. For SDG 12, this extends to ensuring UQ has ethical procurement practices, that it responsibly manages the natural resources it consumes and that it actively pursues opportunities to reduce waste and manage it effectively.

Ethical sourcing policy

As stated in [UQ's Procurement Policy](#), all procurement activities, decisions, and decision-making processes, will be consistent with applicable legal, regulatory, contractual and policy obligations and accountabilities, and demonstrate sound ethical behaviour. Those engaging in procurement transactions must:

- retain and appropriately manage contract documents, including any variations and extensions
- act with integrity and demonstrate ethical behaviour in accordance with UQ's values, the [Code of Conduct](#), [UQ's Procurement Policy](#), [Procurement Procedure](#) and the [Probity and Integrity in Procurement Procedure](#)
- ensure that any actual, perceived and/or potential conflicts of interests relating to procurement are declared, recorded and effectively managed.

Sustainability is an element of UQ's ethical sourcing requirements and is defined in policy as: purchasing goods or services in a way that meets UQ's current requirements and promotes and protects economic, environmental, ethical and social outcomes.

The UQ Sustainable Purchasing Guides (not publicly available) assist environmentally sustainable procurement considerations across multiple categories.

Policy extensions to services and suppliers

UQ's procurement planning process, as set out in the University's [Procurement Policy](#), requires the inclusion of sustainability considerations in all purchasing decisions. Additionally, UQ wants ethically, environmentally and socially responsible suppliers. Suppliers are expected to meet the requirements of the Queensland Government [Ethical Supplier Threshold](#), and the [UQ Supplier Standards](#). These standards outline UQ's principal expectations of its suppliers, and the standards in place to help UQ meet its responsible, social and legal requirements.

Suppliers have access to resources relating to procurement activities through the [Supplying to UQ webpage](#).

Waste tracking, reduction and disposal

UQ is actively working to reduce waste through a range of initiatives aimed at minimising disposable items and landfill including:

- reuse and recovery. UQ promotes the reuse of materials through initiatives like furniture repurposing and equipment donation through UQ WarpIT, a Waste Action Reuse Portal which allows UQ staff to post unwanted items for donation or claim items for work purposes. UQ also promotes the reuse of items collected at UQ's Reuse and Recycle Station such as reading glasses, mobile phones, and CDs.
- waste audits and monitoring. Annual waste audits help identify opportunities for improvement and track progress toward waste reduction goals.
- education and engagement. UQ runs awareness campaigns and provides resources to staff and students to encourage responsible waste disposal and sustainable behaviours.

- encouraging BYO coffee cups and water bottles, through awareness programs and cafe discounts.
- providing guides for campus retailers and mobile food vendors to support businesses on campus to reduce their plastic use. Additionally, a Sustainable Event Guide is available to support staff and students in minimising waste at events.
- organics collection and composting. UQ collects organic waste, including paper towels from bathrooms and food scraps from kitchens and food outlets, and sends it for composting, diverting it from landfill.
- recycling programs. The University provides clearly labelled recycling bins across campuses to encourage proper sorting of recyclables such as paper, cardboard, plastics, batteries, e-waste, printer cartridges, polystyrene, fluorescent tubes and lamps, corflute signs and metals.
- requiring construction projects to implement the waste hierarchy – avoid, reduce, reuse, recycle, recover and dispose of waste – outlined in the [UQ Design Standards](#).

Hazardous waste disposal

- All chemical waste must be disposed of safely in accordance with the UQ Chemical Waste Operating Procedure. This procedure outlines the requirements for the disposal of laboratory and other chemical waste to minimise reactivity, toxicity, or risk to humans or the environment during collection, storage, and transportation prior to disposal. Laboratory staff must complete training before they start work with hazardous chemicals, with details provided in the [training and induction requirements](#) section of the UQ staff health and safety training and induction website.

Minimisation of plastic use

- The UQ Unwrapped program assisted food outlets across the University to switch from single-use plastics to reusable or compostable alternatives. UQ has guides for campus retailers and mobile food vendors to support businesses on campus in reducing their plastic use. Most cafes within the University offer discounts for BYO coffee cups, and UQ has installed more than 30 water refill stations across its 2 main campuses to encourage people to bring their own bottles from home.

Sustainability reporting

UQ is committed to supporting progress across the UN SDGs through sustainable operations, teaching and student-support, community outreach, partnerships and research. UQ is a signatory to the [Talloires Declaration](#), the [University Campus Sustainability Declaration](#).

In addition to voluntary reporting, UQ fulfills mandatory sustainability reporting requirements, including compliance with the National Greenhouse and Energy Reporting Scheme (NGERS).

Our global profile

UQ seeks to have a global impact by working with a range of partners and undertaking research and development activities that contribute tangible progress towards SDG 12. Examples from 2024 are outlined below.

