Universitas Sumatera Utara

The Era of Ultimate Excellence

SUSTAINABLE DEVELOPMENT GOALS

Universitas Sumatera Utara

Sustainability Report

2025



usu.ac.id | official.usu

Universitas Sumatera Utara

SUSTAINABLE DEVELOPMENT GOALS

KEY FACTS

Universitas Sumatera Utara

Carbon Neutral Campus Target

2039

17 Sustainability Development Goals

Integrated through education, research and community service

THE Impact Ratings 2026

RANK 401+

Improved from Global Rank 801+ in 2025

Student Achievements

792 achievements

recognized under the student achievement

SDG Impact

91st & 93rd globally

91st for SDG 2 (Zero Hunger) and 93rd for SDG 14 (Life Below Water) in THE Impact Rankings 2026

International Accreditation

29 study programmes

obtained international accreditation in 2026

AT A GLANCE

Established	Students	Faculties	Professors	Doctoral lecturers
1952	42,687	17	233	701



Universitas Sumatera Utara

SUSTAINABLE DEVELOPMENT GOALS

INTRODUCTION

Universitas Sumatera Utara

Universitas Sumatera Utara and The Sustainable Development Goals

The United Nations' 17 Sustainable Development Goals (SDGs) represent humanity's unified call to action to address the world's most critical social, economic, and environmental challenges.

At Universitas Sumatera Utara (USU), we embrace these challenges with unwavering commitment under our strategic vision, **"The Era of Ultimate Excellence"**, and our institutional mandate to remain **"BERDAMPAK" (Impactful)**.

Since our establishment in 1952, USU has served as a catalyst for regional and national development across North Sumatra and Indonesia. Today, we recognize the profound obligation of comprehensive research universities to drive transformative progress toward the 2030 Agenda for Sustainable Development.

Benchmarking Our Global Impact

Our multi-faceted approach is validated by our significant progress in global sustainability benchmarks:

- THE Impact Ratings 2026: USU achieved a landmark surge, advancing to Global Rank 401+ (improving from 801+ in 2025).
- Top 100 World Recognition: USU ranks 91st globally for SDG 2 (Zero Hunger) and 93rd globally for SDG 14 (Life Below Water).

Call for Collaboration

This report is addressed to our diverse network of partners across public institutions, industry, NGOs, policymakers, and international academic networks. We invite all stakeholders to join us in building innovative solutions and lasting partnerships so that, together, we deliver ultimate excellence and a sustainable future by 2030.

CONTENTS

SDG 1: NO POVERTY 01
SDG 2: ZERO HUNGER 02
SDG 3: GOOD HEALTH AND WELL-BEING 03
SDG 4: QUALITY EDUCATION 04
SDG 5: GENDER EQUALITY 05
SDG 6: CLEAN WATER AND SANITATION 06
SDG 7: AFFORDABLE AND CLEAN ENERGY 07
SDG 8: DECENT WORK AND ECONOMIC GROWTH 08
SDG 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE 09
SDG 10: REDUCED INEQUALITIES 10
SDG 11: SUSTAINABLE CITIES AND COMMUNITIES 11
SDG 12: RESPONSIBLE PRODUCTION AND CONSUMPTION 12
SDG 13: CLIMATE ACTION 13
SDG 14: LIFE BELOW WATER 14
SDG 15: LIFE ON LAND 15
SDG 16: PEACE, JUSTICE AND STRONG INSTITUTIONS 16
SDG 17: PARTNERSHIPS FOR THE GOALS 17



Prof. Dr. Muryanto Amin, S.Sos., M.Si.

Rector of Universitas Sumatera Utara



SDG 1

NO POVERTY

Breaking the Chain of Poverty: From Affirmative Scholarships to Regional Economic Independence

1 NO POVERTY

79 publications

15.2% Publication Co Authored

6,670 Low-income Students Receiving Scholarships/Financial Support

7,797 Total Scholarship Recipients

12 International Partner Countries

356 Citation

Total Scholarship Funding
IDR 128.67 Billion

RESEARCH AND INNOVATION

USU research contributes evidence to more targeted approaches to poverty reduction and regional development. A 2025 study by USU researchers analysed poverty across all **33 districts** and cities in North Sumatra using principal component analysis, K-means clustering and regression.

The study identified education, unemployment, housing quality and local fiscal capacity as key determinants of regional poverty and grouped areas into five distinct typologies. The findings provide an empirical basis for geographically targeted poverty-reduction strategies rather than a uniform approach.

At institutional scale, 114 of 386 research outputs (29.53%) were reported as being utilised by vulnerable communities or priority development areas in 2025.

PUBLIC & COMMUNITY ENGAGEMENT

USU strengthens rural livelihoods through practical, locally appropriate innovation. In 2025, a community-engagement programme in Desa Suka, Karo Regency, worked with 27 farmers from the Suka Maju farmer group to convert livestock manure into **Bokashi**.

Programme evaluation showed that 93% of beneficiaries reported lower expenditure on chemical fertiliser, 93% reported increased farm income following improvements in crop quality and quantity, and 96% reported greater economic independence.

By linking waste utilisation, lower production costs and improved farm performance, the programme demonstrates how university expertise can strengthen the economic resilience and welfare of rural communities.

LEARNING & STUDENTS

USU supports students from disadvantaged and affirmative backgrounds beyond access to higher education by strengthening their transition after graduation. In 2025, 347 of 856 graduates in the tracked cohort (40.54%) from affirmative categories entered employment, entrepreneurship or further study within one year of graduation.

This outcome demonstrates how inclusive access to higher education can contribute to longer-term social and economic mobility. 6,670 students from low-income families received KIP Kuliah in 2025, while 88 tracked KIP graduates in the timely-graduation cohort progressed to employment, entrepreneurship or further study within one year.

IDR 128 Billion
Total Scholarship Funding

OPERATIONS AND POLICY

USU reduces financial barriers to higher education through scholarships and income-sensitive tuition support. In 2025, 7,797 students (21.09% of the student population) received scholarships worth IDR 128.67 billion. This included 6,670 KIP Kuliah recipients from low-income families, supported by IDR 120.93 billion.



SDG 2

ZERO HUNGER

End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

2 ZERO HUNGER

429 publications

18.9 % Publication Co Authored

18.5% co-authored with low and middle income countries

29.5 % Impactful research utilised by vulnerable communities and priority areas

81 Partner Countries

1,890 Citation

IDR 1.2B invested in foster village development programmes

164 community engagement programmes delivered in 2025

RESEARCH AND INNOVATION

Climate variability, soil degradation and limited irrigation are placing growing pressure on food production in North Sumatra. **Researchers** at Universitas Sumatera Utara are strengthening more resilient and sustainable farming systems through studies on climate adaptation, soil health and digital agriculture.

A 2025 study of 130 rice farmers in the Lake Toba highlands found that 98.5% of non-irrigated farmers had experienced prolonged drought and 96.7% reported increasingly unpredictable seasons. USU researchers also explore beneficial soil microorganisms, integrated farming, controlled-release agricultural inputs, and smart farming using IoT and machine learning to improve productivity, reduce chemical inputs and support more efficient crop management.

PUBLIC & COMMUNITY ENGAGEMENT

USU works with local farmers and communities to strengthen food security through sustainable agriculture and community-based programmes. In 2025, 46 active foster villages received support across areas including integrated farming, organic horticulture, food security, waste management and eco-enzyme applications.

In Sayur Matua, for example, integrated rice–fish farming and organic horticulture were developed to strengthen food security while supporting environmental sustainability.

40+ Foster villages supported for food security and sustainable agriculture

LEARNING & STUDENTS

USU students explore food security and sustainable agriculture through courses in Sustainable Farming Systems, Urban Agriculture, Food Nutrition and Food Safety.

Agrotechnology students examine integrated soil and pest management, agroecosystems and sustainable production, while Food Technology and Nutrition students explore how food science, processing and nutrition can contribute to healthier and more resilient food systems.

OPERATIONS AND POLICY

USU promotes affordable and sustainable campus food through its Healthy and Affordable Canteen Policy, requiring campus food vendors to provide nutritious meals at accessible prices. Across 17 food outlets, meals are offered at around IDR 8,000–15,000 (less than $1 per meal), helping students access affordable daily food.

USU also tracks food waste across campus dining services and converts organic residues into compost and animal feed, supporting campus landscaping, community farms and a more circular food system.



SDG 3

GOOD HEALTH AND WELL BEING

Delivering World-Impact Medical Research, Building Health Resilience in Rural Communities

3 GOOD HEALTH AND WELL-BEING

322 publications



30.4% Publication Co Authored

39.31 Highest Citation Impact (FWCI)

2,191 Students graduate in health-related programmes in 2025

312 Partner Countries

683 Citation



100% Integrated BPJS Hospital Services

RESEARCH AND INNOVATION

Of the 324 global scientific publications related to SDG 3 produced throughout 2025, Universitas Sumatera Utara (USU) leads critical **research** initiatives in disease prevention and occupational health. The pinnacle of our intellectual leadership is evidenced by our health risk assessment study on Benzene exposure among workers in the informal sector (footwear industry).

This research, which humanizes lower-class workers, achieved an absolute explosive influence metric (Field-Weighted Citation Impact / FWCI) of 39.31. This affirms that the medical and public health expertise of USU does not merely produce literature, but dictates global health protection standards.

2100+
Students graduate in health-related programmes in 2025

LEARNING & STUDENTS

Producing future health workers is not enough from within lecture halls and laboratories alone. We implement a medicine and public health curriculum based on community problem-solving (Community-Based Medical Education). Through our clinical clerkship program and fieldwork practice, thousands of USU health science students are deployed directly to community health centers (Puskesmas) and remote villages across North Sumatra. They are trained to be at the forefront of handling real health crises, ranging from nutritional assistance for pregnant women to reduce maternal and child mortality rates, to early detection of infectious diseases in vulnerable areas.

PUBLIC & COMMUNITY ENGAGEMENT

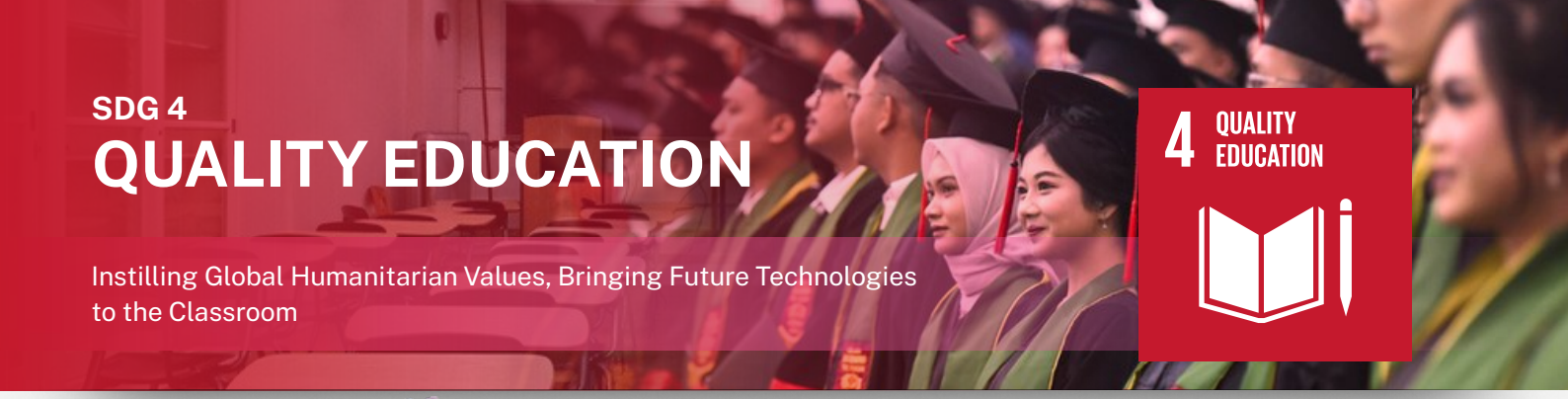
True community well-being is achieved when citizens possess the literacy and independence to care for their own health. In response to the challenge of high mortality due to Non-Communicable Diseases, experts from the Faculty of Medicine (FK) of USU went directly to the grassroots to carry out preventive health education in Kutalimbaru District, Deli Serdang Regency. Instead of merely providing momentary curative treatment, the USU medical team trained the community in the Self-Care Method for **Diabetes Mellitus**.

This systemic intervention successfully transformed patient dependency into community resilience, empowering villagers to monitor, prevent complications, and independently control diabetes in their daily lives.

OPERATIONS AND POLICY

As an institution, USU believes that the campus must be the first ecosystem to guarantee the well-being of its academic community. We operate the Universitas Sumatera Utara Hospital (USU Hospital) and a Primary Care Clinic that provides affordable physical and mental health services, not only for students and staff, but also integrated with the national health insurance (BPJS) for the general public.

Furthermore, the institution enforces a strict Smoke-Free Campus policy across all university facilities and provides free psychological support services for students to ensure mental health and well-being are maintained amidst high academic demands.