- **Australia–Mongolia Partnership: Advancing Sustainable Mining and Green Energy.** In 2024 the Australia Awards Fellowship supported a strategic collaboration between the 2 countries to strengthen Mongolia's mining sector and accelerate its transition to green energy. The initiative focused on professional development, knowledge exchange, and capacity building, equipping Mongolian stakeholders with the skills and expertise needed to implement more sustainable and inclusive practices. Through engagement with Australian experts and institutions, the program promoted responsible resource management, improved social and environmental performance, and encouraged the adoption of cleaner technologies. It also fostered inclusive participation by creating opportunities for women, Indigenous peoples, and persons with disabilities, helping to build a more equitable and resilient mining and energy sector.
- **Green Hydrogen Masterclass.** In 2024 UQ played a pivotal role in the South Asia Regional Infrastructure Connectivity (SARIC) Green Hydrogen Study Tour by hosting a technical masterclass for energy experts from Bhutan, India, Nepal, and Sri Lanka. The program facilitated in-depth knowledge exchange on hydrogen technologies, policy frameworks, and supply chain development. By promoting green hydrogen as a clean and renewable energy source, the initiative supported the advancement of more sustainable production methods and encouraged efficient resource use across the region. The masterclass fostered international collaboration and built technical capacity, enabling participants to explore practical solutions for reducing environmental impact and integrating low-emission technologies into national energy strategies.
- **Ore-Sand: a circular economy solution to reduce mineral wastes and improve global sand sustainability.** Recognised by the UN Environment Program and the UN Zero Waste Advisory Board, UQ's Global Centre for Mineral Security's Ore-Sand initiative was presented by Professor Daniel Franks at the MIT Global Summit on Mine Tailings Innovation on 19 September 2024. The Ore-Sand initiative offers a circular economy solution to reduce mining waste and improve sand sustainability. By refining leftover ore into high-quality manufactured sand, the project addresses 2 major environmental challenges: excessive mining waste and unsustainable natural sand extraction. Ore-Sand promotes responsible consumption and production, reducing reliance on natural sand, generating new mining by-products, and fostering circular economy practices that minimise waste, human security risks and environmental impact across supply chains. UQ's activity in this space extends to the Ore-Sand Knowledge Hub, which connects science, industry, and policy to scale this innovation globally.
- **Responsible Sand and Silicates Initiative:** Led by UQ's Global Centre for Mineral Security (SMI), this initiative addresses the environmental and social risks of sand and silicate extraction. These materials are vital but often sourced unsustainably. Since 2022 the initiative has built a coalition to promote supply chain due diligence and

responsible sourcing. Through international forums, studies, and stakeholder engagement, it is shaping new standards and practices. In 2024 the initiative continued to create the conditions for coordinated, cross-sectoral action, including through multi-stakeholder dialogue, with a strong presence and a plenary session at the Organisation for Economic Co-operation and Development (OECD) 2024 Forum on Responsible Minerals Supply Chains. A baseline study commissioned by the OECD will launch in 2025, paving the way for a global coalition in 2026 to advance sustainable sand and silicate governance.

- **Bioplastics in marine environments.** In June 2024 the UQ-led [Australian Research Council Training Centre for Bioplastics and Biocomposites](#) hosted a visit by attendees at the Senior Government Officials Meeting for the Arafura and Timor Seas Ecosystem Action (ATSEA) program. ATSEA, launched in 2010 to manage and protect the vast ecosystems of the Arafura and Timor Seas, is a long-standing partnership between the governments of Australia, Indonesia, Papua New Guinea and Timor-Leste. ATSEA meeting attendees were introduced to a UQ-led research study in South East Queensland to test how quickly biodegradable plastics break down in waterways, as researchers search for solutions to the world's growing plastics problem. More than 2,000 samples of varying types and thicknesses were submerged at 4 sites including Dunwich in Moreton Bay, Rivergate Marina in the Brisbane River and Spinnaker Sound Marina in Pumicestone Passage. A fourth location – above ground outdoor tanks in a turtle rehabilitation area at Sea World on the Gold Coast – provided a more controlled environment. Early results found PHA plastics which are bioderived degraded completely in water after 7 months, but other bioplastics degraded by a little as 1% in a year. After the visit to UQ, attendees discussed how this research could be applied to reduce marine plastic pollution.
- **[Tourism Destination Decarbonisation Toolkit](#).** Developed by UQ to help tourism destinations build climate mitigation capacity and decarbonise tourism, the toolkit is based on research and real-world case studies and provides practical strategies across 9 decarbonisation areas. It is designed for destination management organisations (DMOs) to develop a coherent and comprehensive climate mitigation plan for systemic change and includes a mobile-friendly website to increase accessibility. The project supports the tourism sector's transition to sustainability and was showcased at COP29, the 2024 United Nations Climate Change Conference in Azerbaijan, underlining its global relevance in addressing climate change through industry-specific solutions.
- **[Seafood Consumer Preferences](#).** In 2024 a UQ researcher was involved in research into seafood consumer preferences for sustainability attributes to understand differences across 12 markets: Australia, China, Hong Kong, India, Indonesia, Japan, New Zealand, Singapore, South Korea, Taiwan, USA and Vietnam. The most important attributes for all markets were found to be food safety and taste, followed by attributes aligned with sustainability including seafood with healthy fish populations, compliance with regulations, and limited pollution. The research, published in 2024, identified 4 consumer segments – sustainability-interested, indecisive, origin-focused, and traditional – which can aid seafood suppliers globally to better understand how to effectively use sustainability attributes in targeted promotion of their seafood products to support responsible consumption.