SDG 4

QUALITY EDUCATION

Instilling Global Humanitarian Values, Bringing Future Technologies to the Classroom

4 QUALITY EDUCATION

119
Research & Publication



30.8%
Publication Co Authored

85,000+
beneficiaries reached through educational outreach

429
Educational Outreach Programmes

12
Partner Countries

91
coastal programmes documented

420
teachers and external learners trained in coding and digital tools

14,000+
schoolchildren reached through educational outreach

RESEARCH AND INNOVATION

For Universitas Sumatera Utara (USU), quality education is not merely about transferring technical skills, but about instilling fundamental humanitarian values. Through 41 globally indexed publications throughout 2025, our educational research performance achieved a Field-Weighted Citation Impact (FWCI) of 1.66, outperforming 66% of world literature in its field. This intellectual leadership culminates in our flagship study, "Islamic Theological Perspectives on Human Rights," which brilliantly bridges theological discourse with the universal principles of Human Rights. This research, which achieved an absolute FWCI score of 12.07, is proof of USU's commitment to responding to the UN's specific target of producing world-class literature that educates society on human rights, inclusivity, and character development based on noble values.

We train more than **400 Teachers** in 2025

LEARNING & STUDENTS

Inclusive education means ensuring that no talent is halted by economic barriers. We are committed to making the campus a space for social mobility through affirmative scholarship schemes, which open the door as wide as possible for students from underprivileged groups to break the chain of poverty and become first-generation graduates in their families (first-generation students). Furthermore, we project this educational spirit outward through volunteer teaching initiatives. Our students are deployed to schools in rural and marginal areas, dedicating themselves to assisting teachers and ensuring basic literacy reaches children in the areas that need it most.

PUBLIC & COMMUNITY ENGAGEMENT

Access to 21st-century skills must not be an exclusive privilege for a small urban demographic. In response to the challenge of the digital divide, experts from the Faculty of Computer Science and Information Technology at USU have stepped in to assist the educational ecosystem at **SMP Negeri 14 Binjai**. We did not merely donate infrastructure, but rather overhauled the pedagogical architecture through the "Digital Learning Transformation" initiative. Teachers and students were intensively trained to integrate interactive programming (Scratch), microcontrollers (Micro:bit), 3D printing, and Artificial Intelligence (AI) into the local curriculum. This systemic intervention successfully transformed students' passive reasoning into computational reasoning, culminating in an extraordinary achievement: our partner school won 1st Place at the STEAM-based Educational Innovation Exhibition at the North Sumatra Provincial level. This is concrete evidence that direct university assistance enhances educator capacity and creates an excellent learning ecosystem.

OPERATIONS AND POLICY

Science loses its meaning if it remains exclusively hidden behind campus walls. Institutionally, Universitas Sumatera Utara implements an inclusivity philosophy (Open Campus) that ensures our educational assets are accessible to the wider public. We open access to University Library references and membership for local communities and students from outside the institution. The democratization of knowledge is also driven through the provision of a Digital Repository (USU Repository) and open courses (MOOCs) that are freely accessible to the public. This policy is a tangible form of our institution's responsibility in nurturing a lifelong learning ecosystem for all levels of society without barriers.



SDG 5

GENDER EQUALITY

Achieve gender equality and empower all women and girls

5 GENDER EQUALITY

123 publications

21.7% Publication Co Authored

61.7% of USU graduates in 2025 were women

61.5% of USU's new students in 2025 are women

17 Partner Countries

397 Citation

55% of USU leadership positions are held by women

52.7% of USU's non-academic staff are women

54.5% of senior academic staff are women

RESEARCH AND INNOVATION

Gender inequality remains embedded in social norms, access to assets and participation in public life. Researchers at Universitas Sumatera Utara examine how these inequalities affect women across cultural, economic and institutional settings. One interdisciplinary study involving 180 Batak Toba women across six districts explored women's rights to customary land under patriarchal traditions, revealing gaps between customary recognition and formal legal ownership. USU research also examines persistent gender inequality in higher education, political representation and women's participation in economic life, providing evidence to support more inclusive institutions, stronger legal protection and greater opportunities for women.

USU's Center for Gender and Child Studies (PSGA) leads interdisciplinary work on gender equality, women's rights, child protection and gender-based violence. Its researchers connect evidence with education, advocacy and community engagement, supporting safer, more inclusive institutions and stronger protection for women and children.

LEARNING & STUDENTS

Gender equality is embedded across several USU degree programmes through dedicated courses. Sociology students take **Gender Sociology** and Gender Analysis Techniques, while Nutrition students study **Gender and Nutrition** and Nutrition and Reproduction. Public Health students can also focus on **Reproductive and Family Health**, linking gender issues with health, wellbeing and family life.

PUBLIC & COMMUNITY ENGAGEMENT

USU engages women and wider communities through programmes that promote gender equality, empowerment and public awareness. In Medan Belawan, **USU works with women fishers** through the Indonesian Coastal Women's Union to strengthen social networks, cooperation and economic wellbeing.

USU also collaborates with women's organisations and community partners to raise public awareness of issues affecting women and young people, supporting greater participation, resilience and social equity.

A safer campus for all genders **through USU's PPKS Task Force***

OPERATIONS AND POLICY

USU's institutional policies promote gender equality across admissions, employment and career progression. Non-discrimination rules require recruitment, promotion and access to university resources to be based on merit and free from gender bias, while women's participation in admissions and academic life is monitored to identify gaps and guide inclusion measures. USU also applies an objective remuneration framework in which salaries are determined by rank, tenure, position and qualifications, supporting equal pay regardless of gender.

*PPKS: Task Force for the Prevention and Handling of Sexual Violence



SDG 6

CLEAN WATER & SANITATION

Securing Clean Water for All: Advanced Membrane Technology and Community Aquifer Conservation

6 CLEAN WATER AND SANITATION

246 publications

26% Publication Co Authored

28 locations Free Drinkable Tap Water Stations

27,000 m3/year Rainwater Harvesting (RWH)

64 Partner Countries

2,233 Citation

150 m3/day IPAL RS USU Capacity

66.6 L/capita/day Gross Water Balance Target (2025)

RESEARCH AND INNOVATION

USU's SDG 6 research portfolio focuses on emission-free solar distillation (Solar Still) technology for coastal communities and the synthesis of CuO-ZnOcomposite ceramic electrodes to accelerate the photocatalytic degradation of Chemical Oxygen Demand (COD) in industrial effluents. Interdisciplinary applied research across the Faculty of Engineering and FMIPA has also developed multi-stage filtration systems integrating quartz sand, zeolite, and activated carbon for flood-prone rural areas.

Supported by 79 Scopus-indexed publications and 271 citations in 2025 with an FWCI of 0.96, USU's membrane engineering and water purification innovations significantly advance sustainable hydrological solutions on both national and global scales

RANK 401–600 World THE Impact Rankings

PUBLIC & COMMUNITY ENGAGEMENT

USU translates hydrological expertise into tangible community solutions across vulnerable areas in North Sumatra. Flagship initiatives include the exploration and commissioning of deep borehole wells (60–70 metres) in Semangat Village, Karo Regency, a 1,000 L/hour community water filtration plant established in partnership with IEEE in Cempa Village, and rapid-response post-flood water sanitation recovery in Langkat Regency.

Through strategic institutional partnerships, USU collaborates with USAID on Spring Vulnerability Assessment and Action Planning (KKMA-RA), and partners with JICA and the Kitakyushu City Government to promote Deli River conservation and community-based urban wastewater management.

LEARNING & STUDENTS

USU embeds water resource conservation and environmental sanitation engineering into its Outcome-Based Education (OBE) curricula across undergraduate and postgraduate programmes. Between 12 and 15 formal courses are delivered across faculties, including Water Treatment Plant Design (PBPAM), Industrial Wastewater Treatment, Integrated Watershed Management, and Aquatic Remediation in the Faculty of Engineering, Faculty of Public Health, and Faculty of Forestry.

Academic instruction is further complemented by field practicums and healthy hydration workshops organized with the Indonesian Hydration Working Group (IHWG), fostering environmental stewardship and aquifer preservation awareness among thousands of active students.

OPERATIONS AND POLICY

USU's water governance is governed by Rector's Regulation No. 3 of 2019 on the **Green Campus Movement**, which mandates a minimum 10% water conservation target, restrictions on single-use plastics, and mandatory wastewater recycling/reinforced by Rector's Regulation No. 29 of 2024 concerning Wastewater Treatment Unit Governance.

Campus operations feature 28 free drinkable tap water stations, water-efficient sensor sanitary fixtures, regular effluent quality compliance monitoring conducted by PT Sucofindo, and the conservation of retention basins and recharge aquifers at the Kwala Bekala campus to ensure an efficient, circular institutional water balance.

SDG 7

AFFORDABLE & CLEAN ENERGY

Fueling a Low-Carbon Future: World-Class Bioenergy Research and Grassroots Clean Power Solutions

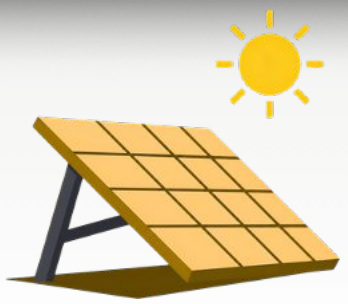
7 AFFORDABLE AND CLEAN ENERGY

589 publications

32.6% Publication Co Authored

192 Partner Countries

4,677 Citation



25+ Solar Panel Installed in 2025

RESEARCH AND INNOVATION

Our researchers develop the clean-energy technologies and knowledge that North Sumatra needs for a lower-carbon future. **In 2025** we published 121 papers on affordable and clean energy, 39% of them co-authored with partners in 26 countries, with a mean field-weighted citation impact (FWCI) of 1.27 (1.00 is the world average). Our largest areas of work are biodiesel and liquid biofuels (26 papers), energy storage and advanced materials (20), solid biomass and waste-to-energy (17) and solar energy (17).

We also work on wind, hydro and hybrid systems, biogas and hydrogen, power systems and energy efficiency, and energy policy. Our study of how reaction temperature affects biodiesel production from palm olein reached an FWCI of 22.8, about 23 times the world average.

Over **25** Solar Panel Installed in 2025

LEARNING & STUDENTS

Our students learn to design by analyzing the reaction temperature affects biodiesel production by heterogeneous catalysts from indigofera leaves ash. The transesterification process of biodiesel involving refined bleached and deodorized palm olein was heated with temperature vaiations of 55, 60, and 65 C to support clean energy

PUBLIC & COMMUNITY ENGAGEMENT

We bring clean and affordable energy to the communities that need it. Our researchers have designed a seawater battery as a lighting source for small-scale fishermen, a pico-hydro plant for street lighting and mangrove bio-pellets as a solid fuel for coastal communities, and have analysed household solar use and hybrid renewable energy systems for homes. We also study energy policy, from the Medan City government's clean-energy communication to project management of the 9.9-megawatt Deli Serdang biomass power plant.

OPERATIONS AND POLICY

Universitas Sumatera Utara generates environmental impact through the development of 34 eco-friendly infrastructure projects across eight key categories: 9 solar power units, 3 micro-hydro/pico-hydro systems, 1 biogas installation, 2 electric vehicle charging stations, 3 energy-efficient/solar lighting systems, 4 building energy management systems, 5 waste-to-energy facilities, and 7 other forms of green infrastructure.

The development of this infrastructure prioritizes sustainability principles, focusing not only on reducing fossil fuel energy consumption, via solar power, micro-hydro, biogas, and wind turbines, but also on building energy efficiency, electric mobility, rainwater harvesting, air quality improvement, water conservation, and the conversion of plastic waste, biomass, and coffee grounds into energy or alternative fuels.



SDG 8

DECENT WORK & ECONOMIC GROWTH

Catalyzing Inclusive Growth: Sustainable Tourism Innovation and Equitable Livelihood Empowerment

8 DECENT WORK AND ECONOMIC GROWTH

468 publications

24.1 % Publication Co Authored

66.78 Social Sustainability Index

113 Partner Countries

2,927 Citation

IDR 310.8 Million research funding for business and industry collaboration

IDR 4.86 Billion invested in applied research for industry and society

RESEARCH AND INNOVATION

Our researchers study how the economy of North Sumatra and Indonesia can grow in ways that are inclusive, sustainable and fair to workers. In 2025 we published 131 papers on decent work and economic growth, 24% of them co-authored with partners in 22 countries, with a mean field-weighted citation impact (FWCI) of 1.09 (1.00 is the world average). Our largest areas of work are sustainable and cultural tourism (29 papers), agriculture and rural livelihoods (18) and regional growth, trade and macroeconomic policy (11).

We also study green-economy and climate policy, small-business finance and women's entrepreneurship, and the protection of workers, from Indonesian fisheries crews on foreign vessels to migrant workers across ASEAN. Our analysis of halal-tourism policy and local communities in the Lake Toba region reached an FWCI of 12.4, about 12 times the world average.

LEARNING & STUDENTS

Our students investigates the impact of halal tourism policy on natural resource development and the economy of local communities in the Lake Toba region, focusing on the predominantly Toba Batak population. **The findings** indicate that while the halal tourism policy enhances the local economy by attracting Muslim tourist and fostering the growth of small and medium enterprises (SMEs), it also encounters resistance from the Toba Batak community due to cultural concerns. This study contributes valuable insights for policymakers and practicioners to balance economic development, cultural preservation, and environmental sustainability in the Lake Toba region

PUBLIC & COMMUNITY ENGAGEMENT

We work with communities to create local jobs and incomes. Our researchers have worked with ecotourism and agritourism communities in Pasar Rawa, Bukit Lawang, Tangkahan, Telagah and Denai Lama, with smallholder rubber and coffee farmers, and with women in fishing communities, and have studied how community empowerment and spatial planning can support tourism around Lake Toba.

More than **IDR 4.80 B** invested in applied research for industry and society

OPERATIONS AND POLICY

According to **Universitas Sumatera Utara Rector Regulation No. 11 Year 2022** about wages and Remuneration for Lecturer in Universitas Sumatera Utara, stated that USU's lecturer wages consist of basic salary and remuneration above Province Minimum Wages (UMP) to support lecturer prosperity.

SDG 9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Accelerating the Research-to-Market Pipeline: Igniting Industrial Innovation and Technology Spin-Offs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

514 publications

32.7% Publication Co Authored

34 Supported Start-ups

129 Granted Patents

168 Industry Collaborations

4,956 Citation

IDR 141.11 B Research Downstreaming & Spin-off Income with Industry and Government

11.34% of total university income

RESEARCH AND INNOVATION

USU is building a research-to-market innovation pipeline. In 2025, its SDG 9 research portfolio produced 226 publications and 612 citations, with an FWCI of 1.30.

Beyond scholarly output, USU developed 35 industrial prototypes and 10 commercialised products, while its intellectual-property portfolio reached 129 granted patents, including four foreign patents. Together, these achievements strengthen the pathway from research and technology development to industry uptake and commercialisation.

120+ Granted Patents in 2025

PUBLIC & COMMUNITY ENGAGEMENT

USU brings innovation directly to local enterprises. In 2025, 32 university innovations were applied by local SMEs. At Rumah Nayozie, a leather-craft SME in Medan, an automated leather-skiving machine reduced processing time from 30–40 minutes to around five minutes, with a reported 60–80% increase in productivity, more consistent product quality and lower occupational risk.



LEARNING & STUDENTS

USU develops student innovators and entrepreneurs through experiential learning linked to its innovation ecosystem. In 2025, 122 undergraduate students engaged in entrepreneurial activities, with 68 successfully becoming entrepreneurs. Industry-facing and entrepreneurship programmes also connect students with business development, technology commercialisation and real-world innovation challenges.

OPERATIONS AND POLICY

USU supports innovation through an institutional ecosystem for intellectual property, incubation, licensing and commercialisation. In 2025, BPRI supported 34 start-ups, including 6 successful spin-offs, alongside 10 commercialised products, 7 licence utilisations and 7 industry collaborations. Income associated with research downstreaming and/or spin-offs with industry and government reached IDR 141.11 billion, equivalent to 11.34% of total university income.

SDG 10

REDUCED INEQUALITIES

Eradicating Disparities: Policy Interventions for Inclusive Societies and Disability-Friendly Institutions



10 REDUCED INEQUALITIES

147 publications

25.9% Publication Co Authored

7,797 low-income students receive financial aid

38 Industry Collaborations

607 Citation

52.3% women educational staff across diverse religious and ethnic backgrounds



RESEARCH AND INNOVATION

Our researchers study how societies can become fairer and more inclusive, in North Sumatra, Indonesia and beyond. In 2025 we published 147 papers on reduced inequalities, 29% of them co-authored with partners in 14 countries, with a mean field-weighted citation impact (FWCI) of 1.11 (1.00 is the world average).

Our work covers human rights, religion and social inclusion (9 papers), poverty, inequality and regional development (7), the livelihoods of women and smallholder farmers (4) and the protection of migrant workers (3). We also study financial regulation and law, health inequalities and trade. Our paper on Islamic theological perspectives on human rights reached an FWCI of 12.1, about 12 times the world average.

Equal Access

regardless of religion, ethnicity, disability or background

LEARNING & STUDENTS

Students aims to examine how human rights principles are interpreted and integrated within the context of Islamic theology, highlighting how Islamic teachings can support universal Human Rights principles while maintaining a distinctive religious identity. The methodology employed is qualitative with a content analysis approach, examining primary sources of Islamic religious texts such as the Qur'an and hadith

PUBLIC & COMMUNITY ENGAGEMENT

We work with disadvantaged and vulnerable communities. Our researchers have worked with women in fishing communities and in smallholder coffee farming, with smallholder rubber and oil-palm farmers, and with Salaon Toba village on clean-water scarcity, have assessed fire risk in informal settlements in Medan, and have studied tuberculosis risk among children in Medan and developed IoT-based remote clinics to help mitigate stunting. We also analyse policy for poverty reduction, from special autonomy in Aceh to rural economies in Southeast Aceh

OPERATIONS AND POLICY

Rector's Regulation
No. 3135/UN5.1.R/SK/KPM/2024 about Disability Service Guidance in Universitas Sumatera Utara. This regulation outlined about the inclusivity for disabled student in Universitas Sumatera Utara to get fair treatment doing University's Tri Dharma (Teaching, Research, and Community Service)

Apart from that, **Rector's Regulation** No. 16 Year 2025 about Prevention and Handling of Violence in Universitas Sumatera Utara by doing several principles, including non-discrimination, focusing on victim, gender equality, accountability, independence, consistent, education sustainability to student.

Both of these regulation works on student with different types of background (race, ethnics, religion, etc.)

SDG 11

SUSTAINABLE CITIES & COMMUNITIES

Building Resilient Cities: Urban Green Mobility and the Preservation of Sustainable Cultural Heritage



11 SUSTAINABLE CITIES AND COMMUNITIES

391 publications



18.7% Publication Co Authored



200,000/product Cost Saving



73 Partner Countries

1,860 Citation



319,000+ library visitors, including members of the public

RESEARCH AND INNOVATION

Our researchers help cities and communities in North Sumatra and across Indonesia become safer, greener and more resilient. In 2025 we published 73 papers on sustainable cities and communities, 29% of them co-authored with partners in 16 countries, with a mean field-weighted citation impact (FWCI) of 1.04 (1.00 is the world average). Our work covers municipal waste and the circular economy, flood, fire and land hazards in Medan and Belawan, sustainable transport and road safety, urban planning and green space, and the cultural heritage of the Toba, Malay and Karo communities. Our review of circular-economy practice in construction and demolition waste management reached an FWCI of 12.0, about 12 times the world average.

LEARNING & STUDENTS

Students aimed to explore place attachment in Bagansiapisiapi, focusing on the cultural heritage surrounding Chinatown. The goal is to preserve the uniqueness of local cultural heritage to enhance the attractiveness of sustainable heritage tourism and improve the economy and well-being of the local community. 193 residents and 193 tourists were stratified and randomly complete the questionnaire. The twelve key informants were purposive sampling selected by semi-structured interviews and observation at the research location by photo documentation. These findings are expected to contribute to sustainable heritage tourism preservation in Bagansiapiapi and promote cultural heritage for tourism stakeholder. It analyzes how cultural heritage influences the identity of the Chinese community and offers strategies for sustainable tourism development to enhance economic growth while preserving cultural heritage

PUBLIC & COMMUNITY ENGAGEMENT

We work with communities and local government to make places safer and more inclusive. Our researchers have examined community radio for disaster-risk reduction through the Radar Tangguh programme, assessed flood and land-use risk in Pemaluan Village near the new capital city, studied small coastal communities affected by marine litter at Pulau Buluh, and analysed how the Medan City government communicates policy on waste and smart-city development.

In 2025, Universitas Sumatera Utara also did a **community service** to preserve local heritage called Gendang Pakpong from Malay ethnics in Pantai Labu, Deli Serdang, North Sumatera. This community servics is to give guidance to Gendang Pakpong producers by making a machine and tools to help them produce Gendang Pakpong independently, rather than using services from other people. Based on this community service, the producer can save up to Rp200,000 per production.

Free public access to USU Library and digital resources

OPERATIONS AND POLICY

Under **Rector Regulation No. 3 of 2019** on Green Campus Movement in Universitas Sumatera Utara, USU committed to a safe, green, and accessible campus. This regulation includes electrical saving around 20%, water saving for 10%.

Universitas Sumatera Utara also committed to provide green mobility infrastructure including 1,190 m bicycle road and 16,405 m for pedestrians. This facility highlighted USU commitment to reduce the usage of motorcycle and pushing healthy movement, and low carbon emission.

SDG 12

RESPONSIBLE CONSUMPTION & PRODUCTION

Redefining Circular Economies: Transforming Waste into High-Value Bio-Resources and Clean Energy

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

537 publications

23.1 % Publication Co Authored

124 Partner Countries

3,912 Citation



8-10 %

Maggot Water Level

RESEARCH AND INNOVATION

Our researchers examine how natural resources can be produced, used and reused more responsibly. In 2025 we published 154 papers on responsible consumption and production, 27% of them co-authored with partners in 25 countries, with a mean field-weighted citation impact (FWCI) of 1.18 (1.00 is the world average). Our largest areas of work are sustainable and cultural tourism (31 papers), sustainable forestry and natural resource management (30) and the conversion of waste into bio-based materials, biochar and bioenergy (21). Among themes with at least ten papers, waste management and the circular economy has the highest FWCI (1.93), and our review of circular-economy practice in construction and demolition waste reached an FWCI of 12.0. We also analyse the policies that shape these systems, from halal-tourism policy in the Lake Toba region (FWCI 12.4) to food estate implementation in North Sumatra.

PUBLIC & COMMUNITY ENGAGEMENT

We work with communities whose livelihoods depend on forests, coasts and farmland. Our researchers have worked with coastal communities in Tanjung Rejo and Sicanang Belawan on mangrove conservation and the traditional uses of mangrove plants, with villages in Langkat, Samosir and Deli Serdang on ecotourism, agritourism and cultural tourism, with smallholder coffee farmers in Simalungun, and with Salaon Toba village on clean-water scarcity.

In 2025, Universitas Sumatera Utara also conducting a community service by developing microwave for maggot production called "**Eco-Wave Mag**" as a clean technology to dry out maggot based on circular economy. Based on the final result, the maggot producer can cut the drying time from 12-24 hours to 3-4 hours using microwave dryer with similar percentage of water inside the maggot (8-10%).

Zero Waste Campus
through an integrated circular waste system

LEARNING & STUDENTS

Our students learn how natural resources can be produced and used responsibly through programmes in forestry, agriculture, engineering, tourism and business. The Kwala Bekala Arboretum of USU, where our researchers have used drone imagery to estimate tree height, offers a living classroom for forest research and teaching.

OPERATIONS AND POLICY

Waste treatment in USU now has been integrated and included 56 products, facilities, and several waste treatment tools that divided into 13 categories. Treatment did not stop on selection and disposal, but also using the principle of reduce, reuse, recycle, recovery, and waste-to-energy, such as: plastic treatment into granule, pyryolysis oil, and ecobrick; organic waste treatment into bioactivator and maggot

SDG 13

CLIMATE ACTION

13 CLIMATE ACTION

Spearheading Climate Mitigation: Blue Carbon Research and Institutional Pathways to Carbon Neutrality

231 publications



42% Publication Co Authored

97 Partner Countries

2,115 Citation



38 % of campus building area supported by smart-building systems

1000 trees planted in the first phase of the Towards One Million Trees initiative

RESEARCH AND INNOVATION

USU researchers are advancing climate action through work on mangrove blue carbon, ecosystem restoration and climate resilience.

Through international collaboration on nature-based solutions, USU contributes to blue-carbon monitoring, biodiversity assessment, GIS and eDNA applications, and the development of mangrove conservation and restoration approaches that can support Indonesia's greenhouse-gas reduction targets. USU research also strengthens climate-risk mapping, environmental modelling and disaster preparedness for floods, peatland fires and other climate-related hazards.

1,000 trees planted in the first phase

PUBLIC & COMMUNITY ENGAGEMENT

USU works with communities and government partners to translate climate knowledge into practical action. The university supports local authorities in strengthening climate-risk monitoring and early-warning systems for floods, peatland fires and ecosystem vulnerability, while its Towards One Million Trees initiative mobilises students, communities and partners in long-term tree planting and carbon mitigation. **The first phase planted 1,000 trees** and introduced digital monitoring to support transparency and long-term maintenance.

LEARNING & STUDENTS

Climate action is embedded across USU teaching in environmental engineering, agriculture and related disciplines. Students engage with themes such as climate-change mitigation, emissions inventories, sustainability, life-cycle approaches and agroclimate, connecting scientific understanding of climate change with practical approaches to sustainable production, resource management and environmental protection.

OPERATIONS AND POLICY

USU is pursuing a transition towards a low-carbon campus through carbon accounting, renewable energy, **energy-efficient buildings** and smart energy management. The university has set a carbon-neutrality target for 2029, while its 2024 campus carbon footprint was reported at 734.29 tCO_2. USU also recorded 53.543 GJ of low-carbon energy use, supported by solar PV installations and real-time energy monitoring, positioning the campus as a living laboratory for climate-responsive technologies and practices.

SDG 14

LIFE BELOW WATER

Restoring the Seas: Collaborative Mangrove Restoration and Blue Economy Empowerment for Fisherfolk

241 publications

27.8 % internationally co-authored

32 Ongoing mangrove restoration and coastal protection projects

20,000 mangrove seedlings planted

67 Partner Countries

1,855 Citation

50,000 pieces of single-use plastics eliminated

15 tonnes plastic bottles recycled each year

RESEARCH AND INNOVATION

USU combines environmental DNA (eDNA), drones, water-quality analysis and biodiversity mapping to monitor coastal ecosystems non-destructively and support adaptive management.

Surveys in the Pini Island Marine Protected Area identified 7 mangrove species and 6 seagrass species. Seagrass cover ranged from 32.75% to 61.50%, while mean live coral cover was 38.35%.

A Belawan Estuary study recorded 26 mangrove species at an average density of 1,420 individuals per hectare. Overall condition was classified as good, but the ecosystem remains vulnerable to land conversion.

These findings inform stronger zoning, habitat restoration, periodic monitoring and evidence-based recommendations for protected-area management.

20,000 mangrove seedlings planted

LEARNING & STUDENTS

Restoration Through Partnerships, together with IKA-USU North Sumatra, government, businesses and communities, **USU planted 20,000 mangrove** seedlings in Beras Basah Village on 22 June 2024. The programme connected habitat recovery with education and coastal livelihood opportunities.

PUBLIC & COMMUNITY ENGAGEMENT

The seven programmes documented in the source file reached Lama-Paluh Kurau, Tapak Kuda, Pulau Sembilan, Kampung Nipah and Kuala Indah. Activities covered mangrove ecotourism, capacity building for village officials, biofertilisers, youth-made souvenirs, visitor waste management and Biocarno fertiliser made from marine organic waste.

Reported outcomes are qualitative: improved skills, stronger local institutions, greater participation in conservation and new community income opportunities.

OPERATIONS AND GOVERNANCE

Rector's Regulation No. 3/2019, the single-use plastic reduction policy, hazardous-waste management and wastewater treatment establish a source-to-sea approach that prevents pollutants from reaching rivers and coastal waters.

The Digital Learning Center wastewater system treats used water for sanitation and building maintenance. The Mangrove Centre of Excellence advances research, restoration, ecotourism and community support through an IDR 1.5 billion allocation.

Future reporting will prioritise mangrove survival rates and restored area, trends in water quality and biodiversity, the volume of marine waste prevented, and changes in community income so impact can be traced from outputs to long-term outcomes.



SDG 15

LIFE ON LAND

Preserving Sumatra's Forests, Driving Farmers' Economy in the Highlands

15 LIFE ON LAND

407 publications

23.8% internationally co-authored

613 Courses/modules covering sustainability and/or biodiversity

97 Partner Countries

2,521 Citation

56 Environmental rehabilitation and restoration programmes

RESEARCH AND INNOVATION

Universitas Sumatera Utara (USU) studies North Sumatra's forests and coasts, from sustainable forestry and mangrove restoration to protecting the Critically Endangered Tapanuli orangutan, with partners such as the Ministry of Environment and Forestry. It is co-implementing institution, with BRIN and Japanese partners, of the planned SATREPS blue carbon mangrove project (2027-2032), and its PUI Mangrove team works on blue carbon, biodiversity and environmental DNA. In 2025, USU researchers produced 129 scientific works with 212 citations, using drones to calculate carbon stocks and track illegal logging (Field Weighted Citation Impact, FWCI, 5.41). Studies in the Gunung Leuser National Park buffer zone (4.63) and the Pandumaan Sipituhuta Customary Forest (4.14) show that respecting indigenous rights makes local communities strong guardians of biodiversity. A 2025 review of the economic benefits and ecological risks of eucalyptus plantations scored 10.35, about ten times the global average.

LEARNING & STUDENTS

USU transforms North Sumatra's biodiversity into a living laboratory for student learning. Conservation practitioners, including **the Leuser Conservation Partnership**, bring practical experience on climate change, forestry governance, and biodiversity protection into the classroom. Students also participate in field-based learning in important ecosystems such as Batang Toru, home to the Tapanuli orangutan, and the **Toba Caldera Geopark**. Through biodiversity surveys, flora documentation, and environmental education activities with local schools, students connect academic knowledge with real conservation challenges while building awareness of the importance of protecting terrestrial ecosystems.

PUBLIC & COMMUNITY ENGAGEMENT

USU supports community-based land restoration by combining environmental conservation with local livelihoods. In 2025, farmers in Sitolu Bahal Village, Humbang Hasundutan, received assistance in establishing an agroforestry system combining **Arabica coffee and sugar palm**. The programme was designed to improve farmer income while supporting soil conservation and environmental sustainability, demonstrating how productive landscapes can strengthen both rural livelihoods and ecosystem resilience



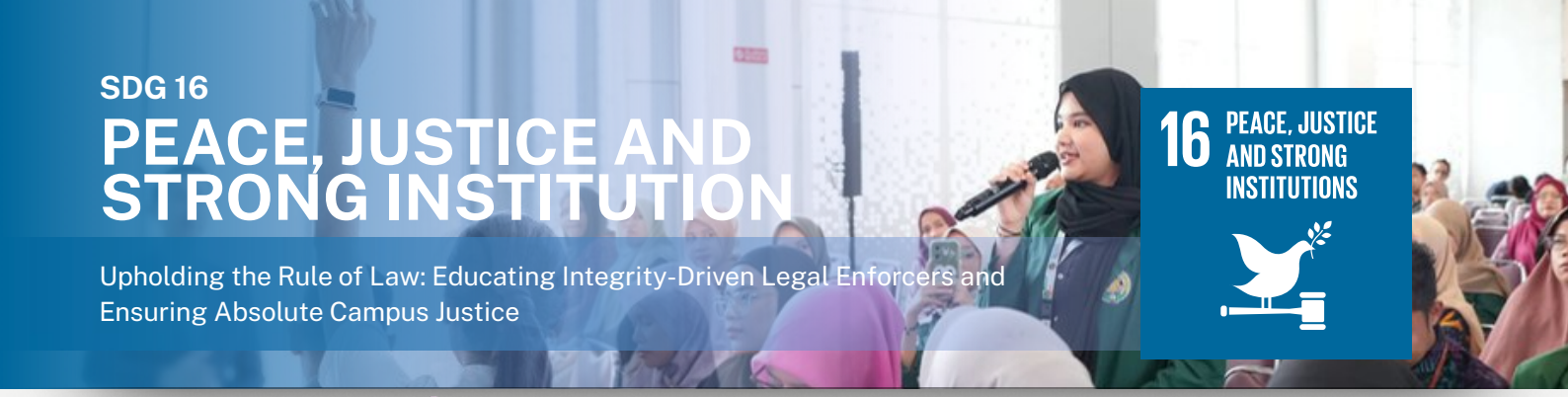
OPERATIONS AND GOVERNANCE

USU recorded 56 environmental rehabilitation and restoration programmes in 2025 across eight categories, the largest being 12 programmes on soil, water or air quality recovery. **The Bekala Campus arboretum**, the Biodiversity Park (Taman Kehati, developed with the Ministry of Environment and Forestry and industry partners) and a forest nursery are managed by the Faculty of Forestry as designated conservation and education zones within USU's Green Campus policy framework (Rector's Regulation No. 3 of 2019). Other initiatives include the USU Conservation Program for rare plants and food genetic resources, agroforestry development at Kwala Bekala, and the embung (retention pond).

SDG 16

PEACE, JUSTICE AND STRONG INSTITUTION

Upholding the Rule of Law: Educating Integrity-Driven Legal Enforcers and Ensuring Absolute Campus Justice



16 PEACE, JUSTICE AND STRONG INSTITUTIONS

332 publications



32.8% internationally co-authored

1,083 Graduates in Law & Law Enforcement

34 Partner Countries

2,058 Citation

100% Implementing Integrity Zone Reform

RESEARCH AND INNOVATION

USU positions legal studies, governance research, and human rights analysis as key drivers of evidence-based policy transformation. Between 2020 and 2025, USU researchers produced 332 Scopus-indexed publications (projected at 80 documents in 2025) accumulating 2,058 citations with a Field-Weighted Citation Impact (FWCI) of 1.28, exceeding the global citation benchmark by 28%.

International research collaboration accounts for 32.8% of total scholarly outputs across partner institutions in 34 countries. The real-world policy impact of this research is substantiated by 160 formal citations in governmental policy documents, legislative white papers, and academic drafts concerning agrarian conflicts, restorative justice, and digital cybercrime frameworks.

PUBLIC & COMMUNITY ENGAGEMENT

Universal access to justice is realized through the free services of the **Legal Consultation and Aid Institute (LKBH FH USU)**, which advocated 138 pro bono cases in 2025, bringing the total to 487 cases for vulnerable communities since 2021. LKBH continuously organizes the Law Training Series to standardize legal due diligence and the preparation of legal memoranda.

The academic community actively contributes regulatory expertise, leading teams for academic manuscripts of regional regulations, acting as expert witnesses in court proceedings, and facilitating neutral dialogue forums on cyber justice and AI together with the High Prosecutor's Office, High Court, and advocate associations.

More than **1,000** Graduates in Law & Law Enforcement

LEARNING & STUDENTS

Law enforcement education is delivered through the Faculty of Law, accredited as Excellent, which serves 2,605 active students across all levels (Bachelor's, Master's, Master of Notary, and Doctoral). In the 2024/2025 academic year, USU graduated 1,083 law graduates and postgraduates (733 Bachelor's, 325 Master's, 25 Doctoral) ready to strengthen the national justice system.

The Outcome-Based Education (OBE) curriculum integrates litigation skills, dispute mediation, anti-corruption ethics, digital criminal justice law, and restorative justice. Clinical learning is enriched through international-standard moot court facilities and direct student involvement in the analysis of public case files.

OPERATIONS AND GOVERNANCE

USU's operational governance is run based on the principles of transparency and accountability: **Rector's Decree** No. 418/UN5.1.R/SK/SDM/2024 on the Corruption Prevention Action Plan (RAPK), Rector's Regulation No. 7/2020 on the Whistleblower System (WBS), Rector's Regulations No. 8 & 9 of 2020 on Conflict of Interest and Gratification Control (UPGPP), as well as the implementation of the Integrity Zone (ZI-WBK) in 16 faculties (including the elimination of exam consumption).

A safe and violence-free campus space is enforced independently by the PPKS Task Force through Rector's Regulation No. 16 of 2025, with evidence of permanent dismissal (drop out) sanctions with zero tolerance for perpetrators of sexual violence.



SDG 17

PARTNERSHIPS FOR THE GOALS

Building Global Networks, Guiding National Policy, Delivering Local Impact

17 PARTNERSHIPS FOR THE GOALS

955 publications

30.05% internationally co-authored

$25,000 Grant for Global Health Innovation

319 Partner Countries

1,985 Citation

39.31 Highest Citation Impact

1,000 Scholarships from Philanthropic NGOs

RESEARCH AND INNOVATION

Universitas Sumatera Utara (USU) positions its research expertise as a vital instrument in national policy architecture. Throughout 2025, our disaster resilience experts from **the Puska PIMB Research Center** sat alongside the Ministry of National Development Planning (Bappenas) to formulate the strategic White Paper on Disaster-Resilient and Climate-Sustainable Development towards 2045. On the coastline, our research collaborated with the regional government of North Labuhanbatu to precisely quantify the economic cost of inaction resulting from 42 kilometers of coastal abrasion. This direct involvement in executive and legislative platforms demonstrates that USU's research transcends academic manuscripts, serving instead as the rational foundation for national regulation and disaster mitigation.

PUBLIC & COMMUNITY ENGAGEMENT

True partnerships must prove their impact on the most vulnerable groups. USU demonstrates the tangible reach of its collaborations through strategic partnerships with non-governmental organizations (NGOs) and philanthropy. Hand in hand with the reputable zakat and philanthropic institution **Dompet Dhuafa Waspada**, our medical experts pioneered rural health interventions to combat stunting through comprehensive nutritional frameworks. In the social justice sector, we spearheaded legal reforms alongside conservation NGOs (Green Justice Indonesia and the Orangutan Information Centre) to advocate for indigenous community livelihoods through non-timber forest product utilization, while ensuring that conservation advocacy in the Batang Toru Ecosystem remains participatory.

$25K
Grant for Global Health Innovation

LEARNING & STUDENTS

Global health challenges demand cross-border data-sharing competencies. USU shatters academic isolation by integrating its academic community into international health networks. We are an active member of regional biological security and pathogen data-gathering consortia, namely the Asia Pathogen Genomics Initiative (Asia PGI) and the PREPARE Network. Alongside research institutions from six Southeast Asian countries, USU medical experts and laboratory technicians underwent intensive training in Singapore to translate genomic sequencing data into epidemiological early-warning systems (genomic surveillance). This initiative ensures that the clinical practices and research capabilities of our students and researchers are directly connected to Asia-Pacific health defense protocols.

OPERATIONS AND GOVERNANCE

Operationally, the USU campus functions as a neutral space, a catalyst, and an epicenter for cross-sector dialogues. We convene policymakers, industry leaders, and NGOs at the same table to break through sectoral gridlocks. This year, the USU SDGs Center brought together the Indonesian Chamber of Commerce and Industry (KADIN) and leading think tank CSIS Indonesia to formulate sustainable trade and investment trajectories in response to global green export pressures under the EU Deforestation Regulation (EUDR). On the legislative front, our campus facilities hosted high-level expert dialogues with the Deputy Minister of Home Affairs to deliberate on electoral law reform, reinforcing our institutional operations as a dedicated hub for shaping a peaceful and inclusive sustainable future.

Universitas Sumatera Utara

The Era of Ultimate Excellence

Universitas Sumatera Utara support the Sustainable Development Goals



usu.ac.id | official.usu